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RURAL LAND ADMINISTRATION AND USE
DIRECTORATE
(RLAUD)

Local Level Participatory Land Use Planning Manual

Concepts and steps in LLPLUP

(Final)

17

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Acronyms

ACZ	Agro Climatic Zone
AEZ	Agro-Ecological Zone
AP	Aerial Photograph
BoA	Bureau of Agriculture
BoEPLAU	Bureau of Environmental Protection, Land Administration and Use
BoFED	Bureau of Finance and Economic Development
BoLAU	Bureau of Land Administration and USE
BoPARD	Bureau of Pastoral Agriculture and Rural Development
BoRLAU	Bureau of Rural Land Administration and Use
CAP	Community Action Plan
CBPWSDG	Community Based Watershed Development Guideline
CSI	Credit and Saving Institution
DAs	Development agents
EMA	Ethiopian Mapping Agency
EPA	Environmental Protection Authority
ESIF	Ethiopian Sustainable Investment Framework
FAO	Food and Agricultural Organization
FDRE	Federal democratic Republic of Ethiopia
FSS	Food Security Strategy
GIS	Geo Information System
GPS	Geo Positioning System
KA	Kebele Administration
KMWDT	Kebele Micro-watershed Development Team
KWC	Kebele Watershed Committee
KWDT	Kebele Watershed Development Team
KWSDT	Kebele Watershed Development Team
LAU	Land Administration and Use
LAUD	Land Administration and Use Directorate
LFA	Logical Framework Analysis
LGP	Length of Growing Period
LLPLAAPT	Local Level Participatory Land Administration and Use Planning Team
LLPLUP	Local Level Participatory Land Use Planning
LLPLUPM	Local Level Participatory land Use Planning Manual
LLPP	Local Level Participatory Planning
LU	Land Unit
LUP	Land Use Planning
MARF	Mean Annual Rainfall

MERET	Managing Environment Resources to Enable Transition to More Sustainable Livelihoods
MMPET	Mean Monthly Potential Evapo-transpiration
MMRF	Mean Monthly Rainfall
MoARD	Ministry of Agriculture and Rural Development
MoE	Ministry of Education
MoFED	Ministry of Finance and Economic Development
MoH	Ministry of Health
MoWR	Ministry of Water Resources
MWDT	Micro- watershed Development Team
MWSDT	Micro-watershed Development Team
NGOs	Non-governmental Organizations
NMA	National Meteorological Agency
NRD	Natural Resource Development
OoA	Office of Agriculture
OoAs	Offices of Agriculture
OoH	Office of health
OoLAU	Office of Land Administration and Use
OoWE	Office of Water and Energy
ORRD	Office of Rural Road Development
PASDEP	Plan for Accelerated and Sustained Development to End poverty
PET	Potential Evapo-transpiration
PLUP	Participatory Land Use Planning
PLUPI	Participatory Land Use Planning and Implementation
PRA	Participatory Rural Appraisal
PU	Planning unit
RF	Rainfall
RLAU	Rural Land Administration and Use
RRA	Rapid Rural Appraisal
RRDA	Rural Road Development Authority
SNNP	Southern Nations & Nationalities and Peoples
SNNPR	Southern Nations, Nationalities and Peoples Region
UNDP	United Nations Development Program
WFP	World Food Program
WLAU	Wereda Land Administration and Use
WWDT	Wereda Watershed Development Team
ZOOP	Objective Oriented Planning Tool

1 Introduction

There is nothing comparable to land that provides basis for livelihood in Ethiopia. Land therefore is the main stay of the Ethiopian people. At the beginning of the last century land and its resources were abundant to the people who want to use it. However, as the population density increased now and again in the last 5 decades and afterwards, the resources were degrading and shrinking below the demands of the people. The result was reflected by shortage of food, feed, and wood for different uses and land for cultivation and grazing per each household.

Sympathetic to the problem as a result of famine and poverty in 1970s, the then Ministry of Agriculture (MoA) launched a resource survey and indicative land use planning project in collaboration with the World Bank and FAO. Following this and the 1986 Highland Reclamation study, the government initiated implementation of a natural resources conservation and development program on large watersheds each covering 30-40 thousand hectares of land.

According to review study of Mille-Dirma Integrated Sub-watershed Management Study Project carried out in 2009 by Ministry of Water Resources: *“In Ethiopia the natural resource conservation was organized and institutionalized since couple of decades though the indigenous and traditional efforts by individual land users were widespread prior to this. Soil and water conservation initiative was commenced within the Ministry of Agriculture only in the early 70s. Soon after its commencement, the drought induced disaster situation of the 1973/74, a forestation and conservation activities expanded significantly in different parts of the country. As a result, vast areas of land were rehabilitated with the continued and increasing allocation of resources mainly from external aids. The level of interventions in terms of resources and actors engaged in the venture were significantly increased during the years 1990. However, the degradation of land and depletion of natural resources were not to the level of efforts made to reverse the situations. Many large projects were failed to achieve their objectives of natural resources conservation especially with soil conservations. Some evaluators have concluded that, the main reasons for the failure of most projects to attain their objectives include:*

- *Erosion prevention is seen as an end in itself and its effects on agricultural production is usually overlooked;*
- *Lack of integration in addressing the problems on the ground;*
- *The technologies focused narrowly on arresting soil erosion without fully considering the underlying causes and were following blanket recommendations;*
- *Appreciation of indigenous knowledge is overlooked;*
- *The interventions were large scale and centralized and this has neglected the participatory approach;*
- *Schemes require very high labor inputs and long-term outcomes whereas farmers see the short term benefits and thus lack motivation;*

- *Socio-economic factors and tangible benefits which attract the poor farmers were not considered;*
- *Its top-down approach and absence of demonstrable changes to the day to day lives of farmers; and additional observations from this manual preparation include;*
- *Participatory land use planning and land management efforts were not integrated as it should be: and*

Most of the natural resource conservation activities were being carried out by food for work and safety net payments without involving the knowhow and interest of the land users.

However; many projects have contributed a lot in the areas of soil conservation during their operational times, especially in physical structures. But these structures have not been maintained and most of them have disappeared, while most community plantations and closed areas have been encroached. Despite all these, still the efforts are underway to understand and tackle the issues of soil conservation and land management in the country. Some donors have taken the initiatives and formulated projects to undertake different activities in the areas of conservation.

World Food Program (WFP) is one of the donors to play a significant role in the areas of soil conservation interventions. Like the other donors, its commencement was connected with the 1973/74 drought and famine. It was initiated with assisting the rehabilitation program in the form of relief in the drought affected and food deficit areas of the Northern parts of the country. Soon after, it was transformed in to food for work project with the objective of catchments rehabilitation. The project under gone several series of phases as expansion and currently it is operating mostly in the northern and eastern parts of the country by scaling up its activities with the new approach named as MERET. Currently the issue of land and natural resources conservation has got due attention by Government and is managed under the Five –Year Plan: a Plan for Accelerated and Sustained Development to End Poverty (PASDEP) program with the main objectives of laying out the directions for accelerated, sustained and people centered development and paving the ground for the attainment of the MDG's by 2015. Towards these objectives Sustainable Land Management Program (SLM) which is assisted by multi donors is formulated in the Ministry of Agriculture and Rural Development to implement the program in selected 177 Woredas in different regions. These programs are organized under Ethiopian Sustainable Land management Investment Frame work (ESIF) which is formulated with the aim of serving as a national strategic planning frame work.

The issue of water harvesting in most parts of the country was very serious since 2005/6. The aim was to alleviate the problems of water shortage in moisture stress areas. The program has contributed a lot in most areas where the application of the technique was appropriate and failed in areas where the plan was not appropriate. That is as a campaign it was planned to be implemented in all areas without considering the actual conditions and consultation of the community. The main reason for its less success is that it was not demand driven. Since the program was a national program in study watersheds also the implementation followed the top down approach and thus the effect was not to the extent of the existing situations”.

The large area/scale efforts however were unsatisfactory due to ignorance to involve the community in planning and implementation on will basis. Since then, lessons learned

encouraged MoA and support international organizations to divert the program to pilot watershed planning approaches using smaller units with involvement of the land users.

The approach was tested during 1988-1991 with technical assistance from FAO. Subsequent to that, the MoA and WFP technical staff developed a simple participatory and community based watershed planning Guidelines to be used by DAs and the community. Added to that, a simple Local level participatory land use planning manual was also prepared by MoA in 1992, to help assist in the process of Participatory planning. During the last 15 years Local Level Participatory Planning (LLPPA) Approaches and LLPLUP were in use for preparation of thousands of community plans mainly to combat land degradation and food insecurity with MoARD-WFP assisted MERET project and some NGOs still giving less importance to participatory land use plans.

Once more in January 2005, MoARD prepared and delivered an improved Community Based Participatory Watershed Development Guideline (CBPWSDG) which encourages planning and implementation at micro-watershed level in all regions.

2 Background

The Ethiopian government has established a Land Administration and Land Use Directorate (LAUD) under MoA giving special focus to address the problems of land and tenure security and natural resources conservation and development based on local level participatory land use planning (LLPLUP) activities.

The Directorate is accountable and mandated to land administration and use activities that should result into beneficial outputs in the country. The mandates and responsibilities issued to the Directorate are enforced by Land Administration and Use laws of the federal and regional governments. These policies, proclamations, and regulations put into effect preparation and implementation of land use plans. Hence, the local level participatory land use plans are meant to serve and advance implementation of provisions given in article 13 of the federal proclamation (456/2005).

Subsequently the regional States have also established land administration and use organizations up to Kebele level to undertake the responsibility of administrating the land, using participatory based planning and managing the land resources of the country.

The major intention is to tackle the problems of tenure insecurity and improper utilization of the land resources by offering legal responsibilities and regulations. Land resources degradation through improper management and utilization of land should be regulated by preparing acceptable and implementable land use plans at grass roots level. Thus, the Land Administration and use Directorate planned to expedite a preparation of Local Level Participatory Land Use Planning Manual (LLPLUPM) that should be implemented at national level & assist regions, zones, Weredas, Kebeles, and any other rural development actors to approach the planning and implementation programs with similar techniques and speeds and insertion of possible adjustments relevant to local situations at grass roots level. Moreover the manual is envisaged to avoid the use of various methods of local level planning so as to integrate efforts into the legal frameworks of development in the country.

Preparation of the Manual is technically and financially supported by ESIF (Ethiopian Sustainable Investment Framework) project which is operational in the Ministry of Agriculture. With regard to this, the manual preparation is given to an individual consultant through careful scrutiny processes. The main purpose of the consultancy work as per LAUD is ***“to produce a practical and operational local level land use planning manual”***

As a result, the individual consultant began the task by assessing the existing land use problems; land use planning constraints and local level land use planning practices of Oromyia, Amhara, SNNPR, Tigray, Beneshangul-Gumuz and Gambela regional States. The assessment work was accomplished between June 9 and July 19 by producing a standalone report submitted to LAUD in digital and hard copy formats. The initial work was useful to show what is lacking and what is available to carry out the task. The LLPLUP manual is prepared to be used by the community, DAs, LAU experts, Extension works with technical support from Wereda SMS at Kebele micro-watersheds level.

2.1 Review of the Statuses of Previous LLPLUP Manuals and Guidelines

International and national organizations and individuals developed various participatory land use planning methods and procedures since mid 1986 in different years. They were made to ensure participation of land users, stakeholders and decision makers. The methods used various titles though they were more or less similar in objectives, contents and elements in participatory approach. The guideline methods used in participatory land use planning included:

- Local Level Participatory Planning (LLPP);
- Participatory Land Use Planning(PLUP);
- Participatory Rural Appraisal (PRA);
- Rapid Rural Appraisal(RRA);
- Logical Framework Analysis (LFA);
- Objective Oriented Project Planning (Zoop); and
- Participatory Land Use Planning & implementation (PLUPI)

2.2 Previous Experiences in Land Use Planning

Late in the 1970s and beginning from early 1980s, a land use planning and regulatory department was established under the Previous Ministry of Agriculture to monitor and follow up the land use planning project activities launched at national level with agreement entered between the Ministry and the World Bank.

The executing institution of the project was FAO with national counterpart staff from the Department. The project carried out a national level natural resource and socio economic inventory, problem identification and analysis, land evaluation and preparation of indicative land use plan at 1: 1,000,000 scales. Following that' the department with the Second phase of the project selected 3 representative Agro ecological Zones in the country i.e. Low cereal potential area in Borkena,; high cereal potential area in Bichena and a mixture of Perennial and Cereal potential area in Hossaiina and did the same at 1: 50,000 scale. Each planning unit covered about 300,000 hectares of land.

In the third phase of the assistant to land use planning project, the exercise was carried out at 1: 250,000 scale in the previous Haykoch and Butajira, Yerer and Kereyu and Menagesha Awrajas with the objective of covering the country and implementation of the plan. Following that the department extended its capacity building to 3 Ketanas/zones in the country i.e. North Western, Southern and Western by establishing offices under the Ketana Agriculture and natural resources sector to operate at local and project levels with provision of technical and material support from the head office. Added to that, the MoWR resources began land use activities at river basins (12) and watershed levels since early 1990s for the purpose of river basins and watershed development master plans preparation. It is advisable to get the documents and use them as a reference and background for subsequent land use planning works of regions, Zones, Weredas and Kebeles.

2.3 Evaluation of the Existing Participatory Methods

These methods had been in use since 1980s till 2005 by government and non government organizations by choosing the method they believe is good for their goals and objectives. However, in 2005 the MoARD developed and issued the Community Based Participatory Watershed Development Guideline (CBPWSDG) as an official micro-watershed development tool. The guideline mainly focuses on soil and water conservation techniques giving less focus to participatory land use planning though it is believed to take care of land use, natural resources management and on farm and off farm activities at micro-watershed level. Plans had been also prepared by natural resource development sectors of BoA and NGOs working in different regions.

This action was taken because all the aforementioned participatory land use planning methods were not applied all over the country since any one of them was given official recognition to be used as single and preferable tool for the country's rural development except the CBPWSDG. Moreover any one of them were not evaluated and modified as best tool to be used in the country by the responsible organization (MoA). The reasons for not using one of them as national Local level Participatory Land Use Planning tool were:

- Lack of concern and appreciations for participatory planning;
- Lack of awareness for the importance of land use planning based natural resources management;
- Ignorance the importance of the contribution of stakeholders and land users;
- Because various NGOs were being guided by their own agenda and preference of planning tools
- Lack of concern for communities empowerment; and
- Believing and accepting that top down planning is the best solution for development.

On the other hand; the CBPWSD guideline didn't give adequate focus and attention to participatory land use planning which takes care of resource management and conservation. Thus MoA as per the RLAU proclamation decided to develop a Local Level Participatory Land Use planning Manual which takes care of the issues of land administration, land use planning and resource management at grass roots level. The main aim is that land should be used and managed with the plan agreed by the community and be administered and regulated by federal, regional, local and bylaws of the community which must emanate from the root laws of the federal government which has been based on FDRE constitution. In line with this, the manual allows and enforces full participation of all stakeholders directly and by means of consultation and oversight follow-up.

2.3.1 Understanding the Legal Framework for Initiation of LLPLUP

Local level participatory land use planning has a legal framework support. It is enforced by the Federal Constitution article 52(2) (d) that states "power is entrusted to regions to

administer land and natural resources to be implemented in accordance to the law to be enacted by the federal State". It is also supported by the Land Administration and Use proclamation No 456/2005; and Natural Resource Development & Management policies, strategies and laws to be undertaken at micro-watershed level development planning. Its purpose is to enhance land resources management and improving production per unit area. This has to be clearly understood by all levels of decision makers and experts through awareness development assemblies.

For instance, the Food Security Strategy (FSS) emphasizes "watershed based participatory agricultural development through natural resource conservation; water harvesting; proper utilization of land and environmental rehabilitation". Added to that, the water sector policy supports "the need for promotion of local community participation in watershed management and water conservation activities and practices". The Plan for Accelerated and Sustained Development to End poverty (PASDEP) also focused on "strengthening tenure security by expanding the ongoing land certification program ; watershed management and rehabilitation of degraded lands; and strengthening natural resources information management" to address the land degradation problem from 2005-2011. On the other hand, the Ethiopian Strategic Investment Framework (ESIF) for Sustainable Land Management addresses the objective of improving the livelihood of small holder farmers through increased productivity by reducing land degradation on the basis of community based watershed development and management interventions.

Land tenure right certification is supported by the land administration and use proclamation (456/2005) that encourages land registration of land holdings of users in order to legalize and enforce land administration by land use plan that provides clear and appropriate land management and intervention mechanisms for each land mapping units.

Appropriate land use and management plan of a mapping unit directly applies to management of land use rights and obligations of a land user that would be indicated with his holding map and certificate.

On the basis of the aforementioned statements, a local level participatory land use planning activity can be initiated by Wereda office of Agriculture (OoA), Wereda land administration and land use (WLAU) team or DAs and land users of a Kebele, micro-watershed and/or Kebele Administration through the established official organizational systems of the Federal government.

2.4 Objectives

The main objective of the task is to prepare an Integrated Local Level Participatory Land Use Planning Manual that ensures decision making on best land use options based on social, economic, institutional, and natural resources problems and potentials analysis and rural Land Administration and Land Use laws. It is believed that the manual facilitates and ensures optimum economic benefits and sustainability of rural land use through appropriate land use planning; protection of land and water degradation and environmental pollution in a planning area of each planning unit at grass roots level.

The main objective Of LLPLUP Manual:

- To ensure decision making on the best uses of land and its natural resources for optimized production of different farming systems' planning units and alternative and sustainable uses and development of land units.

Specific objectives of LLPLUP are to:

- Improve and boost the productivity of a Land Unit based on improved land use plan, water, and natural resources conservation and development activities;
- Improve infrastructures and public services in the planning unit and its communication areas;
- Assist the implementation of land administration and land use laws, regulations and directives;
- Assist in resolving land use conflicts and disputes among land users;
- Ensure & empower the participation of land users and other stakeholders in the preparation of LLPLUP; and
- Tackle misuses of land and water that cause land and water degradation.

2.5 Scope of the Task

The scope of the manual preparation is mainly to create capacities of LLPLUP by enabling, addressing and solving the problems of misuses and low productivity of land by identifying and analyzing the social, economic, and institutional and land resources potentials, problems and constraints of a land unit of a certain planning unit area and identifying and assigning potential land use options that enhance benefits, conservation and development of natural resources. The scope also goes to the level of creating a facilitating talent for appropriate land administration, management and regulation mechanisms by integrating policies, strategies and regulations and land use plans from bottom to top levels and vice versa during planning. Thus the manual builds settings for alternative development interventions, so as to enforce, monitor, evaluate & regulate the plan during implementation and evaluation stages.

2.6 Methodology

The manual is prepared based on:

- quick assessments of land use planning problems, constraints and experiences of Tigray, Amhara, Oromia, SNNP, Gambela and Beneshangul regions;
- Discussions held with regional, wereda and kebele officials and experts of land administration, land use and other relevant natural resource, agriculture, socioeconomics, mapping and GIS experts;
- review of National and International LLPLUP manuals contents and experiences in LLPLUP practices and implementation mechanisms;
- Preparation of draft manual;
- Holding workshop on draft report with Federal and regional experts;

- Incorporating workshop comments;
- Preparing semi-final manual;
- Holding second workshop with core Federal and Regional experts; and
- Incorporating comments and preparing Final the manual

3 Basic Concepts

3.1 *Land Resources*

Understanding the quality and quantity of the land resources by type is so essential and prerequisite in undertaking local level participatory Land use planning. Local level participatory land use planning (LLPLUP) is basic for obtaining optimum level of production and introducing appropriate land management practices for better or improved livelihoods.

Thus, land resources are understood as conditions and elements of the land that can be exploited, developed or managed without causing negative impact that risks the fragile environmental relationships. The conditions and elements of the land which are crucial for living are climate, soils, vegetations/flora, fauna, water, minerals, etc.

Their features as they appear in the space can be represented in sequential manner above, around and below as part and parcel of the environment. The land features constituted elements that partially or entirely fulfill the needs and demands of human beings and other living things. The important sequential categories of land resources from apex to the bottom are:

- a) The Atmosphere
- b) The Biosphere
- c) The Lithosphere; and
- d) The hydrosphere

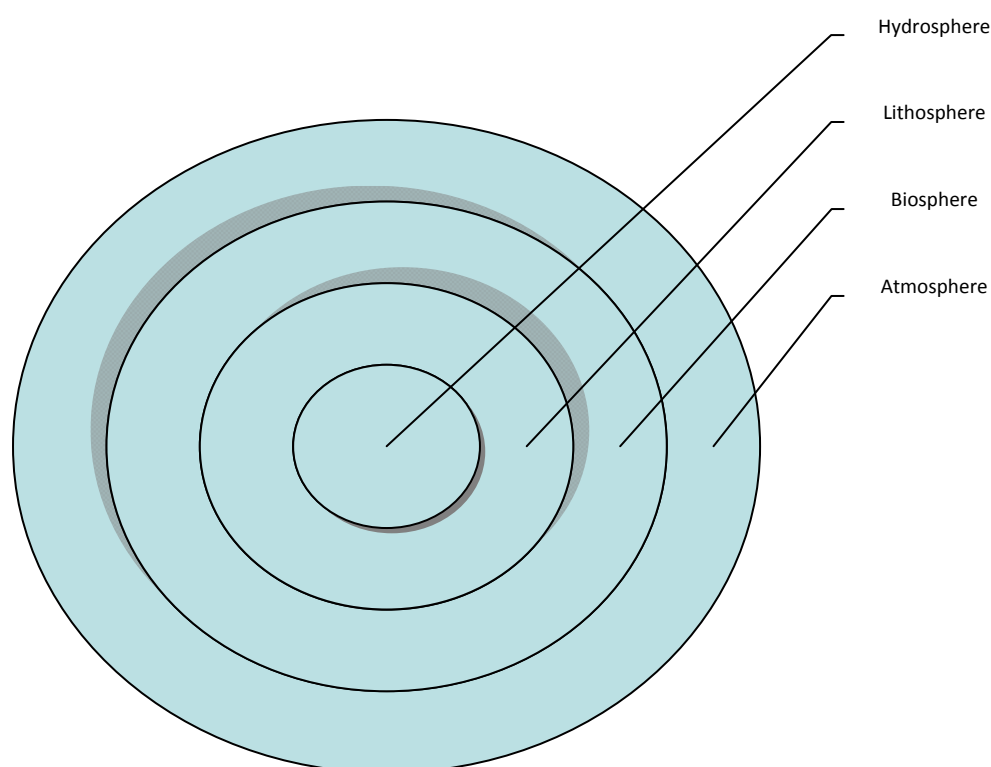


Figure 3.1: Topo-sequential homes of land resources

The atmosphere constituted the climatic elements such as air, temperature, clouds, humidity, etc. On the other hand the biosphere contains mainly human beings, the flora, the fauna and manmade features. While the lithosphere is represented by soils, moisture, heat, water, geology, minerals, etc.

The hydrosphere for the most part represents the ground and surface waters which are composed of various minerals and gases. The balanced combination of these resources is the major source of livelihoods. However, if some elements are unwisely used could be causes of destructions and eliminations of diversity and consequently dependable livelihood.

3.1.1 Climate

Climate is the major controlling physical factor in agricultural land use. It is one of the main development factors of relief (topography) and soils. The main agent in determining water balance in geo-hydrology and hydrology is climate. **Climate also decides the nature and floristic compositions of the natural vegetation of a specific site. Interactions among climate, relief and soils are important in determining socially acceptable, economically viable and environmentally sound land use types.**

The main climatic elements, which directly govern land use types to be considered for a certain area, are the rainfall amount and distribution; and the air temperature level. Thus data on these elements are so important for sustainable local level land use planning processes.

The following climatic elements are important factors in determining the land use options of a certain locality or planning area:

3.1.1.1 Precipitation

The term precipitation includes rainfall, snow and dew. The availability of water through precipitation or rather the lack of it is often the most limiting physical factor in crop and livestock production in countries where water is scarce for irrigation. In our country while undertaking any level of land use planning, it is important to know the spatial reliability of the rainfall amount and distributions. In addition, its seasonal distribution governs the choice of major land uses, crops and the optimal planting time, harvesting and other farming operations such as land preparation, weeding and threshing. The general trend of rainfall in Ethiopia is that the amount increases as the altitude increases and the temperature decreases as the altitude increases. Meaning that, the highlands receive dependable rainfall with reliable distributions.

Cropping calendar of a planning unit can be determined by discussing with farmers of different Climatic Zones and/or Agro-ecological zones.

3.1.1.2 Air temperature

As far as air temperature is considered, average temperature data has very little meaning in the assessment of the temperature conditions of an area. For agricultural development planning; monthly, seasonal, and decade data as well as data on diurnal fluctuations and average daily minimum and maximum temperatures are very essential.

3.1.1.3 Wind

Certain crops are sensitive to wind during critical growth stages (flowering, pollination, fruit setting, etc). Considerable damage might result from strong winds in the period just before harvesting. Thus a planning team established at agreed planning unit area has to be aware of the wind conditions of the planning unit in different seasons of the year.

3.1.1.4 Frost

Frost affects crop growth and development. In Ethiopia, frost occurs specifically anywhere in valley bottoms, depressions and at higher and highest spots of certain topography or locality. Certain crops do not stand frost hazard while others tolerate. Frost is classified in to four, according to its severity levels as follows.

- Light frost between 00 c and -2,50c;
- Moderate frost between -2.50c and -50c;
- Severe frost between -50c and -100c; and
- Very severe frost below -100c.

Therefore, any agricultural development planning should involve assessment of frost conditions of an area so as to point out risks of development and involve possible passing mechanisms.

3.1.1.5 Length of growing periods (LGP)

The amount of rainfall and its distribution together with influence of air temperature on Potential evapo-transpiration determine/decide length of growing periods. This period could be defined by relationships of monthly mean amount of rainfall, evapo-transpiration and half evapo-transpiration occurring in a certain area (Figure 2). When rainfall is above $\frac{1}{2}$ evapo-transpiration and below full evapo-transpiration, it is a moist period where moisture is adequate for land preparation and drought tolerant crops. When rainfall is above full evapo-transpiration it is a humid period where there is a lot of water and water harvesting is possible. When rainfall drops below half evapo-transpiration it is a period of dry spell. Counting LGP starts at the point where RF exceeds $\frac{1}{2}$ evapo-transpiration and ends when RF drops below $\frac{1}{2}$ evapo-transpiration. The lowlands suffer from moisture stress and short length of growing periods. Such areas require supplementary irrigation or full irrigation to grow crops and nurture livestock.

