

# **Oromia Environment, and Climate Change Authority**

**Training Manual for training of trainers  
on Facilitation of Integrated Land Use  
Planning, and Plan Implementation  
(ILP&PI)**

**Training Manual Submitted as  
Handout for the training of the  
Trainers by ABT-PCS**

**ABT-PCS**

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# Note

**Please Use this Training Manual As a Resource  
Training Material While Using the Training  
Handout Prepared in Powerpoint Which is  
Attached to this Training Manual**

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## I. Prelims of the ILUP Training Manual

### I.1 Brief Profile of the Training Manual

Applicant:	Horn of Africa Regional Environment Centre and Network (HoA-REC &N).
Brief Description:	<p>Oromia regional state is the home of a pristine ecology, wildlife habitat and fertile land, industrial forest that have regional relevance, a large area of swamps and wetlands that have climatic significance for the region as well as fertile land, forest, and fishery resources which could contribute to the economic transformation of the peoples of Oromia and beyond. In this regard, a beneficiary-driven, and integrated land use plan (ILUP) would be thought on how the training would contribute to this optimal and rational use of these lands. The ILUP training manual would serve as a guide for optimal allocation of land according to its productivity potential and sensitivity classes and would also indicate priority economic growth focal areas. Best ILUPs are developed in a stakeholder-driven and expert-guided and government-facilitated approach. The training manual would revolve around how such an approach would be facilitated.</p> <p>MODULE I of this project is focused on organizing, building capacity, and engaging these three actors (Facilitators, drivers, guiders) of the ILUP process. Strengthening the regional and zonal LAUEPA offices will be the focus of MODULE I.</p> <p>Oromia is known for all sorts of conflicts and tribal and resource use. Land use planning will deal with resolving conflict. Therefore, the project deals with the establishment of a conflict-avoiding system and mechanisms in its first phase (PART I). PART I would also focus on establishing participatory monitoring and evaluation system as well as piloting ILUP implementation concurrent to planning.</p>
Objective of the Training Manual	<p>The objective of the training manual is to transform the lives and landscapes of the peoples of Oromia through the provision of an integrated land use master plan (ILUP) to be used as a guide. Given this goal, its immediate objective is to produce the ILUP in full participation of the ILUP facilitators, drivers, and deployment of competent guiding experts by:</p> <ol style="list-style-type: none"> <li>1. Organizing, building capacity, and engaging ILUP facilitation actors</li> <li>2. Organizing, training, and engaging major stakeholders as drivers of the ILUP process</li> <li>3. Avoiding conflict between all sectors of communities, gender groups age groups, wealth groups, and invisible minorities &amp; tribes</li> <li>4. Securing advanced ILUP implementation by way of implementation of cross-cutting actions. Projects and programs</li> </ol>
Performance Indicators:	<ol style="list-style-type: none"> <li>1 strength and capacity of the regional, and zonal ILUP facilitation offices and their staff</li> <li>2 quality and organizational strength of the regional data management centre</li> <li>3 Organizational strength and building the capacity of the direct beneficiaries in driving the ILUP process.</li> <li>4 Strength of the system-driven Conflict Resolving Elders Committees which can also be guided by an early conflict warning system and mechanism</li> <li>5 The strength and quality of the Monitoring and Evaluation system established for improving and enforcing ILUP</li> </ol>
Sector:	Land utilization, administration, and environmental protection office (LPF)
Location:	Region-wide: Oromia regional state and stratified by its ----- zones, -----Woreda and capital cities of all the zones.
Total requested project Cost:	<b>US\$ 3,000,000 to be used over three years</b>
Implementing Agency	Horn of Africa Regional Environment Centre and Network
Implementing Period:	3 years, 2014-202016
Contact for further information	DR. AZENE BEKELE-TESEMMA <a href="mailto:azeneb@yhoarec.org">azeneb@yhoarec.org</a> Managing Director, ABT-PCS, Addis Ababa, Ethiopia.

## I.2 General Information On The Consultant

Title of the action:	Training Manual on Integrated land use planning and plan implementation
Location(s) of the action:	Oromia region, Ethiopia
Name of the applicant	ABT-PCS,
Nationality of the applicant	ETHIOPIAN
Applicant's contact details for this action	
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## I.3 Training Modules of the Training Manual

	Training Course Particulars	Contact time	Trainer
		hours	
Preliminary works	Registration of participants and other preliminary ceremonial works	Morning 2 hrs	The Organizers
<b>Module I.</b>	Background knowledge and Prerequisites in Land Use Planning	2	Dr Azene
<b>Module II.</b>	Overview of Road Map on Making the National Integrates Land Use Plan (NILUP)	4	Dr Azene
<b>Module III.</b>	Organizing and Capacitating the Land Users for Enabling them to Drive the Planning Process from the <b>Bottom Up</b>	6	Dr Azene
<b>Module IV.</b>	Institutionalization and Capacitating the Land Use Planning Facilitation Office for It to Facilitate the Integrated Land-Use Plan from <b>Top-Down</b>	6	Ato Mesfin
<b>Module V-A</b>	Application of GIS as a land-use Planning Tool -theoretical basis	6	Dr Gudina
<b>Module VI.</b>	Integrated Rural Land-Use Planning Methodology and Know-How –Expert-guided planning approaches, methods techniques	14	Dr. Azene
<b>Module V-B.</b>	Application of GIS as a land-use Planning Tool – GIS	6	Dr Gudina

	Practical using land use prioritization		
<b>Module VII.</b>	Integrated Urban Land-Use Planning Methodology and Know-How	7	Ato Melaku
<b>Module VIII</b>	Strategic Environmental and Social Assessment	7	PhD candidate Mesfin Kinfu
<b>Module IX</b>	Producing and Mainstreaming Land-Use Implementation Projects for Implementation of ILUPPI	6	Dr Azene
<b>Module X</b>	Monitoring the Execution of Land Use Plans and Evaluation of the After-Effects	6	Dr Azene
<b>Total number of Contact Hours</b>		70	

Total lecture hours effective = 70 hrs. or 10 days two solid weeks: 1<sup>st</sup> Week Monday to Friday plus 2<sup>nd</sup> Week Monday to Friday

#### **I.4 Participation of The Trainees**

Active participation of the trainees is very crucial. This is an adult education where everyone should be seriously concerned about what he/she gets from the training. In addition, this is a training manual for the trainers of other trainees. Therefore, every segment of the training must be well discussed and understood. Active participation of the trainees is crucially essential. The training will be conducted exclusively by PowerPoint.

In addition to the active participation of each trainee, the trainees will elect two trainees who will be rapporteurs of each of the training modules except for Module 1 and Module 2 which are going to have only one reporter. The rapporteurs would be responsible for preparing excerpts on each of the modules for that they are responsible. The two rapporteurs will make good notes of the training and learning process. The trainer doesn't need to know any of the rapporteurs before they report their report to the plenary. One of the two rapporteurs of each of the modules would be responsible for making a brief presentation on the salient issues of the training in about 30 minutes.

In addition to the presentation to be made by the fellow trainees, the trainees would be given chance for raising their questions for further discussion and understanding in the next 30 minutes.

#### **Course Evaluation**

Ten most priority expectations of the trainees will be listed at the beginning of the course. Later, at the end of all the ten training modules, the trainees will evaluate the training in three levels of satisfaction: 1) highly satisfying, 2) somehow satisfying and 3) not satisfying at all.

## 2. Module I. Background and Prerequisites to Land Use Planning

2 hours of lecture and  
1/2 an hour question and answers

### 2.1 Glossary of terms

**Administrative entity:** the Regional States and their capital cities, zones and their capital cities, Woredas, City of Addis Ababa, Dire-Dawa or a similar entity entrusted with integrated land use planning.

**Adopted plan:** A plan which is aligned with the National Integrated Land Use Plan.

**authority):** An organization that must be consulted following the SEA Regulations. Can be the Bureau/ Communications/Agency Department/ etc....

**Baseline environment:** A description of the present state of the environment of the P/P area.

**Characteristics:** Environmental resources, issues and trends in the area affected by the P/P.

**Cumulative effects:** Effects on the environment that result from incremental changes caused by the strategic action together with other past, present, and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space.

**Data:** Includes environmental data, proxy data, any other relevant statistical data.

**Environmental Assessment:** The preparation and conducting of SEA process, the carrying out of consultations, the consideration of the environmental report and the results of the consultations in decision-making and the provision of information on the decision

**Environmental indicator:** An environmental indicator is a measure of an environmental variable over time, used to measure the achievement of environmental objectives and targets.

**Environmental objective:** Environmental objectives are broad, overarching principles which should specify the desired direction of environmental change.

**Environmental receptors:** Include biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage (including architectural and archaeological) and landscape etc....

**Environmental Report (ER):** A document required by the SEA as part of an environmental assessment which identifies, describes and evaluates the likely significant effects on the environment of implementing a plan or program.

**Environmental targets:** A target usually underpins an objective often having a time deadline that should be met and should be accompanied by limits or thresholds.

**Evolution of the baseline:** A description of the future state of the baseline in the absence of a plan or program assuming 'business as usual' or 'do

nothing' scenarios, depending on which is more reasonable for the P/P being proposed.

**Harmonized plan:** Integrated land-use types that are organized to co-exist in agreement with each other with minimum or no conflict.

**Indirect effect:** Any aspect of a P/P that may have an impact (positive or negative) on the environment, but that is not a direct result of the proposed P/P. May also be referred to as a secondary effect

**Integrated land-use planning:** A general term used for evaluating and harmoniously allocating and planning land-use types in an efficient, legal, ethical, and sustainable way, in both rural and urban settings, to address peoples' needs and sustainability of the environment.

**Interrelationships:** Associations or linkages, related to the environmental impact of the proposed P/P usually on environmental receptors.

**Key environmental issues:** Those significant environmental issues, which are of particular relevance and significance within a P/P area and/or the zone of influence of that P/P. These issues should be identified during the SEA Scoping process.

**Land:** A delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, the soil and terrain forms, the surface hydrology (including shallow lakes, rivers marshes, and swamps), the near-surface sedimentary layers and associated ground water reserve, the plant and animal populations, the human settlement pattern, and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)(FAO 1995).

**Land-use policy:** A legal framework serving as a guiding instrument of government in framing the direction to be taken on major issues related to the allocation, use and management of the country's land resources over some time. Land-use policy is an instrument which provides a framework within which government can prepare legislation for controlling defaulting parties so that implementation of NILUP continues to be realized as planned.

**Material Assets:** Critical infrastructure essential for the functioning of society such as: electricity generation and distribution, water supply, wastewater treatment transportation etc.

**Mitigation measures:** Measures to avoid/prevent, minimize/reduce, or as fully as possible, offset/compensate for any significant adverse effects on the environment, as a result of implementing a P/P.

**Mixed zoning:** A spatial organization of urban land uses in an overall mix of all land uses that have a complementary and healthy co-existence. The major advantage is keeping transport distances short and ensuring a mosaic appearance with greater beauty.

**Monitoring Program:** A detailed description of the monitoring arrangements to be put in place to carry out the monitoring of the impact of the proposed P/P on the environment including; frequency of monitoring, who has responsibility for monitoring, and responses if monitoring identifies significant negative impacts.

- Monitoring:** A continuing assessment of environmental conditions at, and surrounding, the plan or program. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted. The primary purpose of monitoring is to identify significant environmental effects which arise during the implementation stage against those predicted during the plan preparation stage.
- NILUP:** A national integrated urban and rural land-use plan to be produced at national, regional, Zonal, Woreda recognized city/and or town levels.
- NILUPP Agency/Commission:** An authoritative and politically high-level institution which oversees guiding and facilitating NILUPP preparation as well as facilitating, overseeing, and arbitrating implementation of NILUP and its projects by concerned ministries and other agencies nationwide.
- Non-technical summary:** A summary of the findings of the ER, that can be readily understood by decision-makers and by the general public. It should accurately reflect the findings of the ER.
- Participatory planning approach:** Involving grassroots communities that are organized by their livelihood sectors to express their Kebele-level shared concerns and demands to be considered in Woreda-level land-use planning processes.
- I.1.1.1.1.1.1 **Plan or Program:** which are subject to preparation and/or adoption by an authority at the national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and - which are required by legislative, regulatory or administrative provisions.
- Planning Unit:** A single administrative entity (national, regional state or autonomous city, zone, zonal capital city/large town/medium or small town) for which rural and urban land-use plans are prepared.
- Proxy data:** Is a measure of activity resulting from a P/P which provides information on environmental impact without the need for a direct measure of an environmental receptor. For example, an increase in the number of vehicles (activity resulting from a P/P) can provide information on the impact on air quality and greenhouse gases without having to measure the concentration of these parameters in the receiving environmental receptor.
- Public:** One or more natural or legal persons and, under national legislation or practice, their associations, organisations or groups.
- Public:** One or more natural or legal persons and, following national legislation or practice, their associations, organisations or groups.
- Reasonable alternatives:** Alternatives should consider the objectives and geographical scope of the P/P. There can be different ways of fulfilling the P/P objectives, or of dealing with environmental problems. The alternatives should be realistic, capable of implementation and should fall within the legal and geographical competence of the authority concerned.

**Rural Zonal Land Use Plan:** A zonal-level land-use plan that shows the boundaries of all its Woredas in a 1:50,000 scale map.

**Screening:** The process of deciding the content and level of detail of a SEA, including the key environmental issues, likely significant environmental effects and alternatives which need to be considered, the assessment methods to be employed, and the structure and contents of the Environmental Report.

**SEA Statement:** A statement summarizing: - how environmental considerations have been integrated into the P/P - how the ER, the opinions of the public and designated authorities, and the results of transboundary consultations have been considered - the reasons for choosing the P/P as adopted in the light of other reasonable alternatives.

**Strategic plan:** A plan where the physical, economic and environmental conditions are coordinated in the urban plan.

**Structural plan:** A plan where a frame for the different land-use categories is shown in urban planning. A structural plan indicates assigned places to each land-use sector and special stipulations as the cases may be.

**Urban area:** Land designated and planned for urban dwelling in the region, zone, district or Kebele.

**Urban land-use plan:** A plan that shows land uses set aside for the different uses and to guarantying sustainable prosperity of dwellers of a designated city or town.

**Urban sprawl:** Unplanned expansion of urban development that results in inefficient and unsustainable urban development resulting in long and costly physical distances.

**Zone of Influence:** The area over which a plan can impact on the environment.

## 2.2 Acronyms And Abbreviations

ACZ	Agro-Climatic Zone
AfNRS	Afar National Regional State
AMNRS	Amhara National Regional State
BEGNRS	Benishangul-Gumuz National Regional State
CCG	Common Commodity Group
CFE	Common Framework of Engagement
DEM	Digital Elevation Model
EIAR	Ethiopian Institute of Agricultural Research
EIB	European Investment Bank
EIBC	Ethiopian Institute of Biodiversity Conservation
EMA	Ethiopian Metrological Agency
ESIF/SLM	Ethiopian Strategic Investment Framework / Sustainable Land Management
EWCA	Ethiopian Wildlife Conservation Agency
FSC	Federal Steering Committee
GANRS	Gambella National Regional State
GDLA	General Department of land Administration (Vietnam)

GIS	Geographic Information System
GTP	Growth and Transformation Plan
HANRS	Harari National Regional State
IISPT	Core Intermediate-level Investigative Study and Planning Team
ILPT	Intermediate Land-use Planning and Policy Team
MoANR	Ministry of Agriculture and Natural Resources
MoEFCH	Ministry of Environment, Forestry and Climate Change
MoFED	Ministry of Finance and Economic Development
NGO	Non-Governmental Organization
NILUP	National Integrated Land Use Plan
NILUPP	National Integrated Land Use Plan and Policy
NMA	National Mapping Authority
ORNRS	Oromia National Regional State
PES	Payment for Environmental Services
PIF	Policy and Investment Framework
REDD	(UN collaborative program on) Reducing Emission from Deforestation and Forest Degradation
RSC	Regional Steering Committee
RTC	Regional Technical Committee
SEA	Strategic Environmental Assessment
SISPT	Senior-level Investigative Study and Planning Team
SLPT	Senior Land-use Planning and Policy Team
SNNPRS	Southern Nations, Nationalities and Peoples Regional State
SONRS	Somali National Regional State
TINRS	Tigray National Regional State
TOR	Terms of Reference
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WB	World Bank
WBISPP	Woody Biomass Inventory and Strategic Planning Project

## 2.3 Module Objectives

The overall objective of this Training Manual are:

- a) Integrated land-use plan (ILUP) is transforming the knowledge and expertise -of the trainers who may be deployed to train experts of Oromia Regional State on Integrated land use planning for optimal use of its land-based natural resources such as land, water, forest, wildlife, fisheries, minerals, and ecology. In addressing this objective, The trainers will be trained about the preparation of a coordinated, aligned, and harmonized, land use master plan (ILUP).
- b) The second objective is training the trainer experts on methods and approaches that are relevant for facilitating the implementation of the integrat4ed land use plan
- c) The third objective training the trainers dwells on how land use plans and implementations could be monitored and evaluated

Though there are three objectives to be addressed, the immediate objective of this Training Manual is to enable the land-use experts of the Oromia region on producing an expert-guided and stakeholder-driven land-use master plan preparation. Therefore, the training manual will deal with methods and approaches for:

1. organizing, and building the capacity of the staff of OEFCCA and OLUB and engaging them as plan facilitation actors
2. Organizing, and building the capacity of Common-commodity production groups (members of the CCGs)<sup>1</sup> as drivers of the ILUP process.

These above-two objectives are designed to effectively contribute to:

- Optimal and sustainable use of land, and the pristine ecology of the Oromia region to guaranty the sustainability and improved use of all land-based resources following the agroclimatic zone's potential and its sensitivity/ resilience to envisaged development plans
- Secured dignity of the peoples of Oromia for its people to remain proud of the region and they believe in a promising future.
- Let that Oromia becomes a leader in social welfare and its communities are enabled to enjoy a stable, secure, and prosperous environment.
- Make sure that Oromia becomes a market and tourism center equipped with the necessary infrastructure for its information and communication needs,
- Assure that the inhabitants of Oromia are engaged in fruitful economic growth sectors where there is a high employment rate, and higher economic returns by way of sustainable utilization of its land-based resources
- Make sure that Oromia has a modern, sustainable, safe, and land-based infrastructure that supports effective and sustained utilization of its land resources
- Avail a system that encourages a guaranteed clean, healthy, and safe environment with good maintenance mechanism.
- Making tourism a significant job-creating sector of the economy.

