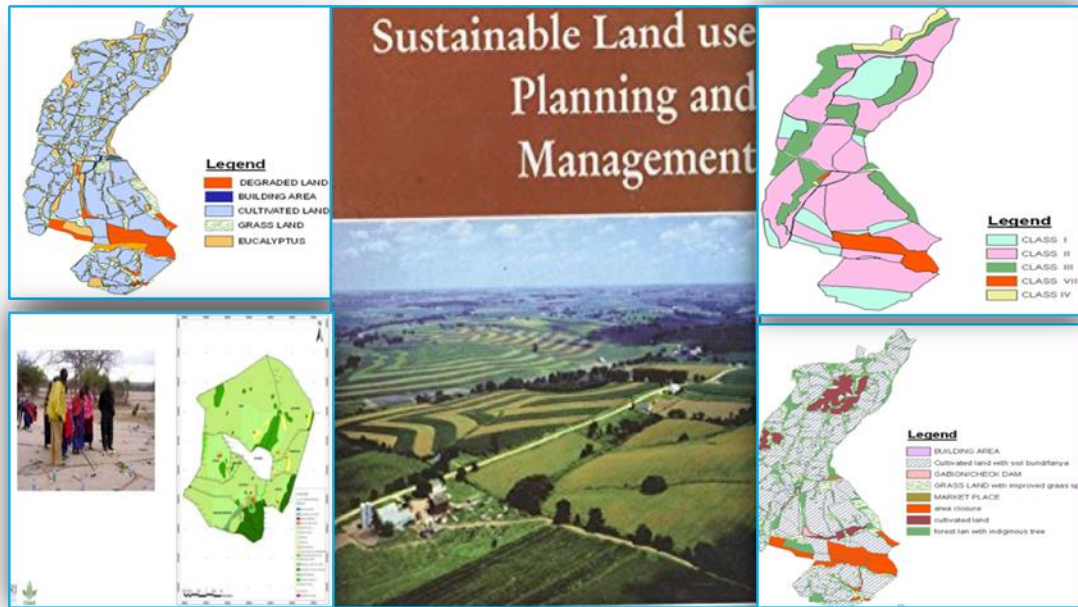


Rural Land Administration

Level – III

**Based on March 2022, Version- II Occupational
Standard**



Module Title: - Land Use Plan

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Introduction to the Module

This unit of competence covers knowledge, skill and attitude required to collect land related information, problem identification, designing alternative solutions, decision making ways and preparing land use planning in accordance with national land use policies and strategies.

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LG #42

LO #1- Framework for Land Use Plan

Instruction sheet 1

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Basic concepts of land use plan
- Functions of land use plan in land administration
- Roles of land use planning
- Principle, goals and focus of LUP
- Planning elements and useful tools
- Levels of land use plan
- Fields of Land Use Plan application
- Stakeholders in land use planning
- Element of land use planning
- Types of land use plan

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Discuss basic concepts of land use plan
- Discuss functions of land use plan in land administration
- Identify Roles of land use planning
- Identify stakeholder of land use plan
- Identify Principles, goals and focus of LUP
- Discuss Planning elements and useful tools
- Identify Levels of land use plan
- Discuss elements of land use plan
- Discuss fields of Land Use Plan application
- Describe Types of land use plan

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks

Information Sheet 1

1.1 Basic concepts of land use plan

Land use refers to the use of the land for different purposes to produce goods and services, crop, timber, animals, sewerage, road, settlement, schools, hospitals, wildlife and recreation, etc.

- **Land use** = land cover + the actions of people in their environment.

Land cover, on the other hand, refers to the physical and biological characteristics of the land surface, such as vegetation, water bodies, bare soil, or built-up areas. It describes the natural or artificial features that cover the land, regardless of whether they are the result of human activity or not.

Land unit refers to a homogenous area of land with similar characteristics and qualities that are used for a specific purpose or set of purposes. Land units are often classified based on characteristics such as slope, soil type, vegetation cover, and land use history. For example, in agriculture, land units may be classified based on the suitability for different crops. In forestry, land units may be classified based on tree species and age class. In urban planning and development, land units may be defined based on factors such as zoning regulations and infrastructure accessibility. Land units are important in land use planning because they help to identify the unique characteristics and potential uses of different pieces of land within a larger area. This information can be used to inform decisions about the most appropriate and sustainable uses of land, ensure efficient use of resources, and support the protection and preservation of natural habitats and biodiversity.

Land-use planning has been defined as "the systematic assessment of land and water potential alternative patterns of land use and other physical, social and economic conditions, for the purpose of selecting and adopting land-use options which are most beneficial to land users without degrading the resources or the environment together with the selection of measures most likely to encourage such land uses".

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. Decisions on options of land uses are always made based on analysis of potentials and constraints of the land resources

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guided by the needs of the communities, the government development policies and laws of land uses and land resources management and conservation.

Participatory land use planning (PLUP) refers an approach to land use planning that actively involves stakeholders and community members in the planning process. This approach recognizes that those who live and work in a particular area typically have important knowledge and insights about the land, resources, and needs of the community, and that their participation is essential to developing effective and sustainable land use plans.

Conventional Land Use Planning refers Conventional land use planning refers to the process of identifying and managing the use of land in a particular area in order to achieve specific goals and objectives. This process typically involves assessing the current and future needs of the community and developing plans and policies to guide the use of land in a way that meets those needs while also protecting natural resources and promoting sustainable development.

The goal of conventional land use planning is to ensure that land is used in a way that promotes economic growth, environmental sustainability, and social equity, while minimizing negative impacts on the environment and community. However, critics argue that conventional land use planning can be slow, bureaucratic, and inflexible, and may not always reflect the needs and desires of the community.

Integrated local level land use planning (ILLUP) refers the development of comprehensive policies and strategies that promote sustainable and equitable land use within a specific area. The plan should prioritize community participation and engagement, data collection, and ongoing monitoring and evaluation. In order to develop an effective land use plan, there are several key steps that must be taken.

The Purpose of land use planning is to select and put into practice those land uses that will best meet the ideas 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.

Driving force of land use plan is the driving force of land use planning is to ensure that land is used in the most efficient and effective way possible. This includes ensuring that land is used for

the right purposes, such as agriculture, housing, or commercial development, and that it is used in a way that is sustainable and environmentally friendly.

1.2 Functions of land use plan in land administration

The land use plan plays an important role in land administration by providing a framework for land use decision-making. Land use plan plays a critical role in land administration by providing a structured and coordinated approach to land use decision-making that is consistent with the goals and objectives of the plan. Some of the key functions of the land use plan in land administration include:

- **Establishing land use policies and objectives:** The land use plan sets out the policies and objectives that guide land use decisions. These policies may include zoning regulations, environmental protection measures, and economic development strategies.
- **Providing a basis for decision-making:** The land use plan provides a basis for land use decisions, ensuring that decisions are made in a structured and predictable way that is consistent with the goals and objectives of the plan.
- **Facilitating coordination and collaboration:** The land use plan facilitates coordination and collaboration between different agencies and stakeholders involved in land administration. This helps to ensure that land use decisions are made in a holistic and coordinated manner.
- **Supporting land valuation:** The land use plan can support land valuation by providing information about the intended use of the land and the context in which it is located. This is important for ensuring that land is valued appropriately for taxation or compensation purposes.
- **Guiding land acquisition and disposal:** The land use plan provides guidance on the acquisition and disposal of land for public purposes. This helps to ensure that land is acquired and disposed of in a way that is consistent with the goals and objectives of the plan.
- **Providing a basis for monitoring and evaluation:** The land use plan provides a basis for monitoring and evaluating land use decisions to ensure that they are consistent with

the goals and objectives of the plan. This helps to ensure that the plan remains relevant and effective over time.

1.3 Roles of land use planning

The roles of land use planning are many, and they can vary depending on the specific context and goals of the planning process. Here are some common roles of land use planning:

- **Guiding development:** Land use planning can guide the location and intensity of development, ensuring that development occurs in a way that is compatible with the natural environment and the needs of the community.
- **Promoting sustainability:** Land use planning can promote sustainable development, balancing economic, social, and environmental goals to ensure that development takes place in a way that is both equitable and environmentally responsible.
- **Protecting natural resources:** Land use planning can help to protect natural resources such as water, air, and wildlife habitats by identifying areas that should be conserved or protected from development.
- **Improving quality of life:** Land use planning can improve the quality of life for residents by promoting access to amenities such as parks, green spaces, and community services.
- **Enhancing economic development:** Land use planning can enhance economic development by promoting the location of businesses and industries in areas that are well-suited for their needs and by providing the necessary infrastructure and services to support economic growth.
- **Addressing social equity:** Land use planning can address social equity issues by promoting access to affordable housing, transportation, and community services for all residents, regardless of income or background.

1.4 Principles, goals and focus of land use plan

1.4.1 Principles

Land use planning should be based on certain guiding principles that guarantee the attainment of land use objectives. Effort should be exerted in order to respect such land use planning principles

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which otherwise the end results of land use planning will be challenged. The specific elements of principles by which land use planning should be guided include:

- Aiming at sustainability of balancing social, economic and environmental needs. A land use plan should be socially accepted, economically viable and environmentally sustainable;
- Resulting in a legally binding land use plan and/or legally binding land use rules. Formal recognition of the land use plan or land use rules is crucial for its implementation;
- It is a dialogue. A central part of any land use planning is the initialization of a communication process that allows all stakeholders to express their interests and enables them to agree on future land uses that respect all positions in a fair and adequate way;
- It is an all-inclusive process. This requires that all stakeholder groups are represented.
- It is based on stakeholder differentiation and gender sensitivity. To identify all relevant stakeholders, a gender differentiated analysis of all actors should be done in advance;
- It is realistic and oriented to local conditions. Content and methods of a land use planning have to fit the technical, economic and organizational capacities of the local population as well as administration;
- It is based on a “light” methodology avoiding unnecessary data collection;
- It considers and uses local knowledge. Rural societies or groups often possess a complex enormous autochthonous knowledge of their natural environment. They can contribute valuable information and should, therefore, be mobilized during land use planning;
- It takes into account traditional strategies for solving problems and conflicts. Traditional rural societies have their own way of approaching problems and settling conflicts concerning land use;
- It integrates bottom-up aspects with top-down aspects (“vertical integration”). Land use planning needs to combine local needs and interests with provisions made by higher levels;
- It is based on inter-disciplinary cooperation and requires sectoral coordination (“horizontal integration”). This generally requires support in institution building and improving cooperation between different sector ministries/agencies;

- It requires transparency. If there is no transparency, some people could be deprived of their rights and/or that future land use will not be sustainable;
- Land use planning is an iterative process. Land use planning is more than the preparation of a planning document; it is an iterative process. New developments and findings are specifically observed and incorporated into the planning process. It may lead to the revision of decisions and the repetition of steps already taken;
- Land use planning is implementation oriented. It does not end with the land use plan. The implementation of limited measures right at the beginning of the process or parallel to it plays an important role in establishing villagers' confidence in the planning process;
- Land use planning is linked to financial planning. This is crucial for implementation. Unless proportionately budgeted financial resource is earmarked by concerned bodies, land use planning can be halted.

Generally, local level land use planning should follow participatory, integrated, and interactive process.

1.4.2 Goals of land use plan

The goals of Land Use Planning is to make efficient and productive use of the Land in equally and socially acceptable manner which meets the needs of the present while, at the same time, conserving resources for future generation.

1.4.3 Focus of land use plan

A land use plan is a document that outlines how land within a particular area will be utilized and developed over a specified period. The focus of a land use plan may vary depending on the specific goals and objectives of the plan, as well as the needs and priorities of the community or organization that is developing it. In general, however, the main focus of a land use plan is to provide a framework for guiding future land use decisions in a way that promotes sustainable development and balances the competing demands for land.

1.5 Planning elements and useful tools

- **Planning elements may include:**

- ✓ **Plan Formulation:** Plan formulation involves the development of a vision and goals for the study area, as well as identification of the key issues and challenges that need to be addressed through land use planning. This stage also involves the identification of stakeholders and the development of a stakeholder engagement plan;
- ✓ **Negotiation and Decision-making:** This element involves the negotiation and consensus-building process among stakeholders, including community members, landowners, government agencies, and other interested parties. This stage also involves the development of land use policies and regulations, and the establishment of decision-making criteria and processes;
- ✓ **Data Collection and Analysis:** Data collection and analysis involve the gathering of information about the study area, including environmental, social, economic, and cultural data. This stage also involves the analysis and interpretation of data to identify patterns and trends, and to inform decision-making;
- ✓ **Preparation:** Plan preparation involves the development of a land use plan that outlines the recommended land use patterns for the study area. This stage also involves the development of strategies and actions to achieve the goals and objectives of the plan;
- ✓ **Implementation:** Implementation involves the actual implementation of the land use plan, including the adoption of land use policies and regulations, and the implementation of land use strategies and actions outlined in the plan. This stage also involves the allocation of resources and the coordination of efforts among stakeholders;
- ✓ **Monitoring and Updating:** Monitoring and updating involve the ongoing evaluation of the effectiveness of the land use plan and its implementation. This stage also involves the identification of new issues or challenges that may arise, and the adaptation of the plan to address these issues.

- **Planning tools may include:**

Planning tools can vary depending on the specific needs and goals of a particular planning effort, but here are some common examples:

- **SWOT Analysis:** SWOT analysis is a tool that helps planners identify the Strengths, Weaknesses, Opportunities, and Threats associated with a particular planning effort. This can help planners develop strategies that take advantage of strengths, mitigate weaknesses, capitalize on opportunities, and address threats.
- **Scenario Planning:** Scenario planning involves creating and analyzing different hypothetical scenarios to evaluate the potential impacts of different planning decisions. This can help planners anticipate future trends, identify potential risks and opportunities, and make more informed decisions.
- **Cost-Benefit Analysis:** Cost-benefit analysis is a tool that helps planners evaluate the costs and benefits associated with different planning decisions. This can help planners make more informed decisions by weighing the potential benefits of a particular policy or project against its costs.
- **Community Engagement Tools:** Community engagement tools are designed to facilitate meaningful engagement with community members and stakeholders. These tools can include public meetings, focus groups, surveys, and online engagement platforms.
- **GIS and Remote Sensing Tools:** Geographic Information Systems (GIS) and Remote Sensing tools can help planners visualize spatial data, such as land use patterns, demographic data, and environmental data. This can help planners identify spatial patterns, assess potential impacts, and make more informed decisions.