Lengths of growing periods severely govern the production capacity of an area/or a unit of land. In order to design a sustainable participatory local level land use planning for an area or unit of land, one has to analyze the records of the climatic elements so as to determine the existing and/or available LGP.

The major climatic elements, which determine the type of land use of an area, are temperature, evapo-transpiration and amount of rainfall. The amount of Evapo-transpiration is always governed by air temperature and wind conditions. When the temperature is high the amount increases and when low its amount decreases. Similarly high wind speed increases the amount of evapo-transpiration and in low wind speed areas it is low. Combination of strengths of the two is a big danger in crop production. Table 3.1 gives an example of mean monthly climatic features and Figure 3.2 Length of Growing Period (LGP).

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.

Table 3.1: Examples of 25 years mean monthly climatic data

Climatic parameters	Months												Total
	Jan	Feb	Mar	Apr	M	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
MMRF(mm)	30	80	100	160	15	75	240	300	150	25	5	3	1183
MMPET(mm)	160	150	160	170	200	100	75	60	70	75	100	150	1470
½ PET(mm)	80	75	80	85	100	50	37.5	30	35	37.5	50	75	735
MMT(°C)	17	20	15	16	20	19	15	14	16	15	17	16	16.7

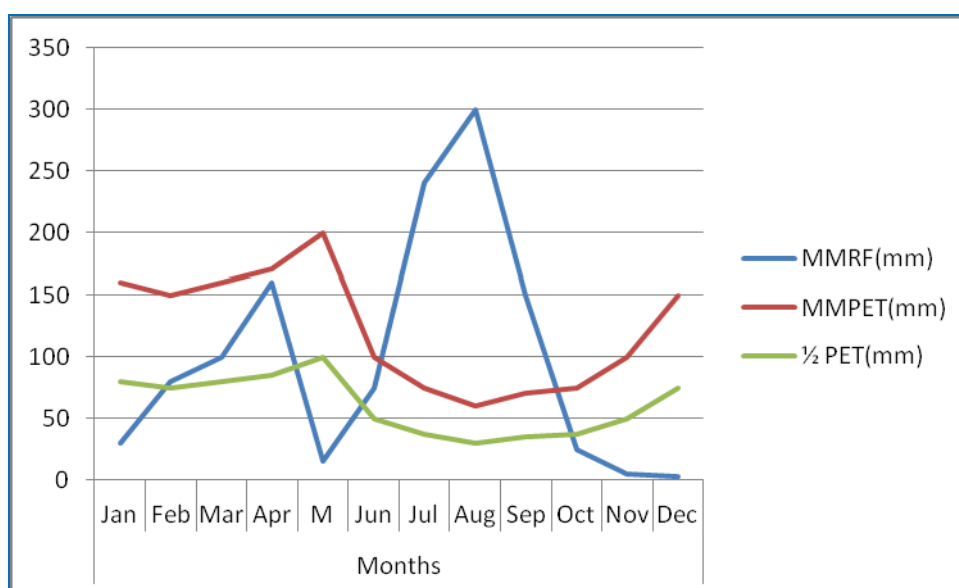


Figure 3.2: Graph showing LGP

Box 1: Reading instruction for Figure 3.2

- **The point where the ½ PET and RF intersects in February is the beginning of moist period.**
- **The point where ½ PET and RF intersect in May is the end of moist period and starting time of dry spell**
- **The point where ½ PET intersects in June is the end of Dry spell and beginning of the second growing period; this period is moist till RF intersects full PET in again in June**
- **The point where ½ PET crosses RF in October is the end of the second growing period; soil moisture holding capacity extends till end of October depending on soil type**
- **Since the figure shows two independent LGP; the RF is bimodal**
- **The two growing periods supplement to each other and form the annual LGP**
- **The period where the RF is greater than full PET is a moist period where there is plenty of water to harvest and conserve.**

3.1.2 Topography

It is the physical feature of a landscape or terrain. There are four aspects of topography on which information is required when assessing their impact on land use. These are slopes to be measured in percent and length in m, macro and micro relief and positions. These factors influence accessibility, drainage, rate of erosion, costs of land development and size and shape of fields that have to be developed and managed.

3.1.3 Soils

One of the natural resources that determine land uses anywhere in the world and specifically in Ethiopia are soils with their physical and chemical characteristics / properties.

The nature of soils exerts major influence in determining the feasibility of land uses and composition of natural communities (plants, animals, etc.) of an area or site. Therefore, a study on the physical and chemical conditions, structure, composition, and overall characteristics/properties of soils is necessary for land use planning. Soil physical and chemical properties data are collected through soil survey activities.

Soil survey is a process of measuring the extent, characteristics and properties of soils at a site or location of an area under study. Properties that would be measured during soils survey include:

- physical and chemical characteristics;
- Classified Soil types based on property data into defined units/types;
- Boundaries of units mapped and located on large sheets of papers; and
- Predicted suitability of types for various uses (crops, grazing, forestry, construction, etc.).

The knowledge of soils conditions is indispensable inputs for undertaking studies of the past and present land uses as well as for prediction of future use potentials.

Detail information on soils of Ethiopia is very scanty. The existing soil inventory map, which covers the whole country, is available at a scale of 1:2,000,000 produced by the Land Use Planning and Regulatory Department of the MoA (1984) and 1: 250, 000 scales for Basins master plans studied by Ministry of Water Resources (MoWR).

Detail/large scale soils study data are also available as prepared for areas of research stations, state farms, investors' farms, and specific project and development areas, etc. these secondary information are so important to help assist participatory land use development planning.

According to the MoA Soils map (1984), there are 18 dominant soils associations in Ethiopia. Their variability is also very high. This is attributed to the diversifying nature of climate, topography, parent material, time and biological attributes such as vegetation, land use and activities of organisms in the soil. Major characteristics and extents of these soils can be referred from FAO/MoA study conducted in 1984.

Land use planning options mainly depend on characteristics and qualities of soils such as texture, rooting depth, stoniness, rockiness, organic matter content, nutrient status, physical structures, drainage conditions, slope, etc.

Added to that, farmers through their long years of experiences categorize characteristics of different soils of their localities in their own ways and can describe them. They also determine their potentials and constraints. In order to develop a participatory local level sustainable land use plan, a planning team has to be well acquainted with land users' categorization of characteristics, limitations and potentials of soils for different land uses.

Soils in Ethiopia are highly eroded due to steep slopes, wanton cutting of the vegetation cover, overgrazing and poor management practices. The fertility statuses of most of the soils are declined due to erosion, high nutrient exploitation and little or no return of nutrients (for instance burning of dung cakes and crop residues).

- **In order to design a sustainable local level land use plan, the topography, soil types, slope and the soil qualities and characteristics of any development area must be studied, classified, analyzed and understood.**
- **Soils of half of the highlands in Ethiopia are severely eroded to the extent that they cannot support crop and animal production (the highland reclamation study, 1986).**
- **The dominant soils in Ethiopia are: Cambisols (11.6%), Fluvisols (8.3%), Leptosols (17%), Nitisols (12.2%), Regosols (10.9%), and Vertisols (10%) (FAO/MoA, 1984). But when it comes to local level planning areas, detail surveys must be carried out.**
- **The poor and shallow soils i.e. Regosols, Leptosols and Cambisols occupy about 40% percent of the country's land area. These soils require special attention and management to make them sustainably productive (FAO/MoA, 1984).**

3.1.4 Water

Water is an essential resource required for drinking by human beings and animals, and for irrigation and navigation by human beings and plants to perpetuate, grow and produce. The quality and quantity of available water determines the type of land use options and land utilization types we can think of (full irrigation, supplementary irrigation, and rain-fed).

The known sources of water are lakes, rivers, ponds, and springs, well (shallow and deep) and overall rain. The availability and accessibility of water resources in an area determines sustainability and the types of land uses that can be implemented.

In areas where water is scarce and evapo-transpiration is high; we should look into the possibilities of water harvesting techniques during rainy periods. In Ethiopia, a lot of water is flowing away in the form of overland flow/runoff during wet seasons. To collect this water, farmers need to be trained in different techniques of water harvesting (CBPWSDG, 2005). Water could be collected in ponds, dams, and reservoirs for different uses. Roof catchments could also be used as one of the techniques of water collection/harvesting. Sustainability of a land use is highly influenced by availability and unavailability of water. In our country, and in the world, good soils of some areas/sites do not produce crops mainly due to shortage and lack of rain and /or water/moisture. There is no synchronization of resources at places especially between land and water.

3.1.4.1 Hydrological cycle

It is concerned with studies of water balance in the soils and on the surface. Water and soils are on the one hand stable resources on which all land use must be based. On the other hand, they to some extent be manipulated and adopted to human being's requirements.

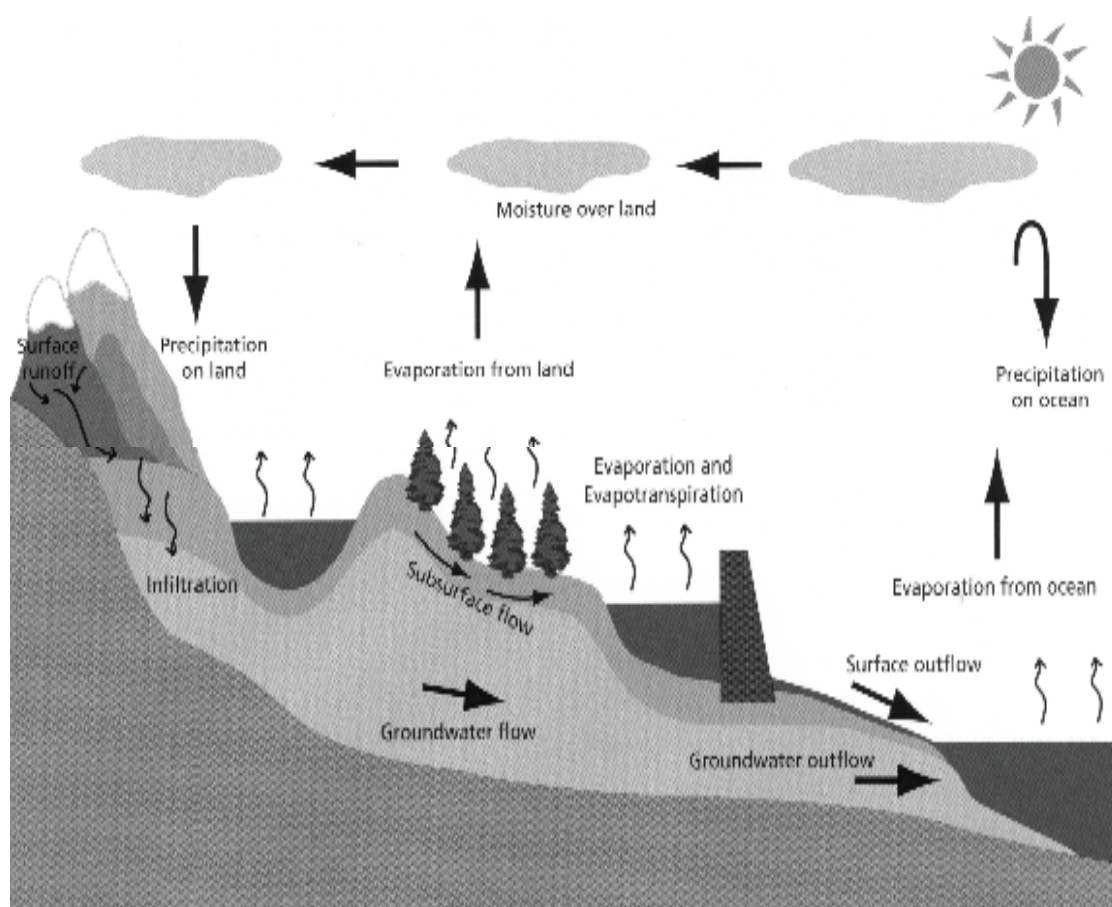


Figure 3.3: Hydrological Cycle

3.1.5 Natural vegetation

Natural vegetation in this context includes all plant species that are not purposely and continuously manipulated by man for any of his systematic land uses. It may of course be used by human beings to fulfill some of their needs; such as gathering for: timber, fruits, poles, medicinal herbs, firewood, food, recreation and feed for animals. It may also satisfy scientific or aesthetic and conservation needs. Natural vegetation also forms habitats for wild animals. Thus, it is a harboring house of animals, pests, and their predators. Natural vegetation appears as a mosaic of the ground cover in undisturbed conditions.

The natural vegetation in Ethiopia has been classified as dense forest, open forest, dense woodland, open woodland, dense bush land, shrub land, and grassland. It provides cover for the ground / soil and allows the rainwater to percolate into the ground to create ground water and springs. A good vegetation cover with its rooting structure protects the soil from being eroded away by wind and rain.

In terms of land use, natural vegetation may sometimes be regarded as hindrance to land development or reclamation. On the other hand, man sometimes uses the natural re-growth of vegetation for regeneration of his land/soil fertility (shifting cultivation) or other forms of fallowing. Decaying leaves, twigs, barks and stems of natural vegetation improve the fertility and organic matter content of soils and the roots pump-up nutrients to the surface to be easily absorbed by shallow rooted plants (crops).

Land use has also benefited from natural vegetation by the use of natural species in plant breeding programs. Thus, increased attention is being paid to possible importance of natural vegetation for healthy and ecologically balanced land use.

As the natural vegetation is becoming scarce, people are forced to consider and include the planting and regeneration of trees for different uses in their sustainable land use system (reforestation, agro forestry, and area closure). Re-vegetation in local level participatory land use planning can be consider as development mechanism of food and feed crops (fruits and forage), soils management, and wood resources for production of timber, firewood, construction wood etc.

3.1.6 Land use and land cover

Land cover is what immediately appears on the surface of the earth while land use can be defined as a function of land resources, inputs, human labor and social demands. Land use can also be explained by the efforts exerted on natural resources to derive benefits out of them for living. The efforts could be exerting energy, knowledge, inputs and technical knowhow on a unit area of land. The conditions and elements of the land exploitable, manageable and developable are plants, animals, water, minerals, etc. in order to satisfy both basic and luxurious needs and demands of an individual, community, society, nationality and peoples. The human and other living things utilization of land for meeting their livelihood requirements depend on the quality and quantity of land resources.

The basic human needs that should be satisfied through land resources or land use by any person or community are:

- 1 Shelter;
- 2 Food including water;
- 3 Fuel wood; and
- 4 Clothes;

Other material demands that depend on land and its resources are:

- Vehicles
- Electrical energy
- Mineral energy
- Household utensils
- Furniture, dock etc.

Moreover Land is needed for livestock and crop productions, settlements, industries, infrastructures, docking, warehouses, exploitation of water and woods for various purposes, camping and others not mentioned here.

In line with this, land use can be associated with different land cover types such as villages, homesteads, towns, cities, croplands, forestlands, grasslands, woodlands, nature reserves, water bodies, wetlands, etc. Moreover, Land Uses can be divided as current and potential or future. Thus it is essential to determine the two as input to compare while planning.

In the past while the users of the land were small in number, the land and its resources areas had been abundant. Hence, the effort exerted to derive the required land uses were nearly nil compared to the number of the present time land users. As the size of the resources are becoming below the people's growth and demand, exploitation exceeded replenishment and return. The outcome thus led to land use planning for improvement and maximization of production, management and protection.

3.2 Socioeconomic Resources

The socio economic resources information and data are important inputs for local level participatory land use planning. These data and information can be collected from recent secondary sources such as archives of Wereda, DAs, and extension workers offices.

This information includes demographic, agricultural statistics of crops and livestock productions and land holdings. In addition to that inputs costs and prices of crops and livestock are essential information. If these data are unavailable from sources, they can be collected by means of census and random data sampling techniques from primary sources existing in the planning unit or land users of the planning unit.

3.3 Land Use Planning

Land use planning 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 guided by the needs of the communities, the government development policies and laws of land uses and land resources management and conservation. Land users, other concerned stakeholders, technicians and decision makers engage in the process of local level participatory land use planning (LLPLUP) so as to make the decision demand oriented i.e. in terms of infrastructures including market and roads, land users choices and land management, land administration and resource conservation needs and available budget allocation for implementation of the plan.

The processes of land use planning bases on the quality and quantity of the resources and inputs available for improvement of livelihoods and the environment. Thus, decision making processes will take place on the basis of the knowledge of the land resources by all participating bodies and/or stakeholders. Facts on the existing conditions and or prevailing problems and potentials of land resources will be obtained from primary and secondary sources by working together with land users.

Land users being the main actors and the ones facing the impact of changes in land use planning and resource management and conservation have to play the leading role in identifying problems, solutions and alternative potential uses.

We technicians should recognize and accept that land users have accumulated knowledge for classifying their land resources by type and judging their problems and potentials to open an avenue for technical decisions and mutual agreement on options of suitable land uses.

Primary data can be collected through ground surveys and by holding discussions with communities, focus groups, key informants while secondary data are collected from documents of previous studies, aerial photographs including Ortho photos, satellite imageries/Google map and any archives existing in relevant Wereda, KA and DAs offices and from any other sources.

3.4 Local Level Participatory Land Use Planning

According to FAO, 1995 participatory land use planning is “an iterative process based on dialogue among all stakeholders aiming at the negotiation and decision for a sustainable form of land use in rural areas as well as initiating and monitoring its implementation”. Thus, Local Level Participatory Land use planning, must be intended to form a comprehensive program of activities to improve, boost, sustain, intensify and expand the required land use options based on the quality and quantity of the resources and community needs.

Such a land use plan should not only improve the livelihoods of the existing community but also meet the resources development and administration needs of the future generation. In the process of participatory land use planning the participating planers should identify simple techniques, procedures and instruments of planning to improve economic benefits of the land and social infrastructures. Accessibility, market, health facilities and types of outputs are important aspects of the plan those should be considered and agreed ahead of planning.

Participants of local level land use planning must base themselves on clear understanding of extents, quantities, and qualities of the land resources such as climate, current land use, socioeconomic situations; rural development policies, programs and laws; farming systems, land types by slope, soils, crops, livestock and national strategies of development. Added to that, data on water, landform and current land cover and use are important aspects of the process that can be collected by combining PRA techniques and straight sources/archives.

Excellence of a local level participatory land use plan (LLPLUP) will be mirrored by the quality of the planning team composition/stakeholders and the data quality collected and used by the team.

Participatory land use planning should also be guided by goal and objectives. They emanate from understanding of problems and constraints of the resources and development demands of the community and environmental management requirements of the planning unit.

Community level land use plans and/or local level land use plans are always participatory where the land user and stake holders play major roles in the process. Technicians provide technical support, and play the role of facilitations, reminding and advising while the community makes decisions on choices and what should be produced on a certain unit of land recognized by the planning team.

Important in Local Level Participatory Land Use Planning (LLPLUP) is to identify and map the planning unit; identify problems and discuss them in-depth; identifying optional solutions and potentials of a certain land unit and make decisions on its future use; inputs required to overcome the problems and determine the costs of improvement and inputs that can remove the problems and decide what should be more productive on that unit of land. Land use options should confirm sustainability though it could be flexible based on demands of markets and the community needs.

3.4.1 Participation

It is the process of being involved in the practice of land use planning which entails identifications of problems, constraints, opportunities, development options and priorities and interventions and analysis of them. In other words, participation means practicing the democratic rights of being involved in the process of land use planning and preparation of action plans.

Types of participations are defined as follows.

Passive participation: people participate by being told what is going to happen, or has already happened.

Participation by information giving: people participate by answering questions and then waiting for what will happen.

Participation by consultation: people participate by being consulted, and external people listen to their views; decision making is however is not shared.

Functional participation: people participate by forming groups to meet predetermined objectives.

Interactive participation: people participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones.

Self-mobilization: people participate by taking initiatives independent of external institutions to start processes, or to change their situation.

3.4.2 Objectives of participation

The following are the most important objectives of participation. By achieving them, a sustainable land, water and environmental management and natural resources development system that would be transformed from generation to generation will be established in the recent future.

- To bring development changes as per communities' needs and development potential of the environment;
- To empower the community by direct involvement of both men and women through democratic representation in order to handle the demands of gender;
- To improve the living conditions of the general community and its environment based on the predetermined government goals, purpose and objectives;
- To strengthen the socio-political conditions of stakeholders; and
- To provide opportunity to community members who are relatively powerless in decision making to acquire better power.

3.5 Integration of Natural Resource Information with Socio-economic Information

Local level Participatory land use plans are prepared based on natural resources, social, economics, and environmental data collected, analyzed and collated from planning units of mapping units by a participatory planning team. The following flow chart shows the integration of information in the LLPLUP planning process.

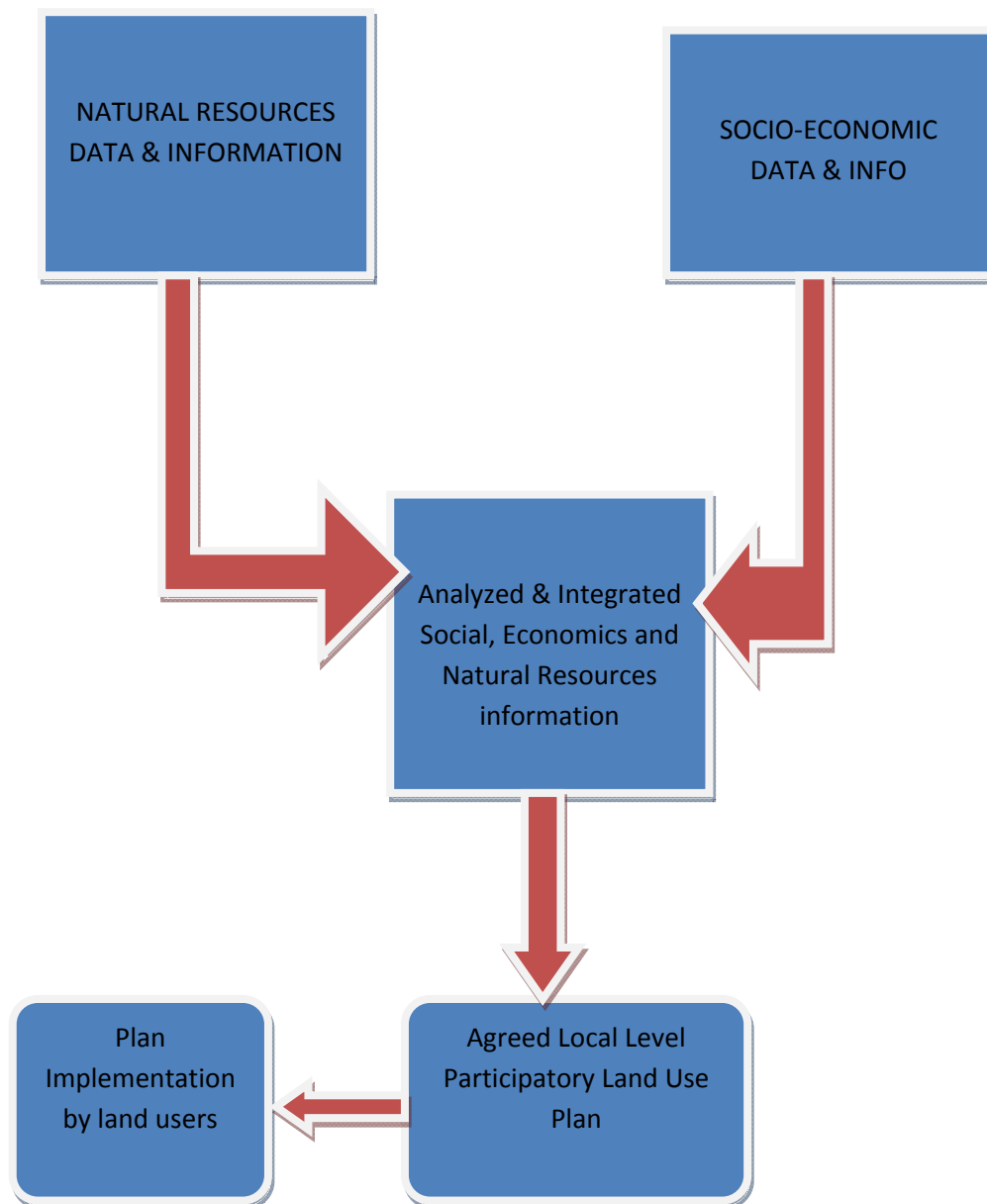


Figure 3.4: Integration of Local Level Land Use Planning Processes

Data and information for analysis of land uses and development interventions options will be collected by a participatory team from the planning units' area in order to arrive at integrated participatory plan that would be implemented by land users.

3.6 Integration of LLPLUP with Legal Frameworks

The Ethiopian Federal rural land administration and use proclamation No. 456/2005 is the major legal framework for land administration and land use planning. It defines rural land administration as “a process whereby rural land holding security is provided, land use planning is implemented, disputes between land holders is resolved and the rights and obligations of any rural land holder are enforced, and information on farm plots and grazing land holdings are gathered, analyzed and supplied to users”. It also defines land use as “a process whereby rural land is conserved and sustainably used in a manner that gives better benefits”. Moreover, it defines rural land use plan as “ a practice where by the options that give greater economic benefit without causing land degradation and environmental pollution are determined and implemented from among different use options a rural land can give on the basis of physical, economic and social information”.

According to the proclamation integrated land use plan is “the integration of different perspective needs and restrictions in the land use planning”. The integrations could be vertical i.e., national, regional, and local level planning that should be incorporated; and horizontal with government organs such as ministries, bureaus and OoAs.

Figure 3.5 illustrates vertical and horizontal integrations of plans and legal perspectives in Land Use Planning.

3.7 Important Technical Packages

Natural resources and socio-economic data for local level participatory land use planning can be collected from primary and secondary sources with assimilation and simple tools of the PRA and remote sensing methods and tools. The following are simple and easily implementable techniques after short training.

3.7.1 Aerial Photographs

If Local level participatory land use planning team can establish access to acquire remote sensing data base such as large scale Aerial Photographs (> 1: 10,000) and Ortho photo from Ethiopian Mapping Agency (EMA), the team can use them as first hand data sources. Data acquisition from these sources requires technical capacity to make interpretation, annotation and mapping. Supporting instruments required to use these data sources are mirror and pocket stereoscopes. Topographic maps larger or equal to 1: 50,000 scales are also good sources of physical and social information. Large scale data bases can also be interpreted visually.