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<sup>1</sup> ***These are all communities whose livelihood sector is dependent on manipulation of the land resources of Oromia. Though these are the center of focus in driving the process, the primarily important targets of the training manual are the ILUP -facilitation actors who are supposed to conduct Training of Trainers.***

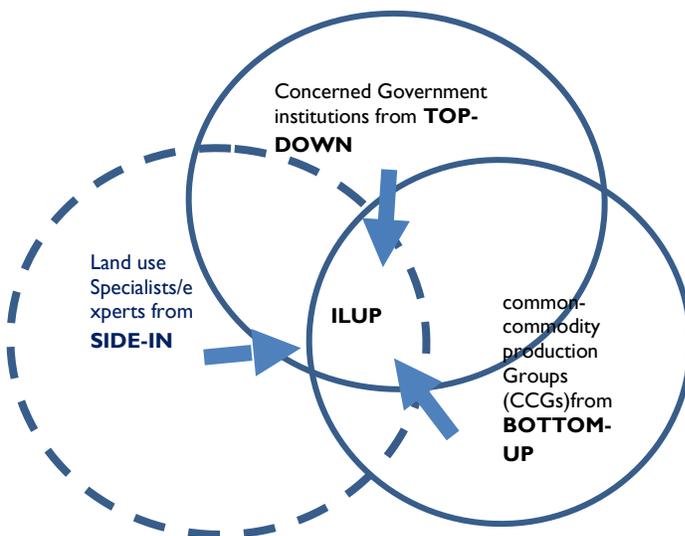
- Guaranty that the effort in assuring that natural and cultural heritages of Oromia are protected preserved, made easily accessible and inviting to domestic and foreign visitors.
- Make sure that water resources are used on a long-term basis and in a sustainable way.
- Enable that the use of renewable energy resources is increasing by making its people, companies, and public authorities aware of the potential and mode of sustainable use of land and its resources.
- Make sure that Oromia has a diversified economy, with a significant share of income to be generated from diversified land-based resources.

## 2.4 Training Targets

Efforts have soon to start by OEFCCA to Organize, build capacity, and engage ILUP facilitation actors as the training targets. Of course, the training would have to cover all facilitation actors as they are functional down to the district level in their preparation to produce integrated land use plans at regional, zonal, and district levels.

The knowledge support to the land use planning of the Oromia region is part of a coordinated intervention that must ultimately lead to having sustained use of land in Oromia. This intervention is intricately linked with a pseudo land use planning effort that is currently being undertaken. Therefore, the current training manual preparation is more precisely geared towards building the capacity of the trainers on how to come up with coordinated, integrated, and aligned land use plan (ILP) by making use of the data from the past watershed-based development plan for a tailor-made integrated land-use plan to be appropriated at an administrative level.

In coming up with such an integrated land use plan, the genuine involvement of the tri-partite actors will be considered. **The integrated land use plan (ILUP)** is designed to be born from the ardent involvement of the land use beneficiaries organized in the form of common-commodity production Groups (CCGs) from bottom-up, professional subject-specific experts from Side-in, and relevant government institutions coming from top-down as shown in figure 2 at the preceding page



**Figure 1. Tripartite involvement of the planning actors**

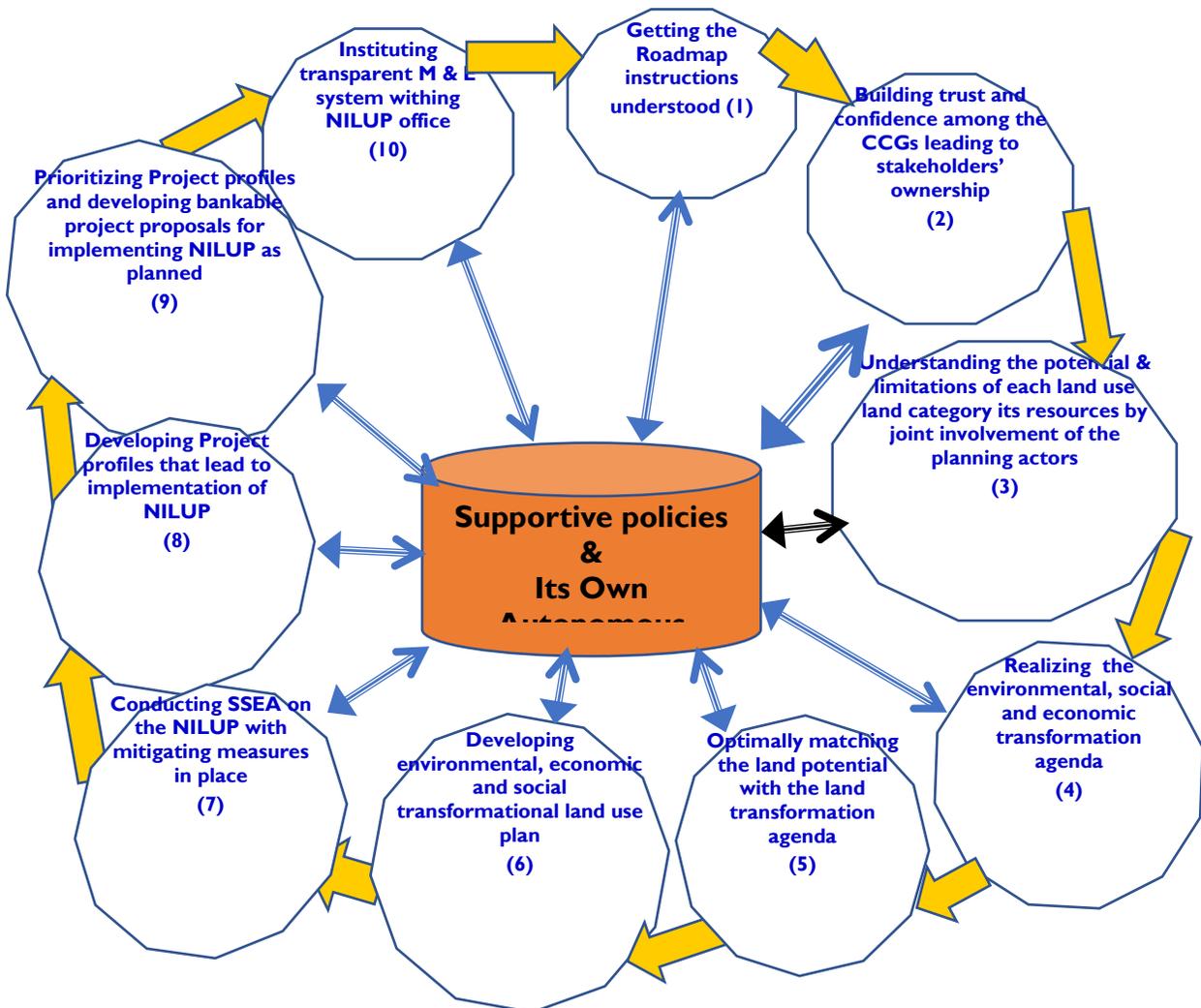
The modules target capacitating the following three groups of land use planning actors.

- Enhancing genuine participation of Land users in driving the planning process from bottom-up
- Equipping the staff of the land use planning facilitation office with knowledge-based land-use planning guidance from top-down

- c) Land Use planning guide experts who are to be the knowledge-house of the land use planning process aligned from side-in as shown in the diagram below

## 2.5 The Planning Principle.

1. The planning process shall be action-oriented (pre-establishment of trust and awareness among stakeholders, participatory social and physical diagnosis, trade-off based on mutually agreed land suitability judgment, iterative decision, and planning that leads to a living integrated land use plan.
2. The focus shall be on the contribution of the integrated land-use plan to the Social, Environmental, and Economic transformation of the people of each of the planning units for generations
3. Implementation would be by empowerment (knowledge and organization) instead of by directives
4. Modern planning techniques and processes such as GIS, combined with GPS and RS to use with other databases and spatial information shall be used
5. Information flow shall be designed to be often automated and streamlined by establishing Data /information management center,



**Figure 2. Land Use Planning, implementing, monitoring, evaluation, and plan updating sequences of ILUP – all under supportive policies in place.**

This training manual assumes that the planning will be conducted by the knowledge-based involvement of the three planning actors listed below. Therefore, this planning manual is prepared intentionally to guide these three planning groups. The training manual which is divided into the following training modules will have to effectively guide the following three planning actors. The training modules are the following five.

There shall be supportive policies and neutral land use planning and directive (regulatory) institution for safeguard follow-up of the land use planning with at least the 10 mandates indicated in Figure 2 above

### **3. Module 2: An Overview/ Excerpt Of The Nilupp Road Map**

#### **3.1 Introduction:**

Ethiopia is a federal government divided into nine national regional states and two autonomous cities. The country is home to **pristine ecology** that has national and regional relevance. It is the home of large areas of tropical rainforest, fertile agricultural land, arid fertile plains, populated central highlands, lakes, and wetlands, large areas of rangelands, wildlife habitats, biodiversity, and fish resources. It is known for its long and wide rivers that most originate from the central highlands and travel traversing the country and flowing into neighbouring countries.

At the same time, there is an appreciable rapid, huge, and successful effort on the part of the government and its people on various land-based development fronts. Expansion of roads, urbanization, the building of schools and health infrastructure, etc., is taking place throughout the country. Ethiopia has also made enormous and rewarding efforts in devising land resource development plans. It is almost fully covered by river-basin studies. The river-basin studies such as Abay (Blue Nile), Omo, Gibe, Baro-Akobo, Genale-Dawa, Awash, Tekeze, Wabe Shebele, Dawa sub-basin, Middle-Awash sub-basin, and Danakil sub-basin are excellent undertakings. In addition to the utility of these studies for development purposes, the data that has been assembled during such river-basin studies will continue to have huge importance. For instance, the current land-use plan preparation will use most of their data and may save a huge amount of time and cash

At the same time, it is necessary to appreciate that the implementation of river-basin plans has been **isolated**. Implementation focuses on projects related to hydropower and irrigation sectors. Since the interest of experts is on hydropower and irrigable land, more attention has been given to the lower catchment. As a result, the implementation of the full-fledged plans has been hampered by a lack of ownership of the plans on the part of other sectors because they were not made part of the initiation and the making of the plans. They lacked an **arbitration and enforcement system** to implement them at least as integrated plans. Both planning and implementation lacked an **all-serving institution** that can effectively play facilitative and regulatory roles when land is being used for what it was not meant to.

Due to the lack of this fully **participatory planning**, the absence of regulatory mechanisms, enforcement systems, and institutions, urban expansion and industrial investment have been taking fertile agricultural land without considering alternatives. Forestlands have shrunk; steep slopes are cultivated; wildlife is cornered at the country's peripheries and many are approaching extinction. Many of the riverine lands are cultivated up to the riverbanks, letting rivers cut deep into gorges. **Land degradation** has continued unabated. Consequently, the battle against food insecurity could not be won. Many more factors must have contributed to these deteriorations; however, from the outset, lack of integrated, coordinated, harmonized, and aligned land-use planning, and lack of an authoritative land-use institution that can play facilitative and regulatory functions have a pervasive share.

Almost all the land-based studies are said to have been participatory. Many consultative approaches such as **Rapid Rural Appraisal (RRA)**, **Participatory Rural Appraisal (PRA)**, questionnaire interviews and the like have been used. These are all good for understanding basic skills, capacity gaps, and development needs; for understanding community-oriented physical assessment parameters, etc. In such studies, these communities do not need to be organized because they are not meant to give coherent views and are not necessarily required to arbitrate and reconcile land-use conflicts and implementations.

However, in people- and **organisation-centred land-use planning**, the level of community participation differs greatly. At the grassroots level (Kebele-level), land-use plans need to be discussed and negotiated through the involvement of organized communities that can also make their opinions heard, own the land-use plan and defend it, assist in arbitrating land-use conflicts, and serve as an extension arm in facilitating and enforcing land-use plans. In particular, in the rural setting, these kinds of community participation necessitate communities to be organized in their **livelihood domains**. The livelihood domain may cover beekeeping, coffee growing and marketing, livestock production and marketing, production of high-value fruits and vegetables, smallholder agriculture and commercial farming, commercial and protected forest development and marketing, etc. This necessitates integrated, aligned, and harmonized urban and rural land-use plans that are developed with the full participation of ministries and communities.

For effective participation and ownership by the rural communities, it is necessary to organize them according to their livelihood options and to build their capacity in participatory planning and livelihood project identification. The same applies to a land-use planning and enforcement institution (commission or agency under the PM's Office) that can facilitate, guide, and regulate land-use planning and at the same time regulate the misuse of land. Raising awareness of the general public is also important.

Designing rational urban and rural land-use plans will not be easy. A well-thought planning roadmap is required to guide the process. The **roadmap document (RMD)** is a step-by-step procedural guide on the preparation of Integrated-Land Use and Development Plans. Its purpose is to show the step-by-step processes and procedures, including costs and timelines, for the preparation of rural and urban land-use and development plans at all administrative levels (9 administrative regions and 2 autonomous regions). The same is true in the preparation of urban land-use plans for the metropolis Addis Ababa and 17 other cities, 25 large towns, and 98 medium-size towns. In general, *the purpose of this Roadmap is to laying out clear directions and procedures for the preparation of NILUDP in three years.*

The main purpose of **the national land-use plan** is to serve as a guide for efficient, effective, equitable and sustainable use of the country's land and land resources. In the rural setting, one national integrated land use plan, nine regional integrated land use plans and 91 zonal level plans will be produced. In the urban setting, **strategic land use plans** of 17 cities and metropolises in Addis Ababa, **structural land-use plans** of 25 large towns, and **basic land use plans** of 98 medium towns will be produced. Though the mapping scales of the cities, large towns, and medium towns will be produced in 1:5,000, 1: 10,000, and 1:20,000 respectively; town/city plans get constituted from zonal /sub-city land use realities where their respective Woredas are delineated and shown on the plan maps. Understanding that there is a separate land-use policy team, this road map highlights only the basic land use policy issues that are needed to legalize the making and implementation of the rural and urban land use plans.

In **Section Two**, a digest of international and national experiences is provided. After a thorough analysis of international experiences, it has been realized that no planning methodology of any country can be taken as a blueprint. Therefore, the planning method and approach presented in this roadmap is a conglomeration of approaches and methods used in the different

countries which is customized to fit the Ethiopian physical and social realities as well as development priorities. As it is obvious and common in all of the other countries reviewed, developing land use plans at the administrative entity level has been taken as the right approach because it makes organized people and administration at the Centre both at the planning and implementation levels.

At the same time, after the review of the national land-use planning methods and approaches followed so far, having huge biophysical and socioeconomic data and information in the river basin studies that almost cover entire Ethiopia, is considered as a huge opportunity and support producing the land use plans at administrative entities quicker than it could have been the case without.

Section **three** focuses on the problems to be addressed are highlighted. In this regard unavailability of land-neutral authoritative institutions for facilitation of land use planning as well as for regulation and arbitration, land-use implementation is a major problem. Planning institutively by experts' reasoning, assuming development plans as land use plans, neglect of the development of livelihood-sector projects that can be put-across plans to actions, lack of authoritatively deciding institutions on land use conflict, absence of mutual consent among planning-facilitators in adjacent planning units are other problems that are realized during the roadmap preparation. The other major issue to be considered in this land-use planning is considering water as a diminishing resource and giving due consideration to water catchments and wetlands as land use. Therefore, the roadmap intends to restore and boost climate resilience and productivity of lands in the entire planning approach and methodology.

In addition, the roadmap embarks on a beneficiary-driven, institution-facilitated, and expert-guided planning approach. Therefore, the roadmap has recommended a bottom-up and top-down fused approach. Though the whole Ethiopians benefit, those whose livelihoods are connected to the land and its resources are the most beneficiaries. However, the list of stakeholders includes implementing actors, decision-makers, and development partners. Concerning the project framework, the **main objective** of NILUP is guiding the sustainable transformation of rural and urban lives and land resources of Ethiopia by providing coordinated, all-serving, aligned and harmonized land use plans and livelihood-growth project ideas for:

1. Ensuring sustainable and harmonized land-use plan for improved and complementary productions
2. Supporting the economic transformation of the people of Ethiopia by allocating land according to its use potential and avoiding land-use conflicts,
3. Enabling speeded-up and improved social transformation of the beneficiaries all the nine regional states and the two Autonomous Cities of Ethiopia,
4. The guarantying sustainable environment that can support the economic and social transformation agenda and projects identified under 2 and 3 above.

In this context, as its purpose, this roadmap has indicated all the step-by-step processes and procedures; including costs and timelines for the preparation of the urban and rural land use planning by which land-use conflict is going to be resolved and equitable transformation of the lives and land-resources of the nation can be achieved. Details on the specific objectives are given in the main body of the document.

The other main concern of the roadmap has been the institutional setup and staffing. Organogram is developed for federal, regional, zonal, and Woreda level institutional setup. The organogram suggests establishing 6-directorate institutions at federal and regional levels while the zonal and woreda offices will have five and four directorates, respectively. At the Woreda

level, all 6 directorates will be needed at project development and implementation levels. At federal, and regional levels, the National Integrated Land Use and Policy facilitation and regulatory Agency/Commission will have its own office while the staff at the zonal and district level, will be housed within the zonal and Woreda Administration offices. Ministries, bureaus, agencies, organizations, and authorities will play their support functions being members of the federal and regional steering and technical committees. Members of the federal and regional level steering and technical committees are listed, and their roles are discussed in detail in the main body of the document. There will be 23; 231; 819 and 3188 staff at federal, regional, zonal, and Woreda levels respectively. In total at the planning phase alone, there will be 4,224 staff. Of the 4,224 staff, 338 staffs are targeted for a short-duration (2 months) intensive training while 103 of them are to be engaged in long-term training (2 years) master's degree program in a sandwich setup where these are to be trained while working on the planning exercise as well. As much as the staff capacity is to be improved, the capacity is targeted to be built in terms of materials, equipment, and vehicles. The planning approach is discussed in detail in **section six**. The planning modalities, the disadvantages, and advantages of various planning approaches such as watershed versus administrative entity-based planning approaches, and top-down versus bottom-up planning approaches are detailed for both urban and rural land use planning conditions. The data collection and analysis methods are illustrated for both situations.

**Section Seven** of this roadmap document presents the methodology and procedure parts of the urban and rural land use planning. The methodical approach and procedures are detailed for each of the preparatory phase, the planning phase and the approval and GTP-mainstreaming phases. Procedures that are to be considered in Peri-urban land use planning and urban-rural linkages are discussed. Considerations in integrating sectoral land use plans into integrated rural and urban land use plans are explained. The benefits of joint planning of adjacent towns /cities and the town administrations of its peripheries as well as separated implementations cognizant of constitutional considerations are discussed in this same section.