1.6 Levels of Land Use Planning

The most known levels of land use planning are Federal, Regional, Zonal, Woreda, and Grassroots (Kebele) levels. Different kinds of decisions are taken at each level where the methods of planning and kinds of plans also differ. However, at each level there is a need for a

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defined policy and working system concerning land use planning, implementation, and monitoring and evaluation.

I. Federal

The Federal responsible body for land use planning will be the coordinating institution of the Integrated Local Level Participatory Land Use Plan. This ministerial organ is responsible for:

- Provide policy & strategic guidelines in relation to land use;
- Gathering national LLPLUP data, analyzing, and dissemination of information;
- Resource mobilization to support regions;
- Coordinating matters related to land use planning such as informing and distributing availability of latest spatial data sets (e.g. air photos, satellite imageries, orthophoto, topo maps, etc.) to Regions;
- Delivering training of trainers (ToT) to Regions to be cascaded down to Kebele level;
- Organizing workshops to create experience sharing forums for Regions;
- Assist Regions while executing purchase of required technologies for land use planning;
- Doing action-research;
- Give direction and emphasis to Regions when international and national situations change;
- Support Regions in the areas of identified gaps or when it is requested; and
- Follow up land use planning and implementation of plans, and update Manual.

II. Regional

The Regional responsible body for land use planning technically reporting to Federal Land Use Planning body will be the Regional coordinating organ of Integrated Local Level Participatory Land Use Plan process. This Regional body for land use planning is responsible for:

- Provide policy & strategic guidelines in relation to land use;
- Gathering regional LLPLUP data, analyzing, and dissemination of information;
- Coordinating matters related to land use planning such as informing and distributing availability of latest spatial data sets (e.g. air photos, satellite imageries, ortho photo, topo maps, etc.) and preparing specific technical procedures;
- Delivering ToT to Zones and Woredas to be cascaded down to Kebele level;

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- Organizing workshops to create experience sharing forums for Woredas;
- Assist Woredas in the formation of Land Use Planning Teams;
- Assist Woredas while executing purchase of required technologies for land use planning;
- Assist in the allocation of budget for Woredas when necessary;
- Support Woredas in the areas of identified gaps or when they request;
- Give direction and emphasis to Woredas when national interest changes; and
- Follow up land use planning and implementation of plans, and update Manual.

Though regions can have variations in their institutional arrangements, there is one responsible body for land use planning.

III. Zonal

In Regions where Zonal arrangements are mandated for land use planning roles, rooms should be opened for them so that they can add value for land use planning and implementation. At least, they can assist building the capacity of Woreda responsible bodies for land use planning and establish a linkage bond between Regions and Woredas. Here it is emphasized that flexibility is very important for issues related to Integrated Local Level Participatory Land Use Plan and, therefore, Regions can make use of their relevant Zonal structure potential.

IV. Woreda

The Woreda responsible body for land use planning will be the coordinating organ of Woreda Integrated Local Level Participatory Land Use Plan Team. This Woreda body for land use planning is responsible for:

- Identifying Woreda stakeholders for land use planning;
- Rendering overall facilitation to Kebele Land Use Planning Teams along the process of land use planning;
- Developing selection criteria to prioritize Kebeles and micro-watersheds;
- Organizing ToT to Kebeles to be cascaded down to micro-watershed levels;
- Organizing workshops to create experience sharing forums for Kebeles;
- Assisting Kebeles in the formation of Land Use Planning Teams;
- Facilitating Objective Oriented Land Use Planning (OOPP) and SWOT (Strength, Weakness, Opportunity, and Threat) Analysis workshop and assist the preliminary

- identification of land use problems and objective setting;
- Allocating budget for Kebeles for planning and implementation;
- Overseeing and solving any problems that arise between two or more Kebeles /micro watersheds;
- Reviewing and commenting Kebele land use plans and giving technical cosmetics;
- Merging Kebele land use plans and develop consolidated Woreda land development plan;
- Supporting Kebeles in the areas of identified gaps or when they are requested;
- Following up implementation of plans and give feedback to the Region for the update of the manual; and generally they are part of the Kebele Integrated Local Level Participatory Land Use Plan Team.

Members will have the possibility to ensure taking care of their sectoral interests. From expertise point of view, the team can include as much as possible from the following professions:

- Land Use planning expert (Team Leader)
- Soil Conservation / Soil Survey Expert
- Forestry Expert
- Agronomist
- Livestock Expert
- Agriculturalist
- Water Harvesting /Irrigation Expert
- Land Evaluator
- Economist/Socio-economist/Agro economist
- Cooperative/Marketing and Inputs Expert
- Rural Road Construction Expert/Infrastructure expert
- Environmentalist
- Ecologist
- GIS and Remote Sensing /Surveyor, and
- Woreda Level Rural Kebele center related expert

V. Kebele

The Kebele responsible body for land use planning will be the coordinating organ of Kebele Integrated Local Level Participatory Land Use Plan Team. Kebele Integrated Local Level Participatory Land Use Plan Team is responsible for:

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- Identifying Kebele stakeholders for land use planning;
- Mobilizing communities to participate in the prioritization of localities for land use planning;
- Training delivery to participating Kebele or micro-watershed communities;
- Organizing workshops to create experience sharing forums for different locality communities;
- Supporting Micro-watershed Teams, if there are any, in the areas of identified gaps or when they are requested; and
- Develop land use plans with community or assist locality communities in the study and planning.

The Kebele Integrated Local Level Participatory Land Use Plan Team members shall be flexibly drawn from:

- Kebele Manager
- Religious heads of the Kebele
- One male and female representatives from each micro-watershed
- Representative of the youth
- Chairperson of the Land
- Administration Committee
- Chairman of cooperative
- Chairman of water management/users committee
- Chairman of forest management committee
- Chairperson of women's association
- One community elder
- Principal of school
- Head of health post
- Rural road representative, and
- DA coordinator

1.7 Fields of Land Use Plan application

Land use plans can be applied in various fields, depending on the specific context and goals of the planning process. Here are some common fields of land use plan application:

- **Urban planning:** Land use plans are commonly used in urban planning to guide the location and intensity of development, ensure that development is compatible with the natural environment, and promote sustainable, livable communities.

- **Rural development:** Land use plans can be applied in rural areas to guide the location and intensity of agricultural, forestry, and other rural land uses, while also ensuring that natural resources are protected and rural communities are sustainable.
- **Environmental planning:** Land use plans can be used in environmental planning to identify areas that should be conserved or protected from development, such as wetlands, wildlife habitats, and areas with high ecological value.
- **Transportation planning:** Land use plans can be used in transportation planning to guide the location and design of transportation infrastructure, such as roads, highways, and public transit systems.
- **Economic development:** Land use plans can be used to guide economic development efforts and promote the location of businesses and industries in areas that are well-suited for their needs.
- **Disaster risk reduction:** Land use plans can be used in disaster risk reduction efforts to identify areas that are prone to natural hazards such as floods, landslides, and earthquakes, and to guide land use decisions to reduce the risk of disasters;
- **Health planning:** Land use planning is applied in the field of health planning to promote healthy living environments and to minimize the impact of environmental factors on public health. This can include developing plans for parks and recreation areas, and designing buildings to promote physical activity;
- **Heritage preservation:** Land use planning is applied in the field of heritage preservation to protect historic and cultural resources and to promote cultural tourism. This can include developing plans for historic districts, and designing buildings to be compatible with historic architecture.
- **Water resource management:** Land use planning is applied in the field of water resource management to manage water resources and to minimize the impact of land use activities on water quality and quantity. This can include developing plans for watershed management, and designing buildings and infrastructure to reduce storm water runoff.

1.8 Stakeholders in land use planning

Stakeholders include primary, secondary and occasional users of land, as well as decision makers. They could be farmers, herders, nomadic pastoralists, firewood collectors, commercial

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companies, dam builders, local government departments, elected officials national government, cooperatives, unions, non-timber forest product collectors, conservation organizations, NGOs, etc. By considering all the different groups of land users, the different social groups should be included by default and should include women, men, young people, the elderly – but this should be checked. It can be more socially acceptable to include usually marginalized groups because they are land users rather than because they are of a particularly marginalized group, e.g. women, young people or pastoralists. Stakeholders are also individuals, groups, or organizations that have an interest or stake in the outcome of the land use planning process. Identifying and engaging stakeholders is an important part of the land use planning process, as stakeholder input can help to ensure that the plan reflects the needs and priorities of the community.

Responsibilities of local communities in land use plan preparation:

Local communities play a critical role in land use plan preparation. They have unique knowledge and perspectives about the local environment, culture, and economy, and can help ensure that land use plans are informed by local needs and priorities. The responsibilities of local communities in land use plan preparation can include:

- **Participating in Public Meetings:** Local communities should participate in public meetings and other forums where land use plans are discussed. This can help ensure that their voices are heard and that they have an opportunity to provide feedback and ask questions;
- **Providing Input:** Local communities should provide input on the land use planning process, including their concerns, priorities, and preferences. This input can help inform the development of land use plans that reflect the needs and interests of the community;
- **Reviewing and Commenting on Draft Plans:** Local communities should review and comment on draft land use plans. This can help ensure that the plans reflect the community's needs and priorities and that any concerns or issues are addressed;
- **Identifying Community Assets and Needs:** Local communities should identify community assets and show on community map and needs that could inform land use planning. This could include natural resources, cultural heritage, economic opportunities, and social infrastructure;

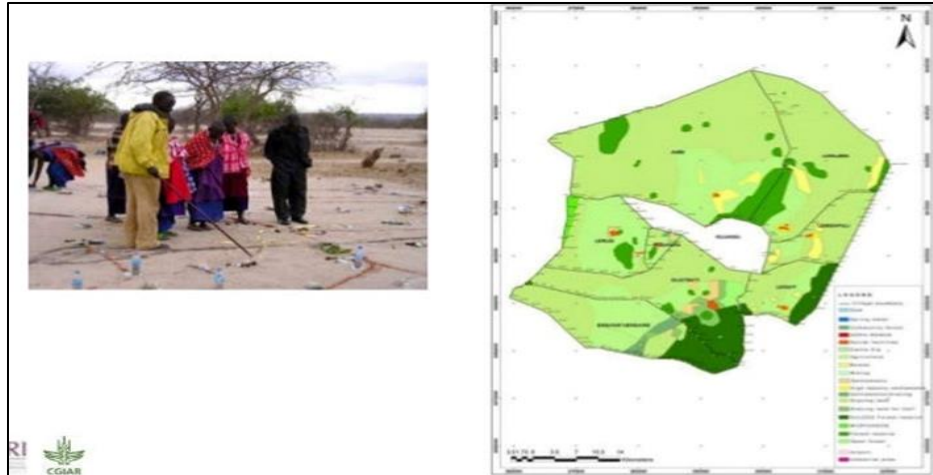


Figure 1.1. Community map

- **Supporting Implementation:** Local communities should support the implementation of land use plans by advocating for their adoption and working to ensure that the plans are effectively implemented.
- **Monitoring and Evaluating:** Local communities should monitor and evaluate the impact of land use plans over time. This can help identify any issues or challenges that arise and inform future revisions or updates to the plans.
- **Building Capacity:** Local communities should work to build their own capacity to participate effectively in land use planning processes. This could include developing skills in areas such as research, analysis, and advocacy, as well as building relationships with other stakeholders;
- **Building Partnerships:** Local communities should build partnerships with other stakeholders, including government agencies, NGOs, and private sector organizations, to ensure that land use plans reflect a range of perspectives and are supported by a broad base of stakeholders.

By fulfilling their responsibilities, local communities can help to create more inclusive and effective land use plans that benefit everyone in the community. It is important for local communities to be engaged throughout the land use planning process to ensure that plans reflect local needs and priorities, and that they are effectively implemented over time.

1.9 Element of land use planning

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Land use planning typically involves several key elements, which vary depending on the specific context and goals of the planning process. Land use planning is a complex process that involves a variety of elements, each of which is important for ensuring that land use decisions are made in a structured and coordinated manner that is consistent with the goals and objectives of the plan. Here are some common elements of land use planning:

- **Land use analysis:** Land use analysis involves the collection and analysis of data on existing land uses, natural resources, demographics, and other factors that influence land use decisions,
- **Goals and objectives:** The goals and objectives of the land use plan are established based on the analysis of existing conditions and the needs and priorities of the community,
- **Land use policies and regulations:** Land use policies and regulations are developed to guide land use decisions and ensure that they are consistent with the goals and objectives of the plan. These policies may include zoning regulations, environmental protection measures, and economic development strategies,
- **Implementation strategies:** Implementation strategies are developed to ensure that the goals and objectives of the plan are achieved. These strategies may include specific actions, such as the development of new infrastructure or the adoption of new policies and regulations,
- **Monitoring and evaluation:** Monitoring and evaluation of the land use plan is conducted to ensure that it remains relevant and effective over time. This involves tracking progress towards achieving the goals and objectives of the plan and making adjustments when necessary,
- **Public participation:** Public participation is a key element of land use planning, as it provides an opportunity for community members to provide input and feedback on the plan. This helps to ensure that the plan reflects the needs and priorities of the community.

1.10 Types of land use plan

There are several types of land use plans, each with a specific focus and scope. The type of land use plan used will depend on the specific context and goals of the planning process. Here are some common types of land use plans:

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Table 1.1. Types of land use plan

Aspects	Conventional LUP	PLUP
Working level	National, Regional, Zonal, Woreda, and Kebele	Local level (village, community, micro-watershed, Kebele)
Main Actors	Regional and district line experts, regional and district administrators	Community, people, local officials, local experts and other stakeholders
Main Focus	Identification of optimal land use areas through land suitability classifications and enforcement of the same by means of incentive or legal directives	Preparation of sustainable land use plans based on the will and interests of the people, implementation of the same by the people and managing the land resources for optimal use and equitable land use
Main Criteria	Technical parameters such as temperature regime, soil depth, soil fertility, slope, socio economic factors etc.	Peoples' needs, priorities, government policies and guideline coupled with quick know-how of the resources
Land Tenure	Not relevant	Considered as crucial issue, need for clear ownership or use right, changes for land tenure right are specified
Implementation	Implemented within a fixed time limit as done for studies	Implemented as process with a sequence of steps according to a village/land users pace and time and resources availability
Main Objective	To make best use of land resources as per the objective criteria	Strengthening local level stakeholders' capacities in managing their resources in a sustainable way

Self-check 1	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Choose the correct answer

A. From the following one is not correct about principles of land use planning

A. It is not a dialogue B. It is all-inclusive process C. It requires transparency D. All

B. From the following one is not levels of land use planning

A. Federal level B. Regional level C. Woreda level D None

Test II: Short Answer Questions

1. List and explain Land use types

2. Discuss the concepts of land-use planning

3. Discuss Fields of Land Use Plan application

LG #43	LO #2- Land Information
Instruction sheet 2	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Identification of Tools and equipment • Land and related information • Present and future needs • Map development and reading • Bio-physical and socio-economic data • Potential land capability differentiation • Procedures for limiting factor(s) identification • Occupational health and safety <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • Select and identify tool/equipment and material • Survey land and related information • Evaluate and asses present and future needs • Develop Map and read • Collect, organize and analysis Bio-physical and socio-economic data • Conduct Potential land capability differentiation • Discuss the procedures for limiting factor(s) identification • Discuss occupational health and safety in LUP 	
Learning Instructions:	
<ol style="list-style-type: none"> 1. Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3. Read the information written in the information Sheets 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test” 	

Information sheet 2

2.1 Identification of Tools and equipment

Land information refers to data and information about the physical, legal, and economic characteristics of land, which is used to inform land use planning and management decisions. Land information includes information about the physical features of the land, such as its topography, soil types, and vegetation, as well as information about land ownership, land use patterns, and zoning regulations. Land information is typically collected through a variety of methods, including field surveys, remote sensing, and data analysis. This information is then organized, stored, and analyzed using geographic information systems (GIS) and other tools to create maps and other visualizations of the land. Land information is important for a wide range of land use planning and management activities, including urban and rural planning, natural resource management, environmental protection, and disaster risk reduction.