Aerial Photographs are prior results of Remote Sensing. Small scales Aerial Photographs (AP) provide general information than large scale photographs. Large scale AP and Ortho-photos taken from low flights are detail & useful to undertake visual interpretation with land users, though it is more appropriate to use Stereoscopes to study properties of objects registered by seeing three dimensional views and where they exist in the terrain system.

Large scale photographs assist to recognize, differentiate and see objects (land cover types, soils, vegetation, etc.) with stakeholders on the photo and compare them with similar objects on the ground and to see where they are situated during assessment. The quality of APs data will be affected by weather and irregular terrain conditions. Rugged terrain and cloudy, misty and rainy weather during flights cause distortions. In general, the central portions of aerial photographs contain reliable information than outside of a match line area. Photo elements that help assist aerial photo interpretation are: Texture, tone, size, situation, pattern, etc. to identify land cover types and other elements.

3.7.2 Topographic Maps

Technicians who will be involved in the planning process need to be able to read topographic maps. If the planning team knows the coordinates of its Wereda, Kebele or watershed can order the required scale map from Ethiopian Mapping Agency to derive the required information and delineate the boundary of its planning and land units at the initial stage of the work.

Topographic maps contain information on land forms, contours, rivers, roads, settlements, land use distribution and vegetation cover, names of prominent features, streams, springs, developed water sources, low and high spots etc. Moreover topographic maps can help calculate slopes, draw cross sections, delineate micro-watersheds by identifying water divides, and prepare base map for transferring annotated data from AP and PRA surveys.

3.7.3 Participatory Rural Appraisal

The Participatory Rural Appraisal (PRA) survey method encompasses different simple and quick tools of data & information acquisition by natural resource and socioeconomic experts, communities and other stakeholders. The primary tool in the participatory land use planning exercise is resource and social mapping of the planning unit area; the second: transect walk; the third: Venn diagram; the fourth: discussion and interviewing at various stages and the fifth ranking. Though there are more PRA techniques and tools; the ones mentioned above are adequate for quick and simple Local Level participatory land use planning. (See details, tools and techniques in Chapter 4)

3.8 Levels of Land Use Planning

The world known levels of land use planning are National; Regional; District or Woreda and currently, Local Level Participatory Land Use Planning (LLPLUP) that can be equated with watershed, community watershed and/or Kebele or village level Land use planning.

As had been discussed in the above sections, LUP is the process of decision making on land use of a certain community holdings units of land by a planning team consisting of all anxious stakeholders. The planning team can make decision based on physical and socioeconomic data analysis and needs of the community if the present land cover and land use of a mapping unit to continue with interventions of some management activities or some of the mapping units' land cover and use need be changed and managed properly to bring better benefits for the land users. Types of land use planning are mentioned to broaden the knowledge of the planning team. However our focus will be on LLPLUP practices and procedures. Characteristics of the different land use planning types are given in Table 3.2 and scales of different land use planning types in Table 3.3.

Table 3.2: Features of different land use planning types

Aspects	Conventional LUP	PLUP
Working level	National, Regional, District, Basin, watershed, sub-watershed	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 units 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

Aspects	Conventional LUP	PLUP
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

Table 3.3: Recommended scales of different levels of land use plans

Level	Administrative unit	Map scale
National	Country	Large: 1:250,000 Medium: 1:1,000,000 Small: 1:5,000,000
Sub-National	Region, Basin, Watershed, Sub-watershed District/Wereda	Large: 1:100,000 Medium: 1:250,000 Small: 1:1,000,000
Local	Kebele, Village, Micro-watershed/Community	Large : 1:10,000 Medium : 1:25,000 Small : 1:50,000
Farm	Farm, Ranch	Large: 1:1,000 Medium: 1:5,000 Small: 1:10,000

Note: Since a LLPLUP is practiced based on large scale/ground survey delineation and sampling of mapping units; a study presentation scale larger than or equivalent to 1: 10,000 is preferable not to lose any unit recognized and mapped in a planning area. Thus, planners can present the output at a largest scale that could accommodate all the units of the planning area and the final land use planning units that must be implemented. The scale could range between 1: 10,000 and 1: 2,000 not to hide any mapping unit with all its characteristics.

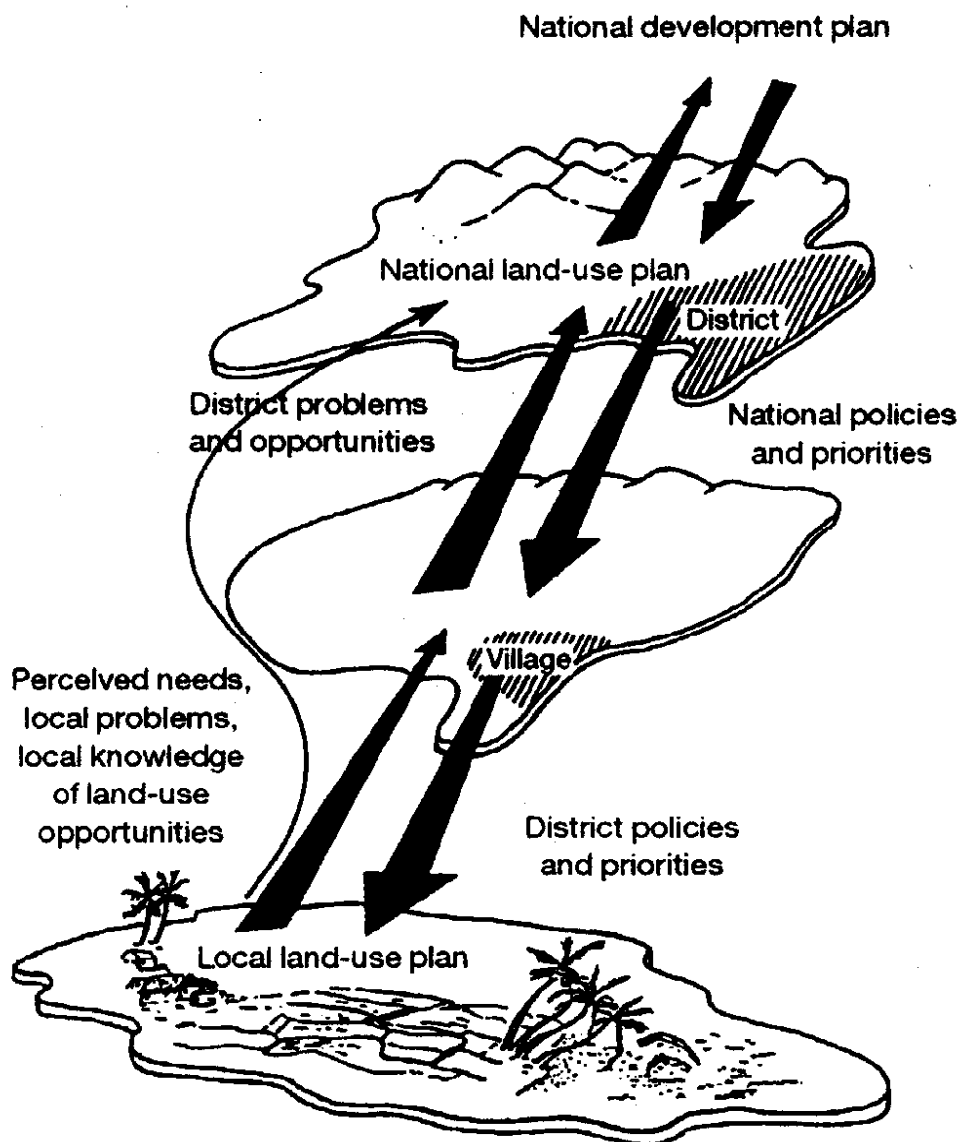


Figure 3.5: Integration flow chart of different levels of Land use plans and policies

3.9 Land Capability Classification Approach

Land capability classification is a simplified method of land use planning developed by the United States Department of Agriculture (USDA) in 1930s. It is simple and easy to use and unsophisticated to apply. The method focuses on inventory of major characteristics of landforms, land use and soil physical and chemical properties. In order to have more

accurate LLPLUP the team can use climatic data such as rainfall, temperature and LGP for enhanced accuracy.

The major data required to employ the method are: classes of slope, soil depth, past erosion status or class, soil texture, soil infiltration rate, and stoniness of a land unit. To embark on this easy classification method, mapping units can be determined by drawing boundaries following slope brakes on topographic maps, large scale APs and or using GPS or PRA mapping techniques for drawing Sketches of land forms. The different landform property factors required for using the method and classifying the capability of a certain land unit area property classes are given in Annexes11 and 13.

As stated above, the land capability classification method is much simpler and more general. The advantage is that it can be carried out by Wereda and or Kebele staff and kebele extension workers after a short training. In this system, land is often classified in eight classes according to its degree of limitation for a number of general land-use categories. These categories may be: annual crops (maize, sorghum, teff, wheat, sweet potatoes, etc.); semi-perennial and perennial crops (banana, enset, coffee, etc.); pasture; forestry; and nature reserve (no significant utilization recommended). The limitations may refer to: topography (slope, past and existing erosion); soils (soil depth, texture, stoniness, nutrient availability, salinity/toxicity (presence of salt/heavy metals, etc.), drainage, flooding risks, climate (rainfall classes, temperature, etc.).

Kebele Development Agents for instance, may, together with some land users, categorize the lands in a watershed mapping units land, based on the severity of the possible limitations and recommend uses as outlined in table 3.6. For instance, when considering the slope as limitation for cultivation of annual crops, there may be no limitation for it on flat land; little limitations on gentle slopes, which can be corrected with moderate soil conservation measures, such as contour ridges; and severe limitations on steep lands, which may not enable sustainable and economic viable use for annual crops.

The following land form factors shown on Table 3.4 is a conversion table organized for determination of land capability classes of a certain planning unit area based on data collected from land units of a planning unit area.

Table 3.4: Land capability classification conversion table

Land capability limiting factors	Land capability classes determining factors of land mapping units derived from Tables 6.1 and 6.2.								
Slope/S	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
Erosion/E	0	0	0-1	0-2	0-2	0-3	0-3	0-4	0-4
Texture/T	3-5	3-6	3-7	2-7	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	0-2	0-3
Infiltration rate/I	0	0	0-1	0-2	0-2	0-3	0-3	0-2	0-2
LGP/G	G3,G4	G3,G4	G3,G4	G2-G4	>G1	>G1	>G1	G1-G5	G1-G5
Stoniness/	0	0-1	0-2	0-2	0-2	0-3	0-3	0-4	0-4
Capability Class	I	II	III	IV	VI	VII	VII	VIII	V
	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. Class one to class four lands are suitable preferably for annual crops and in addition to any other land uses and options of land uses that can be determined as per the need of land users (Table 3.6). The class has no much physical limitations that hinder annual crops production. However soil fertility improving and soil conservation activities appropriate to the slope class might be beneficial in improving yield per hectare (soil drainage on vertisolss, fertilizers, and leguminous plants along field boundaries).

Class II- IV lands though are suitable for annual crop cultivation and other alternative uses, their capacity of production per unit area will be lowered by factors that hinder to reduce productivity such as slope, soil depth and stones cover (Tables 3.7; 3.8 & 3.9). These classes of land productivity can be enhanced with interventions that can ameliorate levels of limiting factors.

As stated briefly above, class I to IV lands are also suitable for any other development activities like livestock and forest development if the planning team needs to choose and allocate as per the farmers or land users choices. Class V land is wet or swampy that requires a lot of investment to change its land uses other than dry season grazing and grass cutting for different uses.

Class VI land is constrained by slope and erosion factors that need intensive input and management techniques and practices to ameliorate and change them to annual crops production; but by constructing appropriate physical and biological measures annual & perennial crops can be grown on bench terraces. Class VII & VIII lands can be developed by enclosing the area as house of natural regeneration and biodiversity conservation.

Perennial crops can also be grown as availability of moisture and suitable temperature relevant to the selected land use. Table 3.5 provides land capability classes' potential land uses and land conditions. Table 3.6 presents detail property descriptions of land capability classes and Annex 13 possible limitations of land capability classes, alternative intervention and different land uses that can be looked by a planning team of a certain Kebele or micro-watershed situated in a Kebele/grass roots level.

Table 3.5: Land capability classes and conditions adapted from Tanzania local level land use planning guideline

Land Capability Class	Degree of Limitation	Capability	Current Condition
I	Not significant	For all land uses, with normal land management practices	Flat, well drained and fertile
II	Little	For all land uses, but moderate conservation practices in case of annual crops	Gently sloping and slightly eroded lands
III	Moderate	For all land uses, but moderate conservation practices in case of annual crops	Sloping and moderately eroded lands
IV	Moderately severe	For all land uses, but annual crops on occasional basis only and with intensive physical and biological conservation practices	moderately steep, stony and eroded lands
V	Permanent swamp	Dry season grazing and grass cutting	Swampy
VI	Severe	For pasture and (semi-) perennial crops with moderate conservation practices and forestry; if for perennial with intensive physical and biological conservation measures	Steep, stony and eroded Lands
VII	Very Severe	For forestry only with area closure; animal feed cut and carry is also possible	Stony and eroded lands
VIII	Extremely severe	Very extensive utilization only (reserve/wildlife)	Very fragile mountainous lands

Table 3.6: 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 practices; 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

3.10 Local/Micro-watershed Level Participatory Land Use Planning (LLPLUP)

Now a day, land use planning at grassroots level is getting support and acceptance from governments, scientists, stakeholders and rural development organizations. The reason is that land use plans should be based on interests and know-how of land users so as to make it implementable, sustainable and effective in improving livelihoods and the problem of land degradation.

Moreover, it is found to be care taker of hydrological principles such as ***“watershed is the basic unit of water supply and the basic building block for integrated planning of land and water use”*** which provides ownership and responsibility to land users.

Steps appropriate to local level participatory land use planning are discussed in chapter 4 to help assist rapid and manageable implementation and amendable activities. Data can be collected by combining the PRA method and tools with Aerial Photographs and topographic map analysis methods. Land use plan can be prepared using the simple Land Capability classification method based on natural resources and socioeconomic data collection and analysis.

Local level participatory land use planning is preferred to be based on micro-watershed planning unit because Land use, vegetative cover, soils, and water interact throughout the watershed, so that management approaches must consistently address them together. Therefore, watershed management programs adopt integrated resource management approaches. From the 1990s, watershed management operations typically targeted to resource use productivity, livelihood improvements, and poverty reduction objectives in addition to resource conservation.

Watershed management programs generally adopt the micro-watershed as the basic planning and management unit, since this allows the integration of land, water, and infrastructure development and the inclusion of all stakeholders in a participatory process. Micro-watershed land use and resource management plans can be integrated as Local Level Participatory Land Use plan to be implemented by the community at Kebele level and ensure sustainability.

4 Local Level Participatory Land Use Planning Steps

4.1 Pre Fieldwork / Preparation

4.1.1 Discussion and Resolution with Decision Makers

Initiation of a local level land use planning requires discussions & indisputable agreement by all level decision makers, administrators and experts for fulfillment of prerequisite conditions. These conditions have been stated in all regions during field survey conducted to determine the problems, experiences and constrains in Local level land use planning processes. Local Level Land Use Planning can be addressed step by step based on technical and budgetary capacities.

According to experts and officials contacted in Tigray, Amhara, Oromiya, SNNPR, Beneshangul Gumuz, and Gmbella national regional states; the following decision actions are the most important nuts and bolts of LLPLUP.

- Awareness development from top to bottom level officials, administrators, experts and land users;
- Willingness to allocate budget for undertaking and implementation of local level participatory land use plans;
- Provision of appropriate and adequate training for experts at all levels;
- Provision of precision instruments at all levels ;
- Appropriate structuring and staffing at all levels; &
- Provision of adequate transportation facilities.

4.1.2 Identifying Required Materials

Materials important for Local Level Participatory land use planning, and that have to be secured by the LLPLUP team are:

- Topographic maps covering the Wereda
- Enlarged aerial photographs covering the Wereda;
- GPS (Geo-positioning system);
- Clinometers;
- Augur;
- PH Kit;
- Digital planimeter;
- Computers with appropriate software(ARC-GIS);
- 4 Wheel Drive Vehicles;
- Motor cycles; and
- Cycles; details are given on Annex 9

4.1.3 Planning area Identification

In order to appropriately manage and use the land resources at grass roots level; local level participatory land use plan is necessary. The plan directs development and regulates land use and brings improved & increased on farm and off farm production and best resource management practices. Most importantly, land use plans at local level are essential instruments because the users of the resources employ them to appropriately manage, develop, direct and change land uses based on Federal & Regional laws as need arises.

According to officials and experts contacted at all regional administrative levels; Kebele level land use plans should be covered by addressing plans in all micro-watersheds falling in a Kebele and adjacent kebeles to be compiled into a Kebele land Use Plan. This is because:

- The size of a micro-watershed is manageable (250-500 ha);
- It follows natural boundaries(water divides);
- Takes care of hydrological principles;
- Easy to identify and plan management interventions;
- Easy to integrate into Kebele plan;
- Easy to extrapolate/scale up plans with possible modifications; and
- Simple to modify plans as per feedbacks from DAs and land users.

This being the interest of the officials and experts at all regional levels; local level participatory land use plans should be prepared at micro-watershed level by incorporating all problem solving alternative solutions. Consequently, land use plans prepared watershed by watershed in the area of a kebele would be collated into single Kebele Land Use plan that accommodates the principle of hydrological units' management.

Since micro-watersheds extend to adjacent Kebeles, the planning team can cover the Wereda micro-watersheds by moving the planning exercise from adjacent Kebele to other adjacent Kebeles starting from eminent critical micro-watershed areas of a Kebele land holding area.

Disadvantages of a Kebele administration level Land use planning are that:

- boundaries of rural kebeles are not static;
- they are not governed by hydrological principles; and
- Heads of watersheds can be cut by adjacent Kebele boundaries thus plans implementation do not control land degradation from top to bottom level; and
- The size of most Kebeles is too large to manage and cover easily.

4.1.4 Micro-watershed Identification and Mapping

A planning site/micro-watershed can be identified and or delineated on:

- Topographic maps;
- Enlarged or large scale aerial photographs;
- By walking on water divides boundary with the community members and sketching; and

- It is also possible to recognize and delineate a planning unit by walking on the boundary and recording coordinates with GPS at bending spots and in between until the starting point is reached.

The coordinates entered into GIS system in a computer will be defined into a boundary and scale of planning unit with ARC-GIS computer program. Coordinates collected using GPS can also help define boundaries of land cover units, rivers, roads, village, homesteads, and social infrastructures, etc.

Use of topographic maps, aerial photographs, and GPS are technical methods to be carried out by professional experts and surveyors in collaboration with land users. Land users can easily capture techniques if they are told in simple languages.

4.1.5 Stakeholders Identification

As a principle, Local Level Participatory Land Use Plans can be appropriate if all level relevant stakeholders can be identified & included in the planning team. They can participate by means of consulting, participating and being aware of the planning team responsibilities. Stakeholders recognized and accepted by the region, zone, Wereda and Kebele administration should be established at all Kebeles in all Weredas of a region before starting any LLPLUP activity.

As per the rural development policy of Micro-watershed development; currently all regions have theoretically established:

- Kebele Watershed Development Team (KWSDT);
- Micro-watershed Development Team (MWSDT) that both involve:
 - the Kebele Administration representative;
 - DAS(3);
 - Youth association member;
 - Women association member;
 - Health extension workers;
 - Community elected elders;
 - Religious leaders;
 - Frontier farmers; and
 - Representatives of poor and rich farmers identified by election and ranking;
- Wereda subject matter specialists of crop, livestock, and natural resources development, Soil and Water Conservation Expert, Rural Road Expert, Water Development Expert;
- Wereda and Kebele LAU experts; and
- Other land users like investors and development actors such as NGOS and Civil Societies, etc as one can be relevant for the task.

Though these being acceptable local level participatory land use planning team members, it has been disclosed that some Kebeles in some Weredas, zones and regions did not establish the team consisting the above essential planning members.

Thus, it is recommended that local level participatory land use planning team consisting of all the above land users and stakeholders should be established to make the plan suitable, implementable, sustainable and easy to be linked with the land administration laws, regulations, directives and all levels of land use plans.

Hereafter, Local Level land use planning training can be provided by being sure that a planning team with above members is established through election and approval of the communities of Kebeles. Following this, avoiding mechanisms for not practicing turnover of trained staff will make the planning effort more adequate and sustainable within a given period of time.

It is also assumed that a steering committee should be established at Wereda level that comments, approves and follows up the implementation of the plan with membership of Wereda Administration, OoA, OoLAU, Office of Water & Energy, Office of Health and Sanitation, Rural Road Authority and Zone Administration by the wereda administration initiatives.

4.1.6 Organizing the Planning Team

A Kebele local level participatory land use planning team must be organized by Wereda land administration and land use planning process established under BoLAU or BoRLAU. The office informs officially the respective organizations to send representing members and when and where the planning team meets and will be established and organized to undertake the responsibility and activities. During the date of establishment, the envisaged planning team should draft action plan that endorses when and how to start the task and accomplish activities.

If the Kebele administration did not already organized the planning team members of KWSDT and MWSDT, the first task of the remaining members will be to inform the community who they are, why they are there and the objectives of local level participatory land use planning while they meet the community through the Kebele administration.

Then, the team members who have been already informed and ready lead the community to establish the teams by electing representative members of the community. Members of the community should include elders, women and Youth associations' representatives, religious leaders, the poor and frontier farmers recognized through election and ranking. After the election session is over, the team will discuss with the elected members when and where to start the task and agree on the role of members of the planning team.

4.1.6.1 The team's task

Once a local level participatory land use planning team organized; it can operate by amalgamating the PRA and the conventional participatory planning methods where it could be applicable in the process. Before starting the task using the PRA method, the team must assign a facilitator and a recorder of the process from among the team members who are thought to be capable in taking the responsibilities.

The rest of the members sit mixing in a circle where the process takes places to record the event using a checklist prepared by the team. No one should be allowed to stand and speak except the facilitator and the one who is elected among the farmer's representatives to undertake the task of identifying and mapping the required data being guided by the facilitator.

Other members of the planning team should sit silently mixing to each other, observe the process, and take notes that would help raise questions after the required data is accessed. Representative members of the community will be allowed to dialogue (argue, comment and discusses) on the issues of the process until consensus is reached. The method help assist to recognize the boundary of the planning unit; to be familiar with distribution of social and natural resources including land use and land cover patterns. And help assign transect walks routs on the map prepared by the community. Useful PRA tools are presented in the following sub sections.

4.1.6.2 Responsibilities of a Planning Team Members

As has been discussed above the Local Level Participatory Team will have MWDT, KWDT, Wereda subject matter specialists, and other relevant stakeholders as members. The Team is organized under BoLAU and or BoEPLAU according to agreed structural organization of Regions. Hence Participatory land use planning at local level has oversight/supervision from region to zone, wereda and Kebele level administrations. However, the local level land use planning responsibility is a team composing of MWDT, KMWDT, Wereda & Kebele LAU experts; Wereda Subject matter specialists including water and road development experts and Kebele development extension workers, and other relevant stakeholders. Agriculture and Natural Resource Development Agents and Wereda & Kebele LAU experts are primarily direct members of the Kebele MWDT and KWSDT. Henceforth responsibilities of members of the planning team will be as specified in Table 4.1 below.

Table 4.1: Responsibilities of LLPLU planning team members

S. No.	LLPLU Planning Team member	Responsibility
1	Bo LAU experts	Identification and prioritization of micro-watersheds; provision of training to Zone and Wereda LLPLUP team members; training handout preparation; plan approval, implementation follow up and commenting on action plans, bylaws and progress reports; approval of budget for non land users implementable development plans such as roads, water sources, irrigation facilities, etc
2	Zonal LAU experts	Verification and delivery of priority based micro-watersheds and Kebeles maps to weredas; provision of training to Kebele LLPLUPT; coordination of implementation and follow up
4	Wereda LAU & Subject matter specialists	Organizing the LLPLUP team. Provision of training to subordinate LLPLUPT with Zonal office staff; approval and delivery of priority kebeles to Kebele administration; initiation of the LLPLUP task; participating in the planning team; technical planning; implementation and follow-up
5	Wereda water, road, finance and health experts	Cooperation to include water, health and road facilities development plan in the land use plan as per demands of the community and upraise financial requirements; follow-up implementation of the plan; cooperate in the participatory monitoring and evaluation activities, participate as Wereda steering committee member.
6	Kebele Administration	Cooperate in organizing the planning team; encourage the planning team; assign appropriate planning team members through election; approve and enforce implementation of the plan; follow-up and evaluate implementation of the plan
7	KWDT	Actively participate in the LLPLUP process; prepare the plan with the other planning team members; assist land users to implement the plan; report problems in countered during implementation to the Kebele administration; participate in the monitoring and evaluation processes ; initiate updating if necessary.
8	MWDT	The same as above/7 at micro-watershed level
9	LLPLUPT	Actively participate in the training and planning processes; present the draft plan to the community; draft bylaw and community action plan (CAP); send the plan and the bylaw to Kebele administration; follow-up implementation of the plan; update the plan as need arises.

4.1.7 Selected PRA tools for acquisition of natural resource and socioeconomic data

4.1.7.1 Natural resource and Social mapping

The tool can be applied by the planning team at one go or independently for social and natural information mapping. Via employing this method subject matter specialists of the planning team and stakeholders other than the community play a facilitation, listening and recording role. Social maps and natural resource maps can be drawn separately or together. At the beginning of the exercise facilitators introduce the objective of mapping to

participants; leads the community elected map drawer how to start and go ahead with mapping the natural resources of the community and social infrastructures of the planning unit.

The mapping activity will begin by drawing the planning unit boundary, roads, footpaths, rivers, settlements, water sources such as springs, ponds and wells; schools, health posts, clinics and health stations; grain mills, markets, land cover types, naming neighboring Kebeles and or micro-watersheds on selected and agreed flat ground.

Mapping units and linear features will be identified, delineated and annotated with materials available in the surrounding area such as pebbles, sand, straws, leaves and ash or seeds. The map drawn on the ground will be copied by the note takers and listeners/observers of the team at the end of the exercise. The community and the map drawers discuss on the appropriateness of the boundary of units, annotated features and positions of social infrastructures in order to correct and adjust them as they appear on the ground as per agreements reached by the community or its representatives.