**Section Eight** is about the Results log frame. The log frame presents outputs at preparatory phases, planning phase, approval phase, and mainstreaming phases. As shown in the same section, the outputs are integrated participatory land-use plans for the entire nation, for each of the 9 regions, and each of the 141 cities/towns. **Section Nine** details about time plan of the NILUP making in the coming three years. For each of the planning units, a five-month preparatory period is suggested. Most of the preparatory activities are to be conducted by the NILUPP offices that are to be established at federal, regional, zonal, and Woreda levels. Therefore, their establishment needs to be immediate. Next to the preparatory phase, the experts will be deployed in six separate phases. Please refer to Table 14 of the main document and Figure 7 for details on the number of experts to be engaged in each of these 6 separate but overlapping phases. The reasons why there are two phases and the justifications for starting one before the other are given in the main body of the document.

**Section Ten** deals with the budget: Budget specificities for the experts to be engaged in sectoral and integrated land use planning, budget needed for office and staff of the NILUPP Agency/Commission, and budget needed for building the capacity of the NILUPP staff both in short-term and long-term training as well as for equipping the staffs with office equipment and furniture outline. The total budget for conducting land use planning in the Oromia region is

**Section Eleven discusses the key challenges and critical risks. Areas of threat are** identified, and conditions are illustrated. One of the most pressing critical risks is not having an independent and authoritative NILUP facilitation institution to coordinate this planning exercise. The other most pressing threat is deciding on national and regional plans to be produced by experts' intuitive reasoning and judgment that can be based on national-level information in a

haste. In both cases, the result will be a plan not reflect the real situation on the ground and the plan will not be implementable as it has been the case for many past plans.

Though discussed in more detail in the main document, **section 12** is about implementation attributes including strategy, staff arrangement, and the need for inclusion of relevant education and research institutions for change detection. Development of bankable livelihood sector projects, having surveillance equipment and IT staff at the regional state and at the NILUPP office at federal NILUPP office is targeted. Next to the development of livelihood projects and M&E system, distribution of the projects and associated implementation budget to sector ministries, agencies, organizations, etc., by the NILUPP office follows.

Duration of the land use planning and important milestones: In terms of time budget, the NILUP preparatory actions and the actual planning would take three years. It is a tight schedule; but, this three-year's time budget is recommended because:

- ✓ There are huge data in several previously produced river-basin, national land use plan, and City/town plans and studies that can be used as the source of data, especially on biophysical factors,
- ✓ There is huge data in several previously produced river-basin, national land use plan, and City/town plans and studies that can be used as the source of data, especially on biophysical factors
- ✓ there are more up-to-date and cheaper satellite imageries at required resolutions,
- ✓ major administrative regions such as Amhara and Oromia regions are aerial photographs
- ✓ digitized 1:50,000 scale contour maps are getting more and more available from EMA, and
- ✓ The rural and urban people of Ethiopia are well organized down to the grassroots level (Kebele level) which is especially important for organizing the common commodity groups (livelihood sources) to be effectively engaged in planning, owning the initiative, and be organized actors of the plan implementation.

During these 3 years, there will be several outputs in the preparatory phase and during the actual planning time. The preparatory phase starts as soon as the government endorses the roadmap at the national level and could continue until the actual NILUP making commences for each of the regions. The integrated land use planning starts on the sixth month for Addis Ababa, Gambella, Benishangul Gumz, and Oromia. The actual planning for the remaining six regions and Dire Dawa autonomous city starts on the 14<sup>th</sup> month. Therefore, finalized and officiated integrated land use plan of all the nine regions and the two autonomous cities will be obtained by the end of the 31<sup>st</sup> -month at the latest. The national-level synthesized, SEA appraised officiated land use plan is scheduled to be obtained by the end of the 3<sup>rd</sup> year. In addition, within the same time budget, strategic plans will be developed for each of the capital cities of 91 zones and nine administrative regions. These are among the 141 cities/towns listed in Annex 5.

**Legality:** It is believed that this roadmap document will be officiated at the highest level of government to be used as a binding and guiding document for the development of the national integrated land use plans at the national level, the regional state level, zonal levels, and at the autonomous, strategic town/ city level.

### 3.2 The Planning Actors

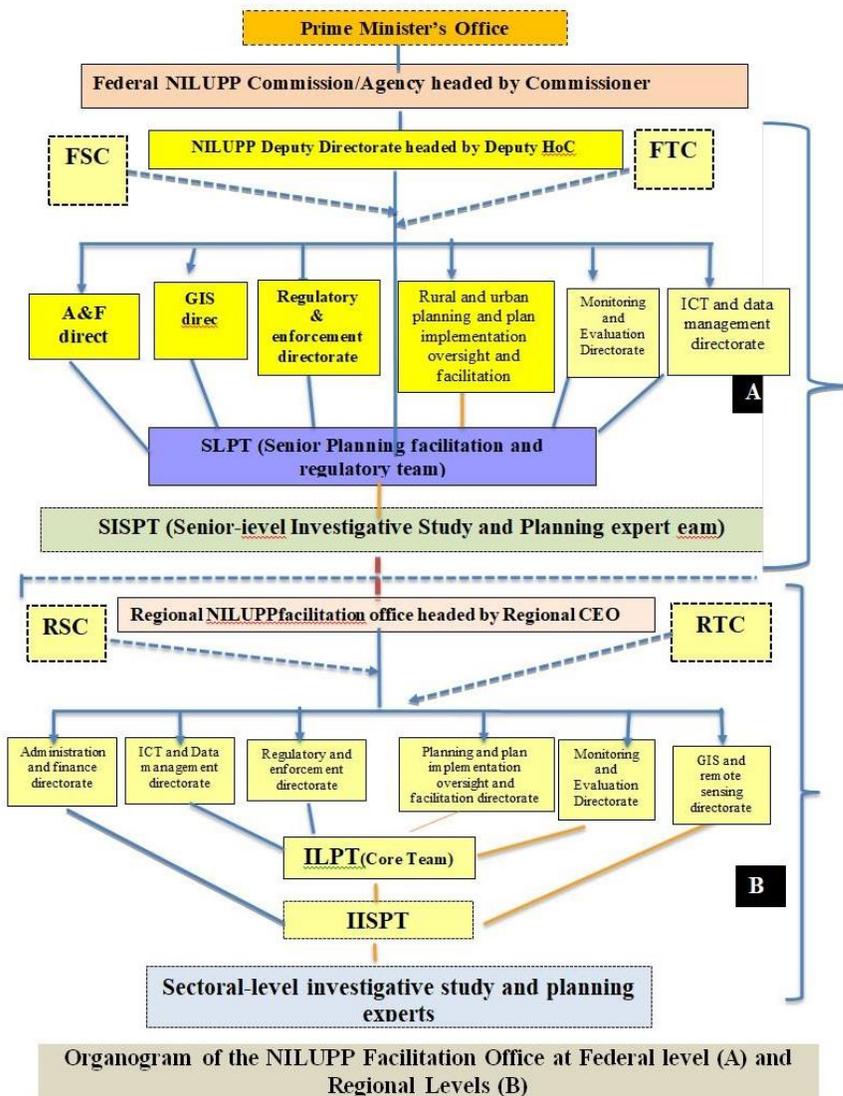
- Establishing NILUPP making, updating and regulatory office structured from federal to Woreda level
- Organizing the Plan facilitation team of the NILUPP directorates,

- Organizing and building the capacity of Drivers of the planning process (CCGs and expert counterparts),
- Recruitment of the right planning-guide experts at different phases

Establishing NILUPP making, updating, and regulatory offices structured at national, regional, zonal, woreda, and kebele levels

### **3.3 Nature of NILUPP Institution**

1. It is responsible for producing timely and updated land Use Plan whenever land-related development directions, utilization technologies, and alternative use types and benefits are realized (current or new)
  2. It is an institution that arbitrates land uses conflicts that may arise between land-claimant ministries, agencies and authorities
  3. It is an institution that continues to safe-keep and furnishes land-use related information to land manipulating sector ministries, agencies and authorities
- These necessities the institution to be a commission or an agency that shall operate at a superior portfolio, most conveniently under the PM office



**Figure 3. Organogram of the land use facilitation cooperation to be established at national, regional, zonal, and Woreda levels**

The NILUPP Roadmap proposes the following facilitation institution Renting airtime on radio and TV and informing the public about the benefits, scope, and coverage of NILUP every week.

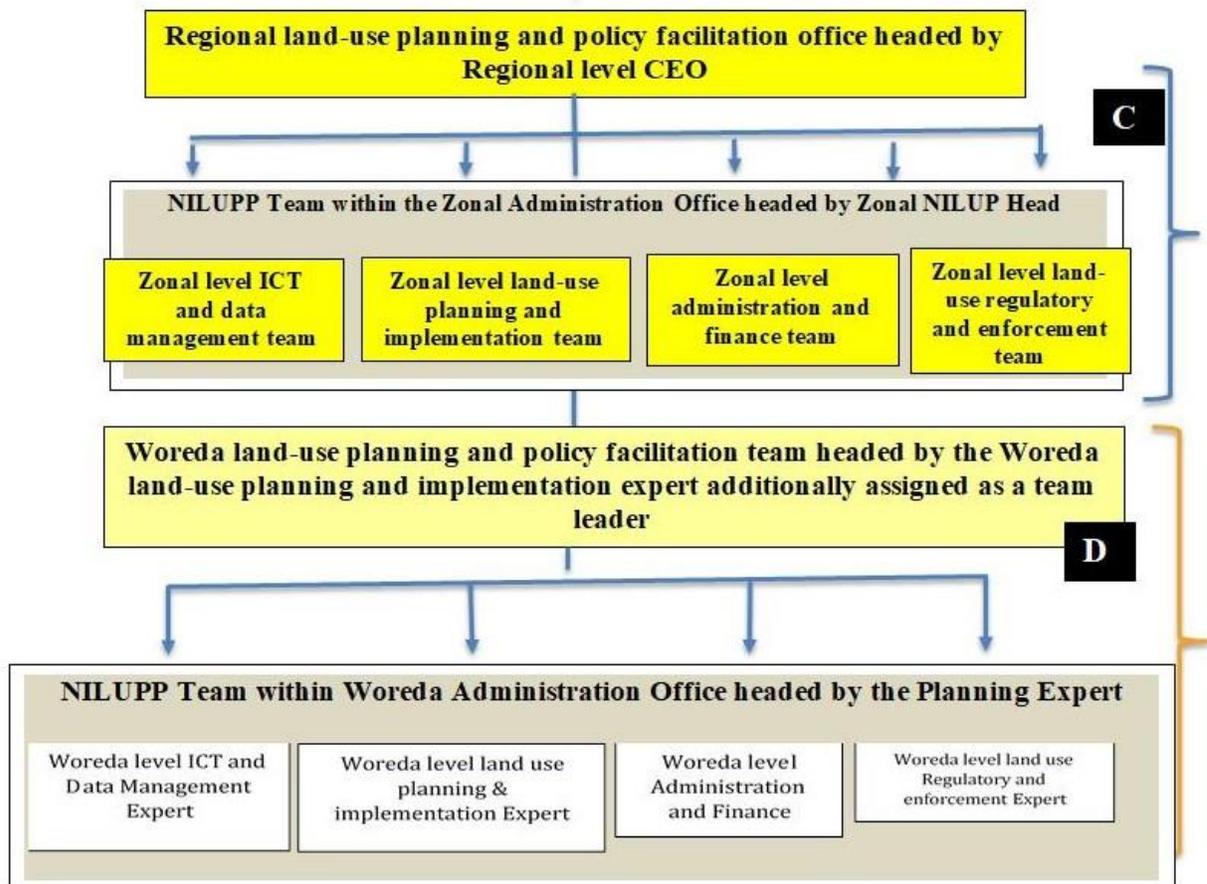


Figure 3 .... Continued.

Organograms of zonal and Wereda level ILUP desks to be housed within the respective government administration offices

### 3.4 Functions Of The Institutions

1. Deploying the right quality of staff and budget for producing ILUPP at federal, regional, and zonal, Woreda levels that mirror and are fit to one another
2. Formulating land use policy on land-use planning and getting it approved by the government.
3. Coordinating the activities of all bodies concerned with land-use planning and serving as a channel of communication between those bodies and the federal and regional Governments.
4. Evaluating the existing and proposed policies and activities to safeguard against wrong, wasteful or premature use or development of land, and to recommend to the national government policies and programs that will promote more effective protection, enhancement of land quality, and better land-use utilization
5. Recommending measures to ensure that government policies, including those for the development and conservation of land, conform with the approved land-use plan;
6. Stimulating public and private participation in programs and activities related to land-use planning and its implementation.

7. Fostering cooperation between federal, regional, and zonal government authorities and other bodies or persons that are engaged in land-use planning programs.
8. Promoting scientific knowledge of positive changes in land use and encouraging the development of technologies that can prevent or minimize adverse effects of land use;
9. Specifying standards, norms, and criteria for the protection of beneficial uses and the maintenance of the quality of land;
10. Establishing and operating a system of documentation and dissemination of information related to land-use planning.
11. Reviewing relevant existing laws and, where appropriate, formulating proposals for legislation concerning land-use planning and implementation issues and recommending their endorsement by the government.
12. Establishing and maintaining liaison with other countries and international organizations concerning issues relating to land-use planning.
13. Establishing and liaising with the Federal Steering Committee (FSC), Federal Technical Committee (FTC), Regional Steering Committees (RSCs), and Regional Technical Committees (RTCs) concerning matters related to:
  - a) Settlement and land use boundary issues
  - b) Policy and technical review of the urban and rural land-use plans.
  - c) Approval of land-use plans, and execution of projects prepared to implement the land-use plan at various levels.
  - d) Ensuring that national and local interests in land use are effectively taken into consideration.
  - e) Issuance of policy guidance, proclamations, and other legal and policy directives as valid.
14. Overseeing the preparation of livelihood-sector common commodity-based development projects that finally must be handed over to the various executive bodies of the federal government
15. Undertaking and promoting general educational programs in land-use planning to enlighten the public regarding the land and the role of the public in its protection, use, and improvement
16. Preparing national, regional, zonal, and Woreda level rural land-use plans as well as city, large town, and medium town small town urban land-use plans;
17. Ensuring implementation of the plans by the national, regional, zonal, Woreda, Kebele level administrations.

### **3.5 Institutional Setup**

1. Regional, Zonal and Woreda-level offices shall have their own Land Use and Development planning and regulatory offices
2. Zone and Woreda office staffs of ILUPP will have to be seconded within their respective administration offices

3. There shall be one Lead Land Use Planning Guide experienced in ILUP at the national, or international level who can play a lead integrative land use planning role at least at the regional level.

### 3.6 Proposed Staff Composition Of The ILUP In Oromia Region

DIRECTORATS OF THE NILUPP OFFICE	Staff distribution		
	Per Region	Per Zone	Per Woreda
Head and deputy head of the NILUPP Agency/Commission	1	1	0
GIS and Remote Sensing Directorate	4	0	0
ICT and Data Management Directorate	2	1	1
Planning and Implementation Oversight Directorate	5	2	1
NILUPP Project Implementation directorate	2	2	1
Monitoring and Evaluation Directorate	2	1	0
Administration and Finance Directorate	3	1	1
Executive Secretary	2	1	-
Sub-total per administrative unit	21	9	4
Total valid for Oromia Region as recommend by the Roadmap	-----	-----	-----
Grand Total for the region			

#### Organizing and building the capacity of Drivers of the planning process (CCGs and expert counterparts),

- Preparing CCG establishment modalities
- Forming CCGs
- Building the capacity of the CCGs
  - On group management
  - Community bylaws
  - Articulation and presentation of group opinions
  - LLPPA-based land use planning

### 3.7 Recruiting and organizing PLANNING-GUIDE EXPERT TEAM in different phases

#### I. Experts in Prerequisite Subjects

- a) GIS/cartography
- b) Building capacity of land users, letting them form CCGs (through the regional office)
- c) Forming FTC FSC, RTC, RSC

- d) Socioeconomic studies
- e) Topography and architecture
- f) Land use/land cover
- g) Weather and climatology
- h) Soils and geology
- i) Agroclimatic zones
- j) Land resilience /sustainability grading
- k) Enumerating study parameters /subject
- l) Graded livelihood sources

2. Land-Claimant Subjects

- 1) Agriculture (commercial and smallholder)
- 2) Forestry
- 3) Rangeland and livestock
- 4) Ecosystem and biodiversity
- 5) Beekeeping and honey production,
- 6) Fishery and aquaculture areas
- 7) Wildlife habitats
- 8) Wetlands /other sensitive areas
- 9) Suitability by class

Slope categories						
		0 -5%	>5 - 16%	>16 - 40%	>40 - 60%	>60 %
SOIL DEPTH	Rock or <20 cm	G (16)	G (17)	G (18)	G (19)	G 20
	20 – 50 cm	G (9)	G (10)	G (11)	G 12)	G 15
	50 – 100 cm	G (3)	G (4)	G (6)	G (8)	G 14
	>100 cm	G (1)	G (2)	G (5)	G (7)	G 13

- Distributing fliers and forming readers circles at the community level (CCGs) covering each of the Woredas.
- Conducting workshop discussions on the purpose, scope, and modalities of NILUP preparation at federal, regional, and zonal levels; rule of law on land use
- Organizing seminars on selected land-use planning topics at regional and zonal levels.
- Preparing pictorial, chart, cartoon, and imagery-supported exhibitions at regional and zonal levels.
- Addressing controversial issues of land-use planning in newspaper columns

### 3.8 Study and planning Phases

- Preparatory phase
- Study and planning phase in three sub-phases
- Prerequisite/foundation subject study
- Land claimant subject study and planning
- Infrastructure subjects' study and planning
- Learning and enforcement studies
- Approval and mainstreaming phase
- Project development phases
- Project implementation phases

The time budget allocated for the Oromia region for making an updated Integrated Land use plan as estimated for each of the planning units is 12 months. This shall be followed by the preparation of projects and solicitation of funds by way of writing bankable projects that lead to the implementation of the integrated land use plan in the many subsequent years to come.

Planning units	Cost per operational year (%)			Proportional share (USD)			Total in US\$
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	
Oromia	15	45	40	1,828,083	5,484,249	4,874,888	12,187,220

#### **Methods of Extension**

- Renting airtime on radio and TV and informing the public about the benefits, scope, and coverage of NILUP every week;
- Distributing fliers and forming readers circles at the community level (CCGs) covering each of the Woredas.
- Conducting workshop discussions on the purpose, scope, and modalities of NILUP preparation at federal, regional, and zonal levels; rule of law on land use
- Organizing seminars on selected land-use planning topics at regional and zonal levels.
- Preparing pictorial, chart, cartoon, and imagery-supported exhibitions at regional and zonal levels.
- Addressing controversial issues of land-use planning in newspaper columns.