Some of tools and equipment used to collect land information may include:

- Line level,
- String,
- Graduated staff,
- Clinometers,
- Measuring tape,
- Ranging pole,
- Pegs,
- Compass,
- GPS/GNSS,
- Table,
- Computer ,
- Automatic level and
- Stereoscope.

The materials used to collect land information vary depending on the type of land information you are looking for. For fieldwork, the materials used include equipment such as

Some of materials used to collect land information may include:

- Aerial photographs,
- Top maps,
- Clip board,
- Notebook and
- Drawing material

2.2 Land and related information

Land and related information refers to data and knowledge about the land and its characteristics, which is used in land use planning and decision-making. This information can be gathered through a variety of methods, including field observations, data collection tools, and existing records and databases. To collect land and land related information, base map will be prepared at the beginning of the land use planning process. The base map is a foundational map that provides information about the physical and environmental characteristics of the study area.

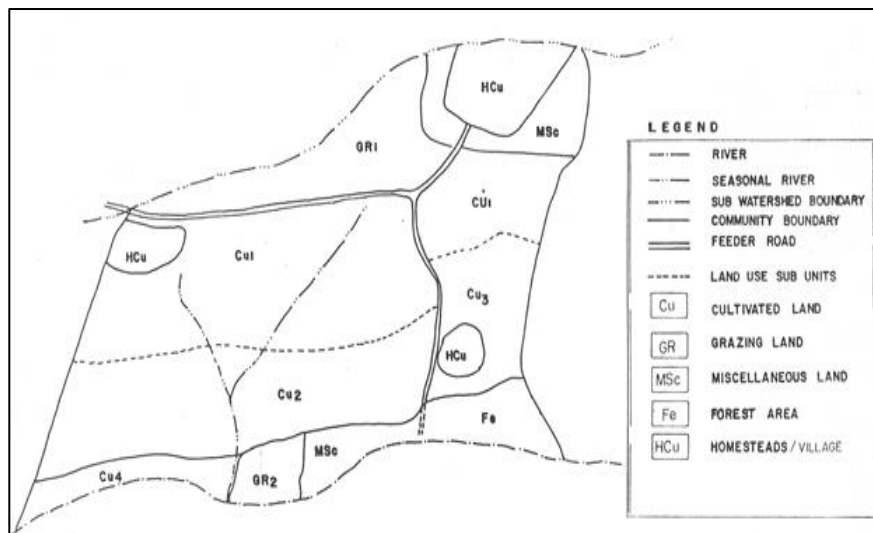


Figure 2.1. Base map of the plan area

Here are some common types of land and related information:

- **Physical features:** Physical features of the land, such as topography, soil types, and geology, can provide important information about the suitability of the land for different uses,
- **Land use patterns:** Information on existing land use patterns can help to identify areas of high importance for conservation or development, and can inform land use decision-making,
- **Environmental conditions:** Environmental conditions, such as water quality, air quality, and natural habitats, can provide important information about the health and sustainability of the land,
- **Property ownership and boundaries:** Information on property ownership and boundaries is important for ensuring that land use decisions are made in a legal and

transparent manner,

- **Demographic data:** Demographic data, such as population density and income levels, can provide important information about the needs and priorities of the community,
- **Legal and regulatory documents:** Legal and regulatory documents, such as zoning ordinances and environmental regulations, can provide information on the legal framework for land use decisions in the area covered by the plan.

Procedures to identify land information:

The procedures to identify land information depend on the specific context and the purpose of the information. These procedures can be used to identify land information that is relevant and useful for land use planning and management. By using a combination of sources, methods, and tools, planners and land managers can gather accurate and detailed data on land features, natural resources, and other factors that are important for sustainable and equitable land use planning and management. However, here are some common procedures that can be used to identify land information:

- **Define the Objectives:** The first step in identifying land information is to define the objectives of the information. This involves identifying the specific questions or issues that need to be addressed, and the types of information that are required to address them;
- **Identify Available Sources of Information:** The next step is to identify the available sources of information. This can include maps, aerial photographs, government records, surveys, and other relevant sources of data;
- **Conduct Field Surveys:** Field surveys can be conducted to collect new information on the land. This can involve measuring land features, such as topography and soil type, water for analysis and collecting all samples of land information;
- **Analyze Data:** Once the information has been collected, it can be analyzed to identify patterns and relationships that are relevant to the objectives of the information. This can involve using statistical methods, geographic information systems (GIS), and other analytical tools;
- **Interpret Results:** The results of the analysis can be interpreted to identify key findings and insights. This can involve summarizing the data in tables, charts, and

maps, and presenting the information in a way that is understandable and useful for decision-making;

- **Validate Information:** It is important to validate the information to ensure its accuracy and reliability. This can involve comparing the information with other sources of data, conducting additional field surveys or analyses, and consulting with experts;
- **Document Information:** The information should be documented in a clear and organized manner to ensure that it can be easily understood and used by others. This can involve creating community maps, reports, and other visualizations that summarize the information.

2.3 Present and future needs

The present and future needs of land vary depending on the location, population, and economic activities of a particular area, as well as social, environmental, and cultural factors. The present and future needs of land are shaped by a complex interplay of multiple factors, and effective land use planning and management are essential to ensure that these needs are met in a sustainable and equitable manner.

Here are some examples of present and future land needs:

- **Residential land:** The need for residential land is driven by the demand for housing, which is influenced by factors such as population growth, household size, income, and lifestyle preferences. In many urban areas, there is a growing need for affordable housing, as well as housing that is accessible, energy-efficient, and designed to meet the needs of diverse populations,
- **Commercial and industrial land:** The need for commercial and industrial land is driven by the demand for goods and services, as well as the need for employment opportunities. In many areas, there is a growing demand for mixed-use development that combines commercial and residential uses, as well as for sustainable and innovative economic activities that support local communities,
- **Agricultural land:** The need for agricultural land is driven by the demand for food, fiber, and fuel, as well as the need to support rural livelihoods and promote sustainable land use practices. In some areas, there is a growing need for diversified and resilient

agricultural systems that can adapt to climate change, as well as for policies and programs that support small-scale and family farming,

- **Natural and recreational land:** The need for natural and recreational land is driven by the desire for open space, biodiversity conservation, and recreational activities such as hiking, camping, and wildlife watching. In many areas, there is a growing need for green infrastructure that can provide multiple benefits, such as flood control, air and water quality improvement, and carbon sequestration,
- **Infrastructure and transportation land:** The need for infrastructure and transportation land is driven by the need to support economic activities, social services, and mobility. In many areas, there is a growing need for sustainable and resilient infrastructure that can withstand natural and man-made hazards, as well as for transportation systems that are accessible, safe, and efficient.

2.4 Map development and reading

Map development and reading are important skills in land use planning, as maps are a key tool for understanding the physical and social characteristics of an area and identifying opportunities and constraints for land use. Here are some key concepts related to map development and reading:

- **Scale:** The scale of a map refers to the ratio between the size of the area on the map and the size of the corresponding area on the ground. For example, a map with a scale of 1:10,000 means that one unit on the map represents 10,000 units on the ground. Understanding scale is important for interpreting the size and distance relationships between different features on the map.
- **Legend:** The legend is a key component of a map that explains the symbols and colors used on the map to represent different features and land uses. Reading the legend is important for understanding how different features are represented and what they mean.
- **Orientation:** The orientation of a map refers to the direction that the map is facing. Understanding the orientation is important for interpreting the direction of features on the map and for orienting oneself when using the map.

- **Projection:** The projection of a map refers to the method used to represent the curved surface of the earth on a flat surface. Different projections can distort the shape, size, and distance relationships between features on the map, so it's important to be aware of the projection used when interpreting the map.
- **Symbols and colors:** Symbols and colors are used on maps to represent different features and land uses. It's important to understand the meaning of different symbols and colors to properly interpret the map.
- **Map layers:** Maps can contain multiple layers of information, such as topography, land use, infrastructure, and environmental features. Understanding how to read and interpret each layer is important for developing a comprehensive understanding of the area.
- **Map production:** Map production involves the process of creating a map, which can include data collection, analysis, and visualization. Understanding the process of map production can help land use planners to develop accurate and useful maps for their work.

Types of map for land use planning:

There are several types of maps used during land use planning to provide a comprehensive view of the physical and social characteristics of a specific area. By using these different types of maps, land use planners can better understand the physical and social characteristics of an area and develop land use plans that take into account the unique needs and priorities of the community. Each type of map provides a different layer of information that is essential for effective land use planning.

Some of the most common types of maps used in land use planning include:

- **Base maps:** Base maps provide a visual representation of the physical features of a specific area, such as topography, land cover, and infrastructure. They are typically used as a starting point for land use planning and serve as a reference for creating more detailed maps and plans;
- **Community maps:** Community maps provide a visual representation of the social and economic characteristics of a specific community, including the location of community facilities, landmarks, and important social and economic factors;

- **Current land use map:** is a type of map used in land use planning that provides a visual representation of the current land use patterns and activities within a specific area. The map typically shows the location and type of land uses, such as residential, commercial, industrial, agricultural, and open space. It may also show the location of infrastructure, such as roads, highways, and utilities;
- **A Land Capability Class (LCC) map:** is a type of map used in land use planning that provides information on the capability of the land for various uses based on its inherent physical characteristics. LCC maps are typically based on soil and topographic data, and provide information on the land's ability to support agriculture, forestry, wildlife habitat, recreation, and other land uses. The classes are usually designated by letters or numbers, with each class having specific characteristics and land use recommendations;
- **A prepared land use plan map:** is a map that shows the proposed land use plan for a specific area, which has been developed by land use planners based on various factors such as community needs, environmental considerations, economic development goals, and infrastructure capacity.

2.5 Bio-physical and socio-economic data

2.5.1 Bio-physical data

2.5.1.1 Bio-physical Data type

In the first place, it is necessary to know what types of biophysical data are required as input for land use planning. The most important land features to be collected using the transect line format are:

- Land slope
- Soil depth
- Past erosion
- Top soil texture
- Water logging
- Infiltration, and
- Surface stoniness or rockiness
- Length of growing period (LGP)

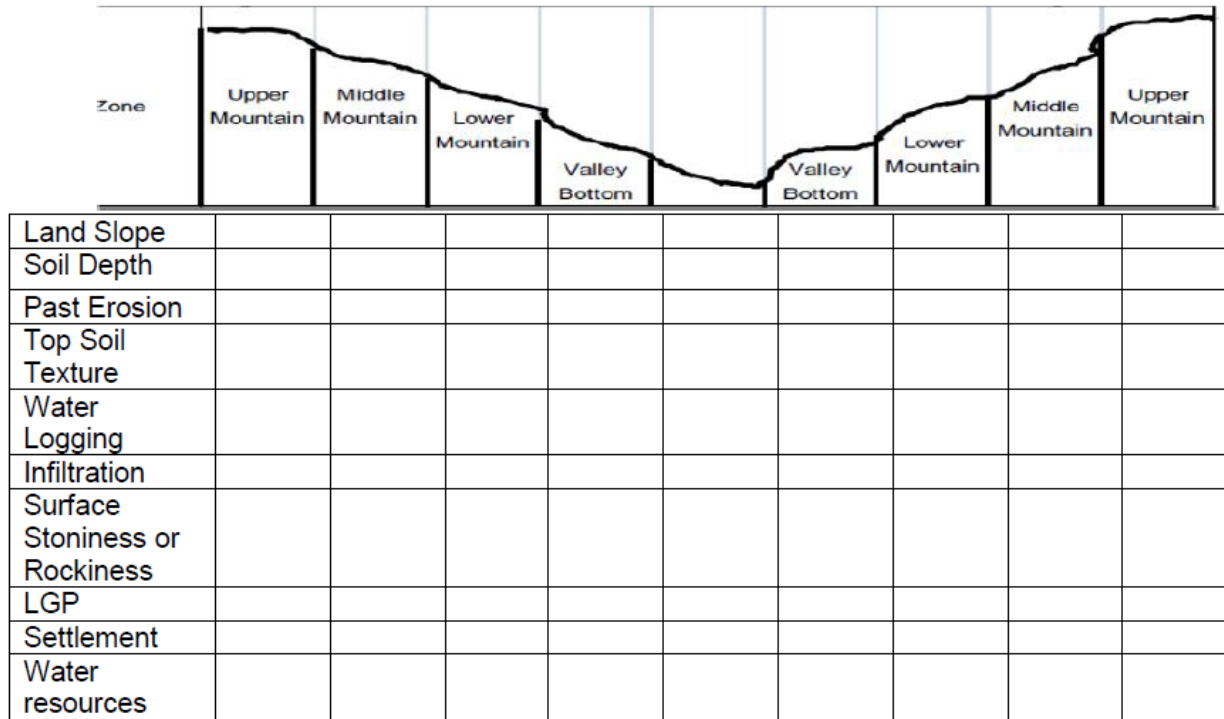


Figure 2.2. Transect Line as Data Collection Format

2.5.1.2 Bio-physical Data Collection

The biophysical data presented in this learning guide is based on FAO Classification. The biophysical data is collected to produce parameters for the decision on the land use. Especially the following physical characteristics should be disaggregated into the right ranges of their classes and put as thematic maps.