Maps drawn by the community do not provide the exact size of units and accurate boundaries and do not specify scale of the map. However, they are good foundations for knowing the existing planning units, initiate questions by outsider participants and experts, enable the participating stakeholders to recognize different problems through discussions appearing in each unit and to discuss alternative solutions for correcting the problems and setting appropriate land use solutions and land management techniques.

Exact boundary of units can be delineated by the planning team on large scale aerial photographs, satellite imagery and topographic maps to compare and appreciate the communities' knowledge of their resources and the problems associating with them. The scale can be adjusted using one of the above remote sensing data bases. Discussion on these maps can help appreciate the work by the planning team especially by land users' representatives.

The map drawn by the community being base for field survey, the planning team can collect adequate/Just enough data and information through transect walk discussions, ranking and using Venn diagram. These methods are simple, strong and appropriate to get clear pictures of the existing land use related problems, potentials of different units for different uses, social problems, and limiting factors for improvement of land uses as per felt needs of the community.

Box 2 : Steps in participatory resource and social mapping

- **Contact DAS & the Kebele administration**
- **Organize a planning team and plan of action**
- **Take appointment for undertaking the task**
- **Remind the appointment**
- **Discuss and agree on the objective of the planning based on socioeconomic and resource problems**
- **Assemble the planning team**
- **Elect facilitator and note takers from the planning**
- **Select a clean ground to undertake social and resource mapping**

- **Collect recognizable materials for delineation of units, sites of social infrastructures and natural features**
- **Elect a sketch map drawer from the community representatives**
- **Ask the map drawer to delineate the boundary of the planning unit with a stick discussing with the community members representatives**
- **Agree with all community members on the boundary**
- **Ask the map drawer to draw rivers, roads, footpaths, settlements, springs, wells, mills, schools, etc falling in their planning unit (one by one)**
- **Ask the map drawer to draw land cover/ land use types**
- **Ask all the community representatives to dialogue and agree on units boundaries**
- **Mark unit boundaries and line representations with available local and easily recognizable materials**
- **Develop legend and naming with symbols preferred by the community**
- **Mark north arrow**
- **Indicate adjacent/ neighboring planning units/Kebeles**
- **Compare the community map with the Map drawn on aerial photographs, topographic maps with the community representatives, etc if available**
- **Ask observers and note takers to transfer and sketch the map on papers**
- **Identify and draw transect walk routs on a map**
- **Assign data collection groups of natural resources and social and economic aspects during transect walk with the community representatives**
- **Use appropriate PRA tools during data collection**
- **Record data on prepared checklist or sketch cross-sections**
- **Undertake data analysis and ranking**
- **Undertake land use options identification and ranking for each unit of land**
- **Prepare land use plan**
 - **Prepare by law**
 - **Prepare action plan**
- **Present the plan to the community**
- **Incorporate community comments and submit the plan including appropriate interventions for implementation**



Figure 4.1: Participatory social and resource mapping

4.1.7.2 *Transect walk*

Transect walk routes can be distinguished by the planning team in such a way that it helps assist to visit and pick information from different agro-ecological, physiographic, soils and land cover units of the social and natural resource map. Since transect walks capture cross section of the representative landscapes, and mapping units, the shape could be straight, diagonal, zigzag, comb or circular depending on the nature and distributions of different mapping units in the planning unit. Useful information that would be collected through transect walk are existing land management practices, crops planted in different units, major cover types as related with slope and elevation, major land use problems of different mapping units, soil texture, drainage, slope class, depth, structure, color and stoniness and rockiness.

Availability and unavailability of social structures and resources needed for development must also be recorded. During transect walk, knowledgeable community representatives can be asked to discuss problems, potentials and constraints of development as related to

each subject such as livestock development, crop development, soils development, natural vegetation development, degraded land management, introducing new crops and breeds, introducing grazing land management techniques, and on the required changes of current land use patterns, etc.

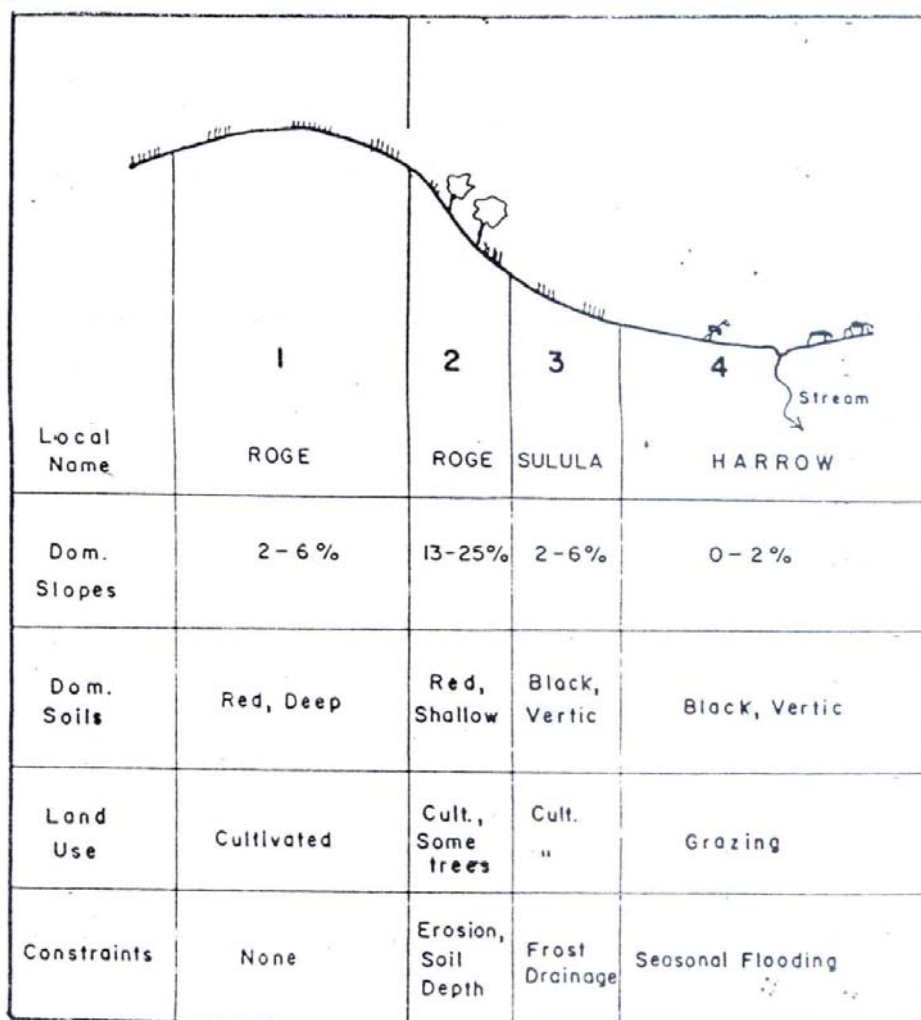


Figure 4.2: Transect walk data collected from Menageha area of typical land units of a planning unit area

4.1.7.3 Venn Diagram

Venn diagrams help assist in identifying important institutions involved in the development of the society's livelihoods. Specific to this context are the endeavors of local level participatory land use planning and development of the respective resources.

The closest institution to the society representation circle is the most useful and relatively the farthest is less useful though all are important. This can be shown by placing circles representing each institution on a flat and clean ground as closeness and distance from the community.

Figure 4.3 shows the relationship levels of different institutions to the community. Wide overlaps show more closeness and helping each other in any of the development activities. Such a relationship can easily be illustrated by the community representatives, if hint is given by the planning team how it will be done. Office of Agriculture deals equally with the Kebele administration and religious organizations as they are organized to serve the people in agricultural development activities and religious matters. Since religious organizations have close ties with the society; it is wise involving them in development planning as they have significant say in the community.

On the other hand, the overlap between Kebele administration and Office of Agriculture will not be that wide because, the kebele administration is more close to the DAs office which is working very closely with the community. Religious organizations have less ties or overlap with the DAs office because development activities are mostly done with the community which is closer to the DAs.

RO represents religious organization in the Venn diagram (Figure 4.3). Thus, the circle represents all religious organizations that could be available in a planning area. The purpose is to represent all religious organizations that could be available in a planning area. It should equally represent Mosque, Catholic Church, Orthodox Church and all other Christian churches as are relevant to any planning unit area. There should not be any unfairness to give priority to any religious organization; rather all should be equally part and parcel of the planning team.

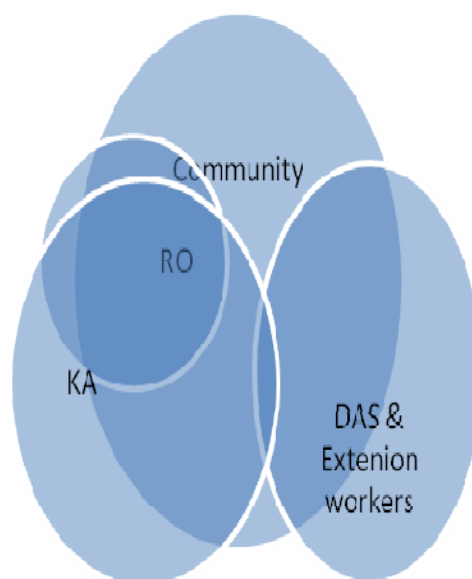


Figure 4.3: Venn diagram showing interrelationships among different organizations

4.1.7.4 Discussion with representative or delegates of the community

Discussion with farmers is one of the best methods of data and information collection during field investigation of a local level participatory land use planning. The method can be applied by all member stakeholders of the planning team as felt interests relate to inputs required by the team. Information can be collected through this technique using the resource and social maps as a base to identify problems as related to subjects of social, economics, infrastructures, land use, soils properties, land management, landholding & land administration issues, forest management and utilization, grazing land or communal land utilization and degradation issues, etc. The technique can also be implemented during field visits/transect walk, focus group discussions and secondary data collection from various sources.

4.1.7.5 Ranking

It is a technique of systematically arranging problems, constraints, development options and social wealth statuses of a community member, etc. as have been investigated. The technique help assist in identifying and arranging issues that have to be given priority

orders from top to zero level as per the community needs during planning. These could include priority orders of land use options and problems.

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 of all. The other way of identifying priority orders of issues is by giving equal chance of scoring to each issue and recognizing the issue given high score by adding the score given by different evaluators (Table 4.2). This, most of the times must be done by the community representatives with free actions. Other stakeholders observe record and appreciate the result.

Table 4.2: Example of pair-wise ranking

Code	Land use problems	1	2	3	4	5	6	7	8	Score	Rank
1	Oxen shortage		1	1	4	5	1	1	8	4	3
2	Poor soil fertility level			2	4	5	6	7	8	1	5
3	Poor drainage				4	3	6	3	8	2	4
4	High price of inputs					4	4	4	8	6	2
5	Crop pests						5	5	8	4	3
6	Crop diseases							6	8	3	4
7	Poor land preparation								8	1	5
8	Land shortage									7	1

4.1.8 Preparation of a General Base Map

A base map is a map that shows the exact boundary of a planning unit area, and positions of rivers; settlements like villages, towns, individual houses; roads, markets, schools, health centers, clinics, grain mills, and health posts. Such a map helps assist in identifying quickly major problems, and what development interventions are available and what are not during reconnaissance field visits. It also helps to be able to easily communicate with land users and raise questions and discussions. A base map can also serve to transfer information gathered from PRA surveys and preliminary and final interpretation of aerial photographs. If topographic maps are unavailable, base map can be prepared through PRA survey and data collection process using GPS and transferring into ARC – GIS software for mapping.

4.1.9 Formulation of goal and objectives

The planning team after identifying quickly the boundary of the planning unit and knowing the major land use problems outlines goals and objectives of the Participatory land use planning. The objectives can clearly be illustrated from prevailing land use problems in the planning area during problem analysis.

Farmers or land users representatives play important roles in identifying the major land use problems and constraints to development by specifying land forms in their own terms.

Discussions held among the planning team are so important to show the problems; planning unit by planning unit or site by site especially as emanating from DAs and the community members. Identification and recognition of land development and land use problems and analysis, help assist in designing appropriate land use plan options based on objectives. However, it is important to note objectives vary from planning unit to planning unit based on problems, land forms, soils properties, socioeconomic situations, climatic conditions and land using activities. However it is good to mention some typical examples that help assist a planning team in its endeavor of PLUP as follows:

- Increase food production to meet demands of the land users;
- Improve the production of cash crops to attain the need for foreign currency;
- Improve the productivity of the land units by tackling soil erosion;
- Improve the availability of feed to attain the productivity of the livestock;
- Improve the land & natural resources management capacities to attain improved livelihoods; and
- Improve the productivity of the land and its resources and social infrastructures.

Various objectives can be combined into one major objective statement through observations and discussions in the field. Discussion among the planning team should also continue till consensus is reached to make the final plan increased production and resource management oriented.

4.2 Fieldwork

4.2.1 Biophysical Data Collection

Important natural resources data that have to be collected from a planning unit area of different land units or mapping units for the purpose of local level participatory land use planning should be determined by the planning team at the beginning of the task. Identification of relevant data and information will be based on preliminary area visit recognition of major land and socioeconomic problems and potentials in the planning unit area. This should be followed by preparation of relevant formats or checklists. The most important natural resource inputs to LLPLUP that must be collected from the planning unit's mapping units will be objects discussed in the following sections. By observing the identified planning unit boundary by the team using the format presented in Table 4.3.

Table 4.3: Format for collecting land features and soils data of a planning unit

1. Region: _____; Zone: _____; Wereda: _____;
Keble _____; Micro- watershed _____; mapping unit code:
_____ ; Date: _____
2. Agro-climatic/ecological zone: _____;
Altitude _____
3. Mean Annual Rainfall in mm: _____
4. Rainy Seasons
 - a) Long rain from _____ to _____
 - b) Short rain: From _____ to _____

5. Major landform types:

6. Dominant soil Types:

7. Surface stones in % of area coverage: _____

8. Flood hazard:

9. Soil drainage condition:

10. Slope gradient in

%; _____

11. Slope Position:

12. Soil depth (cm):

13. Soil Texture:

14. Frost hazard:

15. Erosion status:

17. Water resources:

18. Major land cover types:

19. Major land use problems observed:

4.2.1.1 Agro-ecological/Agro-Climatic Zones Identification

Agro- ecological or agro-climatic information of a certain planning unit can be collected from existing thematic maps or by asking farmers in which traditional agro- climatic zone the unit is situated. Added to that, an experienced expert can differentiate the traditional agro-climatic zones of a mapping unit by searching indicator plants if available and/or judging the environment. The above data collection form can be used to record the agro-climatic zones of a specific mapping unit from the following choices and detail characteristics of ACZ are shown on Table 4.4.

How to collect Agro Climatic Information

- Carefully Look at the surrounding area of the planning unit
- Note if there are different levels of landscapes in terms of height/altitude

- Ask the participating farmers if the different landscapes make differences in warmness and coldness
- Ask again if each one make differences in crop types, vegetation composition and farming practices
- Ask and record what they are called in local climatic zone terms
- If you have GPS or Altimeter read and record the altitude and X Y coordinates

Table 4.4: Detail Characteristics of ACZ

ACZ	Location	Altitude in m	Temperature °c	MARF in mm	PET in mm	LGP in days	Vegetation
Bereha	Danakil depression, eastern plains of Ogaden	<500m amsl	>27.5	<200	>2000	Not reliable	Scattered low shrubs
Kolla	Northern part of the rift valley, eastern part of Hararghe; central part of Bale; southern part of Gamogofa & Keffa	500-1500m	25-27.5	In most areas <700 and in the western part 700-1200	1500-2000	Not reliable in most areas and <50 in some areas; in the western part: 90-200	Variable vegetation types; vegetation density and type increases with increase in moisture; steppe in dry areas and open woodland, Savannah woodland, deciduous woodland, evergreen woodland and lowland forest
Weinadega	Eastern escarpment, most of the Chercher highlands, the western mid highlands	1500-2300	18-25	In most areas 1000-1500 & and some spots 2000	1300-1800	Marginal in some areas with 90; most areas with 90-200 & in southwest > 2000	Mostly evergreen woodland; lowland forest; highland forest; and mountain woodland; acacia, croton, Podocarpus and Juniperus are

ACZ	Location	Altitude in m	Temperature °c	MARF in mm	PET in mm	LGP in days	Vegetation
							common trees
Dega	Most of the central highlands; small part of Chercher highland; parts of bale & Arsi highlands	2300- 3200	10-17.5	700- 1500	1000- 1500	90 – 200 & in small areas >200	Mountain woodland, mountain Savannah and Alpine vegetation; that consist of Festuca sp., Erica sp., Hagenia abyssinica, Juniperus Sp.
Wurch	High altitude areas like Bale & Semein mountains; the Plateaux of Gojam, Shewa & Arsi	>3200	< 10	1200- 1500	< 1200	90-200	Alpine vegetation consisting of Lobelia sp., Festuca sp., Erica sp., and Helichrisum.

Agro ecological/climatic zones widely determine types of crops to be grown; types of livestock to be reared; types of vegetation; and types of physical and biological land management practices to be applied. The relationship of agro-climatic zones and altitude is illustrated on figures 4.4 and 4.5. Since the amount of RF and the degree of temperature determine Agro-climatic zones, data can be collected from the nearest stations (not far from 80 Km but closer) with relatively homogeneous terrain and/ or can be acquired from records of National Meteorological Agency (NMA) for available nearest distance stations of similar AEZ.

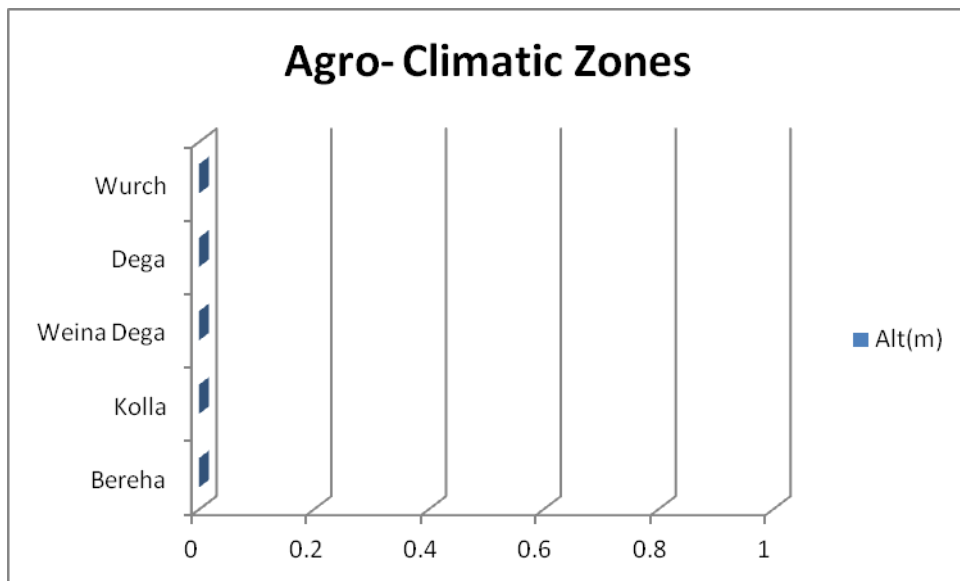
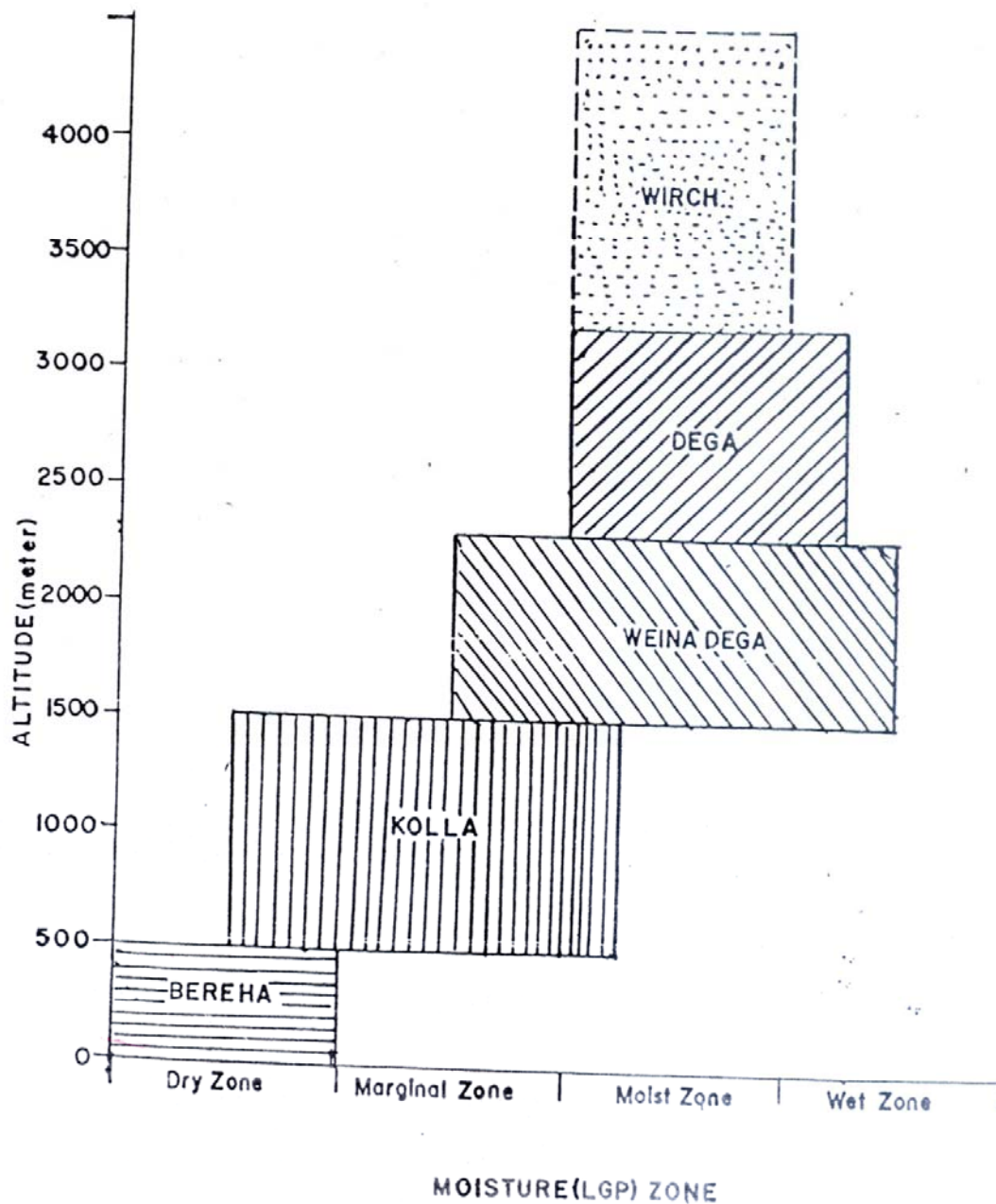


Figure 4.4: Vertical positions of Agro-climatic Zones

AGROECOLOGICAL ZONES



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Figure 4.5: Detail illustration of agro-climatic zones

4.2.1.2 Landforms

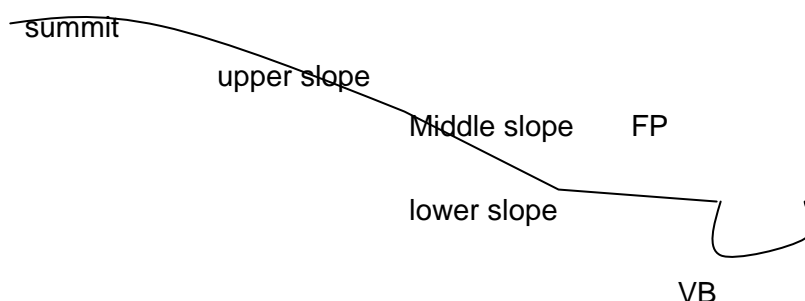
Land forms can be differentiated by making a line on slope breaks during transect walks and or drawing boundaries of slope breaks on topographic maps. Slope gradients can be measured using simple clinometers. From a selected representative point in a mapping unit a clinometers will be pointed to a maximum slope either up or down slope direction at an object of similar height to the eye level of a recorder (Figure 4.6). Then the recorder reads the slope gradient in percent (%) from a scale in the instrument and records the result on a data form. In the absence of clinometers, slope can be measured using a rope, two wooden poles and a simple water level. Slope can be measured at many places in a land unit and the dominant unit can be placed to one of the following classes shown in Table 4.5.

Table 4.5: Slope classes

Slope gradient in %	Class Code
0-2	1
2-8	2
8-15	3
15-30	4
30-50	5
>5	6

Based on measured data, the class code will be recorded in the form during field assessment. Moreover the slope direction and length will be identified, measured with tape or estimated and recorded on the format given above. A drawing of slope position should be made and linked with classification of the local people. Slope positions or landforms example is given below as seen in topo- sequential manner.