#### **Study and planning phases**

- Preparatory phase
- Study and planning phase in three sub-phases
  - Prerequisite/foundation subject study
  - Land claimant subject study and planning
  - Infrastructure subjects' study and planning
  - Learning and enforcement studies

- Approval and mainstreaming phase
- Project development phases
- Project implementation phases
- Success monitoring and impact evaluation

The instructor requests the trainees to summarize the module in half an hour and questions and answer session continues for the other half hour of the same one hour

#### **4. Module 3: Organizing And Capacitating Common Commodity Production Groups (Ccgs As Land Users)**

##### **4.1 Introduction**

Though almost all the watersheds of Ethiopia have land-use plans almost all of them suffer from getting land users implementing these plans. Many reasons can be responsible for this neglect of the plan implementation; however, the major two obvious reasons are: 1) neglect of the genuine participation of the land users in the planning process itself, and 2) land use plans getting choreographed by institutions that themselves have strong interest on land. Both situations have deprived these land use plans of addressing the unbiased interests of all land users and from having a neutral institution that can genuinely safeguard the interests of all the land users.

The watershed-framed land use plans are often conducted by the facilitation and guidance of ministries, agencies or authorities that have a strong interest in manipulating lands for their irrigation scheme development or expansion of rainfed agriculture by the name of *'increased food production*. This biased planning approach and ownership has been exempted from correction because the development policy of the country was also wrongly crafted by equating *food security* to *'food production* instead of defining food security as *having physical and economic access to food*. As a result, steep-slope lands continued to be cultivated. Wetlands got allowed to be drained and cultivated. Forestlands and wildlife habitats continued to be converted into agricultural fields. Many towns, cities, and villages continued to be built on prime agricultural lands. Important water catchments got converted into agricultural fields. Implementation of planned land use was ignored. Many of the watershed-based land use plans remained hiding in shelves of institutions that are not overseeing the implementation of land use plans comprehensively. All these suggest that there must be a better approach, neutral facilitation institution and modality of involvement of all the different land users (common commodity-producing groups or the CCGs) in developing participatory, integrated land use plans that can be safeguarded and effectively implemented. This guideline is an instruction on the involvement of all kinds of land users (CCGs) in an integrated and all-serving land use planning.

##### **4.2 Purpose of the Guideline**

The main purpose of the guideline is to organize primary level land users and those who are producing or transacting commodities that have a strong connection to these land uses for economic, social, and environmental enhancement of the people and their environment in their jurisdictions. The guideline provides complete information on the identity, organizational modality, purpose, and legal formation of the land users (the CCGs) in land use planning. The overall immediate objective of the guideline is to facilitate the participation of the CCGs in driving the land-use planning process in participation with experts who are to guide the planning in their respective professionals and staff of the land use institution which is required to facilitate and oversee the planning process. Next to this immediate objective, the overarching objective of this guideline is getting them organized as CCGs of the different livelihood options so that the CCGs can safeguard and protect their land uses on a sustainable basis to pass them over to the next generation while crafting their benefits from them. Therefore, the major tenet of this guideline framing the involvement of the CCGs is in planning the different land uses and overseeing the implementation of the plan as approved and promulgated in the plan. The purpose of the guideline is to use the land use plan for generating their economic, social and environmental benefits sustainably as well as safeguarding the land

resources to pass them over to their continued generation at least at the quality that they borrowed it from their past generation.

### 4.3 National and International Experiences

Though it is not possible to use the approach and methodology used for planning land use by any country as a blueprint for Ethiopia, Ethiopia must learn about *'how land use plans are made* from other countries and get it tailored to suit pertinent conditions/realities. To this effect, experiences of other countries are discussed here issue by issue. One basic issue which is considered in this review of international experiences is *the modality of planning and presentation of the land use plans*. Reference has been made to the experiences in Rwanda, Kenya, Tanzania, South Korea, the Philippines, Myanmar, Vietnam, Botswana, and Guyana. The literature indicates that all these countries have used administrative entities as opposed to watersheds in producing their master land-use plans. In each of these countries, land-use plans and policy directives are made concerning their administrative entities. For instance, both the past integrated land use and development plan (ILUP) of 2009 and the recently revised National Land Use Master Plan (NLUMP) of Rwanda (RNRA 2011) show that the plans are produced for administrative entities: National, zonal, and district levels. The modality of planning is **entirely participatory**. These countries produce integrated land-use plans by administrative jurisdictions such as national, regional, zonal, district, and village instead of river basins. The 1999 GTZ manual on land-use planning methods, strategies, and tools indicates that planning levels are national or federal, state or province, region/district, community/village, and lastly farming household.

In such a case, the ownership and implementation decisions would be the function of organized people (in our case CCGs) and government than when the focus is on physical resources. However, this administrative-entity-based land-use planning should be flexible to consider functional linkages and other factors that cross the administrative boundaries such as parks and other ecological units in some pastoral ecosystems.

Another experience considered is the stratification of land in the preparation of land-use master plans. The Guyana National Land Use Plan (GLSC, 2013) gives development options for natural regions by sector. Relevant sectors for Guyana land uses are agriculture (crops, livestock), aquaculture, housing, industry, energy, infrastructure, forestry, mining, protection, and tourism. The recommendations are based on an analysis of sectoral constraints and potential. Four grouped development maps have been produced for the country, showing the potential for biodiversity protection, forestry, mineral resources, and agriculture. Additional land-use maps also show present and designated land uses, such as agricultural areas, built-up areas, forest concessions, mining concessions, leased prospecting oil lands, water conservancy areas, protected areas, and remaining "available lands".

In Vietnam, the levels of planning are national, province and district. Implementation of the national plans is initiated and governed by the council of ministers while the province and local level plans are implemented by people's committees. Sector-level plans are implemented by agencies. Almost all consulted countries produce land-use plans by administrative entities because such plans put people and institutions at the centre as opposed to watershed or river basin plans that consider biophysical parameters as central.

Additional reviews were made regarding *the driving forces, issues or reasons* that necessitate master land-use plans, and the modalities of the planning process. In many of the country experiences reviewed, the major deciding factors in land-use master plan preparation are the need for boosting economic and social transformation and building a climate-change-resilient

environment which is the case in Ethiopia now. According to the 1999 GTZ document on land-use planning methods, strategies, and tools, land-use planning is triggered when:

- a) Land-use conflicts, if any, are to be avoided or settled.
- b) Natural resources are to be protected and rehabilitated,
- c) Unexplored land-use potential must be identified and evaluated
- d) Existing land use must be optimized,
- e) Sectoral and national development plans must be harmonized, and
- f) Negotiation between short-term and medium-term economic objectives is required
- g) New settlement areas are to be planned.

The GTZ's 1999 document also indicates that the local population often perceives environmental risks differently from authorities, consultants, and technical specialists. Therefore, any potential risk to the environment needs to be discussed, at the threat analysis stage, with the local rural population and residents of cities as well as large and medium towns. This is one of the many purposes for having the CCGs organized and getting them to drive the process.

The other consideration in the review of experiences was the planning methods, actors in the land-use planning, and the preparations for planning. The findings agree that the availability of information, realistic time plan, minimal logistical preconditions, flexibility of the plan facilitation body, increased acceptance of working methods by the participating population are basic elements of the land-use planning process. The articulated conception of land use by the stakeholders (in this case CCGs) and awareness of the disadvantaged population are also important considerations made in land-use planning by many countries. Other factors considered in this connection are consultations with direct beneficiaries (CCGs), using procedures and techniques of local communities in solving land-use conflicts, and community negotiation and decision-making skills. Many stress an interdisciplinary approach because land-use dimensions are cross-cut ecological, economic, technical, financial, social, and cultural dimensions.

The Land Use Planning Handbook of the "United States Department of Interior, Bureau of Land Management" indicates that the land-use planning process should involve public participation, assessment, decision-making, plan implementation, plan monitoring and evaluation, as well as adjustment through maintenance, amendment, and revision. Another element identified in the experiences of other countries is the nature and scope of the institution used for facilitating land-use planning. In Rwanda, land-use planning, and development were coordinated by the Ministry of Lands and Natural Resources, which is by itself a land claimant. According to Muntlan and Mirelle Ikirezi (2015), the major drawback of the Land Use Planning in Rwanda was found to be the decision made to use this land-claimant ministry. As a result, suggestions have been made to establish a Land Use Planning Commission under the Prime Minister's Office. The commission is supported by a secretariat whose members are seconded staff from the Ministry of Local Government, the Ministry of Economy and Finance, Rwanda Natural Resources Authority, and Rwanda Housing Authority. It was also suggested that the Land Use Planning Commission be supported by a steering committee that has represented the main ministries, the Rwanda Association of Land Government Authorities (similar function to that of the Ethiopian Land Administration and Utilization Authority), and selected district representatives (mayors).

International experiences were also reviewed regarding the nature of the institution responsible for facilitation and enforcement of the land-use master plan. In Myanmar, the land-use plan is prepared under the auspices of a land-use commission established under the presidential office. For enforcement of the plan, a special court is made responsible. In Vietnam, the General Department of Land Administration (GDLA), which is a government agency solely responsible for land administration and land classification at the national level, is the authorized body to do this task. The Department of Land Administration (DLA) at the provincial level together with the cadastral officers at District and Commune levels, oversees the administrative execution of cadastral mapping. GDLA also functions as the national mapping institute, publishing topographic maps at various scales. In addition, GDLA commercializes publicly available aerial photographs produced by aerial surveys carried out for various mapping purposes. In Kenya, an independent institution is established under the presidential office for facilitating the land-use master plan preparations. In many other countries, land-use master plan preparation falls under the ministry of Land; no other agency, ministry, or authority that has an interest in using land for fulfilling its basic duties is recommended.

Regarding the responsibilities of the institution, international experiences show that the institution's roles are facilitating the land-use planning, catalyzing the implementation of the master plan, developing regulatory tools and enforcing the implementation of the plan, arbitrating land-use conflicts that may arise between different land-claiming ministries and other institutions. Other responsibilities of the institution include:

1. Coordination, management, and information sharing for consistency of the land records, maps, etc.
2. Providing precise and correct land information that stakeholders need.
3. Maintaining a system of correct boundary maps, land-use types to recognize legitimate land use, reduce land-use conflicts and resolve all land-use disputes.

Awareness of the importance of participatory integrated land use planning, both in urban and in rural administrative jurisdictions, is still not developed in Ethiopia. This was the same for Tanzania before several decades. Hoben et.al. (1992) notes that, in Tanzania, "government elites had a deeply ingrained faith in integrated land use planning in which experts were preparing maps in considerable detail on how land should be used". In practice, by then, planning continued to be urban-biased and development plans continued to be top-down. Consequently, implementation was difficult and the "development" process, therefore, was slow. Currently, Tanzania has one of the best participatory land-use plans that has grown from the village level up.

Integrated land-use plans are very likely to be accepted, respected, and implemented by the land users when such land users get involved in resolving and reconciling land-use conflicts and they come up with a resolute land use plan in their involvement during the planning process at an administrative level. Therefore, it is said that resolute and integrated land use plans are to be born through a beneficiary (CCG)-driven, expert-guided, and use-neutral institution-facilitation process.

At the national level, the organization, function, strength, challenges, and opportunities experienced by land users who are manipulating land for the production of commodities at primary, secondary, and tertiary level for food and marketing at the administrative level does not exist. Though at the consultation level, land users at the urban setting are involved and guidelines are prepared for their involvement. However, in practical terms, such plans are not

respected because the planning team is not organized to enforce the plan for their shared benefits. Therefore, we often experience road islands as narrow as half a meter in width. Even the 30:30:40 ratio which was supposed to be for 1) transport and road network 30% coverage, 2) urban forest, informal green, recreation and urban agriculture coverage 30%, and 3) residence and other built-up areas coverage 40% is never respected even in Addis Ababa city. The problem is again equated to a lack of a neutral institution for land use planning that has no interest in land for fulfilling its mandate.

In a rural setting, the same holds. Since there is no CCG that can stand for the respect of the rural land use plan for meeting their livelihood requirements on a sustainable basis, and because the land user CCGs are not legally organized to participate in the planning process and stand for the respect of the plan, experience shows that rural lands as steep as 130% slope are being cultivated and lands of 5 – 10% are used for building cities.

#### **4.4 Organizing the CCGs**

At the organizing meeting, the purpose, benefits, and governance modalities of CCGs will be illustrated and discussed regarding land use planning and the associated benefits in improving and sustaining the economic, social, and environmental enhancement possibilities. This awareness creation information will be provided by the land use planning facilitation team of the NILUP office. The possible land-use types and associated livelihoods will be detailed and presented at the meeting so that members of the meeting would realize each livelihood type they belong to.

Land uses that influence the availability of common commodities differs from one area to the other. The available common commodities in Afar National Regional State are different both in type and area coverage when compared to Oromia National Regional State or Gambella people National Regional State. This difference becomes more unique when one considers the more specific area coverage of each land-use type. For instance, the land common commodities available for organizing the beneficiaries at the Woreda level will be more unique and limited in type at the Woreda level than at the zonal or regional level. Therefore, it is not possible to enumerate the type of livelihood options that are available for each specific land use planning unit. Types of CCGs that can be organized can be decided after a thorough analysis of livelihood options that are connected to land use are effectively-identified planning unity by planning unit. However, in the Ethiopian context, the following 75 types of sample commodities may serve as a reference for organizing the CCGs in each of the planning units as available.

The first step would be assembling members who depend on each of such commodities at the Woreda or town administration level. For instance, one of such CCGs may be organized on Aquaculture Site Development, Fishery Management, Processing, Packaging, and Marketing (#1 in the list below). Land users who have been in these ventures or who are interested to establish their livelihood in these specific commodities may be listed from each of the rural or urban Kebele residence registry.

The call for a general meeting may be made by the Integrated Land Use and Development Planning (ILUP) oversight office, which is responsible and authorized for:

- a)** facilitating and overseeing the production of the integrated land use plan in all the planning units (kebele, woreda, zone and federal level),

- b) enforcing the use of the approved and promulgated land use plan developed for each of the planning units, and
- c) facilitating the implementation of the plan but not, by itself, mandated to implement the plan whatsoever.,

Since, it is hoped that such NILUPP institution will be established in all Kebeles, zones, and town/city and regional and national levels to oversee the production and enforcement of integrated land use plans in rural and urban settings. Therefore, a registry of the residents and/ or land use beneficiaries would be conducted at Kebele and Woreda levels. At the general meeting, members could be advised to register in one or more of the livelihood options regarding the 75 possible options or any other. All the 75+ livelihood options may not be available in a single land use planning unit such as the East Shewa zone rural land use plan, the Rural land use plan of Tigray Peoples National Regional State, in an Integrated Urban Land Use Plan of Dire-Dawa Autonomous City, etc. However, those residents or investors who chose the specific livelihood options will be invited to come in a general meeting for an explanation of the nature of the CCGs type by type and in line with what type of CCGs are to be established.

Since one person may be having one or more of the livelihood options that have a connection to one or more land-use types, meetings for the establishment of such CCGs may be held in different times on specific land use-based livelihood options. In the case where residents are having more than one livelihood option, they can participate and become a member of the many CCGs. In agrarian Ethiopia (where the majority of the rural land users and a significant number of urban dwellers are not educated), much effort needs to be made in creating awareness, information dissemination, and building the capacity of these land users as an organized entity (CCG) with reference of the type of land use and its products members chose. Therefore, tailored capacity building may be conducted after grouping the land-use beneficiaries in each of the following land-use types or their products as CCGs.

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| <ul style="list-style-type: none"> <li>1. Aquaculture site development, fish processing, packaging, and marketing</li> <li>2. Aromatic/essential oil production and marketing</li> <li>3. Biodiversity-related forest protection, tourism, and marketing</li> <li>4. Bio-energy production and marketing</li> <li>5. Biosphere reserve protection and use</li> <li>6. Briquet making and marketing</li> <li>7. Charcoal production and marketing</li> <li>8. Cemetery development and marketing</li> <li>9. Coffee production and marketing</li> <li>10. Commercial cereal farming and marketing</li> <li>11. Commercial forest development, utilization, and log marketing</li> <li>12. Construction wood production and marketing</li> <li>13. Controlled hunting and game meat marketing</li> </ul> | <ul style="list-style-type: none"> <li>14. Controlled hunting, organic meat processing and marketing</li> <li>15. Controlled live wild animal taming and marketing</li> <li>16. Education infrastructure construction</li> <li>17. Environmental ameliorations and environmental tourism</li> <li>18. Ethno-botany and herbal medicine production and marketing,</li> <li>19. Fibre crop production and marketing</li> <li>20. Fishery development and marketing</li> <li>21. Fruit and vegetable production and marketing</li> <li>22. Gum and resin production and marketing</li> <li>23. Health infrastructure construction</li> <li>24. Herbal medicine production and marketing/use</li> <li>25. Heritage site development and protection and tourism</li> <li>26. Hiking and eco-tourism</li> </ul> |
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27. Honeybee flora expansion, beekeeping, honey production and marketing
28. Incense production and marketing
29. Insect-replant production and marketing
30. Irrigation-water-catchment protection and production lands
31. Juice /fruit pulp production and marketing
32. Lands of small business enterprising
33. Large-scale irrigation command area protection and marketing
34. Livestock feed processing and marketing
35. Livestock keeping and live livestock marketing,
36. Medicinal/pharmaceutical plant production, harvesting, processing and marketing
37. Mineral mining and marketing<sup>2</sup>
38. Mud block/brick production and marketing
39. Natural heritage protection and development
40. Nectar and other floral part processing and marketing
41. Nuts production and marketing
42. Oil prospective and exploitation areas
43. Oilseed crop production and marketing
44. Oilseed processing and marketing
45. Organic fertilizer (compost) production and marketing
46. Organic fruit production, grading, and marketing
47. Organic poultry (chicken and egg) production and marketing
48. Petty trading
49. Rangeland development, feed belling, and marketing
50. Rural settlement areas and their corollary development options
51. Riverside/river protection and boat-docking and renting
52. Road and transport construction
53. Roof shingles production and marketing
54. Root and tuber crop production and marketing
55. Salt mining, grading and marketing
56. Sawmilling and timber production and marketing,
57. Slaughterhouse construction, meat production, milk processing and marketing
58. Smallholder agriculture production,
59. Small-scale irrigation command area
60. Spice and condiment production and marketing
61. Sugarcane production, processing and sugar marketing
62. Syrup production and marketing
63. Transmission and fence pole production and marketing
64. Urban residence expansion and development lands
65. Value-added fruit and vegetable production and marketing urban lands
66. Value-added Vegetable production and marketing rural lands
67. Value-added Wild/domestic fruit production and marketing
68. Water catchment protection, hiking, and scouting
69. Water-catchment protection, water bottling, and marketing
70. Weaving and dyeing chemical production and marketing
71. Wetland protection and associated crocodile farming and marketing
72. Wetlands and associated butterfly farming
73. Wildlife parks, reserves, and associated tourism
74. Wildlife-attracted tourism and marketing,
75. Wood crafting and marketing

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<sup>2</sup> These may be stratified into a number of types of minerals available

One shall not limit the size of members of a specific CCG. All those that are already using land at the Kebele or Woreda level in either of the rural or urban settings need to be organized as CCG. To this effect, CCG members who are having land or who are depending on the land for their related livelihood options can be organized at the kebele level. The deciding factor for the size of the CCG members is the volume of production that makes it market-size or industry-size. Though the membership fee contribution is equal for each of the members, the benefits to be earned from the production of the common commodity will be according to the proportional size of production of each member. To this effect, the CCG will register the volume of contribution by each of the members to bulk and a receipt of contribution will be issued to each member by the Executive body.