A. Land Slope (L)

Table 2.1. Land Slope Classes

Slope classes	% range	Code
Flat or almost flat	0-2%	L1
Gently sloping	2-8%	L2
Sloping	8-15%	L3
Moderately steep	15-30%	L4
Steep	30-50%	L5
Very steep	>50%	L6

B. Soil Depth (D)

Dominant soil depths of different land units/ landforms can be recorded by relating with the following soil depth classes shown in Table 2.2.

Table 2.2. Soil Depth Classes

Soil depth classes	Cm	Code
Very deep	>150	D1
Deep	100 - 150	D2
Moderately deep	50 - 100	D3
Shallow	25 - 50	D4
Very shallow	< 25	D5

C. Past Erosion (E)

The status on present erosion hazard shall be recorded during field survey while undertaking transect walk by checking exposed tree roots, comparing soil profiles and gully cuts. Additionally, discussion with farmers will provide valuable information on the erosion status both in past and at present. Erosion status shall be recorded based on classes shown in Table 2.3.

Table 2.3. Past Erosion Classes

Erosion classes	Definition	Code
Nil	<ul style="list-style-type: none"> No erosion noticeable 	E ₀
Slight	<ul style="list-style-type: none"> Surface wash & small rills Roots slightly exposed Slight top soil loss 	E ₁
Moderate	<ul style="list-style-type: none"> Rills cover most or the surface Roots are well exposed Much top soil is removed in the upper part 	E ₂
Severe	<ul style="list-style-type: none"> Shallow gullies are frequent Tree/plant roots are frequent exposed Most top soils are removed 	E ₃
Very severe	<ul style="list-style-type: none"> Most of the land is dissected by gullies Small top soil are present Land consist of rock (parent material) as result of complete removal 	E ₄

D. Soil Texture (T)

Soil texture is defined in terms of the relative proportion of sand, silt, & clay, and can be analyzed and classified as follow.

Table 2.4. Soil Texture Classes

Textural group	Textural class	Code
Coarse	<ul style="list-style-type: none"> • Sand • Sandy Loam • Loam 	T1 T2 T3
Medium	<ul style="list-style-type: none"> • Silt Loam • Clay Loam 	T4 T5
Fine	<ul style="list-style-type: none"> • Clay, Silt Clay • Heavy Clay 	T6 T7

Soil texture can be determined by feeling wet sample soil between finger tips and rolling the samples and throwing the ball at a hard surface like wooden board or a wall. While feeling between fingers, sticking is a property of heavy clay; slippery is the property of silt; friable is the property of loam; and disintegrating is the property of sand. Soil texture limits water holding capacity in relation to depth and workability. Soil texture varies at different depth and the average is the totals property. If the soil is difficult to mold into a ball and disintegrates before reaching the target, it is sandy. If the ball is fairly cohesive but shatters and partially reaches and adheres to the target surface, it is loamy. If it forms a ball that sticks firmly to the target surface, the texture is clayey.

Soil texture can be also determined by seeing the shape of wet soil (“Ball Method”) as shown in the graph below.

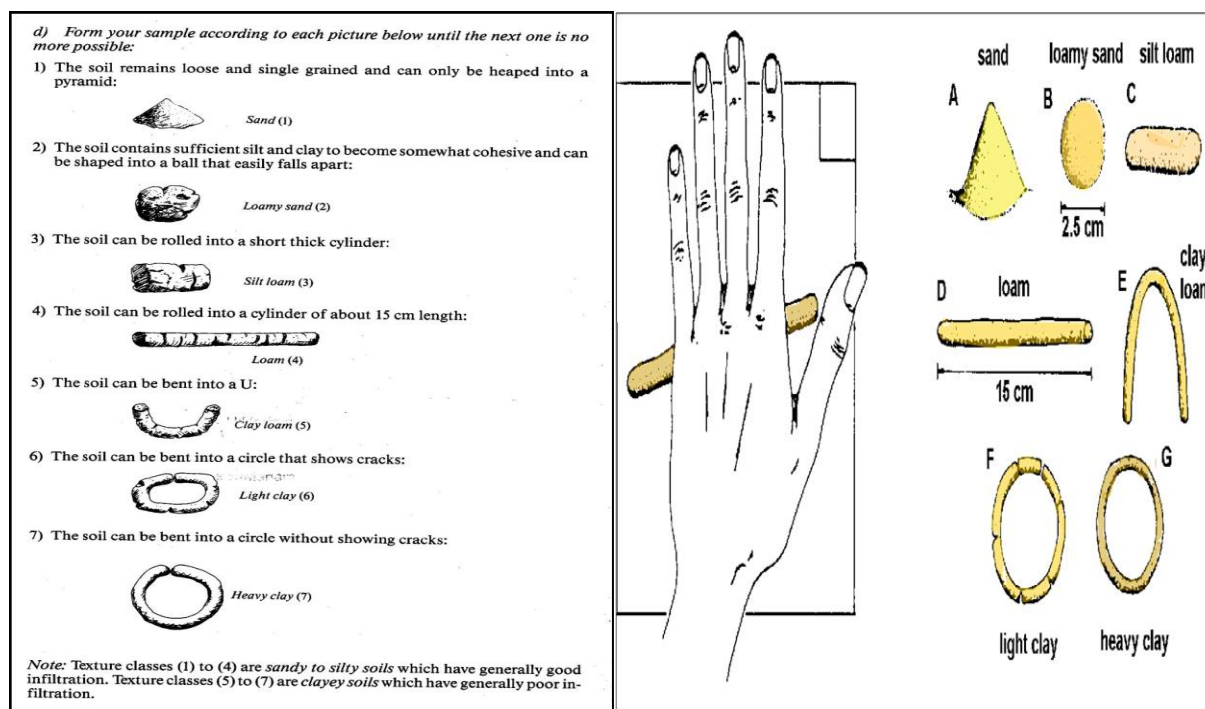


Figure 2.3. Soil texture identification

E. Water Logging (W)

Waterlogging is a condition where soil becomes saturated with water, to the point where it cannot absorb any more, and excess water accumulates on the surface or in the subsurface. This can happen due to heavy rainfall, poor drainage, or a high water table. Waterlogging is a serious problem affecting many areas of agricultural land. As waterlogging is due to restricted water movement through the soil, we need to understand the behavior of water in the soil profile before we can identify the most appropriate course of action.

Table 2.5. Water Logging Classes

Water logging	Definition	Code
No water logging	<ul style="list-style-type: none"> Well drained soil 	W0
Intermittently water logged	<ul style="list-style-type: none"> Imperfectly drained areas Water & logged during heavy rains for a few days in 1 week 	W1
Regularly water logged	<ul style="list-style-type: none"> Poorly drained areas Commonly flooded during wet season 	W2
Swampy area	<ul style="list-style-type: none"> Very poor drained areas Water table at or near the surface during wet season 	W3

F. Soil Drainage

Soil drainage refers to the ability of soil to allow water to move through it. It is an important characteristic of soil that affects plant growth, soil erosion, and water availability.

Table 2.6. Soil Drainage Classes

Class	Description
Poor	Grey or black vertic soils with mottles and common water-logging in rainy season
Imperfect	Black vertic or mottled brown soils and with possible short period water-logging in rainy seasons
Well	Red, brown or non-vertic black soils without mottles and never water-logged in rainy seasons.

G. Surface Infiltration (I)

Infiltration refers to the rate at which water enters (mm/hr) into the soil and it is largely determined by the condition of the soil surface.

Table 2.7. Infiltration Classes

Infiltration classes	Definition	Code
Good	The soil is porous or very permeable. Dry soil breaks into fine clods & grains when plowed dry.	I ₀
Moderate	The soil has massive structure to slow permeability. Surface has tendency to compact and seal. Soil breaks into large clods and when plowed.	I ₁
Poor	In addition to massive structure, soil has strong tendency to seal on settling to an almost impermeable crust. When dry, soil does not show cracks at the surface.	I ₂

H. Surface Stoniness or Rockiness (S)

Surface stoniness or rockiness refers to the presence of stones, pebbles, boulders, or other rock fragments on the surface of the soil. It is an important soil characteristic that affects plant growth, soil erosion, and water availability.

Table 2.8. Surface Stoniness or Rockiness

Stoniness classes	Rockiness Area	Cover (%)	Code
No Stone or few No	rock or few	<15	S ₀
Moderate Stony	Moderately rocky	15-30	S ₁
Stony	Rocky	30-50	S ₂
Very Stony	Very rocky	50-85	S ₃
Rock out Crops	Rock out crops	>85	S ₄

I. Flooding Hazard

Flooding hazard refers to the risk of flooding occurring in a particular area. Flooding is the overflow of water from rivers, lakes, or other bodies of water that inundates land that is normally dry. It can also occur due to heavy rainfall, storm surges, or the failure of man-made structures such as dams or levees.

Table 2.9. Flood Hazard Classes

Class	Description
None	Never flooded
Rare	Occasionally flooded for a short periods in years
common	Flooded for short periods in most years
Frequent	Flooded for prolonged periods in most years
permanent	Land normally under water, except in dry years

J. Vegetation Cover

Vegetation cover refers to the presence and distribution of plants on the land surface. It is an important component of land cover and is often used as a proxy for ecosystem health and biodiversity.

Table 2.10. Vegetation Cover Categories Descriptions

Vegetation and other cover categories	Description
Natural dense forest	A plant community with closed deep and complex strata of canopy. The height of the tallest tree may be 50m or more and the lowest >5m. The crown interlinked and cover > 60 of the ground
Natural open forest	Same as the above but the canopy cover at spots is not interlinked
Riparian forest	Forest along a river bank area with features of dense natural forest. Tall trees are common and evergreen
Disturbed natural forest	Natural forest disturbed by cutting of trees for timber and other purposes
Plantation forest	Dense forest planted on rows for industrial or conservation purpose. Mainly dominated by one or two species at spots. Plantation forest mostly forms a layer of single canopy cover.
Dense woodland	Trees with a height of greater than 5 and less than 20 meters. Branches of tree canopy are not complex, mainly umbrella shape and branched.
Open wood land	Less density of trees and more grasses , herb and shrub cover are common on the ground

K. Land Use /Land Cover

Land cover is an element or matter that directly appears on the surface of the earth. On the other hand, land use is the output of a function of land resources, inputs, human labor and social demands. The human and other living things utilization of land for meeting their livelihood requirements depend on the quality and quantity of existing land resources.

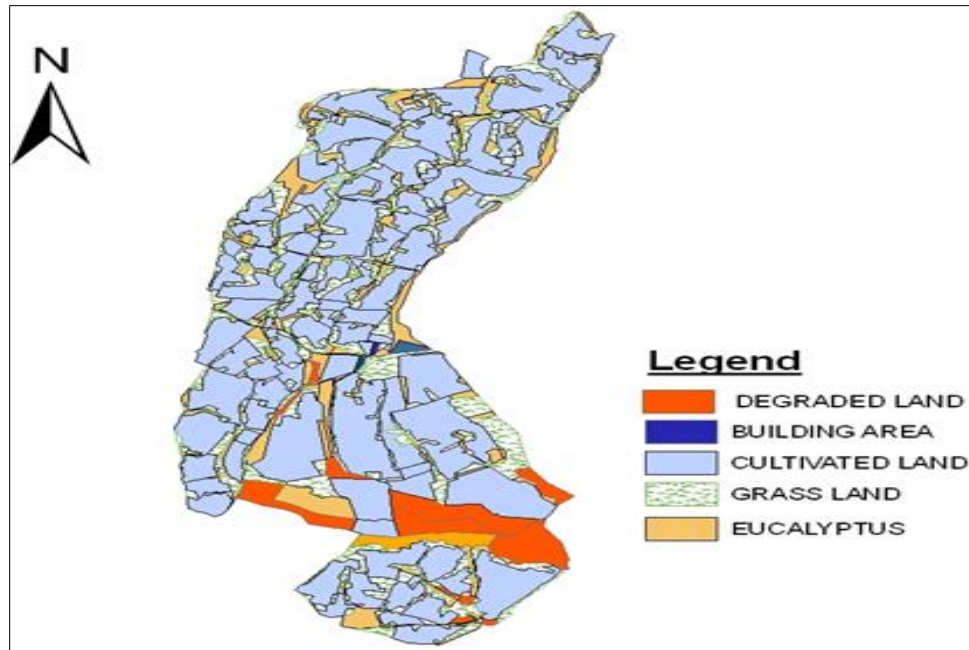


Figure 2.4 Current land use map

L. Length of Growing Periods

The length of growing periods (LGP) refers to the number of days in a year during which the temperature and moisture conditions are suitable for plant growth. It is an important factor that influences crop yields and vegetation growth, and is used in agricultural and ecological studies.

Table 2.11. Traditional Agro-climatic Zonation (Annual Rainfall (mm))

>3700m			High Wurch
3200 to 3700m		Moist Wurch	Wet Wurch
2300 to 3200m		Moist Dega	Wet Dega
1500 to 2300m	Dry Woina Dega	Moist Woina Dega	Wet Woinadega
500 to 1500m	Dry Kolla	Moist Kolla	
< 500m	Bereha		
	< 900mm	900 to 1400mm	>1400 mm

In areas where there is no recorded data, length of growing period can be determined by interviewing elder farmers when the big and small rains begin and terminate in good and bad years. Length of growing period is indicated on a map.

Table 2.12. Length of Growing Period

S.N	Length of Growing Period(days)		Code
1	<90	Dry	G1
2	90-120	Sub-moist	G2
3	120-150	Moist	G3
4	150-240	Humid	G4
5	>240	Very humid	G5

2.5.1.3 Bio-physical Data Analysis

The physical features data collected is analyzed and systematically classified to show potentials and limitations of a specific land unit. Land Capability units are determined by overlaying different thematic maps of physical characteristics. The major data required to employ the method are: classes of slope, soil depth, past erosion status or class, infiltration, soil texture, waterlogging, and stoniness of a land unit. When maps showing these features are overlaid together, it is likely to get the eight capability classes.

In general the following steps can be followed:

- After collection of biophysical data, physical characteristics are classified into their respective classes of land (slope – basis for base map, soil depth, past erosion, top soil texture, water logging, infiltration, and surface stoniness /rockiness);
- Overlay the classes of physical characteristics and develop Land Capability Map;
- Produce Current Land Use Land Cover Map;
- Superimpose Land Capability Map on existing Land Use /Land Cover Map;
- Set land use alternatives (relate land uses with land capability if matching is acceptable);
- Socio-economic evaluation based on proposed land use alternatives;
- Environmental evaluation and appraisal vis-à-vis the proposed bio-physical and socioeconomic evaluation for each proposed land unit;
- Prepare land management options for each land unit (relate land uses with land capability if matching is acceptable and consider land management options for each proposed use /cover);
- Produce final land use plan.