- Summit
- Upper slope
- Middle slope
- Lower slope/foot slope
- Flat plain
- Valley bottom



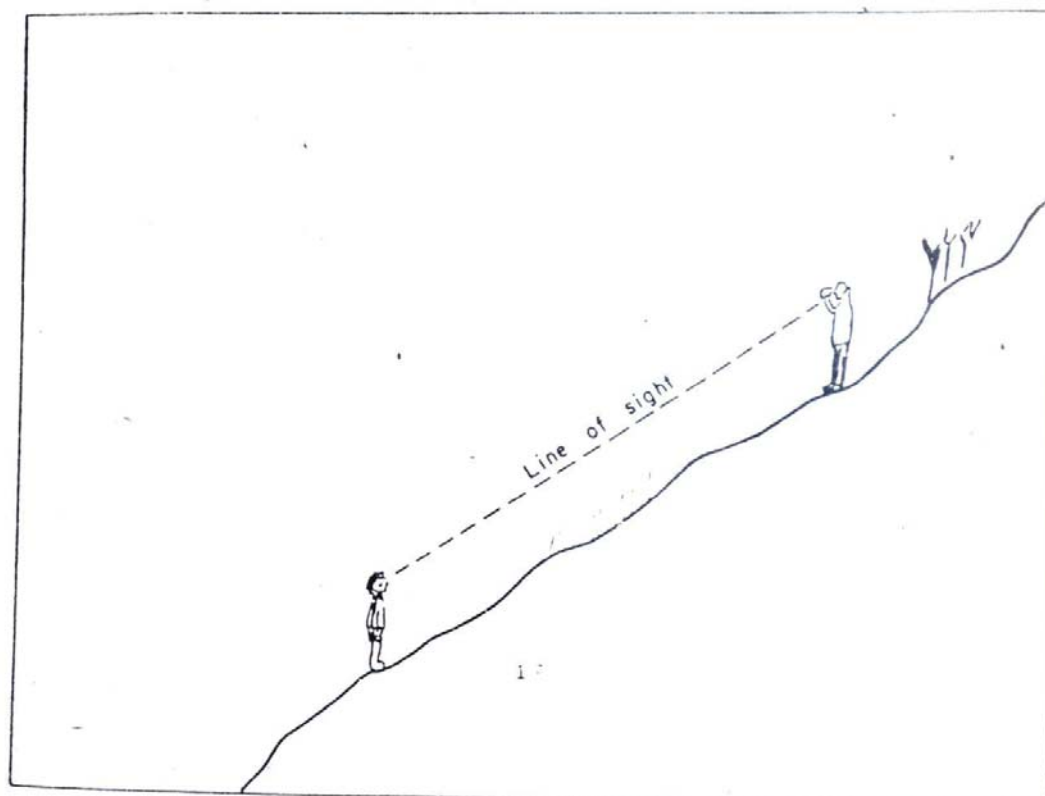


Figure 4.6: Slope Measurement using Suunto clinometers

4.2.1.3 Soil Physical properties

Soils at different slope positions even at close distances exhibit different physical and chemical properties. These properties can be measured at field and laboratory level. Laboratory analysis of soil samples taken from different spots of different land units and soil profiles is expensive and time taking though the result is accurate and dependable. Therefore; for quick local level participatory land use planning soil characteristics and qualities measurement can be done with the help of auger to take depth of different layers or from road and gully cuts of relatively homogenous unit of land. Samples of different units' soil characteristics can be measured by feeling, observation and color differentiation at field level of investigations and recorded on a format prepared by the planning team.

4.2.1.4 Soil type

Soil types for local level LU planning at field level can be classified by color. Soil colors can be observed from road cuts or profiles taken with auger by wetting the sample with water and comparing colors with color chart. Soil colors define the drainage conditions

and textures of soils. Colors can also be correlated with local soil type classification by land users.

The following soil types determined by color are common in Ethiopia.

- Red
- Brown
- Grey
- Black- Vertic
- Black-non vertic

Black vertic soils are heavy clay; they crack during dry seasons and expand in wet seasons. Their workability is poor & difficult. They suffer from drainage problems. Non vertic black soils are always present on cold areas at higher elevations; they are friable with high organic matter contents.

4.2.1.5 Soil depth

Soil depth is an important property that determines crops by rooting depth requirements; deep soils have good rooting depth for variety of crops. Shallow soils limit the type of crops due to rooting depth limitations hindered by rocks under and poor water holding capacities. Dominant soil depths of different land units/ landforms can be recorded by relating with the following soil depth classes shown on Table 4.6. Soil depth can be measured at road cuts, gully cuts and measurements with auger. The total length of a standard auger is 150cm while the scoop is 15cm. (Check with measuring tape).

Table 4.6 Soil Depth Classes

Class	Depth in cm
Very Shallow	25
shallow	25-50
Moderate	50-100
Deep	100-150
very deep	>150

4.2.1.6 Soil texture

Soil texture can be determined by feeling wet samples 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.

If the soil is difficult to mould 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 round ball that sticks firmly to the target surface, the texture is clayey (Figure 4.7).

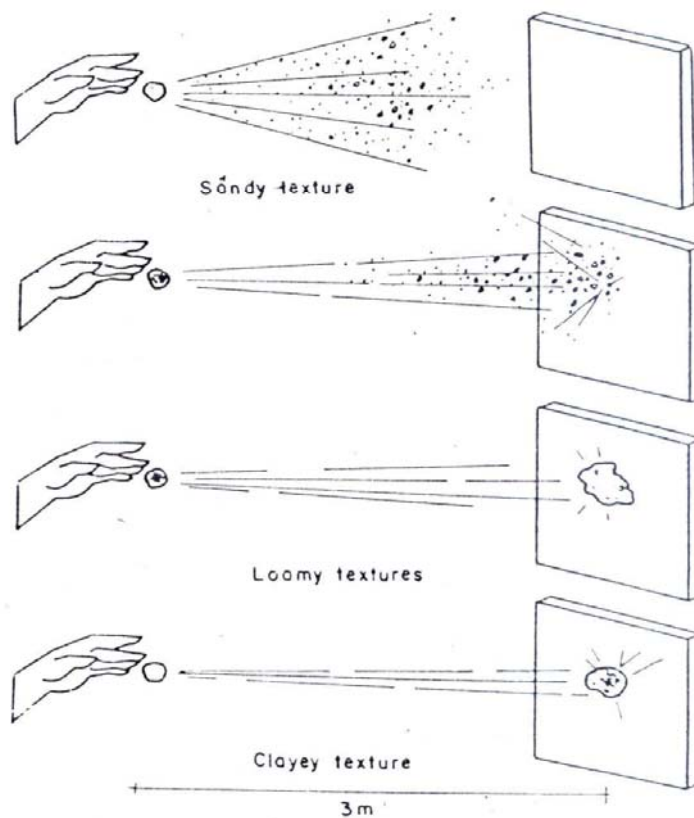


Figure 4.7: Soil Texture measurement

4.2.1.7 Soil drainage

Soil drainage condition can partially be determined from colors. Distributions of mottles or streaks of different colors in the soil can exhibit drainage problems. Field observation during wet seasons can show water logging in soils having drainage problems. Each land unit or land form can be assigned to one of the following drainage classes as shown on Table 4.8. Water logging determines aeration problem in a unit of land.

Table 4.7: 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.

4.2.1.8 Flooding hazard

Flood hazard can be observed in the field during rainy seasons. Discussions with farmers and or land users can determine the flooding conditions in a certain land unit. Land units can be allocated to the following flood hazard classes based on the result of observations and discussions as revealed on Table 4.9. Long period and frequent flooding retards vegetation growth and kills crops.

Table 4.8: 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

Land in common; frequent and permanent classes cannot be cropped in Meher season. However, the common and frequent lands can be cropped with residual moisture immediately after the rainy season.

4.2.1.9 Status of erosion

In undertaking local level participatory land use planning, the planning team should record the past and current status of erosion of a mapping unit or land unit. The data serves as a base for planning to what purpose the land should be allocated and what conservation and reclamation measures to be recommended. Erosion decreases soil depth and depletes fertility, The following classes of erosion shown on Table 4.9 should be recorded.

Table 4.9: Past erosion classes

Class	Descriptions
None	Depositional area
Slight	Some sheet and shallow rills
moderate	Common sheet, rills and few erosion gullies
Severe	Common erosion gullies, significantly reducing the land that can be used for cropping or grazing/dissected
Badland/truncated	Land from which the soil has been removed

4.2.1.10 Percent coverage of stones and rocks on the land unit's surface

The percentage level of stones and rocks coverage and extent on the surface of a land unit hinders development unless removed by the developer even if other conditions are conducive for cropping and other uses. The following classes of stones and/or rocks coverage of a mapping unit can be recorded as shown on Table 4.10.

Table 4.10: Stone coverage classes of a mapping unit.

Stone Coverage Class	% Coverage of the surface
None	<0.1
Few	0.1-1
Common	1-10
Many	10-50
Abundant	>50

The land can be ameliorated by removing the stones and rocks up to 50% level of coverage if the soils are conducive for any kind of development to enhance the required output.

How to differentiate various soil properties using simple Techniques

- **Recognize different land classes or land forms of the mapping unit by local names**
- **Measure the slope of a unit using clinometers or water level with rope**
- **Locate road or gully cuts in each unit**
- **Where there is no gully or road cut select a representative site where to dig a hole with a hoe**
- **If you have an augur use the augur to dig out soils of different layers from representative sites by turning around the augur**

- **Lay the soil dug with each scoop on the ground sequentially**
- **Measure the depth of the soil**
- **determine the texture of the different layers of the soil and determine the overall texture using the technique given under texture**
- **Differentiate by observation if there are mottles in different layers and determine their levels**
- **Determine the drainage class by levels of mottles**
- **Ask the farmers if the unit is flooded, when and for how long**
- **Determine the color by wetting the different layers of soils and agree on the overall color**
- **Estimate and agree on percent cover of stones**
- **Observe the unit and recognize signs of erosion and ask farmers if the unit is badly eroded during rains, time or months of serious erosion and why**
- **Record findings in a format**

4.2.1.11 Land use and vegetation or land cover mapping

Study on land use and vegetation begins mainly from review of existing maps, documents and pre-field interpretation of recent aerial photographs and satellite imagery. To analyze land cover and land use; aerial photographs not older than 5 years are preferable. If not available old photographs can be used with intention of careful field verifications. Land cover of a certain area constituted different land uses that can be revealed during field survey or based on accumulated knowledge of the area by the interpreter.

For local level participatory land use planning, data on existing land cover, land use and vegetation can be availed from large scale aerial photographs and Ortho-photos with visual interpretation by involving the planning team members to distinguish differences of mapping units based on characteristics of photo elements. If the two data bases are absent interpretation can be made on topographic maps by traveling around the planning unit to sketch the units. The other options are delineating the units using GPS or mapping the units by community representatives on clean ground and copying on a piece of paper/flip chart using the PRA tool.

The land cover and vegetation map can serve to describe and analyze the existing land cover types. It also helps assist to distinguish land use problems associating with each mapping units during field survey. The present land uses associating with land cover and vegetation types are the activities of human beings on the land and its resources to fulfill their living needs in a given period of time.

The common and major land cover types that can be distinguished in an area could be all of the following or some of them depending on the nature of the landforms and needs of the community. Subdivisions can be made if need arises and when there is technical capacity.

- Built-up area
- Cultivated land
- Forest
- Woodland
- Bush land
- Shrub land
- Grassland
- Marsh land
- Rock outcrop
- Bare land including sandy surface; and
- Water body

4.2.1.11.1 **Cultivated land**

A cultivated land unit can be sub classified based on percent of area under cultivation and percent of area under non-cultivated units. The uncultivated units in our country or in a planning unit area could be areas covered by field boundaries, conservation structures, and scattered patches of grasses, shrubs, trees, stones and boulders in a MU. Categories of cultivated lands that can be distinguished on remotely sensed data bases/AP and that could be verified during field survey estimations in percent are the following shown on Table 4.11.

Table 4.11: Cultivated land categories

Category	Code	% under cultivation	% under other covers
Intensively cultivated	C1	80-100	<20-0
Moderately cultivated	C2	60- 79	< 40- 21
Less moderately cultivated	C3	40-59	<60-41
Sparsely cultivated	C4	20-39	<80-61

4.2.1.11.2 **Vegetation & others**

In this unit, land cover types of different physiognomic vegetation types including plantations, water body and bare surface can be categorized. The vegetation category includes different % levels of associations and strata of trees, woods, bushes, and grasses. These may be recognized during interpretation and field verifications in a planning area. Vegetation in a planning unit area may compose of natural and manmade or planted species.

Vegetation is a collective name to all plants managed by man or naturally perpetuated. Vegetation in general has ecological values that interrelate with soils, climate, geology and water and economic benefits. Their economic benefits include food, medicinal, fuel energy, construction, conservation and aesthetic values. Livelihood without vegetation is very difficult in the world.

The following shown on Table 4.12 are the main categories of vegetation types that could be recognized and delineated during interpretations and field verifications. The expert can also record species, height and density of species and their uses using the techniques he acquired from regular studies.

Table 4.12: Land Cover and/or vegetation cover categories descriptions

Vegetation and other cover categories	Description
Built-up area	An area occupied by construction, roads, markets, villages and individual homesteads
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
Wooded shrub land	Strata of woods are branched; crowns do not form complex canopy cover. The shrub layer is not more than 5 m and trees reach up to 15 m height.
Wooded grassland	The type is characterized by grass cover and scattered trees of less than 15 m height.
Bush/shrub-land	Multiple stem woody vegetation of less than 5m height are common. Branches are interlinked.
Shrub-grassland	Scattered low shrubs and grass vegetation form the unit.
Open grassland	Land dominated by grass cover of different heights.
Barren land	Degraded land due to overgrazing, over cultivation, over cutting, natural rockiness.
Water body	Area occupied by, ponds, lakes and rivers

Note: the data is presented to show possibilities of occurrence at national level, but the planning team can use simple and generalized classification as given in the previous section.

Land uses of a definite land cover unit area can be discovered during field surveys and /or interpreted if the interpreter is knowledgeable about the planning unit area and had previous experience in the region, zone, wereda and kebele land use patterns. The land uses of a certain land cover unit could be one of the following or an association of two or more.

- Perennial crops cultivation;
- Annual crops cultivation;
- Grazing and browsing
- Grazing
- Wood collection
- Nature conservation
- Forestation

- Area closure
- Cut and carry, etc.

The crop types grown, species of vegetation and the livestock composition and can be determined during field survey on a format or checklist with their density and quantity respectively. Other land uses like wildlife existing in a mapping unit can also be recorded by a surveyor.

Box 3: Steps In land cover and land use mapping

Pre-field Work:

- **Collect data bases; (enlarged AP and Topographic maps)**
- **Delineate the land cover units on aerial photographs or sketch the units using GPS; or sketch the units using the PRA resource mapping tool;**
- **Prepare code and legend for the mapping units;**
- **Transfer the units and legend to a base map;**
- **Prepare preliminary land cover/land use map**

Field Survey:

- **Undertake field survey to verify units and boundaries and legend;**
- **Collect any relevant land use and land management information from units or representative units as related to slope breaks;**
- **Collect relevant vegetation and land use data from units or representative units**

Post Field Work:

- **Compile, compress and analyze the land cover and land use data**
- **Transfer compressed and analyzed field data and boundaries to finalize land cover and land use map and build final legend;**
- **Prepare land use plan by integrating: land form, soils, socio-economic and environmental information**
- **Prepare implementation and action plans and bylaws;**
- **Submit the plan to the community/land users, and wereda steering committee for approval;**
- **Follow- up Implementation of the plan and bylaws.**

4.2.2 Socio Economic Data Collection

Socio-economic data is so important for preparation of Participatory land use planning in order to make the plan social, economical and ecological problems solving and changing livelihoods of the community. Socio economic data can be collected from different agro-climatic zones as problems vary and relate to different ecosystems being influenced mainly by temperature and moisture conditions.

The common agro-climatic zones prevailing in Ethiopia are Bereha, Kolla, Weinadega, Dega and Wurch (Figure 4.5). Socioeconomic data can also be collected from secondary sources such as previous study documents, Wereda Agriculture Office, KA administration, and DAs archives. Primary data can also be collected through focus group discussions, random sampling and questionnaire surveys and discussions. Instruments are checklists & questionnaires. The amount of data that need to be collected should be limited by the expert and the team depending on the problems of the society in a definite planning unit.

The most important data that must be collected on socio-economic data format include:

4.2.2.1 Farming systems

Farming systems are relationships of farming activities with the environment that mainly depends on climate and social interest of the community. Climate influences the type of crops to be grown and the community chooses crops based on tastes/ flavor, food value, and production capacity per unit area. On the other hand, the farmer likes to keep animals based on their services, market and food value, resistance to diseases, availability of feed and climatic condition. The farming system thus can separately deals with homestead farming and field level farming of a certain climatic zone.

4.2.2.2 Demography

It is highly important to know the population structure by age group and density of a planning unit area in undertaking a local level land use planning. The data is required to plan the area of land required for cropping, livestock keeping, forestry etc. Moreover, it is necessary to determine the level, facilities and capacities of schools; health facilities and supply of clean water available in the area. These data can be collected from secondary and primary sources.

4.2.2.3 Livestock pattern

This information is also important to determine land area required to feed the livestock and fit the feed resources available from crop residues to the livestock. Carrying capacity of the planning unit feed resources can be determined by the production capacity of the land and requirements of the livestock. It also helps to know the livestock products and uses obtained for livelihood of the community

4.2.2.4 Availability of animal power

In the Ethiopian farming systems, oxen power is the most important animal power to cultivate and/or plow the land and thresh crops after harvest. In some highland areas horse power is also important in a farming system. Thus census data on availability of oxen power per each household is so important to undertake crop production and use the land at optimum level. The ratio of availability of oxen pair to cultivable land per household and available feed is so essential for planning and determination of interventions.

4.2.2.5 Availability of land

Livelihood in rural Ethiopia is mainly based on availability of land for cropping, livestock rearing, settlement/homestead, tree planting etc. Land holdings per family is an important data that need to be known to determine the amount of crops, livestock, and wood to be produced per household and plan the management practices that have to be incurred during planning per each family land holdings and regulations to be set while issuance of land use right certificate and use right and obligation map.

Other data required for socioeconomic inputs during preparation of local level participatory land use planning can be specified and collected by the respective participating professional expert. An example of socio economic data format is presented in Table 4.13.

Box 4: Steps in socioeconomic data collection

Preparatory work:

- Undertake preliminary field visit to identify major problems and major agro-ecological zones
- Prepare agro-ecological zones boundary in the planning unit area
- Determine data collection methods(FGD, questionnaire or KII)
- Determine sampling or census sites
- Prepare checklist for FGD and/ or structured questionnaires
- Determine number of samples based on household number
- Hire, organize and train enumerators
- Undertake test data collections using questionnaires
- Review documents, identify missing issues and document findings to fill gaps

Field Survey:

- administer questionnaires and checklists survey
- filter and clean questionnaires and checklist data

Post fieldwork:

- organize, classify and compress data
- undertake data and information analysis
- use findings for land use planning
- undertake land use planning

Table 4.13: Socio economic data collection format

Date: _____

1. Region: _____; Zone: _____; Wereda: _____; KebeLe: _____; Micro-Watershed/Planning unit: _____; Agro-Climatic Zone: _____; Alt. in m _____ amsl.

2. Available Institutions and Infrastructures:

Type	Inside KA	Outside KA	Distance in Km	Remarks
Primary market(local)				
Secondary Market(Wereda)				
Service Cooperatives				
Ware houses				

Type	Inside KA	Outside KA	Distance in Km	Remarks
Flour mills				
All weather roads				
Dry weather road				
First level school (1-4)				
Second level school (5-8)				
Secondary school (9-10)				
Preparatory school (11-12)				
Technical I Training Centers/college				
College				
University				
Adult literacy center				
Youth Association				
Women Association				
Health post				
Health Center				
Clinic				
Hospital				
Veterinary post				
Veterinary Clinic				
Input Suppliers				
Saving & Credit Institutions				
MWSDT				
KWSDT				

3. Crops produced, yield per ha and local market values per quintal/100 Kg in the planning Unit area

Type of Crop	Climatic Zone	Yield /Ha in Kg	Market price in Birr/100 Kg	Problems of production

4. Inputs used per each crop type and prices per 100 Kg

Crop type	Inputs used	Price/100 Kg	Problems encountered

5. Types of livestock reared; uses; market values and livestock production problems

Livestock type	Use	Market value in Birr per type	Production problems	Traditional coping strategy

6. Livestock products & market values

Livestock type	Product/year	unit	Unit price	Remark

7. Livestock Feed and Sources

Livestock type	Feed type	Source	Problems Encountered	Coping Strategy

8. Community Source of Income in the planning unit area

Type of income	Source	Annual value in Birr	remark whether off farm or on farmactivity

9. Livestock type and number available in the planning unit

Livestock type	Total Number	Number/ house hold	Feed source

10. Land Cover types available in the planning unit area

Land Cover/Use type	Size in ha	Average holding/household In ha	Remark

11. Human population in the planning unit area

Age Group	Male	Female	Number of Female house holds	Number of male households	Landless female households	Landless male households

12. Literacy situation of the population in the planning unit

Literacy Level	Male	Female	Total
Illiterate			
Grade 1-4			

Grade 5-8			
Grade 8-10			
Grade 1-12			
College and technical schools Diploma			
First university degree			

4.2.3 Identifying Land Use Problems

Visiting land cover types during field assessment help discover the land use types dominating in mapping units. The data and information can be obtained through discussions with land users of the unit and observations made during field assessment. The data must be recorded on a format prepared by the planning team. Some of the problems and constraints that could be hindrance to development could be:

- Shortage of cultivable land;
- Lack of water both for human and livestock;
- Lack of knowhow how to manage and develop communal lands;
- Overgrazing;
- Cutting trees for sale and expansion of crop land;
- Poor fertility of soils;
- Diseases, insects and pest;
- Lack of improved breeds and varieties;
- Inaccessibility;
- Lack of marketing links; and
- Severe sheet, rill and gully erosion; etc

4.3 Analyzing the Collected Data

Data diagnosis and analysis is the core step in the whole planning exercises. Without identifying problems and analysing their causes and effects, one is in no position to plan for improving terrible situations in land use. Principal issues to be analysed include the types of problems and their nature of severity. Ultimately, the causes to these problems must be analysed. Here it is also important to note concept differences between symptoms and actual problems. Often many development approaches partly failed simply because the interventions were geared to arrest symptoms of the problems than addressing root causes of the core problem. Considering “Land resources under stress” as a core and broad problem area, its symptoms are manifested in terms of impacts on people and in terms of deteriorating the condition of the land or its impact on other natural resources. The problem of land resources under stress are manifested by physical, social and political causes.

Land use problems and constraints can be analyzed by drawing a problem tree. The tree can articulate the cause and effect of problems. It also determines the core problem resulted from the interconnected problems. Solving a cause of a single problem or symptom does not overcome the core problem. However, focusing on solving the core problem will overcome all the problems appearing in the problem tree as causes and effects. For instance poverty can be resolved by working to clean all the problems and symptoms in integrated manner (Figure 4.8).

It means that land use plan by itself is not a panacea for improvement of livelihoods. It must be integrated with solutions such as land husbandry, resources management, crop development, livestock management, and environmental management. This is what a participatory land use plan should do to improve livelihoods.

Figure 4.8 is a problem tree that reflects causes and effects of problems that lead to the core problem. The core problem thus establishes the objective of planning. In this case the objective is **“to increase crop production per unit area of land”** by overcoming all the problems and symptoms appearing under low crop production that in turn creates poverty and famine.

Box 5: Physical and Social Symptoms	
Natural resources Symptoms	Symptoms on humans
-Soil erosion	- Food shortage
- Loss of fertility	- Fuel wood shortage
- Loss of vegetation	- Land use conflicts
- Desertification	- Water shortage
- Salinization	- Poverty
- Pollution	- Social disruption
Overall Effects	
-Vulnerability to natural disaster	
- Global climatic change	
- Change in energy balance	

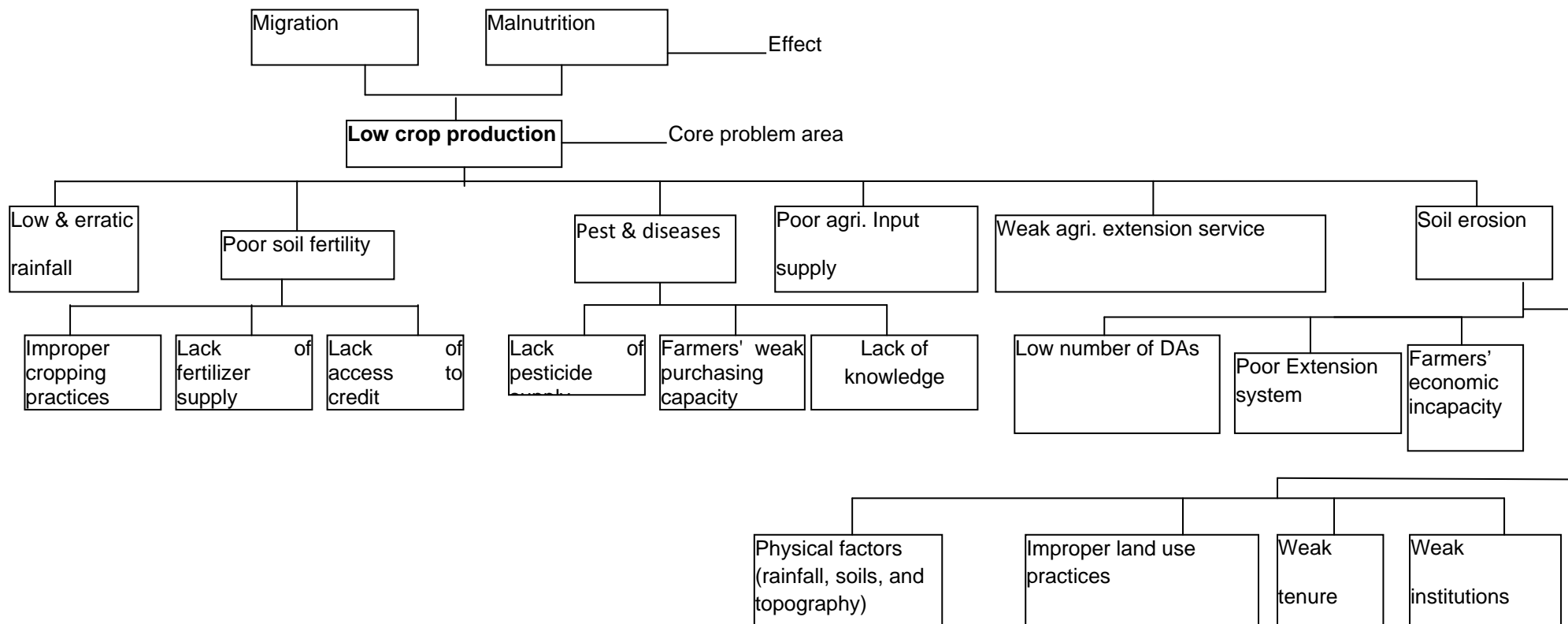


Figure 4.8: Problem Tree

4.4 Identifying Best Options and Solutions

Identification of problems and opportunities is an iterative and dynamic process that continues throughout the planning process. The problems statements should reveal the following feature.

- The nature and severity with respect to land units and land-use systems;
- Short-term and long-term effects of the problem; and
- Summary to causes of the problem (physical, economic and social).