**4.5 Processes of Establishing the CCGs**

After the necessary awareness creation, training, and sensitization is created to the level that is required the membership registration continues. The membership registration is open to all who are beneficiaries of a single livelihood option that form a general assembly. The **General Assembly** of a given CCG would choose and delegate about 24 individuals and form their Executive Body.

During the selection and formation of the Executive body, members make sure that the following three distinguishing characteristics (representations) are met.

- 1. The youth, middle-aged and the old (8 each) =24
- 2. The adult women and men (12 each) =24
- 3. The wealthy, average, and the poor (8 each) =24

In case where the men and women (in # 2 above) are not represented (not available) equally in the registry to produce the commodity in consideration, proportionate representations can be calculated and used.

The 24-member executive body of a given CCG will have 9 office bearers stratified into 1) a chairperson, 2) a vice-chairperson, 3) a secretary, 4) treasurer, 5) a public relations person, 6) a cashier, 7) marketing, 8) value-addition and 9) an advocate. The 15 remaining members of the 24 executive body members will be designated as “members”. Of the 24 executive body members, at least 50% must be educated while the others may be illiterate. When possible, it will be necessary that all are educated. In a situation where all are educated, proportions may be kept by higher learning and lower learning criteria where M. Sc., and B. Sc level education accounts for 50% of the office bearers and the remaining 50% is allocated for diploma and below. The term of the executive body members of the CCG may be limited to five years; however, this will be determined in the CCG bylaw by approval of the general assembly. This bylaw needs to be produced by a policy and law professional to be provided as an advisor by the NILUPP office. The term of the Policy and Law advisor will stay functional until the bylaw is produced in his/her support and approval by the Woreda, Zonal, and /or regional level NILUPP office as it is fit. Members of the Executive body will be elected by a sample ballot. Three candidates each will compete for each of the nine positions. Where to register demands on the coverage of the livelihood source. For instance, if it covers the national park situated in the Oromia region, the CCG registration will have to be approved at the regional level that needs to be seconded at the federal level.

The nature and content of the bylaw will be determined upon registration and formation of the CCG. Because the type of livelihood option, members’ whereabouts, volume and nature of the product to be produced, the nature of the commodity the CCG produces, and its connection to a given Land Use and its operating jurisdiction (be it Kebele or Woreda) is not known at this time, and because this author is not professional in legal terms, the nature and contents of the bylaws of the CCGs cannot be presented here. Instead, having a legal advisor at the Zonal NILUPP office is recommended

to oversee such responsibilities. Of course, the CCG bylaw will have to indicate the address/location of the office, operational area coverage which may cover beyond one Woreda, , name of the CCGs, purpose and activities, eligibility for membership, registration and fees, share, right and responsibilities of members, dismissal of members, organizational structure, power and duties of the general assembly, executive committee members, and their duties, business plan and sharing benefits, auditing, the effective date of bye-law and revision of bylaws, termination and withdrawal, approval and signature, etc. can be highlighted as customized to the nature and coverage of the specific livelihood type that the CCG is built on.

A CCG may be established either at Kebele or at a higher organizational or administrative hierarchy (Eg. Woreda as it fits the livelihood coverage of the specific CCG). The choice is given depending on the size of production that members make and sell at the market or the volume needed by the recipient agency. This depends on the nature of the commodity which may be an input to All members of any CCG shall endorse by signing the bylaw and the same shall be endorsed at least at the zonal level NILUPP. The requirement for endorsement of the bylaw shall be 1) duly signed application letter, 2) Minute of the selection of the members of the executive body, 3) bylaw of the CCG approved by members of the General Assembly of that specific CCG. Members of the general assembly (all members) can be as many as required to meet the production requirement of market-size volume in their specific production of market goods which is to be treated as business plan preparation. Unfortunately, since the business plan is usually prepared commodity by commodity, and because the contents and nature of the business plan cannot be known at this stage, the business plans cannot be presented here.

The bylaw shall indicate that share of the benefits of the bylaw is in line with the proportion of the production each member contributes to the volume of the common commodity. Any value addition which is exerted on the common commodity that needs to penetrate marketing shall be financed by the CCG as an association. Such expense shall be covered from the contribution of the members of the CCG. There shall be an external auditor to be hired by the Executive Body to conduct auditing annually. He/she is not a member and cannot vote. This External Auditor is accountable to the General Assembly.

#### **4.6 Engagement in Driving The ILUP**

Once legally established, the nine executive members of each of the CCGs will attend and **drive** the synergistic land use planning processes in the presence of a conglomeration of professionals who are **guiding** the ILUP process. One or two lead planning drivers will be chosen to moderate the planning process from the CCGs that are established within a planning unit to participate in the actual planning process. They will work on a 25 – 35 m<sup>2</sup> land use map production area and show the land use types, identify and mitigate areas of land-use conflicts and finally come up with a resolute land use plan on the ground that they have considered representing their Kebele or Woreda in the integrated land use and development plan. First, they will establish reference land-use types such as existing roads, permanent rivers, and any other reference land-use types to serve them orient themselves. They will discuss and situate major land uses and their whereabouts. They discuss issues of land use conflict planning they face in their planning unit and resolved the land-use conflicts in line of prioritized economic contribution, sustenance of productivity, and longevity of the resource-base for continued and sustained economic production. Though the community groups drive the planning process, the specialized subject-specific experts guide the process especially by requesting issues of ambiguities for clarification. The experts from the NILUPP office will facilitate the planning process. In all cases, environmental concerns will be examined in line with concerns that Ethiopia is signatory at regional and international levels.

#### **4.7 General Purposes Of The CCGs**

The CCGs of all kinds have the following purposes and even more.

1. Identifying the various benefits that the community wish to get from the sector, land use
2. Having a better understanding of their involvement with the ILUP guiding team from the inside-out
3. Learn the possibilities for collective restoration of the damaged environment, deteriorated economy, and social status
4. Effectively participating and driving the integrated land use planning
5. Letting the community reason out to the planning team why and how the community can develop and protect its resource base
6. Discussing the possibilities for producing a value-added commodity from the resources for improved marketing
7. Building the interest and confidence of the communities about the economic, social, and environmental benefits of their resources in the sector
8. Devising detailed modalities of engagement for their involvement in the NILUP process
9. Genuinely defining the working relationship between all actors of the NILUP process
10. Identifying where exactly the resource sector is most abundant and needs to be designated as a separate resource on land in the Woreda or Kebele
11. Actively working in sensitization of the community about the overall objective of the NILUP, its processes, and the role of the executive body of the CCG which is representing the specific community.
12. Developing their community bylaws and memorandum as well as articles of their association for having legal registration for successful implementation of bankable projects of the sector economy.
13. Contributing to the definition of desirable attributes of the sector that can enable it to be considered as a land-use by the NILUP guiding expert.
14. Sharing issues that are raised by the Expert Team for the search of solutions within the CCG's leadership in a case where the need arises.
15. Assisting in developing objectives, priorities, and goals of the development of the sector as a bankable project
16. Comply with the requirements of the CCG bylaw
17. Meeting quality standards of the productions as established and agreed by the CCG executive body of the CCG
18. Paying budget contributions required for covering expenses that need to uphold the CCG as agreed and decided by the Executive body
19. Conducting routine surveillance on the sustenance or disruption of the land use plan by any land user in their jurisdiction and reporting on time to NILUPP for action
20. Creating Awareness and Building the Capacity of the CCGs

It is necessary that the members of the CCG in general and the respective Executive Bodies are aware of meeting quality standards in their production, amicable resolution of land-use conflicts, linking production to marketing for better income, and responsibly upkeeping their environment for

sustainable production. In addition, members need to be aware of the benefits of quality, size, and grade of their produce in supplying high-value fetching productions to the market. Members would have to learn how to grade their produces by market quality standards and grades at the farm level. Often, such awareness creation and capacity building is product-specific. Therefore, the need for awareness creation and capacity building depends on the commodity to commodity or CCG to CCG. Therefore, monitoring the awareness and capacity levels of the CCG members on a routine basis and mitigating deficiencies is very vital. The Capacity Building arm of the NILUPP would have to be responsible for routinely monitoring and capacity building. Most importantly, since the major targets are using the CCG members for the production of food and market goods on sustainable land use, the capacity of the CCG members will have to be established in meeting market quality standards regarding ISO standards. Since standards and grades of the different market goods

Awareness creation and capacity building is the responsibility of the NILUPP facilitation office. The office conducts capacity gap assessments and provides training or office-level capacity building as deemed necessary time after time.

The CCGs are to address the bottlenecks of production for own consumption and for penetrating the market for generating cash income. In this regard, the following problems need to be addressed in the capacity-building effort. In addressing this hurdle effectively, trained personnel are needed, especially in all the value addition technologies such as bio-engineering and genetic manipulation, preservation, processing, packaging branding, patenting, crafting, and transporting expertise. Because of cost implications within the limited purchasing power environment, local consumers are not stringent about quality standards, quality control, packaging, and product presentation. Therefore, simultaneous effort is needed in creating assets for local consumption of the CCG members as well as for having a significant portion of value-added production for national and regional markets. Farmers and their related corollaries have been traditionally brainwashed to focus on food crop production and related items for domestic consumption. Therefore, training and capacity-building efforts to be exerted on members of the CCGs need to dwell more on producing commodities that are attractive in market terms.

To overcome the many value-addition and standardization problems of the CCG products, several other factors need to be considered in building the capacity of the CCGs. A few of them are the following.

1. Training and building capacity of the CCG members as needed in business management
2. Training on the formation of partnerships among the CCG members for meeting market volume is essential
3. Establishing CCG training field schools that teach various marketable basic skills is essential
4. Policies that promote and synergize production with value-addition and marketing need to be treasured and communicated to the CCGs
5. A legal environment needs to be put in place for building the CCGs that are tailored for maximizing labour and other inputs that can maximize quality and quantity of production, bulking of production, and as well as about creating trust and confidence by guarantying reliability among their business partners.
6. Creating a joint forum where experts from production, value-addition, marketing and business, infrastructure, and policy need to come together and devise holistic measures by which related CCGs complement and contribute to the national economic development. Similar capacity building is needed in monitoring the progress being made by each CCG

The roles and responsibilities of the NILUPP office at regional, zonal and woreda office is immense in getting the Capacity of the CCGs built as well as in getting the CCG's administrative organ

empowered. This includes supporting the CCG in getting their bylaws produced by hiring professionals in law and policy and, later getting their bylaws officially promulgated so that their bylaws can be considered and used in the Ethiopian judiciary system.

#### **4.8 Officiation**

For the land-use beneficiaries (CCGs) to be effective and authorized, they need to have a CCG bylaw which is officiated by the Woreda, Zonal and regional level NILUPP Office. This is important for legally agreeing with national and international parties which may enter into the market contract of their produce at national and international level institutions. At the same time, the levels of registration and officiation depend on the coverage of the livelihood commodity resource's area coverage. For most of the CCG products, to meet market size (volume of the market commodity) may need to come from members of the CCG operating in more than one kebele, or Woreda. Often, the marketable commodity may need to come from members who are distributed in different Kebeles, Woredas, and even zones to meet market size. This is the major reason approval at the zonal level offices is much more reliable and trusted by market partners who are partnering in the market dealing at national and international levels. This makes their cases heard and their involvement ligament at a higher level which has the power to rule the case. Such officiation may need to be renewed on annual basis. All these indicate that support and coaching is required from the hiring level at the regional level down to the Kebele level government system. The requirement for endorsing the bylaw will be available at least the following.

1. Bylaw approved by all members of the general assembly of the specific CCG who are to produce, add value, and market their surplus production
2. An application letters
3. Minute of the general assembly meeting for the establishment of their CCG
4. Minute of choosing the executive body of the specific CCG
5. The type of livelihood option the CCG is to depend on for production and marketing
6. Signed commitment letter signed by all members of the CCG for following and respecting the integrated land use plan which is endorsed by national regional state

#### **4.9 Conditions for Dissolution:**

The CCG membership is for an indefinite time. Membership may be continued by a member who has legal inheritance when the original member is interested to pass his/her right to any other member. In addition, a member of the CCG may pull out from being a member of the Association (group) after paying all its dues to the group. Furthermore, the CCG may be entirely dissolved when 3/4<sup>th</sup> of its members decide to do so or when the production of the remaining members is not meeting market size or discontinues to produce income in the approval of a certified auditor.

#### **4.10 Final Remark**

Membership registration form, draft model bylaws, and contents of the business plan for any of the livelihood sectors can only be produced after the beneficiaries are identified in line with the livelihood sector to be identified after holding the residents of the rural and urban Kebeles. This is purely beneficiary cantered that need to be done by learning, doing, and teaching between the three actors among whom CCG members are part. Else, the participatory nature of the process gets hurt before the beginning. The need for a business plan is to show economic viability which is necessary for market dealing.

## **5. Module 4: Establishment of an Autonomous and Legally Backed Land Use Plan Facilitation and Enforcement Office**

### **5.1 Justification**

Encroachments of agricultural activities on the forest, pasture, and wetland areas, and free grazing would rapidly exhaust the productivity of the lands in Oromia. Urban expansion on the best agricultural lands without weighing alternatives would also lead to misuse of planned land uses and diminish agricultural production on many future occasions. In addition, lack of guardians that can arbitrate on the implementation of the integrated land-use plans, absence of control on the use of land for what it is not best suited, the rapid urban and industrial expansions would all contribute to the misuse of land. As a result, the land will not be used for purposes that have relatively greater economic, social and environmental protection returns. Consequently, various land uses that could have effectively contributed to food security and economic growth of the Oromia region on a sustainable basis will be greatly compromised. This can only be safeguarded by an integrated land use planning and surveillance/regulatory office that has at least a portfolio not less than a Bureau at the regional level. In a few countries, it has its court to rule the defaulters as they violate the land use plans.

It is a fact that noting this challenge, Proclamation No. 456/2005 has required regional states to prepare a master land-use plan that “takes into account soil type, landform, weather condition, plant cover, and socioeconomic conditions by the competent authority”. Unfortunately, this authority does not exist currently exist in Gambella. This is a strong threat to the implementation of the current land-use plan.

There is no doubt that Oromia Region is aiming at fostering equitable spatial development across the region as planned. No doubt, Oromia Region would confer to the international framework conventions and agreements, such as the Voluntary Guideline on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VG), the Sustainable Development Goal (SDG), the Africa Union Declaration on Land Issues and Challenges in Africa and the Climate Change conventions (Kyoto Protocol and the Paris Agreement) that Ethiopia is a signatory. The Oromia Region would confer to policies, strategies, and plans including the Federal and Regional Land Administration and Use Proclamations, Growth and Transformation Plan (GTP), and Climate Resilient Green Economy (CRGE) strategy that Ethiopia has prepared.

As part of realizing these legal instruments and strategies and overcoming the different environmental and land management challenges of the country, the Ethiopian Government has strongly supported the preparation of the Integrated Land Use and Development Plan. Indeed, the Government of Ethiopia, as shown in its INDP document has affirmed that an integrated, aligned and harmonized land-use plan and policy are necessary for all its administrative regions. In this same document, it has shown that an independent, superior portfolio institution is required to effectively oversee the implementation of such integrated land use plans.

Throughout the history of Ethiopia, using land for what it is not best suited, has been playing havoc on many fronts. For instance, many of the national parks and other important wildlife habitats have

become lands where livestock are freely grazing. Even the gazetted Awash National Park is the best example of this. Many of the riverbanks of the Oromia regional are settled and cultivated. Many National Park is settled in its heartland. Livestock is free to move around competing with wildlife. In other situations, as much as good lands are used for free-grazing, pastoral lands that are best suited to grazing are being used for agriculture which mines the nutrients from the shallow soils and makes it deserted after a few cropping seasons. From experience in Ethiopia itself, a significant number of industries have been built haphazardly competing against agricultural lands along all roads radiating from Addis Ababa. There is no guarantee that the same will not happen when investments flourish following this studied plan. All these factors strongly suggest that Oromia Region needs an effective and high-portfolio institution that is backed by policy and law to enforce the plans at all levels.

The road map for integrated and participatory land-use planning and policy development (RMD) presents the step-by-step processes, institutional and manpower arrangements, timeline, budgets, and other inputs for successful land-use planning and enforcement. But, so far, unlike in many of the regions, Oromia Region has plan enforcement institutions established. Unfortunately, so far, the Oromia Land Use Planning and Plan enforcement Bureau does not seem to be in the driving seat. It is still surprising that the task of coordinating this assignment has been given to a project instead of such a bureau itself.

The prepared and approved ILUPs, at various planning unit levels, are about having lands that can be used for which they are the best fit and comparatively most resilient against negative climate change impacts. However, in the realm of land scarcity that gets worse and worse in the future, there is no guarantee that these integrated land use plans will not be violated.

Because the plans are developed by considering the inherent physical limitations and potentials of the land against possible land-use alternatives such as crops, forestry domains, horticulture entities, biodiversity perpetuation, pleasing residence, flourishing of wildlife, safekeeping the heritage resources, etc, plus land-resilience under the different planned land-use types, defaulting the plan will be a futile exercise. Therefore, establishing **an independent institution** that can conduct continued surveillance against plan-defaulters, do plan-adaptation works as valid and needed, sue defaulters for respect of the plans, and conduct training for the different land users about correct interpretation and use of the plans, is crucially essential.