2.5.2 Socio-economic data

2.5.2.1 Socio-economic data type

Socio-economic data refers to information that describes the social and economic characteristics of a population or community. Here are some common types of socio-economic data:

A. Human population: The detail data types to be collected include:

- ✓ Total HHs (male-headed and female headed) and family size;
- ✓ Household characteristics like family size by sex, age and educational status;
- ✓ Household energy demand and supply focusing on sources;
- ✓ House hold material requirement for construction and farm implements;
- ✓ Early marriage status and migration;
- ✓ Household food self-sufficiency;
- ✓ Land holding: landholding per HH [i.e. Max, min, and average], No. of parcels [i.e. max, min and average], average parcel area size;
- ✓ Other off-farm sources of income; and
- ✓ Ethnic group and religion proportions, etc.

B. Farming system

- ✓ Cropping pattern: The major crops that cover dominantly the cropped area of land should be known. Also include area cultivated, production, and yield.
- ✓ Livestock pattern and population: The detail data types to be collected include:
 - ✚ Livestock types and their population;
 - ✚ Average livestock possession by type per HH;
 - ✚ Uses of livestock (why livestock is required by HHs);
 - ✚ Grazing practices and availability of livestock feed resources over time in a year (surplus and deficit months); and,
 - ✚ Encroachment and disputes related to the community pasture/forest lands, and state lands;

C. Wealth Status: Communities classify themselves in terms of wealth using their own criteria. Examples are land holding size, number of oxen owned, and others. Stakes in land use planning can be different related to wealth status.

D. Household Income and Expenditure: The household income and expenditure collected during household survey should be processed to see the financial status of households. Statistics should be generated from the data collected from sampled households. Data of different issues can be collected and processed in a similar manner to quantify statistics or parameters.

Table 2.13. Household Income and Expenditure

Sources of Income /Expenditure	HH Income /Expenditure (Birr)		Remark
	Income	Expenditure	
Sales of grain			
Sales of livestock			
Sales of wood			
Wage income			
Sales of straw /hay			
Others (Specify)			
Total Income (1)			
Fertilizer			
Seed			

E. Market system: The different market hierarchy where agricultural and non-agricultural commodities are exchanged including local markets, [i.e. often at KA level], primary markets [i.e. mostly located in the Woreda capital] and secondary market [i.e. mostly located in the zonal capital] shall be assessed and recorded. Product sold and exchanged, prices fluctuation and other detail of the market system/chain shall be collected. Here emphasis is given to the problems /gaps existing as perceived by rural communities.

F. Infrastructure: Both physical and social infrastructures facilities have a strong influence on the livelihood strategies of rural people and influences land use. Important data to be collected include:

- ✓ **Road network and accessibility:** Existing road linkage to the Woreda and the KA shall be described including standards of the roads;

- ✓ **Education:** Existing formal education including the number of enrolled students at various levels [i.e. elementary school, junior secondary schools and secondary school] and other higher levels shall be recorded;
- ✓ Mobile network coverage;
- ✓ Potable and livestock water availability; and

G. Human and Animal Health: A valuable health institution [i.e. health posts and clinics] at both the Woreda capital town and within the KA, types and occurrences of the top ten diseases will be recorded. The standard for the existence of these institutions in relation to population should be known and recommendations made accordingly during planning.

H. Agricultural Extension Services and Input Supply: Agricultural extension service is an important instrument for dissemination of agricultural technologies. Therefore, it is important to assess the pattern of the extension and dissemination process both at Woreda and in a given KA. Farm inputs like farm implements, fertilizer, improved seeds and herbicide are made available through the cooperative unions, which is institutionalized from the Federal to Woreda level. Procedures and systems to accessing improved agricultural inputs shall be collected from the Woreda Cooperative Development [WCD] office.

From the WCD office the following data shall be collected:

- ✓ The amount and types of improved agricultural inputs accessed and distributed in time series by a given KA.
- ✓ Existing systems to deliver improved agricultural inputs;
- ✓ Capacities of farmers to pay the loans and history of repayment;
- ✓ Differences between farmers in adopting improved agricultural inputs; and
- ✓ Problems and opportunities, etc.

The following key topical areas will be collected to assess the efficiency/productivity of the existing extension system:

- ✓ Number of DAs and their expertise assigned at Woreda level and in a given KA;
- ✓ Average distance from where the DAs are stationed to the remote farm HHs in the KA's;
- ✓ Land use problems observed as a result of the existence or absence of certain technologies; and
- ✓ Attitude of farming households towards those technologies distributed through extension.

- I. Credit Services:** Institutions providing cash loan and the system in place shall be assessed and recorded.
- J. Household energy sources:** Types of energy sources and quantifying each source proportion signify how households manage their land resources;
- K. NGOs and others:** Existing NGOs operating in the Woreda and in a particular Kebele shall be noted with clarity on their stakes and their potential roles during the land use planning and implementation.

2.5.2.2 Socio-economic data collection

Selected PRA tools including Transect Walk, Focus Group Discussion, Problem Ranking/Pair-Wise Ranking and Scoring methods shall be used to accomplish listing and prioritizing land use problems. Key Informant Interview, Semi-structured Interview, etc. are also tools to be selected. At the same time, members should exploit every opportunity to collect socio-economic data as well. Scope of socio-economic data collection depends on the problems to be solved and the objectives to achieve.

A mixture of the following data collection methods and tools can be used for socio-economic:

I. Review of Secondary Data

Both biophysical and socio-economic data needs can be met by reviewing already organized data and information. Especially, the Woreda land use planning team is responsible for this to collect written materials, available data, and information. This can be about the Woreda, Kebele and micro-watershed biophysical and socio-economic situation. Reviewing depends on the availability of secondary sources. Especially similar study reports help to minimize cost and time. Household survey shall be undertaken based on Purposive Sampling Technique fixing the sample size for each category.

II. Direct Observation

Team and committee members have the opportunity to observe and associate many issues while they are communicating with different stakeholders. The land, crops grown and their statuses, mix and conditions of livestock, soil and water conservation practices, peoples clothing, household utensil, land use land cover, water resource, environmental issues, etc. can be observed and supportive data generated.

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III. Semi - Structured Interviews (SSI)

This can be conducted guided by a questionnaire which is used flexibly and, hence, there is no need to design structured /pre-coded questionnaire.

IV. Focus Group Discussions

Focus group discussions concentrate on predetermined topics, with specific interest groups, stakeholders or individuals who share characteristics such as gender, profession, age, challenges, etc.

V. Individual Interview

The purpose of this interview is to obtain representative information from various purposely selected respondents (Farmer leaders, water users associations, Kebele cabinet members etc.).

VI. Key Informant Interview

We use this interview when we are interested to obtain information from special knowledgeable persons about a particular topic of interest to the survey. Unlike regular survey, the key informant interviewee does not answer questions about the interviewee himself/herself but about the subject of which he has a good knowledge.

VII. Formal Household Survey

Household survey shall be undertaken based on Purposive Sampling Technique fixing the sample size for each category.

2.5.2.3 Socio-economic Data Analysis

The data collected employing different methods can be organized into different data sets in order to facilitate decision making during considering land use alternative options. The data sets can take different forms depending on the issue to be overviewed.

I. Patterns

Cropping and livestock patterns can be generated to understand the most important crops and livestock types in the farming system.

II. Parameters and Statistics

Figurative values describing populations and samples of variables covered by study should be generated when appropriate.

III. Ranking Methods

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These are techniques that can help community to identify the main developmental problems and potentials that affect most individual community members. Decision is reached by voting, or by weighted scores or by eliminating the less important constraints/problems using:

- **Pair-wise Ranking**

Pair wise ranking is one of the techniques that gives chance to see how many times one of the issues is selected by the community representatives and its order of rank. Farmers can prioritize and rank their own problems if they are given chance to do so.

Table 2.14. Land Use Problem Ranking

Problems	1	2	3	4	5	6	Score	Rank
Erratic Rainfall		1	1	1	5	6	3	2
Food Shortage			3	2	5	2	2	3
Low Household Income				3	5	3	3	2
Soil Erosion					5	4	1	4
Land Shortage						5	5	1
Lack of Fuel Wood							0	5

However it does not show the cause and effect relationship of issues.

- **Preference Ranking**

It is one of the techniques that can help community to identify the main developmental problems that affect most individual community members and decision is reached by voting, or by weighted scores or by eliminating the less important constraints/problems.

Community members list major development problems and rearrange them in their order of severity based on agreed criteria. The criteria could be:

- ✓ Category of population being affected (affected groups);
- ✓ The size (number of individuals) of the affected groups;
- ✓ The weight of the problem with respect to other or subsequent problems caused by it, etc.

- **Direct Ranking**

Communities show their priority towards a certain issue. Example is given below.

Table 2.15. Direct Ranking

Type of Infrastructure	Rank	Description of the Situation
Potable water	2	Community uses river water for household use and, hence, women and girls walk a 5 km one way distance to fetch water.
School	5	There is no second cycle elementary school in the village.
Human Health Care Centers	4	There is only a health post.
Road	3	The micro-watershed has no feeder road to Kebele center though its seriousness is less water and potable water.
Fuel wood	1	Almost degraded area and no fuel wood collection. No fuel gas.

IV. Stakeholder and Problem Analysis – OOPP

Objective Oriented Project Planning (OOPP) is one of the tools to design activities in a participatory manner. By discussing the problems and possible solutions, the participants can come to a mutual understanding of each other's points of view. Once some form of consensus is reached, these problems are organized into a logical sequence.

V. Seasonal Calendar

Calendars are diagrams that focus on seasonal issues and how things change with time. They help to present large quantities of diverse and complex information in a simple diagram about farming activities, labor allocation, livestock diseases, prices, marketing, human diseases etc. By having seasonal calendar diagrams, we can identify the time (e.g. months) of greatest difficulties and impact on people's lives. The following steps can be followed to develop seasonal calendars:

- To capture the gender dimensions, group discussions should consist of separate groups of men and women;
- Draw up a 12 month calendar as appropriate, on flipchart or on the ground;
- Community members who are knowledgeable discuss different events and use beans or small stones to quantify information and indicate their relative magnitudes; and
- Make the appropriate labeling of diagram/curves.

2.6 Potential Land Capability Differentiation

Using the data collected showing classes of the limiting factors (slope, soil depth, past erosion, water logging, infiltration, texture, and stoniness or rockiness, LGP), ranges of values, and coding for each separate limiting factor, we can use Land Capability Classification Conversion Table given below to identify the land capability classes from Class I to Class VIII with a relative decrease of potentials or increase of limitations with the exception of Class V.

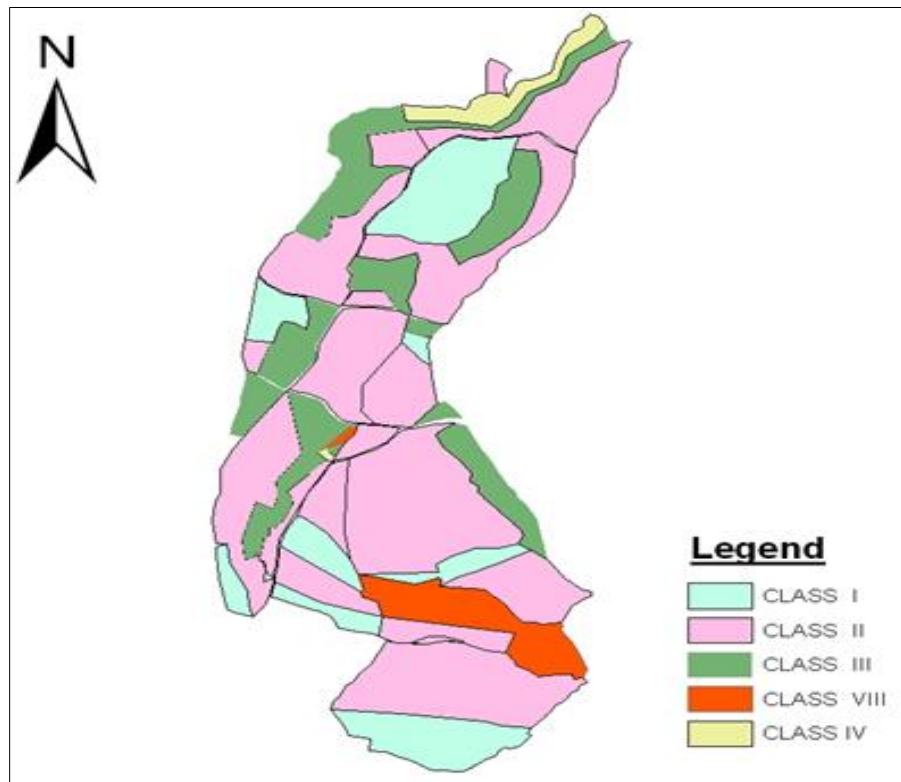


Figure 2.5 Current land use map

Table 2.16. Land capability classification conversion table

Land capability limiting factors	Land capability classes Determining factors of Land Mapping units								
Slope (L)	1	2	3	4	1-4	5	6	1-6	1-6
Soil depth (D)	1	1-2	1-2	1-3	1-4	1-3	1-4	1-5	1-5
Past Erosion (E)	0	0	0-1	0-2	0-2		0-3	0-4	0-4
Top soil texture (T)	3-5	3-6	3-7	2-7	2-7		2-7	1-7	1-7
Water logging (W)	0	0	0-1	0-2	0-2		0-2	0-2	0-3
Infiltration rate (I)	0	0	0-1	0-2	0-2		0-2	0-2	0-2
LGP	G3, G4	G3, G4	G3, G4	G2-G4	>G1		>G1	G1-G5	G1-G5
Surface Stoniness (S)	0	0-1	0-2	0-2	0-3		0-3	0-4	0-4
Capability Class	I	II	III	IV	VI		VII	VIII	V
	Land suitable for annual crops				Suitable for perennial crops & grazing		Suitable for forest development	Not suitable for crop production	Swampy land

The classifying factors of land capability classification determine 8 classes of land of a planning area. Each land map unit is assigned a capability class of I through VIII, and classes II through VII are assigned a sub-class describing limitations or hazards for agricultural purposes. Class I soils do not have limitations for crop production and has no subclasses.