Once the local level participatory land use planning team identified land use problems and development constraints land mapping units by land mapping units; the team can start to analyze and incorporate findings of the socio-economic and natural resources data and information into a planning unit data. This can be done by interpolating the various sectors information analysis into holistic data base or map. The process enables the team to overview the cause and effect of symptoms, problems and constraints. The cause and effect of symptoms and problems lead to development objectives that lead to optional activities which enable to bring changes by ameliorating the problems and constraints at different times in the future (Figure 4.9).

Options of development or land use solutions for overcoming the problems can be ranked and structured through systematic discussions among the planning team members by giving priority to the land users' interest. Discussions enable the planning team to see alternative solutions and development options that accommodate technical, social and environmental issues in the LLPLUP. Reversing negative situations in Figure 4.8 provides solutions.

After discussion the following options may be created in the decreasing order of choices.

- Crops cultivation
- Grazing
- Vegetables production
- Tree planting; and
- Hay farming/ production

Various land use options can be worked out for the different planning units following problems analysis. The options should also be validated against social acceptability, economical viability and environmentally soundness to assure sustainability of the plan

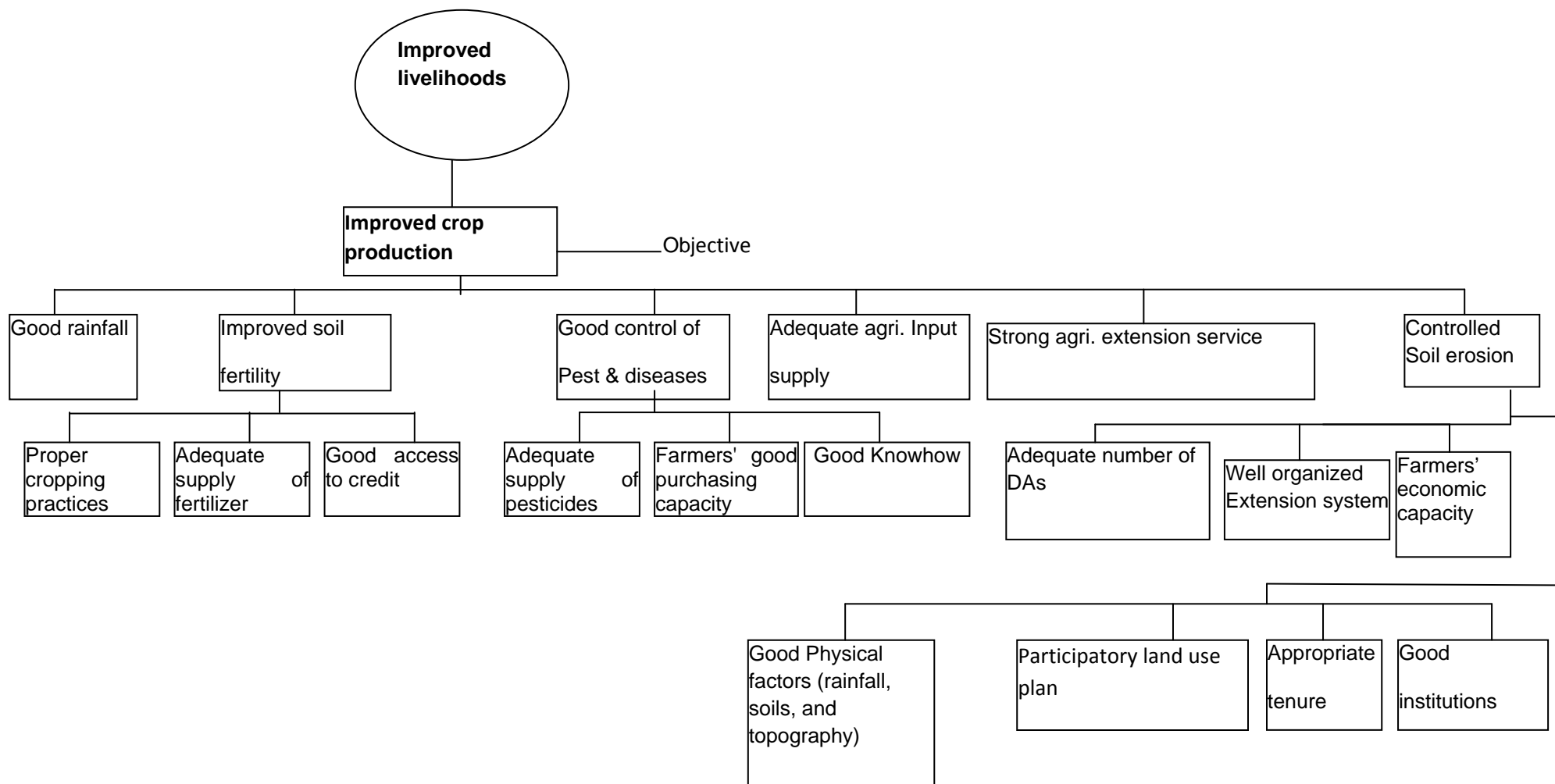


Figure 4.9: Solution Tree

4.5 Land Units Mapping

Classifying the land by slope gradient classes or soil units/types provides land mapping units of relatively homogenous properties. Mapping units are different for different themes such as soils, land forms, vegetation, land cover, and current land use. They can be delineated by sketching, interpretation of topographic maps, aerial photographs, etc. Mapping units for participatory land use planning can be made from slope class map and or by overlaying land cover and land use map and drawing homogenous land units. Land unit maps are advantageous for preparation of a land use options, land management and land administration and regulation map of homogeneous properties and a technical report. Homogenous land unit map can be prepared from:

- Already existing thematic maps;
- Enlarged aerial photographs mosaic map;
- Large scale aerial photographs and or Ortho-photos;
- Large scale topographic maps;
- Sketch maps of PRA; Using GPS and large scale imagery maps; and
- By overlaying land cover map on soils map;

Box 6: Steps in Land units mapping

- **Collect land unit source thematic maps;**
- **Copy land units from already existing land units map; if not available;**
- **Delineate land units map on enlarged AP or Ortho photos following slope breaks; if not available;**
- **Delineate land units map on large scale topographic maps following slope breaks; if not available;**
- **Delineate land units maps on PRA maps following slope breaks using GPS in the field;**
- **Delineate land units map by superimposing land cover and soils type maps following units boundaries of both mapping units**
- **Delineate land unit maps using GPS and recording coordinates to prepare land units map**

4.6 Preparation of LLPLU Plan

The planning team after identifying development options or solutions for the land use problems and constraints can start preparing a land use plan for homogeneous Land Units that reveal what has to be done where and how in the future. Interventions agreed for each land units will be also analyzed by the team members and structured how they will be implemented, by whom to be implemented and the budget required in terms of material, labor and technological inputs will be specified on a matrix table as shown on Table 4.14.

Added to that, the share of stakeholders in implementing the land use and land resources options will also be clearly indicated and defined by the planning team. Figure 4.10 also shows how land use plan can be decided by a planning team.

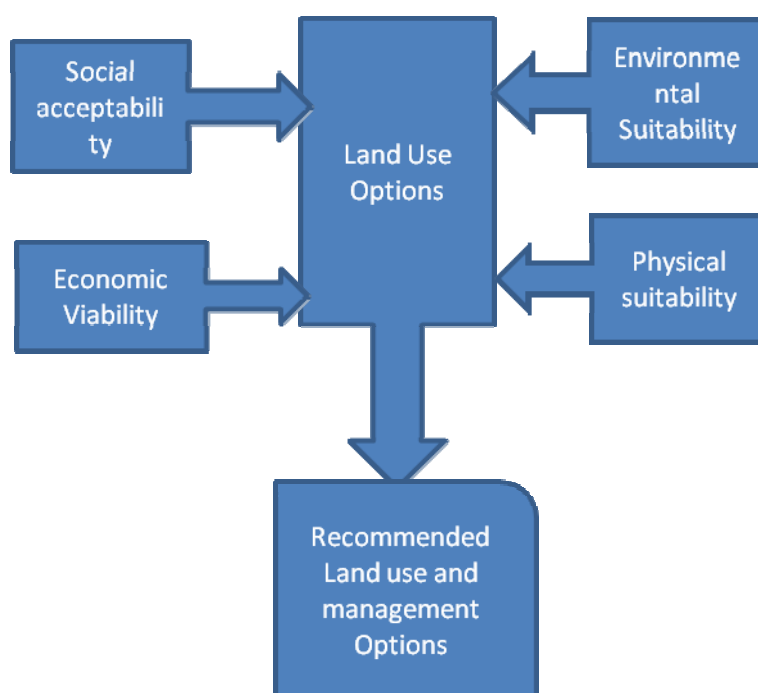


Figure 4.10: Land Use plan options chart

Table 4.14: Land use and land management plan for Kebele A or Micro-watershed C

Mapping unit	Area in ha	Current land cover	AC Z	LG P	slope	s. color	depth	texture	s. drainage	Past erosion	stoniness	Flood hazard	Recommended LU	Recommended interventions & inputs	budget	implementer	Time of implementation	Legal responsibilities
A																		
B																		
C																		
D																		
E																		

4.7 Presentation of the Plan and Report to a General Assembly

Land users in a community are prime owners and implementers of the LLPLUP as per the prepared plan of action. In the planning process they are represented by elected members. Thus, it is so crucial that the plan should be presented to the Kebele administration & the community to review and comment and agree by suggesting amendments. The plan then is made acceptable by their endorsement. The community; during & after presentations can ask questions and discuss issues in order to get

clarifications and suggest ideas that fit their interest. Once they forwarded comments for improvement or amendment; it is the responsibility of the planning team to make amendments and adjustments as per the community needs.

On the other hand; all the local level participatory planning team members may not have been participated in the process since the beginning because some of them might have been represented to be aware of the plan process and give comments and endorse the plan at the end of the process due to technical limitation or lack of time. Thus, the planning team should sit with them/together to discuss the plan, incorporate comments and endorse the plan and the accompanying report in the final presentation to the community.

Comments gathered during presentation to the community, will be discussed among the planning team members and incorporated to the plan and plan of action. The plan modified as per comments of the land users will finally be endorsed by them and sent to the steering committee established at Wereda level for approval and budget allocation as per the agreed plan. Implementation as indicated in the plan of action will be carried out mainly by the land users with close support from the Kebele and Wereda experts.

4.8 Handing Over the Final Plan to the Land Users

The plan approved and budgeted by the Wereda steering committee will be agreed, signed, stamped and sent back to the land users through the Kebele administration to be implemented with assistance from DAS and the respective rural development agents and LAU experts.

The Wereda subject matter specialists and administration follow up the activities as scheduled on the plan to make suggestions for improvement and backstop activities delaying behind the schedule. This helps make the land use plan given to each land user is being done in relation to the land administration law and regulations. If there was no mistakes in the plan and implementation the output will be admired and marked as the best achievement for scaling up and sharing experience.

Box 7: Useful Selected Case Study

A participatory micro-watershed Local Level land Use Planning study was carried out in Chincha Mariam Micro-watershd; Mekane Eyesus Kebele; East Estei wereda; South Gondar Zone in Amhara National Regional State by a team consisting of land users of different social groups; a Zone, Wereda and Kebele Land Administration & Land Use experts in March 2012.

The Team at the beginning of the work agreed on the objectives of the study and set expected outputs based on preliminary reconnaissance assessment of the micro-watershed. The study in its introduction part indicated that; the regional land administration proclamation statement “a rural land user can use his land for homesteads, cultivation, livestock rearing; forestry or any another related land uses” created a problem of miss-uses and miss-management of the land and its resources. In order to overcome these problems and the improper administration of land, a participatory land use planning activity was organized. The activity was intended to undertake land use as per production capacity of land units of the micro-watershed that bases on capability classification of land.

The objective formulated by the team reads as “to produce a sustainable land use plan based on land units’ production capacity to improve the improper utilization of land units that enhance production and productivity”. The team also formulated the following specific objectives that would be achieved through local level participatory planning.

- To identify land use problems and potentials of alternative uses;
- To prevent communal land graving and improve its production capacity;
- To prevent illegal constructions being undertaken around rural centers and enable rural centers construction to be based on land use plans;
- To improve the production and productivity of food crops;
- To improve household income by focusing on production of vegetables, fruits and livestock and livestock products;

Next to that ,the Local Level participatory land use planning was based on:

- Reconnaissance assessment of situations;
- Professional team’s discussion findings;
- PRA teams ‘ general discussion outcomes;
- Discussions held with land users on issues of land use, using checklist or questionnaires;
- Collection of information from secondary sources;
- Integration of data from different sources
- Delineation of the boundary of the micro-watershed and developing a base map using GPS;
- Delineating the current land use/land cover mapping units using GIS;
- Collection of land and soils data using techniques such as wetting soil samples(Soil depth; past erosion; soil texture; water logging; stone covers in %; infiltration)
- Identifications of problems; and potentials for options of land uses that would be appropriate for each land unit;
- Identifications of potential land uses based on each capability classes of land units and parcels of lands that would be provided to each land user;

The team collected data on the following areas for the LLPLUP preparation.

- Social, economic and natural resources situation;
- Major economic sources or basis;
- Off farm economic sources;
- Major off farm activities problems;
- Forest resources extent, situations, problems and uses;
- Current crop production techniques;
- Cropping calendar;
- Current use of inputs;
- Techniques used in use of inputs;
- Current crop production problems;
- Traditional crop production problems coping mechanisms;
- Current crop production costs and comparative income analysis;
- Feed resources;
- Livestock production problems per each animal;
- Available livestock health facilities;
- Uses of livestock per each animal;
- Market prices of livestock and feed;
- Existing Soil and water conservation techniques and coverage;
- Problems of the existing techniques;

- **Problem ranking analysis using pair wise ranking technique;**
- **Prioritizing problems;**
- **Problem tree analysis;**
- **Solutions tree analysis; and**
- **Analyzing problems and potential land use solutions using a matrix table;**

Then after, the team drew a land use options plan map and action plan that described the characteristics; qualities and interventions deemed important to enhance resources development and production per unit area as planned.

4.9 Participatory Monitoring and Evaluation

In order to measure the results of Local Level Participatory Land Use Planning, monitoring of activities, achievements and effectiveness is a vital process to be done by the planning Team. In the mean time, it becomes necessary to evaluate outputs and outcomes and their impact on livelihoods of land users as a result of activities identified and implemented. The exercise would enable to follow up on the appropriateness of the options, feasibility of investment and response to environment stability. This in turn would allow undertaking timely measures for improvement of the plan and its implementation action plan.

Regular and frequent process evaluation can be carried out by the Kebele planning team members (includes DAS) that is accountable to the Wereda team members and the steering committee for follow up and actions.

Following activities of monitoring; progress evaluation can be carried out every quarter, and annually. It can be carried out internally during the implementation period so as to measure the impacts of activities in addressing outputs and meeting the objectives. This can be done by the planning team.

After implementation of activities and measures taken to improve the plan, evaluation will be carried out in the midterm and during at final stage of the plan of action to determine if the land use plan has progressed as planned and whether the expected outputs, objectives and goals are achieved. Evaluation also assists in determining the participatory land use plan's impacts, strengths and weaknesses for scaling up in other areas with possible adjustments & modifications.

Monitoring and evaluation must be an integral element of LLPLUP. This will provide information on whether the planning interventions are successful in achieving the development objectives and whether implementation is proceeding according to the arrangement. The process integrates the measurement and monitoring of both development and performance indicators.

Monitoring being a continuous process, it provides necessary information which facilitates an assessment of the progresses of program implementation. Moreover, monitoring ensures that progress is maintained according to schedule, and measures the quality and effect of the processes and procedures.

The monitoring and evaluation process will follow both conventional and participatory processes and will engage a range of stakeholders. Monitoring is mainly based on quantitative and objective indicators and objective assessments done during assessment of resources and socio economic conditions for planning. Only when it is not possible to get objective assessment, the plan settles on subjective assessment.

Monitoring results of a participatory land use planning will be forwarded to all stakeholders. The findings and results will be used by higher bodies, implementers and the land use planning team to improve performance and take corrective measures consecutively throughout the implementation period and until the whole responsibility will be handed over to the land users.

4.9.1 Participatory Monitoring

In view of the objectives of LLPLUP, a participatory monitoring and evaluation system will complement the efforts. The Planning team set up from different stakeholders will ensure joint monitoring and evaluation of application of capacity building, socio-economic, soil and water conservation, forestation, livestock development, and crop production as has been planned to be done planning unit by planning unit by the team. In addition, monitoring and evaluation committees are also proposed to follow the smooth execution and proper utilization of the resources for the benefit of objectives and goals of local level participatory land use plans.

4.9.2 Process Monitoring and Evaluation

This system will include an assessment of:

- Planning and approval of procedures for community action plans;
- Effectiveness of the community participation;
- Organization and management structure and institutional capacity at all levels; and
- Linkages between stakeholders;

This can be done by the wereda planning team.

4.9.3 Environmental Monitoring

This system will focus on assessing the effectiveness of the different physical and biological soil and water conservation measures with regard to implementation of various land uses as per the plan and land management interventions. It will also look into the effects of the effort in minimizing soil erosion, flood and sedimentation downstream and improving production per unit of land and livelihood upstream and downstream.

4.9.4 Socio-economic Baseline Data Monitoring

The baseline survey data have been collected from different land units during processes of surveys for planning. This information provides nuts and bolts for monitoring and evaluation of activities within micro-watersheds of a planning unit. These data thus would be used as a spring board during evaluation of LLLUP implementation activities and progresses.

4.9.5 Impact Evaluation

The process of LLPLUP implementation evaluation undertakes overall impact assessment of interventions in terms of implementing the plan and land management practices. In this process comparisons will be made on situations inventoried before preparation of the

LLPLUP and situations inventoried after implementation and interventions based on the data collected during evaluation and implementations. An independent organization or the whole planning team will undertake evaluation of the project outcomes and impacts based on achievements of the outputs and objectives and its contributions to the overall goal.

4.10 Plan Updating Decision

A local level participatory land use plan must be flexible and targeted to changes of development in order to bring best impact on the livelihood of the community and the environment. The planning team members after following up and evaluating the implementation processes and their impact seat together and assess the results. If the result is unsatisfactory they think of other options needed to overcome errors. If not, the team will document the best results obtained and changed the situation positively in the planning unit. Both best and bad results are important to be discussed with land users so as to be able to take additional action harmoniously and learn from bad results. Best results can be scaled up with possible adjustments to the local situations or similar environment and can be recorded as models for experience sharing with other Kebeles in the Wereda, Zone, Region and the Country.

5 Institutional and Legal Framework for Implementation of LLPLUP

5.1 Institutional Framework

As per the organizational structure of the Ethiopian Federal Government, the Ministry responsible for land administration and use is the Ministry of Agriculture. Under the structure of the Ministry a deputy Ministry responsible for natural resources development is established. And under the deputy, the Land Administration and Use directorate is responsible for rural land administration and use.

Direct responsibilities given to the Ministry according to the rural land administration and use proclamation No 456/2005, article 16 are:

- To implement the proclamation by providing the necessary professional support and by coordinating the competent authorities
- To initiate on the basis of information gathered at national level and those obtained from time to time through monitoring and evaluation, development of new policy ideas and amendment of the existing policy as necessary; and
- To create the system for exchange of information between regions and the Federal government pertaining to land administration and use.

Likewise under the national regional states Bureau of Land Administration and Use or Bureau of Environmental Protection, Land Administration and Use are responsible for land use planning. The names differ in different regions based on special situations of each region. However, the regions have established land administration and Use offices at zone, wereda and Kebele levels to undertake LLPLU and land administration and those did not establish are expected to setup similar institutions in the future.

5.2 Legal Framework for Establishing Institutions

The Legal institutional establishment framework is supported by article 17 (1) of the Land Administration and Use Proclamation No 456/2005 that states “each regional council shall enact rural land administration and land use law which constituted detailed provisions necessary to implement this proclamation” and sub article 2 states that “the regions shall establish organizations at all levels to implement rural land administration and land use systems and shall strengthen the institutions already established”.

The federal land administration law also directs other sectors institutions to cooperate in implementing the proclamation. Thus relevant bureaus and offices established at all levels cooperate to participate and prepare land use and development plans at local level and help assist in implementation of sector plans like road, water, school and health. Cadastre survey, land registration and certification of land holdings will be the responsibility of LAU bureaus and offices.

The proclamation article that enforces land registration and certification article 6(1) states that “the size of rural lands under holdings of private persons, communities, governmental and nongovernmental organizations shall be measured as appropriate using cultural, and

modern measurement equipments, their land use and level of fertility shall be registered as well in the data base center by the competent authorities established at all levels". In support to that; article 6 (2) states that "rural land holdings described under sub article 1 shall be measured by competent authority and shall be given cadastral maps showing their boundaries". In addition to that " any holder of a rural land shall be given holding certificate to be prepared by the competent authority and that indicates size of the land, land use type & cover, level of fertility, borders, as well as obligations and right of the holder. This information thus should be obtained from LLPLUP and cadastre surveys.

5.3 Legal and Binding Rules for Local Level Participatory Land Use Plans Implementation

Land use plans preparation at all levels is supported by the land administration and land use proclamation article 13(1) which states that "a guiding land use master plan should be prepared which takes into account soil type, land form; weather conditions, plant cover and socio-economic conditions and which is based on watershed approach shall be developed by the competent authority and implemented". Obligations for implementation of land use and natural resources management plans are sub articles one to 4 stated in article 10 of proclamation No 456 / 2005. The statements as set in the proclamation subsequently are:

- "A holder of rural land shall be obliged to use and protect his land. When the land gets damaged, the user of the land shall lose his use right. Particulars shall be given in the land administration laws of regions".
- " where irrigation canals are constructed the holder shall have obligation to allow the construction of irrigation lines and other infrastructures if they cross his land holding"
- " the holder of rural land shall have the obligation to cooperate when requested by the competent authority to measure and survey his land"
- " any rural land holder shall have the obligation to notify the competent authority when he abandons at will his land use right"; and

Article 12 states that "where dispute arise over rural land holding right; effort shall be made to resolve the dispute through decision and agreement of the concerned parties; where the dispute cannot be resolved through agreement, it shall be decided by an arbitral body to be elected by the parties or be decided in accordance with the rural land administration of the region".

Moreover, article 13 concerned with land use planning and proper use of sloppy land; gully and wetlands planted the following regulatory guiding laws:

- " an equitable water use system shall be established between upper and lower watershed communities"
- "In any type of rural land where soil and water conservation works have been undertaken, a system of free grazing shall be prohibited and a system of cut and carry feeding shall be introduced step by step.
- "The management of rural lands; the slope of which is less than 30% shall follow the strategy of soil conservation and water harvesting. The details will be determined by rural land administration of regions"

- “Development of annual crops that have slopes between 31-60% may be allowed only through making bench terraces”; and
- “ rural lands the slope of which is more than 60% shall be used for development of trees; perennial plants and forage production”
- “Rural lands of any slope which is highly degraded shall be closed from human and animal interferences for a given period of time to let it recover, and shall be put to use when ascertained that it has recovered”
- “Rural lands that have gullies and are located on hilly areas shall be rehabilitated and developed communally and as appropriate by private individuals”
- The biodiversity in rural wetlands shall be conserved and utilized as necessary, in accordance with suitable land use strategy”;

Added to that, article 14 on its part states that “a strategy of settlement, villagization and development of social services that helps to bring about a better system of rural land utilization shall be formulated”

Though the above guiding and binding laws seem not to regulate and enforce rural land holders and users by specifying legal measures, the proclamation gives right to regional states to develop regulatory and enforcing rules based on them according to their environment and social situations. These give chance also for a local level land use planning team to develop bylaws that fit to local conditions based on the regional policy and regulations.

5.4 Management Interventions and Legal Responsibilities

Interventions to improve the productivity of a definite land unit depends on the problems relating to climate, soils, vegetation cover, land use and wrong measures undertaken in the past. It is believed that by controlling the processes of erosion resulting from de-vegetation, overgrazing, trampling, over cultivation, steep slopes and intensity of rainfall can be controlled by undertaking appropriate measures that overcome the problems and ameliorate the land.

Legal responsibilities are the land management and administration proclamations and regulations declared by the national and regional governments to be implemented by the land users. The planning team thus should make clear to the land users that the plans should be respected and implemented as per the agreed land use plan, plan of action, and land using certificates and regulations given to each land user. Undoing what have been stated and indicated in the plan should result into implementation and enforcement of the rules stated in the regional laws and given on land use right map and certificate to each land user of the Kebele and/or micro-watershed. These laws also are also clarified and agreed by the community as bylaw to be implemented by the community.

Application of the physical and biological soil and water conservation measures in the agreed units of the participatory land use plan must be based on the techniques and work norms given in the Community Based Participatory Watershed Development Guideline prepared by MoARD in 2005. This guideline must be used side by side with this manual during planning.

The watershed concept as presented in the guideline is “any surface area from which runoff resulting from rain is collected and drained through a common confluence point”. Thus hydro-logically it is defined as an area from which runoff drains through a particular point in a drainage system. A watershed is made up of the natural resources in the basin like water, soil, and vegetative factors. At socioeconomic level a watershed includes people, their farming systems including livestock, and interactions with land resources, coping strategies, social and economic activities.

Taking micro-watershed as a planning unit, development actions in a micro-watershed should start from the most upstream point in order to make the effort result oriented. Table 5.1 provides the necessary elements that need to be included in the final plan for ease of presentation & application. Interventions required for development of different land use units in a definite local level participatory land use planning unit are given in Table 5.2.

Recommended land management interventions that are seen important and agreed by the Team in Local Level Participatory land Use planning given in Table 5.2 help assist planners to follow up progress during implementation. More appropriate interventions as related to micro-watersheds land use planning and resource management can also be decided by the planning Team giving priority to the community representatives’ opinions.

Table 5.3 on the other hand provides work norms that help assist in calculating costs of development for recommended interventions. Cost per unit area can be based on regional daily wage rates. The norms are taken from CBWSDG in order to create quick identification of norms during planning.