## 5.2 Nature of the Institutions

1. It is responsible for producing timely and updated land-use plan implementation oversight reports whenever land-related development directions, utilization technologies, and alternative use types and benefits are to be implemented.
2. It is an institution that arbitrates land uses conflicts that may arise between land-claimant bureaus, agencies, and authorities
3. It is an institution that continues to safe-keep and furnishes land-use-related information to land-manipulating sector ministries, agencies and authorities

The institution, that may be a commission or an agency, shall operate at a superior portfolio, under the regional president's office. For effective execution of its ILUP functions, the Commission must have a minimum of the following organs.

1. Administration and finance directorate
2. GIS and remote sensing (cartography) directorate
3. Land-use plan implementation oversight directorate.
4. ICT and data management directorate
5. Monitoring and evaluation directorate, and
6. Regulatory and plan enforcement directorate (policy and law)

### **5.3 Major functions/tasks**

The following are the future functions of the ILUP institution

- Recruitment and deployment of oversight experts for continuing monitoring and surveillance
- Conducting continued surveillance, and M&E of matching plans with implementation
- Capturing, processing, and utilizing Geo-data information for monitoring, surveillance, and updating the plans
- Stimulating public and private participation in programs and activities related to land-use plan oversight and its implementation.
- Fostering cooperation between federal, regional, zone, Woreda, and city/town government authorities and other bodies or persons that are engaged in land-use oversight responsibilities.
- Promoting scientific knowledge of positive changes in land use and encouraging the development of technologies that can prevent or minimize the adverse effects of land use.
- Specifying standards, norms, and criteria for the protection of beneficial uses and the maintenance of the quality of the land.
- Establishing and operating a system of documentation and dissemination of information related to land-use planning.
  - Review relevant existing laws and, where appropriate, formulate proposals for legislation concerning land-use planning and implementation issues and recommend their endorsement by the regional government.
  - Establishing and maintaining liaison offices with other countries and international organizations concerning issues relating to land-use planning.
  - Overseeing the preparation of livelihood-sector common commodity-based development projects that finally must be handed over to the various executive bodies of the federal government
  - Undertaking and promoting general educational programs in land-use planning to enlighten the public regarding the land and its resources the role of the people in its protection, use and improvement
  - Regional, zonal and special Woreda level rural land-use plans as well city and town level urban land-use plans.

- Ensuring implementation of the plans by the regional, zonal, woreda and city and or town-level legal administrations.
- Producing updated rural and urban plans in their respective planning unit as needed

#### 5.4 Institutional Setup

Each of the Planning Units up to rural Woreda and Basic Town town level shall have a land-use plan and regulatory offices Land-Use plan implementation regulatory offices

Positions of the Office of Oromia Region	Oromia Region	Staff needed per zone	Staff needed at Woreda level	Staff needed at Zonal capital town level r	Total
Head and deputy head of the NILUPP Agency/Commission	1	1	1	1	12
GIS and Remote Sensing Directorate	1	1	1	1	12
ICT and Data Management Directorate	1	1	1	1	12
Planning and Implementation Oversight Directorate	2	1	1	1	14
Monitoring and Evaluation Directorate	2	1	1	1	14
Administration and Finance Directorate	1	1	1	1	12
Executive Secretary	1	1	1	1	12
<b>Total</b>	<b>9</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>88</b>

*Table 1. Proposed manpower arrangement of the ILUP liaison Office for implementing GPNRS*

#### 5.5 Selected Policy Backing Issues

The participatory and integrated land use and development planning, which needs to be conducted for the Oromia region, may be produced before the land use policy is developed and promulgated for the regional state. However, this gap shall be established at federal and regional level technical and steering committees that must be guided by a memorandum of understanding to be signed between the Plan facilitating institution OEFCCA, regional and federal level technical committees as well as federal and regional level Steering Committees. However, for smooth, rapid, and coordinated land use plan oversight and regulatory functions, of the regional, zonal, woreda, city, and town level functions, at the minimum, the following policy issues need to be addressed.

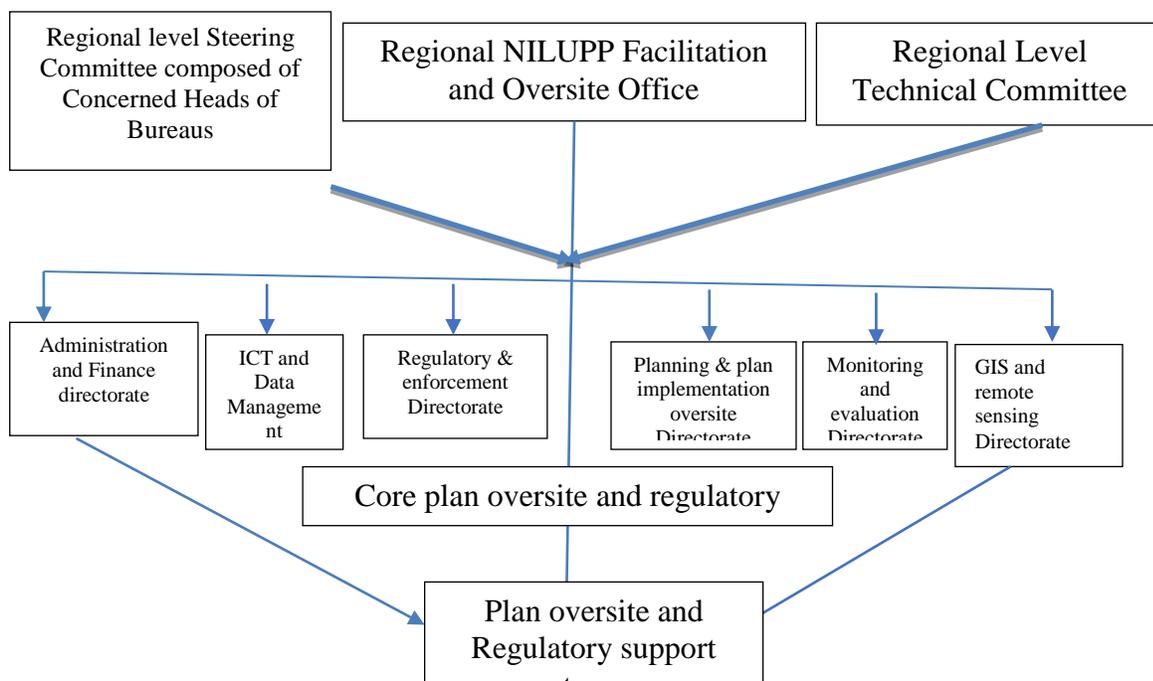
- 1) Policy on the establishment of recognized and superior ILUP institutions at federal, regional, zonal, and woreda levels so that an ILUP institution is mandated and inaction on Land-Use planning and regulatory actions.
- 2) A policy that the above-mentioned institution is mandated and authorized to conduct surveillance and monitoring so that defaulters are spotted when land-use damage is at an early stage
- 3) A policy that authorizes the land use planning and regulatory institution to arbitrate between any two or more defaulting institutions who might have been found to use land for which the plan is not meant.
- 4) A policy that authorizes and mandates the Integrated Land Use planning, updating and authorizing the institution to follow-up land-use changes through people's involvement and participatory manner

- 5) A policy that mandates administrative and judiciary organs to cooperate in all plan-regulatory functions at all levels when the institution is conducting land use planning and regulatory functions.
- 6) A policy that mandates the land Use Planning and Regulatory institution to conduct capacity building, awareness creation, and organizational initiatives for successful implementation of genuinely participatory land-use planning and livelihood-sector development.
- 7) A policy that mandates each land-claimant (land using) institutions such as individuals, groups, organizations, agencies, and ministries to respect the approved and final land use plans at all levels

## 5.6 Organograms

Land-use planning and regulatory process is a people-centred undertaking that needs to be conducted with concerted efforts of all bureaus, authorities, agencies, and commissions that are operational at regional, zonal, special Woreda, Gambella city, Itang town, Metar Town, Abobo town, as well as at Burbe and Tergol strategic towns. It is hugely multi-disciplinary that uses knowledge and expertise at least.

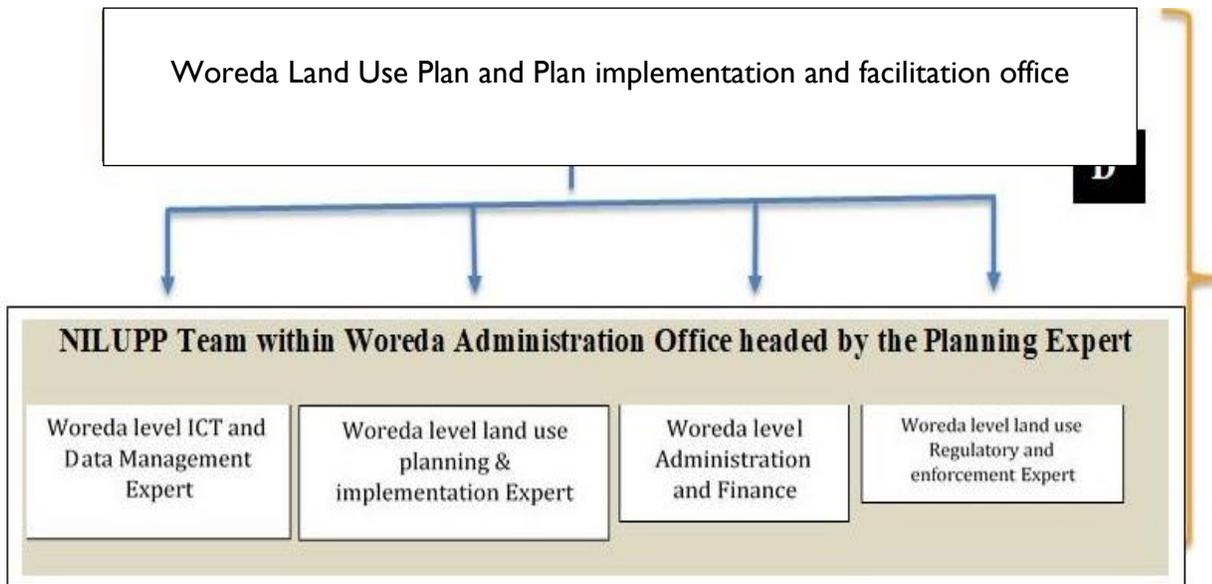
After characterizing and learning the potential and constraints of the lands in focus the suitable limitations of each land-claimant production subject such as agriculture, wildlife, and tourism, ecosystem conservation and biodiversity, forestry, range, etc. are studied individually and let come together in removing conflicts and building synergies. These studies are followed by settlement and other infrastructure subjects such as education, water supply, waste management, roads and transport, health and markets which are again followed by enforcement and facilitation subjects such as policy and law, monitoring and evaluation, and geo-dating subjects. Land use plans are produced in both urban and rural settings which define the detailed land use plans in space and time as shown in their respective plan documents.



**Figure 1. Organogram of Regional, zonal and special woreda and town level ILUPP Offices**

Livelihood-sector projects that are focusing the social, environmental, and economic transformation of the people are many and varied. Their list is already available. Therefore, one need not expect such an institution to have all these professionals in its staff organization. Therefore, if land-use plans are to be obtained within a few years economically, engaging consultants is a necessity than a choice.

The ILUP offices to be organized in the Oromia region will have their independent institutions down to the Woreda level to deal with rural lands while towns and cities will need to have their land use and enforcement offices within their respective cities and towns.



**Fig. 2. Rural village, Kebele, and Woreda level Land Use planning and plan enforcement oversight Office**

## **Module 5: Application of GIS as a land use planning tool**

### **5.7 Summary**

The training manual is designed to help both beginners and advanced users of Geographic Information System (GIS) and Remote Sensing (RS) for land use planning. The manual has two major parts: a) Basics and fundamental principles of GIS and RS; b) Advanced applications of GIS and RS. The first part will deal with, both theoretical backgrounds and practical applications. The second part will focus on applications of the GIS and RS for data processing, storage, and interpretation. Examples using data from the real world will be used to facilitate deeper understanding. Trainees will be introduced to sources of different geospatial data, including GPS, satellite imagery, data portals, and others.

The training materials are prepared to bear in mind that the trainees with and without prior knowledge and skills of geospatial sciences. However, trainees with no prior exposure to GIS and RS are expected to work harder to build their skills in geospatial analysis. Those who previously received some levels of pieces of training or self-taught are advised to come up with their skill gaps so that more customized support can be provided. The overall training approach is described as follows.

The training will address both the basic concepts and applied GIS and RS. Brief lectures, followed by software demonstrations will be the major training approach. Field excursions will be part of the training. ArcGIS v10.5 will be installed on PCs of the. Example data will also be provided so that the trainees will be able to produce the same results same as those demonstrated during the training.

This hands-on training is designed to enhance the spatial analytical skills of experts of land use planners, implementing offices, and other stakeholders related to the implementation of the PLUP of Oromia Regional State. In the first part of the training, trainees will familiarize trainees with the major interfaces of ArcGIS components, basic mapping techniques, and basic image processing. The second part will introduce trainees to some of the advanced GIS analysis and image analysis. Therefore, upon successful completion of the training, trainees will:

Understand the fundamentals of GIS and RS

- Understand the nature of spatial data
- Be able to build geodatabase and manage geographic data
- Produce different types of maps and understand the concepts
- Be able to apply advanced geospatial tools to address real-world problems
- Apply image analysis techniques to extract useful information out of satellite imagery
- Understand how to integrate data from different sources and to model spatial relationships, patterns and other geospatial contexts

### **5.8 Part One: Basics of GIS and RS**

#### **5.8.1 Definitions**

Geographic information systems (GIS) or geospatial information systems is a set of tools that captures, store, analyze, manage, and present data that are linked to location(s). A geographic information system (GIS) is a system for the management, analysis, and display of geographic information. A geographic information system (GIS) integrates hardware, software, and data for

capturing, managing, analyzing and displaying all forms of geographically referenced information.

## 5.8.2 Components of GIS

GIS has four major components:

- i. People:** These are GIS users and GIS specialists who are responsible for collecting, managing and analyzing geographic data, giving technical support to others and users of GIS data.
- ii. Data:** Data that are to be processed and out of which information is generated using GIS tools. Data input in GIS has three parts these are: entering the spatial data, entering non-spatial data, and linking the two together. Spatial data can be acquired from existing data in digital or paper form, survey data by the use of Global Positioning System (GPS) and remotely sensed data /Aerial Photography and Satellite image.
- iii. Procedures:** Standard procedures for data collection, entry into the system, storing,  
 managing, transforming, analyzing, and finally distributing to users.

### iv. Hardware and software:

**Input hardware:** *Digitizer:* existing data printed on paper maps can be digitized or scanned to produce digital data. A digitizer produces vector data as an operator traces points, lines, and polygon boundaries from a map. *Scanner:* Scanning a map results in raster data. *Computer hardware:* Computers with high processor speed, memory storage capacity are needed. Global Positioning System (GPS) is important for collecting the geographic position of data and information.

**Output hardware:** Printer, Plotter

**Software:** GIS software for data input, storage, management, and analysis.

## 5.8.3 An overview of popular GIS and remote sensing Software

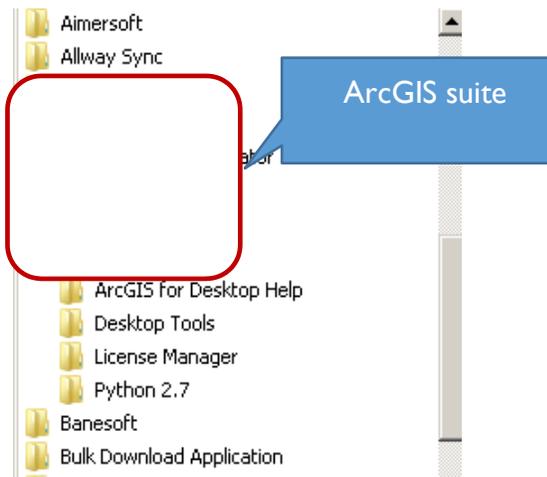
There are several software that are developed for geospatial data processing and analyses. While some of these software are open sources and others are commercial. Some of this softwares are summarized in Table I. Please note that some of the software have both free (often limited functionality) and commercial versions. In this training, we will be mainly using Environmental Systems Research Institutes (ESRI) ArcMap v10.4

## 5.8.4 Brief Introduction to ArcGIS

### Install ArcGIS 10.4

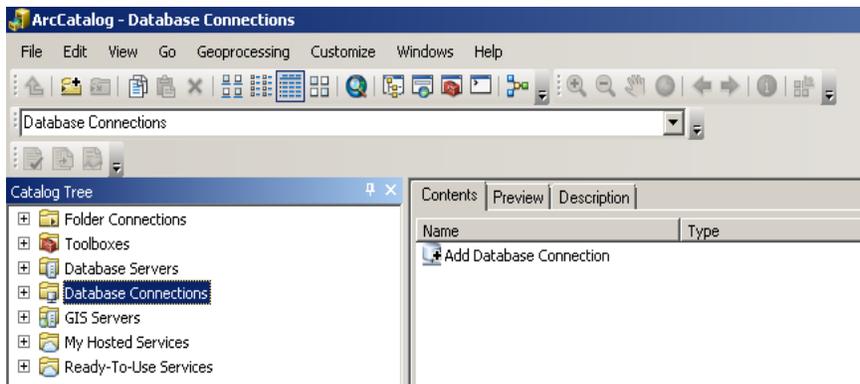
#### A. ArcGIS

ArcGIS Desktop is an integrated suite of advanced GIS applications. Open ArcGIS and see the different components of the software. *Start > All programs > ArcGIS (for Windows 7 users)*



## ArcCatalog

Start > All programs > ArcGIS > ArcCatalog



The ArcCatalog application provides a catalog window that is used to organize and manage various types of geographic information for ArcGIS for Desktop

ArcCatalog is used to:

- Organize your GIS contents
- Manage geodatabase schemas
- Search for and add content to ArcGIS applications
- Document your contents
- Manage GIS servers
- Manage standards-based metadata
- Create new feature files

## B. ArcGlobe

Start > All programs > ArcGIS > ArcGlobe

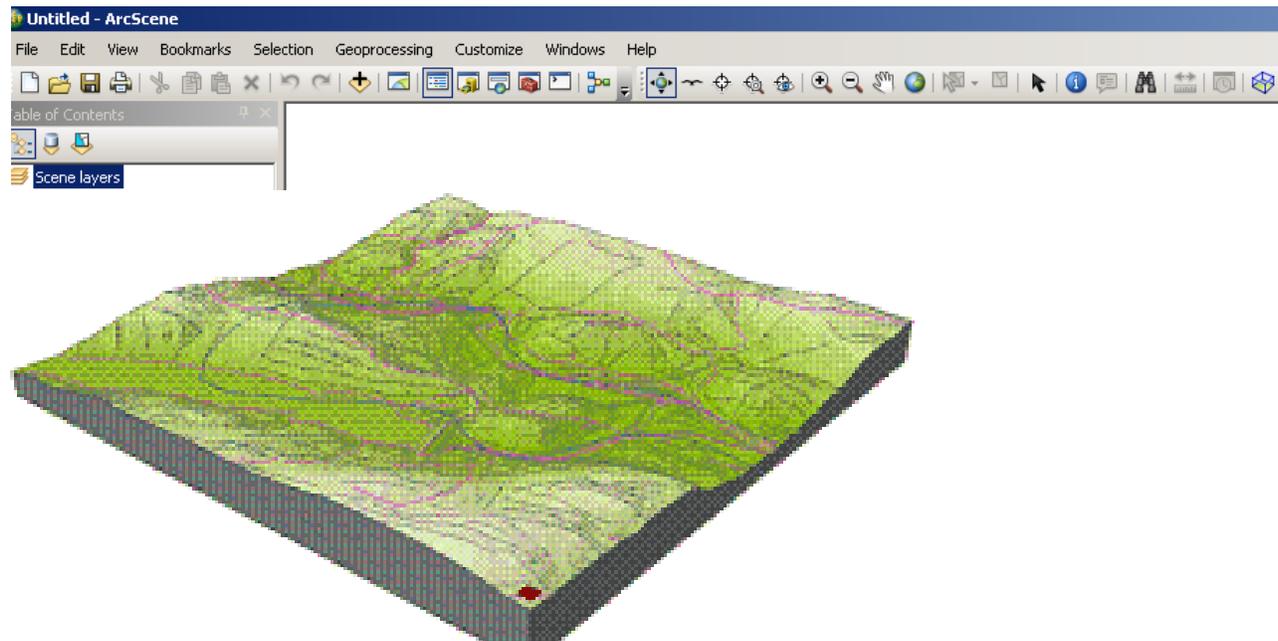




ArcGlobe is part of the ArcGIS 3D Analyst extension. This application is generally designed to be used with very large datasets and allows for seamless visualization of both raster and feature data. It is based on a global view, with all data projected into a global Cube projection and displayed at varying levels of detail (LODs), organized into tiles. For maximum performance, cache your data, which will organize and copy the source data into tiled LODs. Vector features are generally rasterized and displayed according to their associated LOD, which assists in very fast navigation and displays.