Lands suited for cultivation are:

- **Class I lands:** have few limitations that restrict their uses. They are suited to a wide range of plants and may be used safely for cultivated crops, pasture, range, woodland and wildlife. The soils are nearly level and erosion hazard is low. They are deep and very deep, well drained and easily worked. They hold water well and are either fairly well supplied with plant nutrients or highly responsive to input of fertilizer. The sites are level and climate is favorable;
- **Class II lands:** have limitations that reduce the choice of plants or require moderate conservation practices. Soils in this class require careful soil management and conservation practices to prevent deterioration or to improve air and water relations when the soils are cultivated. The limitations are few and easy to apply. The soils may be used for cultivated crops, range, wood and, or wildlife, pasture. Limitations of soils may include, singly or in combinations, the effects of gentle slopes, moderate susceptibility to erosion, less than ideal soil depth, unfavorable structure and workability, and slight climate limitation on soil use or management;
- **Class III lands:** have more restrictions than those in class II and can be used for cultivated crops, pasture, woodland, range, or wildlife. Limitations of soils restrict cultivation, time of planting, tillage, harvesting, and choice of crops. The limitation may result from one or more of the following: moderately steep slopes, high susceptibility or adverse effect of past erosion, very shallow permeability of sub-soil, shallow depth that limit the rooting zone and water storage, low moisture holding capacity, low fertility that is not easily corrected, and moderate climate limitations;
- **Class IV lands:** have very severe limitations that restrict the choice of plants and require very careful management. The restrictions in use for these soils are greater than those in class III and the choice of plants is more limited. When these soils are cultivated, more careful management is required and conservation practices are more difficult to apply and maintain. These soils may be used for crops, pasture, woodland, range, or wildlife. Use

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for cultivated crops is limited as the result of the effects of one or more of the following features: steep slopes, severe susceptibility to erosion or severe effect of past erosion, shallow soils, low moisture holding capacity, or moderately adverse climate;

Lands generally not suited for cultivation:

- **Class V lands:** generally have limitations that are impractical to remove and that limit their use largely to pasture, range, woodland, or wildlife. Limitations of soils in this class restrict the kind of plants that can be grown and that prevent normal tillage of cultivated crops. They are nearly level but some are wet, frequently over flooded by streams, stony, and have climatic limitations or have some combinations of these limitations. Because of one or more of these limitations, the cultivation of the common crops is not feasible but pasture can be improved and benefits from proper management can be expected;
- **Class VI lands:** physical conditions of soils are such that it is practical to apply range or pasture improvements such as seeding, liming, fertilizing and water control with contour furrows, diversions, or water spreaders. Soils in this class have continuing limitations that cannot be corrected, such as steep slopes, severe erosion hazard, effects of past erosion, stoniness, shallow rooting zone, low moisture capacity, or severe climate. Due to one or more of these limitations, the soils in class VI are not generally suited for cultivated crops but may be used for pasture, range, woodland, wildlife, or some combination of these;
- **Class VII lands:** physical conditions of soils are such that it is impractical to apply such as pasture or range improvements as seeding, liming, fertilizing and water control measures such as contour furrows, ditches, diversions, or water spreaders. Soil restrictions are more severe than those in class VI. Because one or more of the continuing limitations cannot be corrected, such as very steep slopes, erosion, shallow soils, stones, unfavorable climate, or other limitations that make them unsuited for common cultivated crops. They can, however, be used safely for grazing, woodland, or wildlife or some combination of these under proper management. Some areas in this class may require seeding or planting to protect the soil and prevent damage to adjoining areas;
- **Class VIII lands:** have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purpose. Gully land, rock out crops, mine tailings and other nearly barren lands are included in class VIII.

Table 2.17. Descriptive characteristics & possible management practices and land use options of land capability classes

Land Capability Class	Characteristics	Required management practice	Possible land uses
I	Very deep, deep, productive, level to nearly level land, no or slight risk of damage while cultivated.	Use of fertilizers, lime, cover crops, crop rotation to maintain fertility and soil structure	Cropping, grazing, forestry; grass cutting, irrigation etc.
II	Gentle slope, productive soils, moderately deep, subjected to occasional overland flow, damage when cultivated.	Crop rotation, drainage ditches, water flow control system, special tillage practices to avoid erosion	Same as above
III	Moderately fertile, moderately steep slope, subject to severe erosion, subject to risk of soil damage.	Maintenance of adequate plant cover; planting hay or; planting row crops	Same as above except irrigation
IV	Good soils; steep slopes; subject to severe erosion; severe risk of damage.	Good grass cover; keep in hay or pasture crop	Occasional cultivation once in five years; systematic grazing; grass cutting; forestry
V	Wet land/swampy or sandy; level to nearly level; subject to slight erosion	Intensive drainage systems	Pasture, forestry, regulated dry season grazing to regulate destruction of the ecosystem
VI	Steep slopes, shallow soils.	Physical and biological soil and water conservation practices, area closure to regenerate the soil and indigenous species	Cultivation with physical and biological conservation practice,; forestry and regulated grazing to prevent destruction of species and aggressive species
VII	Steep; uneven surface; eroded; shallow to very shallow soils; swampy and dry lands; severe risk of damage when used for forestry and pasture	Controlled grazing, careful forest management;	Cut and carry, forest products, area closure, wildlife management, recreation
VIII	Very steep slope, rocky and stony	Area closure	Forest and wild life management

2.7 Procedures for limiting factor(s) identification

Limiting factor(s) of land capability refer to the physical, chemical, and biological factors that constrain or enhance the productivity and suitability of land for specific uses. The concept of limiting factors is a key element of the land capability classification system, which is a tool used to evaluate the potential of land for different uses, such as agriculture, forestry, grazing, or conservation.

Here are some general steps that can be taken to identify the limiting factor(s) of land capability:

- **Define the land use objective:** Identify the intended use or uses of the land, such as agriculture, forestry, grazing, or conservation. This will help determine the criteria for assessing the land capability.
- **Evaluate the eight limiting factors:** Assess the quality and quantity of each of the eight limiting factors that affect the land's productivity and suitability for the intended use.
- **Determine the most limiting factor:** Compare the quality and quantity of each limiting factor with the requirements of the intended land use. Identify the factor that has the greatest impact on the land use capability.
- **Consider the interactions between factors:** Sometimes, multiple factors may be limiting the land capability. In such cases, evaluate the interactions between the factors and their combined impact on the land use capability.
- **Prioritize the factors:** If more than one factor is limiting the land capability, prioritize them based on their impact on the land use capability and the feasibility of mitigating their effects.
- **Develop a plan to address the limiting factor(s):** Once you have identified the limiting factor(s), develop a plan to address them. This may involve implementing management practices to improve the soil quality, installing drainage systems to improve water resources, or selecting crops that are better suited to the climate.
- **Monitor the effectiveness of the plan:** After implementing the plan, monitor the effectiveness of the measures taken to address the limiting factor(s). Evaluate the results and make adjustments as necessary.

2.8 Occupational health and safety

Occupational health and safety is an important consideration in land use planning, particularly for planners and other professionals who may be exposed to hazards in the workplace. Some of the key occupational health and safety considerations for land use planning include:

- OHS hazard identification;
- Risk assessment and control;
- Implement procedures for dealing with hazardous events;
- Hazards may include disturbance or interruption of services
- Solar radiation, dust, soil- and water-borne micro-organisms, sharp hand tools and equipment, manual handling, falling objects, and uneven Surfaces.

Self-Check 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Matching

A	B
-----1. Land suitable for annual crops	Class VI lands
-----2. Swampy land	Class VIII lands
-----3. Not suitable for crop production	Class V lands
-----4. Suitable for perennial crops & grazing	Class VII lands
-----5. Suitable for forest development	Class I-IV lands

Test II: Multiple choices

- From the following material one is not used to collect land information
A. Aerial photographs B. Top maps C. Notebook D. None
- From the following one is not biophysical data type
A. Land slope B. Soil depth C. Population Size D. Surface stoniness

Test II: Short Answer Questions

- Define land information.
.....
.....
.....
- Discuss the present and future needs of land.
.....
.....
.....

Operation Sheet 2

2.1 Procedures for land capability limiting factor(s) identification.

A. Tools and equipment's

VI. Land capability classification limiting factor table

B. Procedures for land capability limiting factor(s) identification.

1. Define the intended land use objective;
2. Evaluate the eight limiting factors;
3. Determine the most limiting factor;
4. Consider the interactions between factors;
5. Prioritize the factors;
6. Develop a plan to address the limiting factor(s).

LAP TEST 2	Performance Test
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Name..... ID.....

Date.....

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **2** hour. The project is expected from each student to do it.

Task-1 Determine land capability class for the intended land use based on the most limiting factor(s) and make recommendations for appropriate land uses.

LG #43

LO #3- Land Use Problem

Instruction sheet 3

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Land use problems
- Problem identification procedures
- Prioritization of problems
- Determination of alternative solution
- Management options

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Prepare problem identification procedures
- Identify land use problems
- Prioritize identified problems
- Determine alternative solution
- Decide management options

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test”

Information Sheet 3

3.1 Land use problems

Land use problem refers to a situation where the current or planned use of land is not sustainable, equitable, or compatible with the natural or social characteristics of the area. Land use problems can take many forms, and can result from various factors, such as population growth, urbanization, agricultural expansion, industrialization, natural disasters, or climate change.

Examples of land use problems include:

- Land degradation: refers to the deterioration of soil quality and vegetation cover, which can result from overgrazing, deforestation, and other land use practices. This can lead to reduced agricultural productivity, increased erosion, and other environmental problems;
- Habitat loss and fragmentation due to urbanization, infrastructure development, or land conversion;
- Water pollution and depletion due to industrial activities, mining, or irrigation;
- Air pollution and greenhouse gas emissions due to transportation, energy production, or waste disposal;
- Climate change: Land use practices can contribute to climate change, and climate change in turn can exacerbate many of the other land use problems mentioned above.
- Land conflicts and tenure insecurity due to unequal or unclear land rights, land grabbing, or displacement of communities;
- Social and economic inequalities due to unequal access to land, resources, and opportunities.

3.2 Problem identification procedures

There are a few key procedures you can follow to identify land use problems:

- **Define the study area:** Begin by defining the geographic scope of your study. This could be as small as a single property or as large as a whole city or region;
- **Identify the stakeholders:** Determine the key stakeholders who are affected by land use decisions in the study area. This could include residents, property owners, government

officials, business owners, and other groups;

- **Assess current land use patterns:** Collect information on the current land use patterns within the study area, including land use maps, zoning regulations, and other relevant government data. This will help you understand how land is currently being used and whether there are any issues or conflicts related to land use;
- **Conduct field observations:** Visit the study area in person to observe land use patterns and any potential issues related to land use. Record your observations and take photographs as needed;
- **Gather input from stakeholders:** Collect input from stakeholders through surveys, focus groups, public meetings, or other means. This will help you understand their perspectives and identify any concerns they might have related to land use;
- **Analyze data and identify problems:** Once you have collected all of your data, analyze it to identify any patterns or problems related to land use. This could include issues such as overcrowding, environmental degradation, lack of green space, or other concerns;
- **Develop recommendations:** Based on your analysis, develop recommendations for addressing the identified land use problems. These might include zoning changes, new regulations, public investments in infrastructure or green space, or other initiatives.

3.3 Prioritization of problems

Land use problems are issues that arise when there are conflicting views on how to use the land, such as for agriculture, industry, housing, or conservation. Prioritizing land use problems involves identifying and ranking the most pressing issues based on their potential impact and the feasibility of addressing them. These are techniques that can help community to identify the main developmental problems and potentials that affect most individual community members: by voting, or by weighted scores or by eliminating the less important constraints/problems.

Generally, there are different ways to prioritize land use problems, depending on your goals and criteria (for detail see information sheet 2 of this LG at 5.2.3):

- I. **Multi-criteria analysis (MCA):** multi-criteria analysis (MCA) is a method to support decision-making by comparing different alternatives based on a set of criteria¹. The criteria are weighted to reflect their importance and the alternatives are scored and ranked according to their performance. MCA can be used for

problems with many dimensions and objectives, such as environmental, social, economic, etc.

II. Using Ranking Methods of:

- **Pair-wise Ranking:** is one of the techniques that gives chance to see how many times one of the issues is selected by the community representatives and its order of rank. It is a method for identifying and prioritizing land use problems based on stakeholder input.
- **Preference Ranking:** It is one of the techniques that can help community to identify the main developmental problems that affect most individual community members and decision is reached by voting, or by weighted scores or by eliminating the less important constraints/problems.
- **Direct Ranking:** Communities show their priority towards a certain issue.

3.4 Determination of alternative solution

Determining alternative solutions for land use problems involves identifying and evaluating different approaches to address the identified problems. Determining alternative solutions for land use problems involves a comprehensive and iterative approach that considers the feasibility, effectiveness, and potential impacts of different approaches, and involves ongoing monitoring and evaluation to ensure that the solutions are achieving the desired results. Here are some steps to determine alternative solutions for land use problems:

- ✓ **Identify potential solutions:** The first step is to identify potential solutions to address the land use problems. This can involve researching best practices in land use planning, consulting with experts and stakeholders, and reviewing past successful interventions;
- ✓ **Evaluate the potential solutions:** The next step is to evaluate the potential solutions based on their feasibility, effectiveness, and potential impacts. This can involve conducting a cost-benefit analysis, reviewing relevant regulations and policies, and assessing potential social and environmental impacts;
- ✓ **Select the most promising solutions:** Based on the evaluation, select the most promising solutions that are likely to be effective and feasible to implement;
- ✓ **Develop implementation strategies:** Once the most promising solutions have been identified, develop implementation strategies that outline how the solutions will be put into

action. This can involve identifying necessary resources, developing timelines and milestones, and identifying responsible parties;

- ✓ **Monitor and evaluate progress:** Once the solutions have been implemented, monitor and evaluate their progress to ensure they are achieving the desired results. This can involve collecting data, tracking progress against milestones, and making adjustments when necessary;
- ✓ **Continuously improve:** Finally, continuously improve the solutions by learning from successes and failures and refining the implementation strategies over time.