Table 5.1: Land use and land management plan for a planning area

Mapping unit	Area in ha	Current land cover	Recommended LU options	Recommended interventions & inputs	budget	implementer	Time of implementation	Legal responsibilities
A								
B								
C								
D								
E								

Table 5.2: Management interventions recommended for different land uses occurring in different slope classes

Major land Cover/land uses	Management interventions recommended for different Slope classes						Legal measures
	0-2	2-8	8-15	15-30	30-50	>50	
Cultivated land	Drainage ditches; grass covered field boundaries, manure with chemical and biological/compost fertilizers, use of improved seeds	Grass and feed bush stripes; grass and bush covered field boundaries; Contour plowing, cut off drains, graded fanya juu; leveled fanya juu, stone & soil bunds, Grass cover between fields and rivers , gullies; manure with chemical and biological/ compost fertilizers; improved seeds	Contour plowing, cut off drains, graded fanya juu; leveled fanya juu, stone and soil bunds; grass cover between fields and rivers, gullies; manure with chemical and biological/compos fertilizers; check dams; use of improved seeds; planting grasses and shrubs along physical measures, cut off drains	Contour plowing, cut off drains, graded fanya juu; leveled fanya juu, stone and soil bunds, grass cover between fields and rivers , gullies; check dams and gabions, manure with chemical and biological/compost fertilizers; use of improved seeds; planting grasses and shrubs along physical measures; cutoff drains	Contour plowing, cutoff drains, check dams, hillside terraces, eyebrow micro basins, tree and shrub planting along conservation measures,	Area closure, cut and carry, half moon basins, micro basins; hillside terraces	
Communal Grassland	Systematic grazing/paddock, reseeding with legumes and grasses; fertilization	Systematic grazing/paddock, reseeding with legumes and grasses; fertilization	Systematic grazing, reseeding with legumes and grasses, fertilization	Area closure, cut and carry, reseeding with legumes and grasses, check dams	Area closure, cut and carry, reseeding with legumes and grasses, check dams	Area closure, cut and carry, reseeding with legumes and grasses, check dams	
Private pasture land	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above	
Dense Forest	Protection and selective cutting	Protection and selective cutting	Protection and selective cutting	Protection and selective cutting	Protection and selective cutting	Protection and selective cutting	
Open/disturbed forest	Protection, selective cutting and enrichment planting	Protection, selective cutting and enrichment planting	Protection, selective cutting and Enrichment planting	Protection, selective cutting and enrichment planting	Protection, selective cutting and enrichment planting	Protection, selective cutting and Enrichment planting	

Major land Cover/land uses	Management interventions recommended for different Slope classes						Legal measures
	0-2	2-8	8-15	15-30	30-50	>50	
Woodland/wooded grassland	Selective cutting, systematic grazing	Selective cutting, systematic grazing	Selective cutting, systematic grazing	Selective cutting, cut and carry	Selective cutting, cut and carry	Selective cutting, cut and carry	
Bush/shrub land	Firewood collection, systematic grazing and browsing	Firewood collection, systematic grazing and browsing, controlling invaders	Firewood collection, systematic grazing and browsing, controlling invaders	Firewood collection, systematic grazing and browsing, controlling invaders; check dams	Firewood collection, cut and carry, controlling invaders; check dams	Firewood collection, cut and carry, controlling invaders	
bush/Shrub grassland	Firewood collection, systematic grazing and browsing, controlling invaders	Firewood collection, systematic grazing and browsing, controlling invaders	Firewood collection, systematic grazing and browsing, controlling invaders	Firewood collection, systematic grazing and browsing, controlling invaders; check dams	Firewood collection, systematic grazing and browsing, controlling invaders; check dams	Firewood collection, systematic grazing and browsing, controlling invaders	

Table 5.3: Work norm for different land development activities

SNo	Management intervention	Measurement	Person Days
1	Level soil Bunds	Km	150/Km
2	Stone Bunds	Km	250/Km
3	Stone Faced Soil Bunds	Km	250/Km
4	Level Fanya Juu	Km	200/Km
5	Bench Terrace	Km	500/Km
6	Hillside Terraces	Km	250/km
7	Waterways(vegetative and stone paved)	M ³	1/m ³ vegetative water way 0.75/m ³ earth & stone
8	Cut off drain	M ³	1/0.7m ³
9	Graded Soil Bunds	Km	150/Km
10	Graded Fanya Juu	Km	200/km
11	Area Closure	Ha	4/ha/year
12	Micro-basins	number	1/5 Micro-basins
13	Eyebrow basins	birr	2 birr/person day
14	Micro trenches	meter	1/3 met
15	Stone Check dams	M ³	1/0.5 m ³
16	Community road	Km	3000/Km-6000/km depending on standard and terrain conditions

Source: CBPWDG, 2005

6 Implementation Arrangements

6.1 Institutions Responsible for LLPLUP Implementation

6.1.1 Background

Institutional arrangement for LLPLUP at micro watershed and after that Kebele levels focused on primarily on BoLAU or BoEPLAU in the regions for the purpose of producing integrated LLPLUP. At higher or federal level the responsibility is legally issued to MoA through its Deputy Ministry of Natural resources. The task is being implemented in collaboration with Regional Administration, BoLAU or BoEPLAU in all regions. It is designed to have a structure which is as simple as possible and that reflects clearly the goal, objectives and purposes of RLAU declared in the Proclamation 456/2005. Furthermore, it has identified clear responsibilities and roles of institutions for each of its schemes by minimizing overlapping or duplications. And at the same time it is planned to promote co-operation, and co-ordination approaches that are flexible to cope with responsibilities with other sectors like road, health and water, education, etc.

The laws of land use, affordability and practicability of duplication of work and effort avoidance; absorptive capacity, the size and complexity, efficiency and effectiveness and national experiences are all the main influencing factors of an institution set-up for the LLPLUP implementation arrangements.

The issues, assumptions and the bases that are employed in conceptualizing and determining the nature and make-up of the proposed institutional set-up for LLPLUP activities implementation at micro-watersheds are so important features that should be given in the area of resources management and controlling climatic change.

6.1.2 Existing Institutional Framework

The organizational arrangements of the Federal Democratic Republic of Ethiopia decentralized power, authority and responsibility from the center down to national regional states, Zones, Woredas and Kebeles. In line with this, the government structure, for its rural development operational activities has divided itself into central Ministries, Regional Bureaus, and Zonal Departments, Woreda and Kebele Administration offices. The purpose of this situational examination of institutions that have direct or indirect links with LLPLUP is to acknowledge their capacities, strengths and weaknesses. The institutions important in LLPLUP and implementations are:

- The federal economic sector ministries, commissions and authorities
- Regional States, Bureaus and institutions
- Bureaus and Office of Agriculture and Rural Development
- Bureaus and Office of Water Resources
- Bureaus and office of Finance and Economic Development
- Offices of co-operatives
- Woreda Administrations; and
- Kebele Administrations,

Non-Government organizations such as:

- Voluntary associations
- Peoples organizations(Idir, Iqub, Senbete, Tiswa mahiber, etc)
- Multi-purpose co-operative societies
- Credit and saving institutions (CSI).

6.1.3 Proposed Institutional Framework for Implementation of LLPLUP

Having understood their importance; implementing institutions should constitute the under listed two specific levels of institutional setups proposed based on the following criteria.

- Institution with simple organizational structure and clear responsibilities
- Mandates and responsibilities clearly reflecting integrated LLPLUP at micro-watershed levels and goal and objectives
- Structure should minimize overlapping and duplication of efforts
- Promoting cooperation, coordination and multipurpose activities
- Flexibility to cope with changing plan and work loads
- Having absorptive capacity, and
- Reflecting national and international experiences

6.1.3.1 Higher level

The upper level institutions must be relevant Federal Ministries and the Regional State Bureaus and Authorities directly or indirectly involved in integrated LUP and watershed management and are in charge of guidance and policy making including supervision and steering. These are MoA, MoWR, MoFED, EPA, Regional States' BoA, BoLAU, BoFED, BoEPLAU, MoH, MoE; Rural Road Construction and BoPARD. The coordinating higher institution will be MoA. The major concern of development for regional states will be Crop, livestock, rangeland, natural resources and Infrastructure development planning components based on resource development & conservation principles.

6.1.3.2 Lower and lowest levels

The second level of institutional setup should definitely be a technical LUP management office that will be responsible for performing technical functions. Accordingly, LLPLUP integrated micro-watershed management study will be endowed with participatory planning staff and accommodations. Hence, the planning and implementing organization of the LLPLUP will in general compose of:

A. Zonal LLPLUP team with professionals of land administration, and land use planning and subject matter specialists of relevant offices;

B. LLPLUPT with adequate professionals and technical staff including

- Woreda LLPLUP development team at lower level; and
- Community micro-watershed development teams at lowest levels

Figure 6.1 summarizes the proposed organizational /institutional structure.

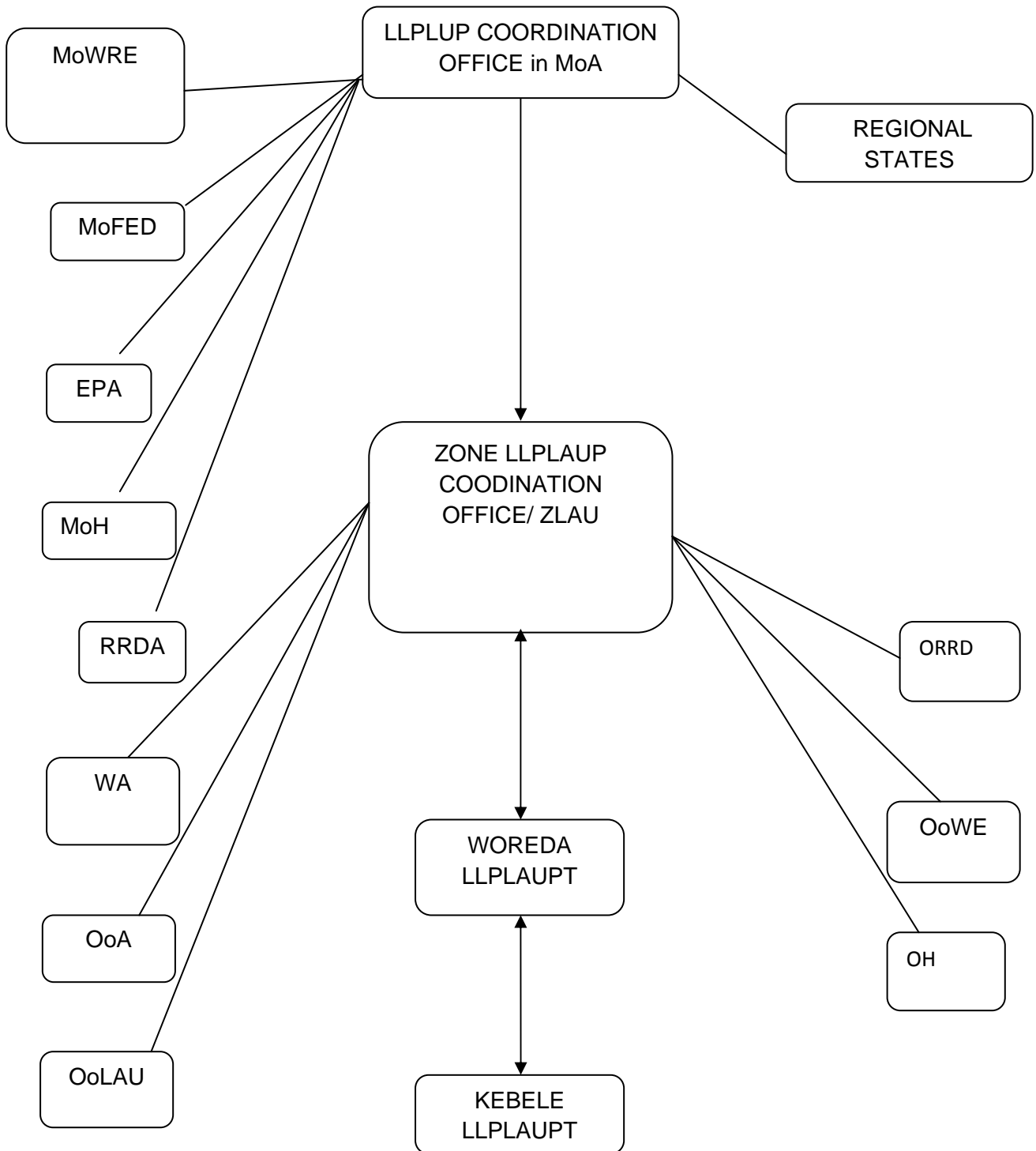
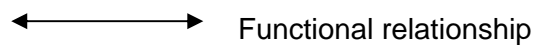
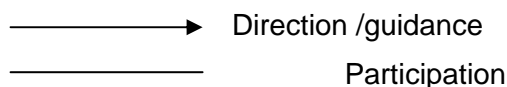


Figure 6.1: LLPLU Plan preparation and Implementation structure

Notes:





6.2 Responsibilities and Functions of Different Levels of Implementing Agencies

6.2.1 Community /Micro-watershed Level (250-500ha)

Integrated LLPLUP at micro-watershed level development by its very nature is a process which promotes the participated and coordinated development and management of land, water, vegetation, fauna, social infrastructure and related resources in order to maximize the resultant economic and social welfare and benefits of the communities participating in the planning & implementation of LLPLUP. Hence, to ensure that the plan is meant for farmers/rural land users, agro-pastoralists and pastoralists in particular and the community in general; establishment of community LLPLUP development and management teams at micro-watershed level is found essential.

The Planning team's members are representatives' of the communities of the micro-watershed who are educated, willing, energetic, capable, enthusiastic, committed, influential, focused, physically fit, exemplary, etc. Thus, the roles, duties, functions and responsibilities of the team will be to:

- Hold meeting as needed;
- Facilitate community participation and contributions; and
- Serve as permanent contact between the coordinating office staffs, WWDTs, DAS, KWDT etc and the rest of the community target groups and local leaders during planning, community action plan (CAP) and bylaw preparations, designing, management & implementation of LLPLUP options.

6.2.2 Kebele Level

To ensure coordination and supervision between the different micro-watersheds and community micro-watersheds LLPLUP existing in each Kebele, a Kebele micro-watershed development committee is essential to be established at Kebele level to act as the main focal point for the LLPLUP implementation support. To make the committee effective and representative KWCs will be chaired by the Chairman of the Kebele Council with wide representations from the community and local government bodies.

Proposed members of the KWC:

- Chair man of the Kebele council
- Kebele council member responsible for rural development
- Kebele Manager
- Religious head of the Kebele
- One male and female representatives from each micro-watershed
- Representative of the youth

- Chairperson of the Land Administration Committee
- Chairman of a 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 and communication representative
- DA coordinator

6.2.3 Woreda Level

Woreda LLPLUP micro-watershed development teams will be established and organized in the Woredas where the LLPLUP will be implemented to support the undertakings of the community integrated LLPLU plan management activities.

The presence of LLPLUP management and development teams at Woreda, Kebele and community micro-watershed levels will ensure and enforce:

- The required Community Action Plan (CAP) advance preparation;
- Whether component parts of the integrated LLPLU plans are properly included in the plans, programs and budgets;
- Required actions are taken by all concerned bodies;
- Cost and labor effectiveness is attained;
- Committed, focused and result-oriented individuals or parties will produce effective work since participation of all concerned are coordinated and organized.
- All the activities and functions of NGOs, investors and others within the planning unit areas are properly integrated and coordinated in order to avoid duplication of work and effort.

Woreda LLPLU Planning team will compose of experts of various disciplines of the Woreda Offices as they would be relevant to integrated LLPLU planning micro-watersheds development plans and activities. The main roles and responsibilities of the Woreda LLPLUP micro-watershed development teams will be:

- Promoting and coordinating the integrated micro-watershed LLPLUP management to the community;
- Facilitating the planning and implementation of capacity building for farmers;
- Reviewing and approving the micro-watersheds LLPLUP bylaws and community action plans (CAP);
- Enforcing preparation of LLPLU plans at all Kebeles of the Woreda ;
- Establishing linkages with other national major rural development institutions and stakeholders.
- Assisting farmers to establish LLPLUP development agents at Kebele level;
- Evaluating and monitoring the on-going LLPLUP implementations conducted at micro-watershed levels; and

- Arranging workshops, trainings, conferences with potential development partners, NGOs, farmer's co-operatives, concerning implementation of LLPLUPs.

The Woreda LLPLU planning micro-watershed development teams will get sufficient first hand information, orientation and training regarding integrated LLPLU Planning and implementation processes, soil and water conservation, agronomy, livestock, co-operatives, etc by specialists and professionals that would be available at regional and national levels.

6.2.4 Regional Level

A LLPLUP coordination office will be established at regional level for follow-up and partially financing the execution of day-to-day technical activities and implementation of LLPLUP. The coordination activities will be carried out by BoLAU or BoEPLAU. The staff will have the capacity to carry out the LLPLUP activities in cooperation with executing sector bureaus and implementing bodies at Zone, and wereda levels. It will be headed by the Bureau Head.

The principal functions and responsibilities will be:

- Managing resources in accordance with the PPLUP objectives, procedures and goals;
- Carrying out overall LLPLUP oversight on planning, implementation, quality and technical supervision and improving monitoring quality of LLPLUP activities;
- Providing the necessary support to the subordinates involved in implementation;
- Administrating the LLPLUP by providing technical assistance, training, office equipment, furniture, vehicles and operating cost in support of implementation and management;
- Following-up and backstopping the implementation processes;
- Providing support in employing and *administrating staff* at Kebele level, and
- Preparing and submitting progress and financial reports, annual budget and work plans and programmers of the LLPLUP team to higher bodies.

6.2.5 Federal Level

MoA will be the coordinating agency of the LLPLUP and will have an overall responsibility for training of trainers, updating of guidelines/manuals; supervising and controlling all activities of LLPLUP. In this respect, BOLAU or BoEPLAU is the sole institution that will be responsible for planning and implementation of integrated micro-watershed development LLPLUP plans through its decentralized rural development channel, as it has all the required structure, capacities, facilities and personnel.

The RLAU directorate established under Deputy Ministry of NRD will oversee implementation and guides the planning & implementation of the LLPLUPs. The Directorate will also be responsible for co-ordination of activities between all concerned institutions such as Federal Ministries, and national regional states.

In short; the directorate is responsible to oversee/keep an eye on whether the LLPLU plan is implemented in an integrated, coordinated, focused, committed, effective and efficient manner in line with its goal, objectives and project components and activities. In addition

to that, it follows-up the benefits obtained and shortcomings of the plan and its implementation to higher bodies.

Glossary

Base map: a map drawn to show boundary of an area, rivers, roads, social structures and water bodies if available for putting or transferring thematic biophysical and planning units.

Carrying capacity: the production capacity & ability of a certain unit of land that supports the feed requirements of a certain number of TLU or human calories requirements for a certain period of time.

Land administration: it is the process of registration and mapping the land holdings of a land user to be utilized as per the prepared land use plan for the kebele's micro-watersheds. It also involves provision of land use certificates and plans with regulatory laws and bylaws for caring of different land use units as per recommendations of plan preparation.

Land Capability map: a physical map that show different class of land suitable for optimum production of alternative land uses suited at different levels and requires different management and regulatory activities.

Land cover: the natural and manmade resources occurring on the surface of the earth as single unit or in mixture of more than one unit

Land degradation : a process of reduction of vegetation cover, soil depth and water holding capacity and fertility and loss of production per unit area of land due to wanton cutting, overgrazing and severe erosion

Land management: it is the activities of developing a land as per participatory land use plans and conservation and amelioration of limiting factors

Land mapping unit: a unit of land that has homogeneous property in terms of soil physical and chemical properties, slope, land form and climatic conditions.

Land resource: natural resources of the earth occurring above or below the surface

Land Unit (LU): Land unit is an area of land which possesses specific and unique land characteristics and land qualities which separates it from adjacent units. It has also similarity with a mapping unit delineated based on homogeneous characteristics and qualities of resources.

Land use: a unit of land covers being assigned for a fixed use based on implementation of labor, inputs and technologies for land development and improvement

Land users: are farmers or others who own land for uses determined on the land use plan and regulations provided for them.

Land: In the Ethiopian context land is an asset of wealth that provides livelihoods for the peoples using it. It is also a base for construction of houses, cultivation of perennial and annual crops, livestock rearing, source of springs; making of ponds, wells and using river waters; planting of tree crops and minerals mining. The quality of livelihood in the rural areas are dependent on quality and size of the land that a land user possesses. The average

land holding in Ethiopian rural farm areas especially in the highland environment is not more than 0.5 ha. This lowers production if used without plan and use of appropriate inputs and management techniques. On the other hand, FAO, 1976 and 1989 and Beek, 1978 defined land as “an area of the earth’s surface. Its characteristics hold all elements of the biosphere, the soil, and the underlying geology, hydrology, the plant and animal populations and the results of past and present human activities. These elements independently and in association exert significant influence on present and future uses of the land. The definition therefore enables us to realize and visualize all the resources that are mutually supporting in the processes of planning practices.

Length of Growing Period (LGP): Lengths of growing periods are continuous periods where soil moisture is available for development and maturity of plants/crops due to adequate rainfall where the remaining components of the environment are conducive. It is also a period where water harvesting is possible when rainfall exceeds full evapo-transpiration.

Planning Unit (PU): is a specified area of land; in which studies of natural resources and socio-economic conditions will be conducted by planners for appropriate and sustainable land use plan preparation and resources management. It can also be defined as homogeneous area of resources delineated for relatively similar problems; potentials and development constraints that influence similar the purposes of planning. Planning units represent areas with development options and/or land use options.

Stocking rate: is TLUs assigned to be fed for a certain period of time by fulfilling their feed requirements.

Total livestock unit: number of livestock units measured in TLUs (Tropical Livestock Unit) where one TLU is equivalent to 250 Kg.

Watershed: is an area of land from which flow of water during rains drain to a water channel or stream and make flow to the main river at a confluence.

References & Reading Materials

A Land Husbandry Manual: Land Use Planning; Physical Conservation; Malawi; 1977

Alemneh Dejene. 1989. The Training and Visit Agricultural Extension in Rainfed Agriculture: Lessons from Ethiopia. World Development, Vol. 17, No. 10, pp. 1647-1659.

Amare G. 1980. Agricultural system in Ethiopia, Agricultural Systems, 5: 29-38.

Amhara Land Administration and Use Proclamation No. 133/2006

Amhara Land Administration and Use Regulation No 51/2007

ANRS: Potential Survey, Identification of Opportunities and Preparation of Projects' Profile and Feasibility Studies: Development Studies Associate and Shawl Consult International: Part one Potential Survey: Land capability and Classification Report; 2006; Bahir-Dar

ANRS; Environmental Protection Land Administration & Use Authority: Nature & the Scope of Land Use Planning; February; 2005

Bergdall, T.D., the MAP facilitators' handbook for promoting rural participation, Lusaka, Zambia, 1994.

Bruce J.W, Allan Hobben and Dessaleghn Rahamtu; 1994; After the Derg: An Assessment of Rural Land Tenure Issues in Ethiopia. Land Tenure Center, University of Wisconsin, and the Institute of Development Research, Addis Ababa University

Bruce John and Shem Migut - Adholla "Introduction" and "The findings and their Policy Implications" in Searching for Security of Land Tenure in Africa (Manuscript)

Bruce John. 1993. "A Review of Tenure Terminology" Land Tenure Center, University of Wisconsin, Madison.

Carp, D., BIDA; Women's leadership training programme 1992, SNV-Zimbabwe, 1993

Chambers, R., Relaxed and participatory rural appraisal: notes on practical approaches and methods, IDS, Sussex, UK, 1993.

Chambers, R.: Rural development; putting the last first. Longman, London, United Kingdom, 1983

Desalegn Rahmato: Land, Population and Environment: What it is "Issue"? A paper presented for the panel discussion on population and Environment in Ethiopia, organized by National Office of Population.

Desaleghn Rahmeto; 1991. Peasant Organizations in Africa: Constraints and Potentials. CODESRIA, working paper 1/1991

Desaleghn Ramato. 1996. Land, population and Environment: What is at Issue? A paper presented at a workshop on population and environment in Ethiopia

Desalehn Rahmato. 1991. Famine and survival strategies: A case study from northern Ethiopia. The Scandinavian Institute of African studies

DHV, (2002); Guideline for Land Use Planning, ANRS, Bahir Dar: ESP: Component 2

EHRs, 1984; Resources for Rural Development in Ethiopia: EHRs, UTF/ETH/037, working paper 17

Environmental Protection, Land Administration and Use Authority: Watershed Management Based Participatory Land Use Plan Preparation Manual; 1997; Bahir Dar (Amharic Version)

- Esman, M.J. and N.T. Uphoff;** Local organizations; intermediaries in rural development; Cornell University Press, London, UK, 1984
- Ethiopian Civil Society Network on Climate Change:** A Review and Analysis of Land Administration & Use Legislation and Application; April 2001; Addis Ababa
- Ethiopian Forestry Action Programme (EFAP) 1994.** Final Report, Volume I - Executive Summary: The Ex- Ministry of Natural Resources Development and Environmental Protection, Addis Ababa.
- FAO, (1976);** A Framework for Land Evaluation: Soils Bulletin No.32: Rome & Wageningen: FAO& ILRI
- FAO,** Land Tenure Series No 3, 1996; Rome
- FAO,** Legislative Study No. 31; G.K. Wilkinson: The Role of Legislation in Land Use Planning for Developing Countries, Rome; 1995
- FAO/UNDP, (2000);** Land Cover Classification System, Rome
- FAO/UNDP/MoA (1984),** Assistance to Land Use Planning Ethiopia: Land Use Production Regions and farming systems. Rome and Addis Ababa; FAO and MoA
- FAO/UNEP/GTZ (1999);** the future of our land facing the challenge: guidelines for integrated planning for sustainable management of land resources.
- Feyera Abdi, et al.,** A comparative analysis of participatory approaches, Addis Ababa, 1997.
- FDRE, Ministry of Information (2002).** Rural Development Policies; Strategies and Techniques: Addis Ababa.
- Flint Michael 1991;** Population, Environment and Development: A paper presented by the Overseas Development and Administration (ODA) of the UK government.
- Friedmann, J.,** Empowerment, the politics of alternative development. Blackwell Publishers, Cambridge, Massachusetts, 1992
- GTZ (1999):** Land Use Planning: Methods, Strategies and Tools
- Harrison, E. 2001;** Participation and partnership in resource management: In Pankhurst (ed).Natural Resource Management in Ethiopia. Forum for Social Science (FSS)
- Hope, A., S. Timmel, and C. Hodzi, I.T.C:** Learning for participatory technology development: a training guide, Leusden, the Netherlands, 1993.
- ICRE;** International course on rural extension; International Agric. Centre, Wageningen, the Netherlands, 1991
- ICRE;** International course on training of trainers in extension: Internat. Agric. Centre, Wageningen, the Netherlands, 1991
- International Maize and Wheat Improvement Center (IMWC) 1980;** Planning Technologies Appropriate to Farmers: Concepts and Procedures. Londres, Mexico.
- Investment Office of ANRS, 2007;** Land Cover/Land Use Report: DSA & SCI, Bahir Dar
Investment Office of ANRS, 2007; Land Capability Classification: DSA & SCI, Bahir Dar.
- Lakew Desta, Carucci, V., Asrat Wendem-Agegnehu and Yitayew Abebe, (2005).** Community Based Participatory Watershed Development: A Guideline. Part I. Ministry of Agriculture and Rural Development, Addis Ababa, Ethiopia; Pp. 176

Ministry of Natural Resources Development & Environmental Protection; Land Use Planning & Regulatory Department: Manual for Grassroots Level Land Use Planning; March 1992

Ministry of Water Resources: Genale Dawa River Basin Integrated Resource Development Master Plan Study Project; Master Plan Report; Land Evaluation/Land Suitability; Addis Ababa; 2006

MoA and World Bank (1985): Ethiopian Highland Reclamation Studies Reports

MoARD: Community Based Participatory Watershed Development Guideline; Addis Ababa; 2005

MoWR, (1998); Abay River Basin Integrated Development Master Plan Project Phase 2: Land Resources Development

MoWR, 2009; Mille and Dirma Integrated Sub-watershed Management Study Project: Volume I: Project Implementation plan (PIP)

MoWR, WAPCOS (1990); National Master Plan report

Oakley et al. 1991. Project with people: The Practice of Participation in Development. International Labor Office, Geneva, Switzerland

Oromiya Land Administration and Use Proclamation No. 147/2009

Pankhurst, A.2001; Resource Management institutions in post-conflict situations: Lessons from Yegof State Forest, South Wollo Zone, Amhara Region. Pankhurst, A (ed). Natural Resource Management in Ethiopia; Forum for Social Science (FSS)

Phnom Penh (2001); Participatory Land Use Planning Manual for Cambodia

PRA Surveys, Community Forestry and Wildlife Conservation Project (CFWCP), FARM-Africa, 1993/94

Rural Land Administration and Land Use Development Process; South Gonder Zone; East Estei Wereda; Mekaneyesus Kebele; Chinch Mariam Land Use Planning Study; Megabit; 2004 EC(Amharic Version)

Shetty, S.; Developing project in assessing empowerment; ActionAid India, Bangalore, India, 1999?