### C. ArcScene

*Start > All programs > ArcGIS > ArcScene*



ArcScene is a 3D viewer that is well suited to generating perspective scenes that allow you to navigate and interact with your 3D feature and raster data. Based on OpenGL, ArcScene supports complex 3D line symbology and texture mapping as well as surface creation and display of TINs. All data is loaded into memory, which allows for relatively fast navigation, pan, and zoom functionality. Vector features are rendered as vectors, and raster data is either downsampled or configured into a fixed number of rows/columns set by user.

### D. ArcMap

*Start > All programs > ArcGIS > ArcMap*



ArcMap is the primary application used in ArcGIS and is used to perform a wide range of common GIS tasks as well as specialized, user-specific tasks. Here is a list of some common workflows you can perform:

- ✓ **Work with maps**—You can open and use ArcMap documents to explore information, navigate around your map documents, turn layers on and off, query features to access the rich attribute data that is behind the map, and to visualize geographic information.
- ✓ **Print maps**—You can print maps, from the simplest to very sophisticated cartography, using ArcMap.
- ✓ **Compile and edit GIS datasets**—ArcMap provides one of the primary ways that users automate geodatabase datasets. ArcMap supports scalable full-function editing. You select layers in the map document to edit and the new and updated features are saved in the layer's dataset.
- ✓ **Use geoprocessing to automate work and perform analysis**—GIS is both visual and analytical. ArcMap has the ability to execute any geoprocessing model or script as well as to view and work with the results through map visualization. Geoprocessing can be used for analysis as well as to automate many mundane tasks such as map book generation, repairing broken data links in a collection of map documents, and to perform GIS data processing.
- ✓ **Organize and manage your geodatabases and ArcGIS documents**—ArcMap includes the
  - Catalog window that enables you to organize all of your GIS datasets and geodatabases, your map documents and other ArcGIS files, your geoprocessing tools, and many other GIS information sets. You can also set up and manage geodatabase schemas in the Catalog window.
- ✓ **Publish map documents as map services using ArcGIS for Server**—ArcGIS content is brought to life on the web by publishing geographic information as a series of map services. ArcMap provides a simple user experience for publishing your map documents as map services.
- ✓ **Share maps, layers, geoprocessing models, and geodatabases with other users**—ArcMap includes tools that make it easy to package and share GIS datasets with other users. This includes the ability to share your GIS maps and data using ArcGIS Online.
- ✓ **Document your geographic information**—A key goal in GIS communities is to describe your geographic information sets to help you document your projects and for more effective search and data sharing. Using the Catalog window, you can document all of your GIS contents. For organizations that use standards-based metadata, you can also document your datasets using the ArcGIS metadata editor.
- ✓ **Customize the user experience**—ArcMap includes tools for customization, including the ability to write software add-ins to add new functionality, to simplify and streamline the user interface, and to use geoprocessing for task automation.

## E. A quick tour of ArcMap

ArcMap represents geographic information as a collection of layers and other elements in a map view. There are two primary map views in ArcMap: the *data view* and the *layout view*. The data frame provides a geographic window, or map frame, in which you can display and work with geographic information as a series of map layers. The layout view provides a page view where map elements (such as the data frame, a scale bar, and a map title) are arranged on a page for map printing.

### ArcMap Documents

When you save a map, you have created in ArcMap, it will be saved as a file on disk. This is an ArcMap document and is referred to as a map document or mxd since the file name extension (.mxd) is automatically appended to your map document name. You can work with an existing .mxd file by double-clicking the document to open it. This will start an ArcMap session for that .mxd file. Map documents contain display properties of the geographic information that you work with in the map—such as the properties and definitions of your map layers, data frames, and the map layout for printing—plus any optional customizations and macros that you add to your map.

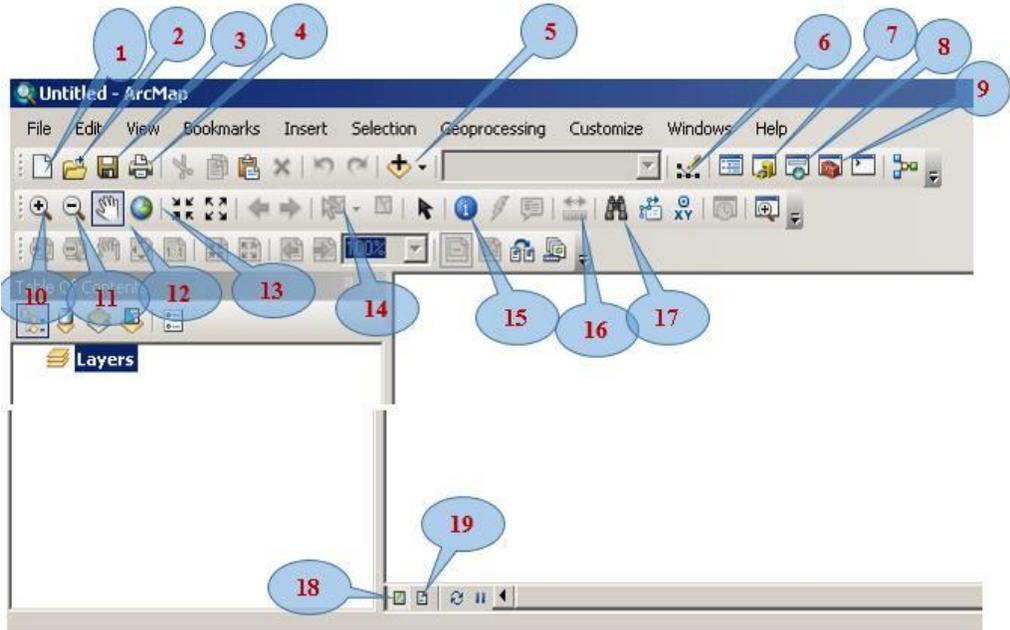
**Views in ArcMap**

ArcMap displays map contents in one of two views:

- Data view
- Layout view

Each view lets you look at and interact with the map in a specific way.

In ArcMap data view, the map is the data frame. The active data frame is presented as a geographic window in which map layers are displayed and used. Within a data frame, you work with GIS information presented through map layers using geographic (real-world) coordinates. These will typically be ground measurements in units such as feet, meters, or measures of latitude-longitude (such as decimal degrees). The data view hides all the map elements on the layout, such as titles, north arrows, and scale bars, and lets you focus on the data in a single data frame, for instance, editing or analysis.



1. Open new project	11. Zoom out
2. Open existing Project	12. Pan
3. Save project	13. Full extent
4. Print Map	14. Select feature
5. Add data	15. Identify

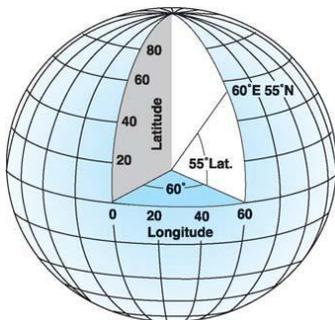
6. Editor toolbar	16. Measurement
7. Open ArcCatalog	i. Find features
8. Open search dialog box	ii. Data view
9. Open Arc Tools	iii. Layout view
10. Zoom in	

There are two main categories of coordinate systems:

- Geographic coordinate systems
- Projected coordinate systems

### ***i. Geographic coordinate systems***

A geographic coordinate system (GCS) uses a three-dimensional spherical surface to define locations on the earth. A GCS is often incorrectly called a datum, but a datum is only one part of a GCS. A GCS includes an angular unit of measure, a prime meridian, and a datum (based on a spheroid). A point is referenced by its longitude and latitude values. Longitude and latitude are angles measured from the earth's center to a point on the earth's surface. The angles often are measured in degrees.



### ***Spheroid and Datum***

While a spheroid approximates the shape of the earth, a datum defines the position of the spheroid relative to the center of the earth. A datum provides a frame of reference for measuring locations on the surface of the earth. It defines the origin and orientation of latitude and longitude lines. Whenever you change the datum, or more correctly, the geographic coordinate system, the coordinate values of your data will change. Here are the coordinates in DMS of a control point in Redlands, California, on the North American Datum of 1983 (NAD 1983 or NAD83).

-117 12 57.75961 34 01 43.77884

Here's the same point on the North American Datum of 1927 (NAD 1927 or NAD27).

The longitude value differs by about three seconds, while the latitude value differs by about 0.05 seconds.

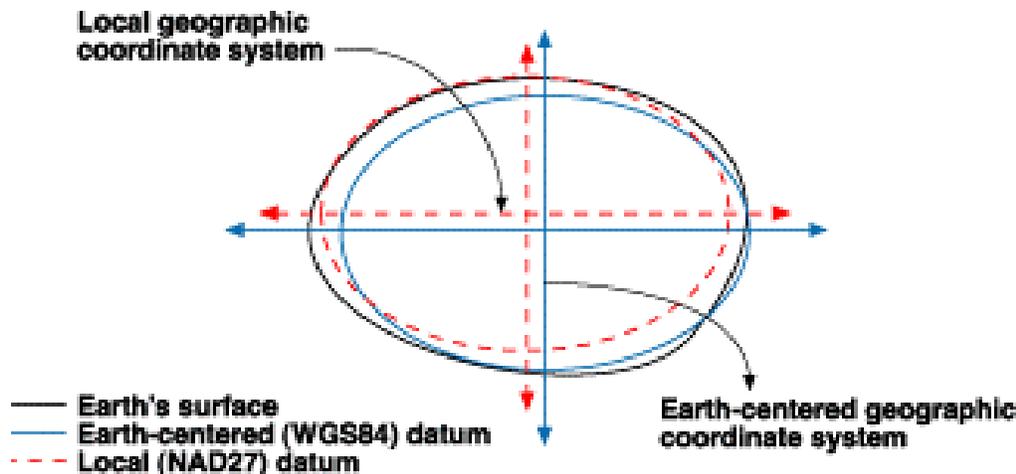
### ***Geocentric datums***

In the last 15 years, satellite data has provided geodesists with new measurements to define the best earth-fitting spheroid, which relates coordinates to the earth's center of mass. An earth-centered, or geocentric, datum uses the earth's center of mass as the origin. The most recently developed

and widely used datum is WGS 1984. It serves as the framework for locational measurement worldwide.

### **Local datums**

A local datum aligns its spheroid to closely fit the earth's surface in a particular area. A point on the surface of the spheroid is matched to a particular position on the surface of the earth. This point is known as the origin point of the datum. The coordinates of the origin point are fixed, and all other points are calculated from it.

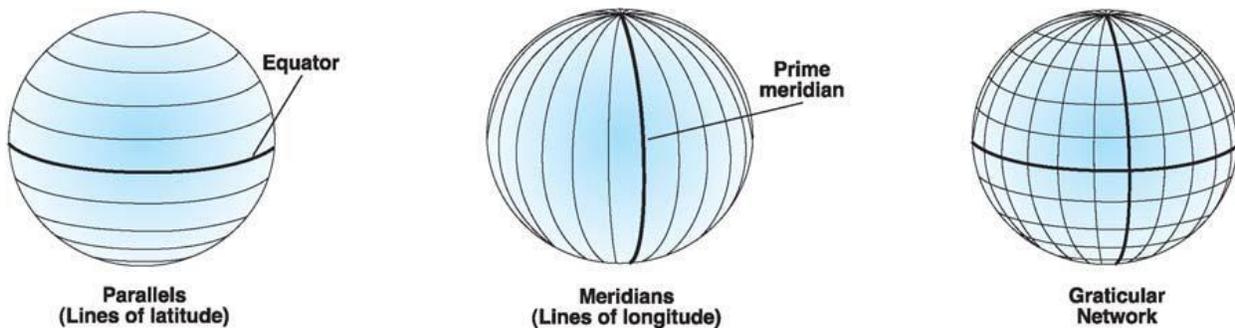


The coordinate system origin of a local datum is not at the centre of the earth. The centre of the spheroid of a local datum is offset from the earth's centre. NAD 1927 and the European Datum of 1950 (ED 1950) are local datums. NAD 1927 is designed to fit North America reasonably well, while ED 1950 was created for use in Europe. Because a local datum aligns its spheroid so closely to a particular area on the earth's surface, it's not suitable for use outside the area for which it was designed.

In the spherical system, horizontal lines, or east-west lines, are lines of equal latitude, or *parallels*. Vertical lines, or north-south lines, are lines of equal longitude, or *meridians*. These lines encompass the globe and form a gridded network called a *graticule*. The line of latitude midway between the poles is called the equator. It defines the line of zero latitudes. The line of zero longitudes is called the prime meridian. For most geographic coordinate systems, the prime meridian is the longitude that passes through Greenwich, England. Other countries use longitude lines that pass through Bern, Bogota, and Paris as prime meridians. The origin of the graticule (0,0) is defined by where the equator and prime meridian intersect. The globe is then divided into four geographical quadrants that are based on compass bearings from the origin. North and south are above and below the equator, and west and east are to the left and right of the prime meridian. Latitude and longitude values are traditionally measured either in decimal degrees or in degrees, minutes, and seconds (DMS). Latitude values are measured relative to the equator and range from  $-90^\circ$  at the South Pole to  $+90^\circ$  at the North Pole. Longitude values are measured relative to the prime meridian. They range from  $-180^\circ$  when travelling west to  $180^\circ$  when travelling east. If the prime meridian is at Greenwich, then Australia, which is south of the equator and east of Greenwich, has positive longitude values and negative latitude values.

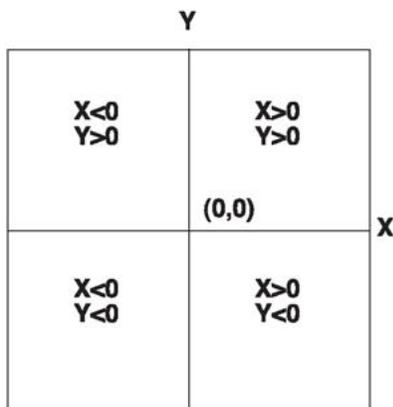
Although longitude and latitude can locate exact positions on the surface of the globe, they are not uniform units of measure. Only along the equator does the distance represented by one degree

of longitude approximate the distance represented by one degree of latitude. This is because the equator is the only parallel as large as a meridian. (Circles with the same radius as the spherical earth are called great circles. The equator and all meridians are great circles.) Above and below the equator, the circles defining the parallels of latitude get gradually smaller until they become a single point at the North and South Poles where the meridians converge. As the meridians converge toward the poles, the distance represented by one degree of longitude decreases to zero. On the Clarke 1866 spheroid, one degree of longitude at the equator equals 111.321 km, while at 60° latitude it is only 55.802 km. Since degrees of latitude and longitude don't have a standard length, you can't measure distances or areas accurately or display the data easily on a flat map or computer screen.



A projected coordinate system is defined on a flat, two-dimensional surface. Unlike a geographic coordinate system, a projected coordinate system has constant lengths, angles, and areas across the two dimensions. A projected coordinate system is always based on a geographic coordinate system that is based on a sphere or spheroid. In a projected coordinate system, locations are identified by x,y coordinates on a grid, with the origin at the center of the grid.

On a gridded network of equally spaced horizontal and vertical lines, the horizontal line in the center is called the x-axis and the central vertical line is called the y-axis. Units are consistent and equally spaced across the full range of x and y. Horizontal lines above the origin and vertical lines to the right of the origin have positive values; those below or to the left have negative values. The four quadrants represent the four possible combinations of positive and negative x- and y coordinates.