3.5 Management options

Managing land use problems effectively requires the implementation of a range of management options that can mitigate environmental impacts while promoting economic and social development. The following are some management options for land use problems:

- **Land-use planning:** Planning is a critical tool for managing land use problems. Effective land-use planning can help prevent environmental degradation, reduce conflicts between land uses, and promote sustainable development. This can involve zoning regulations, land-use plans, and strategic environmental assessments.
- **Environmental Impact Assessment (EIA):** EIA is a systematic process for identifying and evaluating the potential environmental impacts of proposed development projects. It can help identify potential environmental impacts, assess the significance of impacts, and develop mitigation measures.
- **Land conservation and restoration:** This can involve implementing conservation easements, wetland mitigation banking, reforestation, and soil conservation practices.
- **Sustainable land use practices:** This can include promoting sustainable agriculture practices, using green infrastructure to manage storm water runoff, and promoting smart growth policies.
- **Monitoring and enforcement:** Monitoring and enforcement of land use regulations are essential for ensuring compliance and protecting the environment. This can involve regular inspections, monitoring of water quality, and enforcement of environmental laws and regulations.

Self-Check 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Short Answer Questions

1. Discuss the methods used to prioritize land use problems.

2. Discuss the land use problems.

3. Discuss Management options for land use problems.

Operation Sheet 3

3.1 Techniques/Procedures/Methods of ranking of identified land use problems using pair wise ranking method.

A. Tools and equipment

- Land Use Problem ranking Table
- HHGPS/GNSS
- Stereoscope
- Aerial photographs,
- Top maps
- Notebook

B. Procedures/Steps/Techniques

1. Identify stakeholders: Identify the stakeholders who will be involved in the pairwise ranking process.
2. Identify land use problems: Develop a list of potential land use problems that will be ranked. This list may be developed based on data analysis, stakeholder input, or other sources.
3. Develop pairwise rankings: Create a matrix that allows stakeholders to compare each pair of land use problems and indicate which problem they believe is more important. Each stakeholder should rank each pair of problems, giving a score of 1 to the more important problem and 0 to the less important problem.
4. Analyze results: Calculate the total score and ranking for each land use problem by summing up the scores from all pairwise comparisons.
5. Review and validate the results: Review the results of the pairwise ranking process with stakeholders to ensure that they accurately reflect the priorities and concerns of the group.
6. Use the results to inform land use planning: Use the results of the pairwise ranking process to inform land use planning decisions. This may involve prioritizing certain land use problems for further analysis or action, or using the rankings to guide the development of land use policies or regulations that address the identified problems.

LAP Test 3	Performance Test
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Name..... ID.....

Date.....

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **8** hour. The project is expected from each student to do it.

Task-1: Identify land use problems using pair wise ranking method.

LG #44	LO #4- Land Use Plan Preparation
Instruction sheet 4	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Strategic plan development • Outlining of future development plan • Land use policy and strategy • Steps of land use plan preparation • Land use planning activity evaluation <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • Develop strategic land use planning • Outline future development Strategies • Identify land use policy and strategy • Prepare land use plan • Evaluate activities related with land use planning 	
Learning Instructions:	
<ol style="list-style-type: none"> 1. Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3. Read the information written in the information Sheets 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test” 	

Information Sheet 4

4.1 Strategic Plan Development

A Strategy is a specific proposal to do something that relates directly to accomplishing the objective. It defines "what" is to be done.

- Other goals of strategic land use planning relate to the following:
 - ✓ Identification of potential land use alternatives
 - ✓ Assessment of economic, social, and local conditions
 - ✓ Assessment of land and water on-site
 - ✓ Sustainability, efficiency, and equity of the planning process

The development of a strategic plan for land use typically involves several key steps:

- ✓ **Identify the goals and objectives:** The first step in developing a strategic plan for land use is to identify the goals and objectives of the plan. This may include goals such as preserving natural resources, promoting economic development, or improving access to affordable housing.
- ✓ **Conduct a land use analysis:** A land use analysis involves gathering data on the existing land use patterns in the region or community. This analysis can help to identify areas where development is needed, areas that should be preserved for conservation purposes, and areas where development should be restricted.
- ✓ **Engage stakeholders:** Engaging stakeholders is an important part of the strategic planning process. This may include community members, elected officials, environmental groups, developers, and other interested parties. Stakeholder input can help to ensure that the strategic plan reflects the needs and interests of the community.
- ✓ **Develop strategies:** Based on the goals and objectives of the plan and the results of the land use analysis, strategies can be developed to guide land use in the region or community. These strategies may include zoning changes, greenbelt development, smart growth policies, and other tools to manage land use.
- ✓ **Implementation:** Once the strategies have been developed, the next step is to implement the plan. This may involve changes to local land use regulations, the acquisition of land

for conservation purposes, or the development of new infrastructure to support economic development.

- ✓ **Monitoring and evaluation:** Finally, it is important to monitor and evaluate the effectiveness of the strategic plan over time. This may involve tracking changes in land use patterns, measuring progress towards the goals and objectives of the plan, and making adjustments to the plan as needed.

- **Strategies for Land Use:**

- ✓ There are a variety of strategies that can be employed to address land use problems. The specific strategies used will depend on the nature of the problem and the specific context, but here are some common strategies:

- ✚ **Smart growth:** Smart growth strategies promote compact, walkable communities with a mix of land uses, which can reduce urban sprawl, encourage transit-oriented development, and protect open space and natural resources.
- ✚ **Conservation:** Conservation strategies aim to protect and preserve natural resources, such as wetlands, wildlife habitats, and forests, which can help to maintain biodiversity and ecosystem services.
- ✚ **Sustainable agriculture:** Sustainable agriculture strategies promote farming practices that maintain soil health, reduce the use of pesticides and fertilizers, and protect water resources.
- ✚ **Urban forestry:** Urban forestry strategies involve planting and maintaining trees and other vegetation in urban areas, which can help to reduce heat island effects, improve air quality, and provide other benefits.
- ✚ **Transit-oriented development:** Transit-oriented development strategies promote development that is oriented around public transportation, which can reduce traffic congestion, promote sustainable transportation options, and support economic development.

- + **Affordable housing:** Affordable housing strategies aim to increase the availability of affordable housing for low-income families and individuals, which can help to reduce social and economic inequality.
- + **Green infrastructure:** Green infrastructure strategies involve using natural systems, such as green roofs, rain gardens, and bios wales, to manage storm water and improve water quality.

4.2 Outlining Future Development Plan

A future development plan for land use is a strategic document that outlines the goals, objectives, and strategies for guiding the use and management of land within a specific region or community over a specified period of time. The plan typically includes policies, programs, and initiatives that are designed to promote sustainable land use practices while addressing the needs and priorities of the community. The development of a future plan for land use typically involves a comprehensive planning process that includes community engagement, data analysis, stakeholder consultation, and the development of a set of policies and strategies to guide future land use and management. The plan may be developed at the local, regional, or national level, and may be supported by a range of stakeholders, including government agencies, community organizations, environmental groups, and residents.

Outlining a future development plan for land use involves identifying goals, objectives, and strategies for guiding future land use decisions and development in a community. Here are some steps to outline a future development plan for land use:

- ✓ **Assess existing conditions:** The first step is to assess existing conditions in the community, including current land use patterns, environmental conditions, demographics, and economic factors. This will provide a baseline for future planning efforts;
- ✓ **Develop goals and objectives:** Based on the assessment of existing conditions, develop goals and objectives for future land use planning efforts. These goals and objectives should be specific, measurable, achievable, relevant, and time-bound (SMART);

- ✓ **Identify strategies:** Once the goals and objectives have been established, identify strategies for achieving them. This can include a range of approaches, such as zoning changes, infrastructure investments, and community outreach programs;
- ✓ **Develop implementation strategies:** Develop implementation strategies that outline how the identified strategies will be put into action. This can involve identifying necessary resources, developing timelines and milestones, and identifying responsible parties;
- ✓ **Monitor and evaluate progress:** Once the strategies have been implemented, monitor and evaluate their progress to ensure they are achieving the desired results. This can involve collecting data, tracking progress against milestones, and making adjustments when necessary;
- ✓ **Continuously improve:** Finally, continuously improve the development plan by learning from successes and failures and refining the implementation strategies over time.

4.3 Land use policy and strategy

Land use policies and strategies are critical components of the land use planning process, as they provide the framework for guiding land use decisions and actions. During preparation of land use planning, it should be based on legal documents or policies and strategies of the country.

Some of land use policies and strategies (legal documents) that are used in Ethiopia:

- **National Land Use Policy:** The National Land Use Policy of Ethiopia provides the framework for land use planning at the national level. It promotes sustainable land use practices, equitable distribution of land, and protection of natural resources;
- **Agricultural Development-led Industrialization Strategy:** This strategy aims to promote agricultural development and agro-industrialization in Ethiopia. It seeks to increase agricultural productivity and value-added processing, while also promoting sustainable land use practices;

- **Sustainable Land Management Program:** This program aims to promote sustainable land use practices in Ethiopia by supporting soil and water conservation, reforestation, and land rehabilitation activities;
- **Climate Resilient Green Economy Strategy:** This strategy seeks to promote economic development in Ethiopia while also addressing climate change and environmental concerns. It promotes sustainable land use practices, renewable energy development, and green infrastructure;
- **Rural Land Administration and Use Strategy:** This strategy aims to promote sustainable land use practices in rural areas of Ethiopia. It seeks to improve rural land governance, promote equitable access to land, and support sustainable agricultural practices;
- **Urban Development Strategy:** This strategy seeks to promote sustainable urban development in Ethiopia. It promotes compact and mixed-use development, improved transportation infrastructure, and access to affordable housing;
- **Forest Sector Development Program:** This program aims to promote sustainable forest management and conservation in Ethiopia. It seeks to increase forest cover, improve forest governance, and support community-based forest management;
- **Disaster Risk Management Policy:** This policy seeks to reduce the risk of natural disasters through land use planning and disaster preparedness measures. It promotes the identification of high-risk areas, improved infrastructure, and community preparedness;
- **Environmental Impact Assessment Proclamation:** This proclamation establishes the legal framework for environmental impact assessment in Ethiopia. It outlines the procedures for conducting environmental impact assessments for development projects, and establishes the roles and responsibilities of different government agencies in the process;
- **Land Use Planning and Administration Regulation:** This regulation provides detailed guidelines for land use planning and administration in Ethiopia. It outlines the procedures for developing land use plans, and establishes the roles and responsibilities of different government agencies in the land use planning process.

4.4 Steps of Land Use Plan Preparation

The steps involved in land-use planning may vary depending on the specific context and goals of the planning effort, but generally include the following:

Step 1: Establish Goals and Terms of references

- Assess the present situation
 - ✓ Land and land use; land tenure; legislation
 - ✓ Infrastructure
 - ✓ Population; social structure
 - ✓ Administrative structure
- Contact all stakeholders (e.g land users, Govt. agencies, NGO's) & assess their needs.
- Identify problems and opportunities as well as constraints to implement improvements
- Agree on the planning area
- Agree on short-term and long-term goals of the plan taking into account:
 - ✓ Govt, development objectives
 - ✓ Needs and problems of the stakeholders

Output: - project document with ToR, goals, time frame and budget.

Responsibility: decision makers and planners

Step 2: Organize the work

- This step transforms the general planning procedure from step 1 into specific program of work and decisions are made on:
 - ✓ Composition of planning team; responsibilities of team members.
 - ✓ Activities, their duration, timing, responsible person or organizations and required budget
 - ✓ Required materials (GIS Hard and Software, aerial photos, image etc.)
 - ✓ Supporting services (e.g transport, laboratory, printing)

Output: work plan for the project

Responsibility: leaders of the planning team.

Step 3:-Analyze the problems

- Using the frame-work and strata established in the reconnaissance phase
 - ✓ More detailed surveys now conducted into specific problem areas.
 - ✓ There should be constant technical discussion and coordination.
 - ✓ Land resources (soils, agro-climatic, land use and vegetation survey), farming system survey, agronomic survey, livestock and rangeland survey
 - ✓ Assess land use problems and their causes with land users, village chiefs, extension agents and NGO's active in the area of interest.
 - ✓ Formulate problem statements covering
 - ✚ Nature and severity of problem
 - ✚ Short and long term effect
 - ✚ Cause of the problem (through PRA etc.)

Output: Problem statements

Responsibility: planning team

Step 4:- Identify options for change

- Identify and describe land use options that may achieve the goals set in step 1 and that will reduce the problems identified in step 3
- Land use options may include:
 - ✚ New land uses or crops
 - ✚ Improved technology applied in the existing land use
 - ✚ Land improvements such as irrigation, drainage, terracing
- Seek the views of stakeholders and government on these options.
- Select the most promising land use options based on these discussions.

Output: selected land use options

Responsibility: planning team

Step5: Evaluate land capability

- Determine land suitability or capability for each promising land use options and land classes
- Describe selected land use options in technical (management) & socio-economic terms.
- Determine the biophysical requirements of the land use options.

- Delineate land mapping units and their characteristics
- Evaluate land capability: - the extent to which the biophysical requirements of the land use options are satisfied by the characteristics/qualities of the land mapping units or the capability class of the land unit.

Output: descriptions of the land use options

- ✓ Map showing the biophysical suitability of land for each of the option.

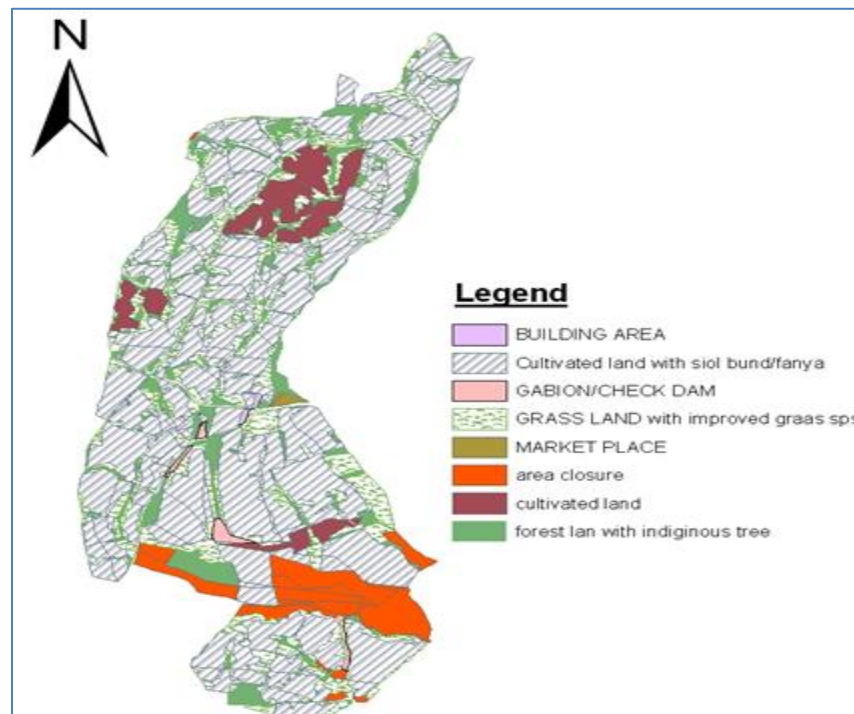


Figure 4.1. Prepared land use plan Map

Responsibility: planning team

Step 6: Appraise the land use options

- Assessment of environmental, economic and social impacts of biophysically suitable land use options.
- Criteria for evaluation
 - ✓ Environmental impact
 - ✚ On site effects
 - Erosion
 - Change in ground water
 - Increase in run-off

✚ Off-site effects

- Dawn stream flooding
- salinization

- Financial (land user) benefits
- Economic (community) benefits
- Social impact (employment)
- Scenic and recreational value

Output: effects of each promising land use option in environmental, economic and social terms.