Sik Boreak (2000): Land Ownership, Sales and Concentration in Cambodia

SOS SAHEL; Seven year woreda development programme: Meket woreda, North Wollo zone, draft, May 1997, Addis Ababa.

South Gondar Zone Area Land Administration & Land Use Department; Watershed Based Participatory Land Use planning manual; Tahisas; 2004 EC; Debre Tabor (Amharic Version)

Sustainable Land Use in Ethiopia and Eritrea" by C. Gribnau, Dec. 1992

The Federal Land Administration and Use Proclamation No. 456/2005

The Food Security Strategy

The Growth and Transformation Program (GTP)

The Plan for Accelerated and Sustained Development to End Poverty (PASDEP)

The Transitional Government of Ethiopia; 1993; National Policy and Strategy for Plant Genetic Resources Conservation and Development

The Water Resource Management Policy

Tigray Land Administration and Use Proclamation No.16/2008

Tigray Land Administration and Use Regulation No. 48/2008

Training for Transformation: a handbook for community workers, part 2, Mambo Press, Gweru, Zimbabwe, 1984.

Verhagen, K., Self-help promotion; a challenge to the NGO community, CEBEMO/Royal Tropical Institute, Oegstgeest, the Netherlands, 1987.

WBISPP, ANRS 2002; A strategic Plan for Sustainable Development, Conservation, and Management of Woody Biomass Resources (Final Report, Addis Ababa, MoA

Annexes

Annex 1: Percent estimation of land cover composition types of a cultivated land mapping unit

Date: _____

Mapping Unit: _____

Sample #: _____

Cultivated land category	Estimated percentage					Major crops grown and other uses in the unit
	cultivated	Patches of grass cover	Scattered shrubs	Scattered trees	others	
C1						
C2						
C3						
C4						

Note: C1: 80- 100% cultivation; C2: 60-79% cultivation; C3: 40-59% cultivation; C4: 20-39% cultivation.

Annex 2: Guide for determining physiognomic Vegetation Types by abundance

Average height				Mapping code	Physiognomic vegetation type
>5m	2-5m	<2 m	0-2m		
Tree %	Bush %	Shrub %	Herbs and Grasses %		
>50	30-40	10-20	0-5	N1	Forest(F)
20-40	30-50	20-30	5-10	N2	Wooded bush-land(WBL)
40-60	0-10	0-10	>30	N3	Woodland(WL)
0-10	40-60	10-40	10-20	N4	Bush/Shrub-land(B/SH)
0-5	10-30	30-50	>20	N5	Shrub grassland (ShGL)
0-5	0-5	0-10	>60	N6	Grassland(GL)

Annex 3: Format for collecting vegetation and wildlife data

1. Date: _____ Sampling Unit Code: _____ Sample #: _____

2. Physiognomic Vegetation Type:

3. Existing land use:

4. Level of Disturbance: high; moderate; low (underline)

5. Vegetation cover data

Strata	tree	High Shrub	Low Shrub	Herb
Cover in %				
Height in m				

6. Total Actual cover in %: _____

7. List of Species and their abundance:

- .
- .
- .
- .
- .

8. Historical back ground of the area

- 0-5 years ago: _____
- 5-10 years ago: _____
- 10- 20 Years ago: _____
- Before 20 years ago: _____

9. List of wild life species

Species abundance (rare, Paucous, many)

10. Constraints and recommendations suggested by the land user

- a)
- b)
- C)

11. Plantation data

species	Year planted	Average height	Area coverage	Purpose of plantation

Annex 4: Format for recording livestock feed and diseases

1. Region: _____; Wereda _____; Kebele: _____; Date: _____

2. Forage specie common in the area

Local Name

scientific name

a)

b)

3. Tree and Shrub legumes

Local name

scientific name

a)

b)

c)

4. Source of drinking water

Source trip)

Distance in Km from grazing area (round

a)

b)

c)

List of other supplementary feed

a)

b)

c)

5. Livestock diseases and parasites

Diseases/parasites	Affected LS	Nature of the disease	Prevalence month	Extent of damage	Controlling measures

6. Other problems relating to livestock development (list)

Annex 5: Format for assessing livestock feed sources

1. Date: _____; Region: _____; Wereda: _____; Kebele: _____

2. Crop residue: yes or no: _____ if yes, type of crops: _____

Grazing on aftermath: yes or no: _____; If yes type of crops: _____

Communal grazing land: Yes or no: _____

Fallow Land: yes or No: _____

Planted forage crops: yes or no: _____ if yes type of crops: _____

Others:

3. Major agronomic Problems:

4. Occurrence of hailstones damage: yes or no:

5. If yes degree of damage: none, slight, moderate, severe (underline)

6. Time of the year when the damage occurs:

7. Types of Soil conservation measures being undertaken:

8. Is there water logging? Yes or no (underline) where:

9. Measures taken against water logging:

**Annex 5: Format for recording land holdings of a randomly selected or a land user
to be surveyed house to house**

Land use type	Area in ha, timad, gezim or gemed
Annual crops	
Perennial crops	
Fallow land and period	
Dry grazing land	
Wet grazing land	
Forest	
Fuel-wood plantation	
Bush and Shrub-land	
Guaro/homestead	
Areas conserved	
Barren land /Rocky or eroded	
Land under closure	
Total	

Annex 6: Terms of Reference (TOR)

Back Ground

The Ethiopian government has taken very essential steps that are necessary to address problems associated to land and tenure security of the country. The main measures taken by the government include establishment of responsible land administration and use organizations and enacting land related legislations. The Federal and regional land laws calls for preparation and implementation of land use plans. The local level plans to serve as a pillar to expedite the implementation of most provisions contained in Article (13) of the federal proclamation. Thus, the federal government as well as regional states has established land administration and use organizations which are responsible for administering and managing the rural lands of the country. In fact at national level, the land administration and use department is organized under the ministry of agriculture as a directorate

Moreover, land related legislations have been formulated both at federal and regional level which are assumed as most important policy instruments to tackle the rural land administration and use problems. In line with this tenure insecurity and improper land use practices are noted in the legislations as the major causes of land degradation in the country. Furthermore some of the policy stated objectives of the legislations indicate that regulation of rural land uses will be through land use planning.

On the other hand, the federal land administration and use directorate is in the process of organizing itself by putting in place the required manpower and internal arrangement to assume the responsibilities to conduct land use studies, planning and implementation. It also has the responsibilities of developing various land administration strategies and implementation plans by establishing harmonized methodologies for cadastral survey whose input is crucial for the various land administration activities which include but not limited to undertake land registration and issuing of certificate for holders right which are instrumental to sustainable natural resources management in particular and rural development in general.

Meanwhile, the regional government has advanced forward towards establishing and strengthening the land administration system. Yet, the move of the regions towards preparing rural land use plans, and the regulation of land uses and development through planning control is gradual. In this regard, the land administration and use offices at all levels which have the official mandate for local level land use planning and enforcement of land use plans are not carrying out their responsibilities adequately despite some watershed based local level land use planning activities has been undertaken in different regions. Even if land use planning is a tool for putting into effect the regulatory function of land administration system, many of the local plans were prepared largely to serve as a tool for watershed management, and moreover the plans are not quite integrated and legally binding.

Hence, it is very important to assess the existing land use planning practices, the major land use problems and challenges of local level planning in rural parts of the regional states. Above all, it is also essential to produce operational local level land use planning manual that will be used by the regions as a guidance material for preparing participatory and enforceable local land use plans.

In order to carry out these activities the LAUD would need to engage an individual consultant who has adequate academic background and experience especially in the field

of land use studies and planning. LAUD will also consider attaching its own experts who have knowledge in the area to build their capacity working with the consultant.

Therefore the consultant is highly expected to critically assess and evaluate all the past and current works on local level land use planning and evolve appropriate manual for the planning that also include a methodology to implement the provisions of the proclamations.

Purpose of the consultancy

The main purpose of the consultancy work is to produce a practical operational local level land use planning manual, which will be used by sub professionals or Development Agents at woreda or kebele level.

Specific duties of the Consultant

- To assess existing information from the different regions ;Specifically, from Oromyia, Amhara, SNNP, Tigray, Benshangul and Gambela concerning major land use problems, planning constraints and local level land use planning practices in collaboration with experts from the federal land administration and use directorate, and produce report document. Moreover, the consultant should consider thoroughly multiple earlier manuals of FAO on approaches to prepare local level land use plan in Ethiopia.
- To design and prepare a simple, user-friendly participatory local level land use planning manual that can help local level experts to prepare local plans which can be enforced by the land administration and use legislations in place. The kind of manual to be prepared by the consultant shall be brief and, which clearly shows all the necessary steps including enforcement mechanisms.
- To present the prepared manual on the consultative workshop, and finalize the manual by considering all the comments to be raised by the concerned participants of the workshop.
- To train field technical staff of the regions using the prepared manual in collaboration with the federal LAUD experts. In line with this the Consultant should have high capacity lap top computer for the study and ready the required training materials and manuals.

Required Qualification and Experience:

- The consultant should have Master's degree in Land Use Planning /land resource management or any other related professions /fields with a minimum of 7 years of proven experience working in land use planning and land resource management or related areas, preferably with experience in land administration and rural development and some knowledge in GIS. Experience must include prior and existing works or understandings of local level land use planning and sustainable land management practices in Ethiopia.
- Knowledge of current land administration and land use policy instruments, such as land laws, strategies and systems in Ethiopia
- Excellent English written skills are required Federal language knowledge is also a plus.

- Proven and demonstrable report writing skills as well as some technical research skills including both qualitative and quantitative methods and cost benefit analysis is essential
- Adequate knowledge of FAO land evaluation techniques such as land capability and suitability classification technique is also one of the preconditions that the consultant to possess
- Proven knowledge of multidisciplinary or integrated watershed or kebele based land use planning techniques including Some knowledge of
 - Crop and LGP assessment in local level land use planning.
 - Agro-ecology classification
 - livestock and range land ecology study in land use planning
 - rural socioeconomic assessment using PRA tools
 - Land use and land cover study and change analysis
 - Experience on remote sensing and interpretation of satellite Imagery.
 - Conventional and participatory soil survey and
 - Land use plan enforcement mechanisms

Requirements

- Interested individual consultants are invited to submit hard copies of a professional license, detailed technical and financial proposal along with their credential
- The consultant should bring certificates for all required qualification and experiences mentioned above, and for the whole thing mentioned in his credential.
- The consultant shall be willing to travel within all the six study regions.
- The consultant who will win the tender will consign consultancy agreement with the directorate and sustainable land management program coordination unit within MOA For the consultant reporting is mandatory - verifiable instances of failure to report the progress of the study and or letdown to submit the manual on the agreed date may lead to immediate termination of the consultancy agreement

Hiring Entity's Responsibility

The client will provide vehicle for the field work with driver and cover the costs of fuels for the car. All the necessary room and equipment like photocopy machine and a desk top computer for the office work shall be availed by the client as well.

Expected output/ Deliverables

A practical operational manual for participatory local level land use planning is the main output of the consultancy. The final manual shall also be prepared after undertaking a national workshop.

Annex 7: Proposed list of materials needed by different level of planners

SNo.	Planning Levels				
	Item	Region	Zone	Wereda	Kebele
1	4 Wheel Drive	2	2	4	1
2	Motor Cycle	-	-	2	2
3	Cycle	-	-	-	2
4	Mirror Stereoscope	3	-	2	1
5	Pocket Stereoscope	2	-	2	4
6	Topographic maps(1:50'000-1:20,000)	Regional Coverage(1:50,00)	-	Wereda Coverage(1:50,000 and 1:20,00)	Kebele coverage > 20, 000
7	Digital Satellite Imagery	Regional Coverage 1: 50,000	-	Wereda Coverage 1: 50,000	Kebele coverage > 1:20,000
8	Digital Map printer	1	-	1	1
9	Large Capacity Desktop Computers	3	2	3	1
10	Large Capacity Laptop Computers	2	1	2	2
11	Hand Hold GPS	5	2	5	3
12	Augers	10	-	10	3
13	Color Chart	5	2	5	3
14	Clinometers	5	-	5	3
15	Software (ARC-GIS)	yes	yes	yes	yes
16	Adequate Working Space	yes	yes	yes	yes
17	Aerial Photographs	Regional coverage(1:50,000) and larger	no	Wereda Coverage(1:50,000) and larger	Kebele Coverage >20,000

Annex 8: Participants of Regional States attended the workshop held in Debrezeit/Bishoftu in August 21 & 22; 2012 and provided constructive comments for enhancement of the manual

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Annex 9: A guiding bylaw preparation model for LLPLU Plan implementation

Preamble

After formulation of a LLPLUP, we the land users of the planning area using the land in micro-watershed/Kebele ____, Kebele ____, Wereda ____; Zone____ and Region __ have agreed to entirely implement the land use and land management plan without any change agreed by the community of the Kebele and approved by the Steering committee of our Wereda LLPLUP.

The land use plan formulated by the planning team and agreed by the land users of the planning unit area is based on the regional land administration and use policy, proclamation, regulation and thus we decided to implement the plan as per this bylaw developed based on the Federal and regional governments land laws.

We believe that the plan is made to improve and upgrade our resources, increase production per unit area and improve our livelihoods. The planning options indicated in the plan are based on our interest of development and requirements and capacities of the land units identified by the planning team of which our representatives and had been fully engaged. Changes made in the current land use are seen important to improve the productivity of our land and our livelihoods. Thus any discomfort and displacement caused by the change is agreed to be accommodated by the land users of the planning unit area.

Areas of Agreement:

1. The land use plan made by the planning team is appropriate for proper management and improvement of our natural resources
2. we have agreed to implement the land use and land management plans indicated on our land holding/ land use right certificates and land use plan of the planning unit area;
3. For the success of the plan, we have agreed to adjust holdings between households of our planning unit so as to have equal chance of livelihood improvements;
4. We have agreed to improve the plan if any error will be observed by the planning team during implementation, monitoring and evaluation processes;
5. We have agreed to own the same size of land by type which had been used before the planning
6. We have agreed to implement all land management recommendations shown on the land use plan and our holding map and certificates of land use right.
7. We have agreed to manage and use communal lands as per the plan
8. Communal land holding rights of previous use rights will continue as had been before this land use plan approval;
9. We have agreed to conserve our soil and water as per the plan and the community action plan

10. Community forests and water resources will be the property of the community and will be guarded by the community;
11. Government Forests and resources within our planning unit area will continue to be the property of the government and will be manage by the community as per the LLPLUP
12. We have agreed to develop and protect our footpaths, all weather roads, irrigation areas, markets, schools, health posts, clinics and health centers as shown on the plan.
13. We undertake development activities as per the community action Plan Developed and agreed with the land use plan;
14. We have agreed to involve all the community members in the development actions.
15. We have agreed to use water resources on equitable basis upstream and downstream
16. Communal forests will be used by the Kebele for communities' common use;

Agreed Regulations and Punishments

1. Any land user of the community if found using the land out of the plan will be given warning by the community WSDT with 1000.00 Brir punishments for the first time.
2. If any land user is going to be found using his land out of the plan for the second time will be punished Birr 5, 000.00 and given a warning that half of his holding will be confiscated/ taken for the community use if he commits the same mistake. If this cannot stop him/her final decision will be given by the Wereda Administration;
3. If any land user is found grabbing communal lands will be punished Birr 2,000 and be warned one fourth of his/her holdings will be taken for the community use in the second time;
4. If any land user do not respect the plan will be dislocated from communal land use; if he is not a communal land user will be punished birr 5, 000.00
5. If any land user is found destroying water sources will be punished 5, 000 birr for the first time and birr 10, 000 for the second time;
6. If any land user is found destroying the government and community forests will be punished Birr 10,000.00;
7. If any land user do not develop and protect his land as per the plan and certificate given to his holding will be punished birr 2, 000.0 for the first time and his one fourth holding will be taken in the second time for the community use.

Conclusion

This bylaw will serve as a law of the planning unit after being signed by the community and sealed by the wereda Administration and WLAU office.

The bylaw is endorsed and signed on this date of _____

Note to the planning team:

This is a sample document to help assist the planning team to discuss issues while developing LLPLUP and making bylaws and Community action plans. The bylaw should be developed and improved by the community in the presence of the planning team.

Annex 10: An example of format for a Community Action Plan (CAP) preparation

Agreed Land Use Options	Area in ha	Land Capability class	Limitations	Recommended land development interventions	Unit	Quantity	Implementer	Time of Implementation

Annex 11: Possible slope, soil depth, erosion status, texture and water logging classes useful for land capability classification

Slope Class	Code	Soil Depth Class	Code	Soil erosion status	Code	Soil texture class	Code	Water logging class	Code
0-2%	L1	>150	D1	none	E0	Sandy	T1	None	W0
2-8%	L2	100-150	D2	slight	E1	sandy Loam	T2	Slight	W1
8-15%	L3	50- 100	D3	medium	E2	loam	T3	Medium	W2
15-30%	L4	25-50	D4	Severe	E3	Clay loam	T4	Severe	W3
30-50%	L5	<25	D5	Very severe	E4	Silt loam	T5	Very severe	W4
>50%	L6		D			Silt Clay	T6		
						Heavy Clay	T7		

Annex 12: Soil infiltration, stoniness and LGP classes

Soil infiltration rate class	Code	Stoniness	Code	Length of growing period	Code
Good	I0	<15%	S0	<90	G1
Medium	I1	15-30%	S1	90-120	G2
High	I2	30-50%	S2	120-150	G3
		50-90%	S3	150-240	G4
		>90%	S4	>240	G4

Annex 13: Land capability classes, current and potential land uses that can be decided by the LLPLU planning team

Land capability class	Major limiting Factors	Current land use in bold & Land Use options to be agreed and decided by LLPLUPT under		
		Cultivated Land	Grazing Land	Forest Land
I	Nil	Intensive cropping + maintaining good vegetation cover + waterways	a. Convert to cultivated land b. Grassland improvement	a. Convert to cultivated land b. convert to agro-forestry c. maintain natural forest with enrichment planting if necessary
IIL	Slope: 2-8%	a. contour cropping b. stripe cropping c. grass stripe d. alley cropping + waterways, cutoff drain	Same as above	Same as above
IIS	Stoniness; Slope: 15-30%	Removal of stones + application of options of class I	Same as above	Same as above
IIIL	Slope: 8-15%	a. grass stripe b. alley cropping c. combination of grass strips and bunds d. soil or stone bunds e. fanya Juu + waterways, cutoff drains	a. convert to cultivated land b. grass land improvement b. convert to agro-silvi-pasture + cutoff drain	Same as the same + stripe plantation following contours
IIIE	Slight past	a. cutoff drain +	Same as above	Same as class I +

Land capability class	Major limiting Factors	Current land use in bold & Land Use options to be agreed and decided by LLPLUPT under		
		Cultivated Land	Grazing Land	Forest Land
	erosion	waterways + if slope 2-8% apply options of Class IIL		cutoff drain + encouraging vegetation cover
IIIW	Intermittently water logged	a. drainage improvement b. broad bed furrows on black soils c. if slope 2-8%; apply options of class IIL	a. convert to cultivated land b. improve the grass land c. convert to agro-silvi-pasture	Same as options for class II + selection of species resistant to water logging
IIIi	Moderate infiltration	a. Soil structure improvement; b. deep plowing If Slope 2-8%; apply options of class IIL	Same as above	Same as options of class I
IIIS	Stoniness; Slope: 30-50%	Remove stones + if slope 2-8%, apply options of class IIL	Same as above + stones removal	Same as options of class I
IVL	Slope: 15-30%	a. combination of grass stripes and bunds b. Alley cropping c. Soil or stone bunds d. Fanya juu e. Bench terraces	a. convert to cultivated land b. convert to agro-silvo-pasture c. Controlled grazing + cutoff drain & waterways	Same as above
IVE	Moderate past erosion	a. cutoff drain & waterways b. selected conserving crops If slope 2-8%, apply options of Class IIL If slope 8-15%, apply options of class IIIL	a. Convert to cultivated land b. convert to agro-silvi-pasture c. Controlled grazing + cut off drains & waterways	Same as above
IVD	Soil depth: 50-100 cm??,	a. selected shallow rooting crops + if slope 2-8%, apply options of Ili If slope, 8- 15%, apply options of class IIIL	Same as above	Same as options of class I + micro-basins for plantations
IVW	Regularly waterlogged	a. Selective seasonal cropping b. drainage improvement c. Broad bed and	a. convert to crop land b. convert to agro-forestry system + drainage	a. Convert to cultivated land b. convert to agro-forestry system c. select species

Land capability class	Major limiting Factors	Current land use in bold & Land Use options to be agreed and decided by LLPLUPT under		
		Cultivated Land	Grazing Land	Forest Land
		furrow plowing + waterways; if slope 2-8% apply the options of IIL	improvement	resistant to water logging
IVi	Poor infiltration	a. deep plowing b. soil structure improvement + if slope 2-8% apply the options of class IIL (graded structure) If slope 8-15 apply the options of Class IIIL	a. Convert to cultivated land; b. Grassland improvement c. Controlled grazing d. convert to agro-silvo-pasture	a. Change into cultivated land b. Fuel plantation + encourage vegetation cover growth
VIL	Slope 30-50 %	a. Establish perennial crops b. convert to grassland or forest land c. establish bench terraces for annual crops + waterways	a. grassland improvement b. controlled grazing c. convert to silvo-pasture system + cutoff drains	a. establish silvo-pasture system b. enrichment planting of tree species c. establish fuel-wood plantation + micro-basins
VID	Soil depth : 25-50 cm	a. Convert to grass land or forest land b. Establish perennial crops If slope 2-30%, the perennial crops should be on contour bunds	a. Grassland improvement b. Controlled grazing c. convert to silvi-pasture system	Fuel-wood plantation + micro-basins
VIS	Stoniness: 50-85%	a. Removal of stones b. establish perennial crops c. convert to grassland or forestland If slope 8-15% establish stone bunds If slope 15-30% establish stone bench terraces for annual crops	Same as above + removal of stones	Same as above + stone micro basins, stone hillside terraces
VIII	Slope > 50%	a. convert to forest land b. Convert to silvi-pasture system c. Hillside terraces for annual crops +cut off drains	a. Convert to forest land b. convert to silvi-pasture land c. Controlled grazing + Cut and carry	a. Fuel-wood plantation b. tree plantation for catchment protection + pitting or micro-basins

Land capability class	Major limiting Factors	Current land use in bold & Land Use options to be agreed and decided by LLPLUPT under		
		Cultivated Land	Grazing Land	Forest Land
VIID	Soil depth: 25-50 cm	a. Convert to forestland b. Convert to silvi-pasture land hillside terraces for annual crops	a. convert to forestland b. convert to silvo-pasture land c. controlled grazing + grassland improvement	a. Fuel-wood plantation b. tree plantation for catchment protection
VIII E	Severe past erosion	a. Area closure b. convert to forest land + Gully control + cutoff drain	a. Area closure b. Cut and carry + Gully control + cutoff drain	a. Area closure b. Tree plantation for catchment protection
VIIID	Soil Depth: < 25 cm	a. Area closure b. convert to forest land(catchment protection) c. cut and carry	a. Area closure b. convert to forest land(catchment protection)	a. Protection of existing natural forest b. Area closure c. encourage wildlife development
VIII E	Very severe past erosion	a. Area closure b. convert to forest land(catchment protection) c. Gully control	a. Area closure b. convert to forest land (catchment protection) c. cut and carry	a. area closure b. encourage regeneration of natural tree c. encourage wildlife development
VIIIT	Sandy texture	Not applicable	a. Area closure b. wind erosion control	a. area closure b. encourage wild life
VIIIS	Stoniness: > 85%	Area closure + tree planting	Area closure + cut and carry	a. catchment protection b. encourage wildlife development c. area closure
V	Swamps; riverbeds	Not applicable	a. temporary grazing; b. controlled grazing	a. Encourage wildlife development