Responsibility: planning team

Step 7: choose the best options

- Review and summarize options for allocating land use to land units and their predicted impacts.
- Hold first public discussion with stake holders
- Choose which changes in land use should be made where taking into account
 - ✓ Environment, economic and social impacts
 - ✓ Preferences expressed by the stakeholders
 - ✓ Govt. objectives
 - ✓ Goals of step 1
 - ✓ Constraints

Output: land use options that satisfy the needs of different stakeholders; or compromise solutions.

Responsibility: planning team/decision makers

Step 8: Prepare land use plan

- Allocate land use options (including their management attributes) to land units.
 - ✓ What should be done where?
 - ✓ Prepare appropriate maps and legends
 - ✚ Where should it be done?
 - ✓ Choose policies and/or sectoral agencies by which land use options will be implemented
 - ✚ How should it be done?

- ✓ Calculate costs of implementation and determine source of funding
- ✓ Prepare time table for implementation
- ✚ When should it be done?
- ✓ Discuss plan with decision makers, agencies and land users.

Output: Land use plan including maps, report and work plan for implementation

Responsibility: planning team

Step 9: Implement the land use plan

- Successful implementation of a plan depends on:
 - ✓ Efficient coordination of sectoral activities
 - ✓ Participation of land users and local communities

Step 10: Monitor and Revise the plan

- Organize regular progress reviews with stakeholders
- Assess the extent to which goals have been achieved
- Seek explanations for failures
- Modify the land use plan, if necessary, based on experiences during implementation that were not envisaged during the preparation of the plan.

4.5 Land use planning activity evaluation

Evaluating activities related to land use planning is an important step in ensuring that the planning process is effective and meets the needs of stakeholders. Here are some procedures that can be taken to evaluate land use planning activities:

- **Define evaluation objectives:** The first step in evaluating land use planning activities is to define the evaluation objectives. This may involve identifying the goals and outcomes that the planning process is intended to achieve, and then identifying the metrics or indicators that can be used to measure progress towards these goals.
- **Collect data:** Once the evaluation objectives have been defined, data should be collected to measure progress towards these objectives. This may involve collecting data on land use patterns, environmental impacts, social and economic factors, and other relevant indicators.

- **Analyze data:** Once data has been collected, it should be analyzed to identify trends and patterns, and to determine whether the planning process is achieving its objectives. This may involve conducting statistical analyses, mapping and visualization, and other analytical techniques.
- **Identify strengths and weaknesses:** Based on the data analysis, strengths and weaknesses of the land use planning process should be identified. This may involve identifying areas where the planning process is working well, as well as areas where improvements are needed.
- **Develop recommendations:** Based on the strengths and weaknesses identified, recommendations should be developed to improve the land use planning process. This may involve developing new policies or procedures, improving stakeholder engagement, or implementing new tools or technologies.
- **Implement recommendations:** Once recommendations have been developed, they should be implemented to improve the land use planning process. This may involve updating policies and procedures, training staff on new tools or techniques, or implementing new technologies or data collection methods.

By following these steps, land use planning activities can be evaluated and improved over time, leading to more effective and sustainable land use practices. It is important to note that evaluation should be an ongoing process, and that the planning process should be continuously monitored and adjusted based on feedback from stakeholders and the results of evaluation activities.

Self-Check 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Short Answer Questions

1. Discuss the goals of strategic land use planning.

2. Discuss the steps for land use plan preparation.

Operation Sheet 4

4.1 Techniques/Procedures/Methods of being acting as development agent and community to show procedures to be followed during land use plan preparation.

A. Tools and equipment

- Legal Documents of land use plan(proclamation, regulation, directives)
- Manual of land use planning

B. Procedures/Steps/Techniques

1. Divide the class trainees into two groups
2. Then, one group acting as Development agent and the second group as community
3. Organize and initiate the community for discussion,
4. Implement training for the community on procedures to be followed during land use plan preparation.

4.2 Techniques/Procedures/Methods of land use plan preparation in your college area.

C. Tools and equipment

- Legal Documents of land use plan(proclamation, regulation, directives)
- GPS/GNSS
- Images of the area

D. Procedures/Steps/Techniques

1. Select and delineate area;
2. Collect Data simply by observation: Get to know the local context, including the socio-economic and biophysical factors;
3. Identify stakeholders: Identify all stakeholders involved in land-use planning.
4. Engage community participation: Engage the community in land use planning with appropriate outreach methods such as community meetings and focus group discussions;
5. Map existing land use patterns manually: Map the current land use patterns to provide information about where crops are being planted, where grazing is taking place, etc.;
6. Priority identification for allocation of suitable land: Identify priority areas for different uses such as agricultural production, grazing land, or conservation;
7. Prepare land use plan: Develop a comprehensive land use plan including zoning regulations that will define what types of activities are allowed where.

LAP Test 4	Performance Test
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Name..... ID.....

Date.....

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **16** hour. The project is expected from each student to do it.

Task-1: Implement training for the community on procedures to be followed during land use plan preparation.

Task-2: Prepare land use plan.

LG #45	LO #5- Implementation of Land Use Plan
Instruction sheet 5	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Resource organization and mobilization • Stakeholders and community Consultation and Participation • Implementation of land use plan • Monitoring and evaluation • Revision of the plan <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • Organize and mobilize Resource • Consult and Participate Stakeholders and community • Implement Land use plan • Monitor and evaluate the implementation of the plan • Conduct revision of the plan 	
Learning Instructions:	
<ol style="list-style-type: none"> 1. Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3. Read the information written in the information Sheets 4. Accomplish the Self-checks 	

Information Sheet 5

5.1 Resource organization and mobilization

The implementation of a land use plan requires the organization and mobilization of various resources, including financial, human, and material resources. Here are some mechanisms that can be taken to organize and mobilize these resources:

- **Identify the resources needed:** The first step in organizing and mobilizing resources is to identify what resources are needed to implement the land use plan. This may include funding, personnel, equipment, and materials;
- **Develop a budget:** Once the necessary resources have been identified, a budget should be developed to allocate funds for the various activities required for the implementation of the land use plan;
- **Secure funding:** Funding can be secured from a variety of sources, including government grants, private foundations, and donations from individuals or businesses. It is important to develop a fundraising strategy that targets these sources and outlines how the funds will be used;
- **Recruit personnel:** The implementation of a land use plan will require a team of professionals with various skills and expertise. Depending on the size and complexity of the plan, this may include planners, engineers, architects, surveyors, and environmental specialists. Personnel can be recruited through job postings, referrals, or partnerships with universities or professional organizations;
- **Train personnel:** Once personnel have been recruited, it is important to provide them with the necessary training to ensure they are equipped with the knowledge and skills required for their roles. This may include training on the land use plan itself, as well as training on project management, communication, and conflict resolution;
- **Procure equipment and materials:** Equipment and materials required for the implementation of the land use plan may include surveying equipment, computer software, office supplies, and construction materials. These can be procured through purchasing agreements with vendors or through donations from businesses or individuals;

- **Develop partnerships:** Developing partnerships with other organizations or stakeholders can help to mobilize additional resources and expertise. This may include partnerships with community groups, non-profit organizations, or other government agencies.

5.2 Stakeholders and community consultation and participation

Stakeholder and community consultation and participation are critical components of the implementation of a land use plan. Engaging stakeholders and the community in the implementation of a land use plan requires careful planning, communication, and ongoing engagement. Here are some steps that can be taken to engage stakeholders and the community in the implementation process:

- **Identify stakeholders:** The first step in engaging stakeholders and the community is to identify who they are. This may include residents, business owners, community groups, non-profit organizations, and government agencies. Identifying stakeholders and their interests can help to tailor the consultation and participation process to meet their needs;
- **Develop a consultation plan:** Once stakeholders have been identified, a consultation plan should be developed. This plan should include strategies for engaging stakeholders, such as public meetings, workshops, surveys, and focus groups. The plan should also outline the goals and objectives of the consultation process and the role of stakeholders in the implementation of the land use plan;
- **Communicate the land use plan:** It is important to communicate the land use plan to stakeholders and the community. This can help to build support for the plan and facilitate ongoing engagement and participation in the implementation process. Communication methods may include public meetings, newsletters, social media, and websites;
- **Facilitate participation:** Facilitating participation involves providing opportunities for stakeholders and the community to provide feedback and input into the implementation process. This may involve establishing advisory committees or working groups, providing opportunities for public comment on proposed regulations or policies, or soliciting input on specific projects or initiatives;
- **Provide feedback:** It is important to provide feedback to stakeholders and the community on how their input has been incorporated into the implementation of the land use plan. This can help to build trust and support for the implementation process;

- **Evaluate consultation and participation:** Evaluating the consultation and participation process can help to identify strengths and weaknesses and improve future engagement efforts. This may involve collecting feedback from stakeholders and the community, analyzing the effectiveness of the consultation and participation strategies, and making necessary adjustments to the process.

5.3 Implementation of land use plan

The implementation of a land use plan involves a series of procedures that need to be followed to ensure that the plan is effectively executed and achieves its intended goals and objectives. It is important to note that the procedures for implementing a land use plan may vary depending on the specific context and objectives of the plan. Here are some general procedures that can be followed for the implementation of a land use plan:

- **Develop an implementation plan:** This involves developing a detailed plan that outlines the specific actions, tasks, timelines, and resources required for the implementation of the land use plan. The implementation plan should also identify the roles and responsibilities of the stakeholders involved in the implementation process;
- **Establish a governance structure:** This involves establishing a governance structure that will oversee the implementation of the land use plan. The governance structure should include representatives from all relevant stakeholders, including landowners, communities, government agencies, and civil society organizations;
- **Allocate resources:** This involves allocating the necessary resources, such as funding, equipment, and personnel, for the implementation of the land use plan. The resources should be allocated based on the priorities and needs identified in the implementation plan;
- **Communicate with stakeholders:** This involves communicating the details of the land use plan and the implementation plan to all stakeholders involved in the implementation process. This will help to ensure that everyone understands their roles and responsibilities, as well as the expected outcomes of the plan;
- **Monitor and evaluate progress:** This involves monitoring and evaluating the progress of the implementation process to ensure that the plan is being effectively executed. This

will allow for adjustments to be made as needed to the implementation plan and to the land use plan itself;

- **Review and update the plan:** This involves periodic reviews and updates of the land use plan to ensure that it remains relevant and effective over time. This may involve incorporating new data or changing circumstances, as well as adjusting the implementation plan as needed to reflect new priorities or challenges;
- **Implement specific actions:** This involves carrying out the specific actions identified in the implementation plan, such as land use zoning, infrastructure development, conservation measures, or community outreach programs. These actions should be carried out in a coordinated and consistent manner, in accordance with the goals and objectives of the land use plan;
- **Communicate progress and outcomes:** This involves communicating the progress of the implementation process and the outcomes achieved to all stakeholders involved in the implementation process. This will help to ensure transparency and accountability, as well as to foster a sense of ownership and collaboration in the management of land use.

5.4 Monitoring and evaluation

Monitoring and evaluating the implementation of land use plans is an important aspect of effective land use planning. It helps to ensure that the goals and objectives of the plan are being met, and that any necessary changes are identified and made in a timely manner. Here are some steps that can be taken to monitor and evaluate the implementation of land use plans:

- **Define the indicators:** Identify the specific indicators or measures that will be used to determine whether or not the plan is being implemented effectively. These may include quantitative measures such as changes in land use or population density, as well as qualitative measures such as stakeholder satisfaction or community engagement.
- **Establish a baseline:** Before implementation begins, establish a baseline against which progress can be measured. This might include data on current land use patterns, resource availability, community demographics, etc.
- **Conduct regular assessments:** Schedule regular assessments or surveys at specific intervals to track progress and identify any deviations from the plan. Depending on the

size and scope of the project, these assessments may be conducted annually, semi-annually or quarterly.

- **Analyze the data:** Review and analyze the data collected during assessments to identify trends and patterns over time. This information can be used to identify areas where progress is being made as well as areas where improvements are needed.
- **Develop action plans:** Based on the data analysis, develop action plans to address any shortcomings or deviations from the plan. These action plans should be developed collaboratively with stakeholders and should be designed to support continuous improvement.
- **Communicate regularly:** Share progress reports with stakeholders and other interested parties to maintain transparency in the process and keep everyone informed about how well the plan is being implemented.

5.5 Reviewing the plan

Reviewing the land use plan is an important step in ensuring that the plan remains relevant and effective over time. Here are some steps to review a land use plan:

- **Assess the progress:** The first step is to assess the progress made since the adoption of the land use plan. This can involve reviewing data on land use patterns, economic development, infrastructure investments, and other relevant factors;
- **Evaluate the effectiveness:** Evaluate the effectiveness of the land use plan based on the progress made towards achieving the goals and objectives outlined in the plan. This can involve a quantitative or qualitative analysis, depending on the availability of data and the specific context;
- **Identify changes in the community:** Identify any changes in the community that may have occurred since the adoption of the plan, such as demographic shifts, changes in economic conditions, or changes in environmental conditions;
- **Engage with stakeholders:** Engage with stakeholders, such as community members, interest groups, and government agencies, to solicit feedback on the effectiveness of the plan and to identify areas for improvement;
- **Update the plan:** Based on the assessment and evaluation, update the land use plan as necessary to ensure that it remains relevant and effective over time. This can include

revising goals and objectives, updating strategies, and identifying new implementation projects;

- **Monitor and evaluate progress:** Once the plan has been updated, monitor and evaluate progress to ensure that the changes are achieving the desired results. This can involve collecting data, tracking progress against milestones, and making adjustments when necessary.

Self-Check 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Short Answer Questions

1. Discuss the Resource organization and mobilization mechanisms during the implementation of land use plan.

2. Discuss the general procedures that can be followed for the implementation of a land use plan:

1. Reference Materials

Books:

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