**Different types of projection**

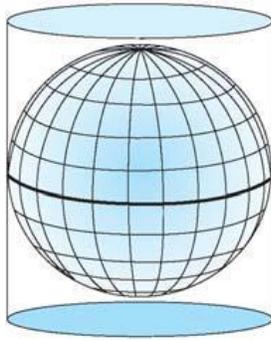
Conformal projections conformal projections preserve local shape. To preserve individual angles describing the spatial relationships, a conformal projection must show the perpendicular graticule

lines intersecting at 90-degree angles on the map. A map projection accomplishes this by maintaining all angles. The drawback is that the area enclosed by a series of arcs may be greatly distorted in the process. No map projection can preserve shapes of larger regions. Equal area projections preserve the area of displayed features. To do this, the other properties—shape, angle, and scale—are distorted. In equal area projections, the meridians and parallels may not intersect at right angles. In some instances, especially maps of smaller regions, shapes are not distorted, and distinguishing an equal area projection from a conformal projection is difficult unless documented or measured. Equidistant projections preserve the distances between certain points. Scale is not maintained correctly by any projection throughout an entire map; however, there are, in most cases, one or more lines on a map along which scale is maintained correctly. Most equidistant projections have one or more lines for which the length of the line on a map is the same (at map scale) as the same line on the globe, regardless of whether it is a great or small circle or straight or curved. Such distances are said to be true.

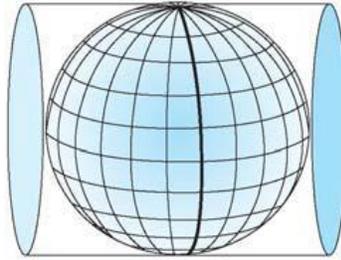
For example, in the Sinusoidal projection, the equator and all parallels are their true lengths. In other equidistant projections, the equator and all meridians are true. Still others (e.g., Two-Point Equidistant) show true scale between one or two points and every other point on the map. Keep in mind that no projection is equidistant to and from all points on a map. True-direction projections The shortest route between two points on a curved surface such as the earth is along the spherical equivalent of a straight line on a flat surface. That is the great circle on which the two points lie. True-direction, or azimuthal, projections maintain some of the great circle arcs, giving the directions or azimuths of all points on the map correctly concerning the centre. Some true-direction projections are also conformal, equal area, or equidistant

### ***Cylindrical projection***

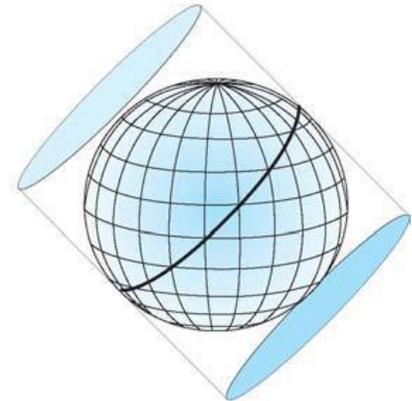
Like conic projections, cylindrical projections can also have tangent or secant cases. The Mercator projection is one of the most common cylindrical projections, and the equator is usually its line of tangency. Meridians are geometrically projected onto the cylindrical surface, and parallels are mathematically projected. This produces particular angles of 90 degrees. The cylinder is cut along any meridian to produce the final cylindrical projection. The meridians are equally spaced, while the spacing between parallel lines of latitude increases toward the poles. This projection is conformal and displays true direction along straight lines. On a Mercator projection, rhumb lines, lines of constant bearing, are straight lines, but most great circles are not. For more complex cylindrical projections the cylinder is rotated, thus changing the tangent or secant lines. Transverse cylindrical projections such as the Transverse Mercator use a meridian as the tangential contact or lines parallel to meridians as lines of secancy. The standard lines then run north-south, along which the scale is true. Oblique cylinders are rotated around a great circle line located anywhere between the equator and the meridians. In these more complex projections, most meridians and lines of latitude are no longer straight. In all cylindrical projections, the line of tangency or lines of secancy have no distortion and thus are lines of equidistance. Other geographical properties vary according to the specific projection.



Normal



Transverse



Oblique

### ***Planar projection***

Planar projections project map data onto a flat surface touching the globe. A planar projection is also known as an azimuthal projection or a zenithal projection. This type of projection is usually tangent to the globe at one point but maybe secant, also. The point of contact may be the North Pole, the South Pole, a point on the equator, or any point in between. This point specifies the aspect and is the focus of the projection. The focus is identified by a central longitude and a central latitude. Possible aspects are polar, equatorial, and oblique.

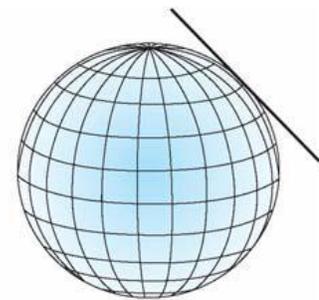
Polar aspects are the simplest form. Parallels of latitude are concentric circles centered on the pole, and meridians are straight lines that intersect with their true angles of orientation at the pole. In other aspects, planar projections will have particular angles of 90 degrees at the focus. Directions from the focus are accurate. Great circles passing through the focus are represented by straight lines; thus the shortest distance from the center to any other point on the map is a straight line. Patterns of area and shape distortion are circular about the focus. For this reason, azimuthal projections accommodate circular regions better than rectangular regions. Planar projections are used most often to map Polar Regions. Some planar projections view surface data from a specific point in space. The point of view determines how the spherical data is projected onto the flat surface. The perspective from which all locations are viewed varies between the different azimuthal projections. The perspective point may be the center of the earth, a surface point directly opposite from the focus, or a point external to the globe as if seen from a satellite or another planet.



Polar



Equatorial

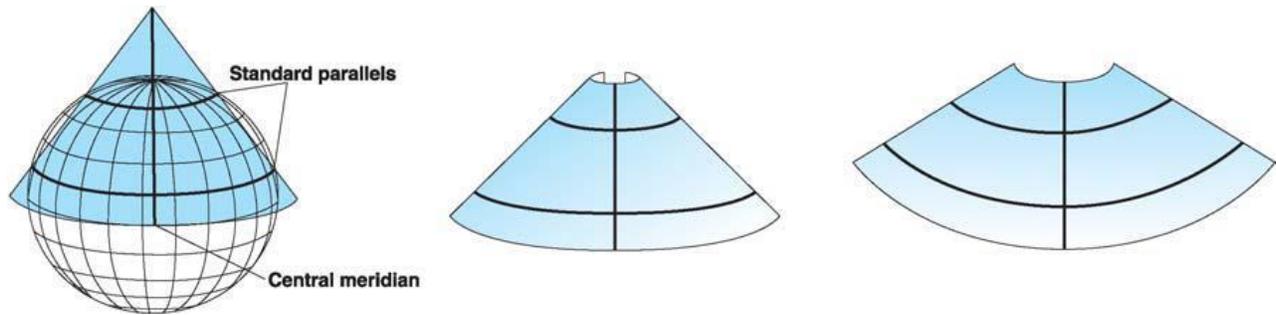


Oblique

### ***Conical projection***

The simplest conic projection is tangent to the globe along a line of latitude. This line is called the standard parallel. The meridians are projected onto the conical surface, meeting at the apex, or point, of the cone. Parallel lines of latitude are projected onto the cone as rings. The cone is then

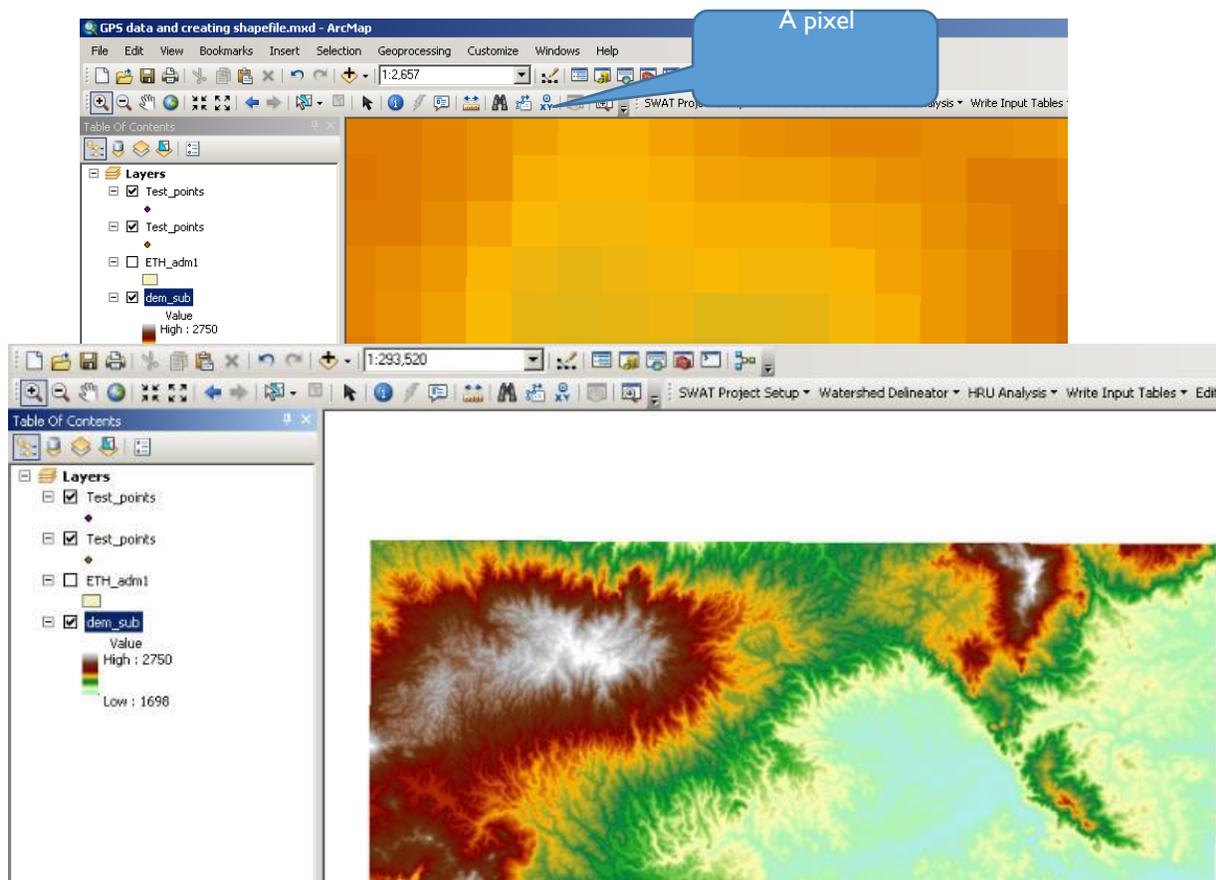
cut along any meridian to produce the final conic projection, which has straight converging lines for meridians and concentric circular arcs for parallels. The meridian opposite the cut line becomes the central meridian. In general, the further you get from the standard parallel, the more distortion increases. Thus, cutting off the top of the cone produces a more accurate projection. You can accomplish this by not using the polar region of the projected data. Conic projections are used for mid-latitude zones that have an east-west orientation.



## 5.9 Geospatial Data Models And Sources

### 5.9.1 Raster and Vector Data Models

Real-world objects such as land uses, roads, water bodies, altitude, temperature, rainfall, are represented using different data models. These data can be generally of two types: discrete objects (eg. buildings) and continuous field (eg. altitude, rainfall amount). Two data models are used in GIS for both discrete and continuous abstractions: these are, **Raster** and **Vector**. Raster is used to represent continuous layers, such as altitude, rainfall amount, etc. Rasters are most commonly used for the storage of satellite images and aerial photographs. In raster data format each object is represented in the form of a cell/grid called pixel.



**Vector** data represent different geographical in different types of geometry: point, line and polygon.

**Points-** are the dimensionless vector data model, and are suitable for representing features at single point. For example, meteorological stations, soil sample points, etc.

**Lines or polylines** are one-dimensional vector data, which are used for linear features such as roads, and rivers.

**Polygons:** are two-dimensional polygons, which are used for geographical features that cover a particular area. Examples are watersheds, administrative boundaries, and lakes.

### **Other important data in GIS**

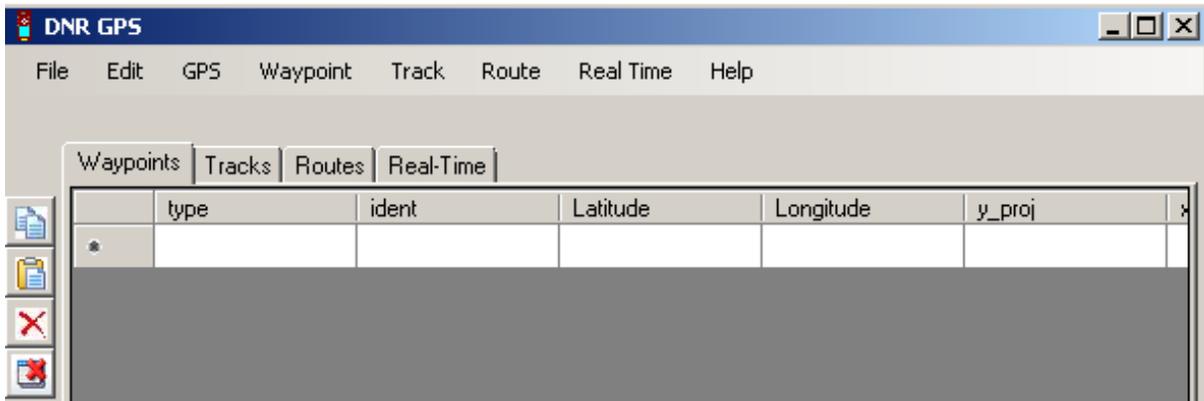
**Tabular data** (also called attribute data): are among of the most important elements in a GIS. These include both quantitative and qualitative data that can be used in spatial analyses.

**Metadata:** is data about the data. It gives information about the content, quality, use and origin of the data.

## **5.9.2 Sources of Spatial Data**

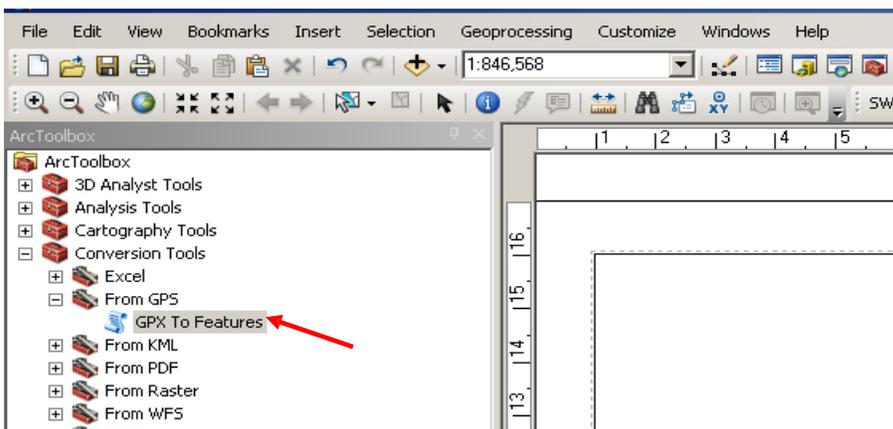
Spatial data can be collected using Global Positioning System (GPS) device. GPS is a set of satellites and ground stations. A GPS device calculates its location using signals received from the satellites.

Funded and supported by the United States government, GPS has widespread use for both military and civilian applications. After collecting data, connect the device to your PC using GPS data cable. Download DNR GPS software to transfer the data to your PC.



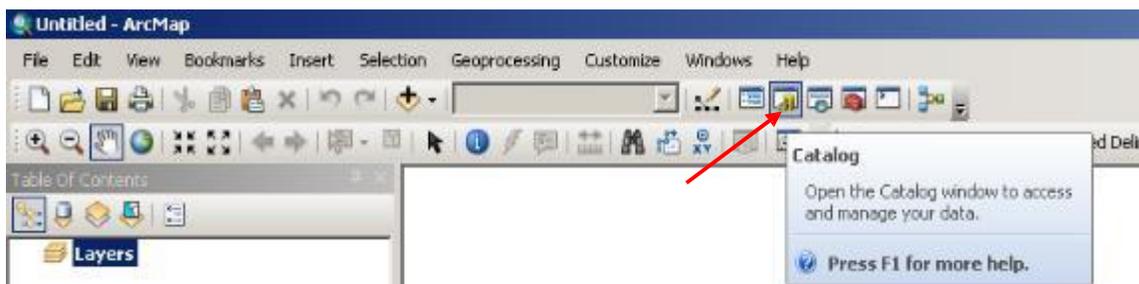
Garmin GPS saves the data in .GPX format. In order to convert the GPX to .shp format (ArcMap native shape file format):

**ArcToolbox > Conversion Tool > From GPS > GPX to Features**



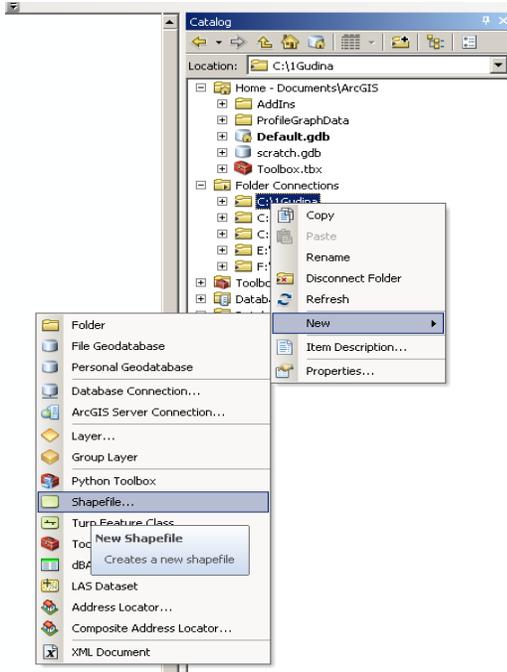
## ii. Creating new shape file

Open ArcCatalog from within ArcMap



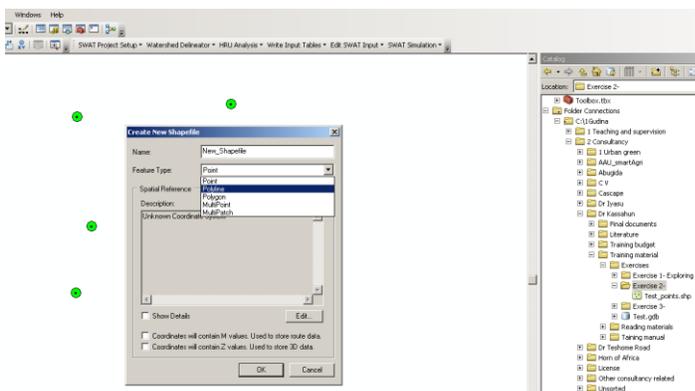
For example, assume that you want to create a polygon showing the boundary of a village after marking the boundaries using GPS. To create **polygon** using the GPS **point** data (need to be converted from GPX to the shape-file format as described above):

- **Right click on your working directory > New > Shapefile >**

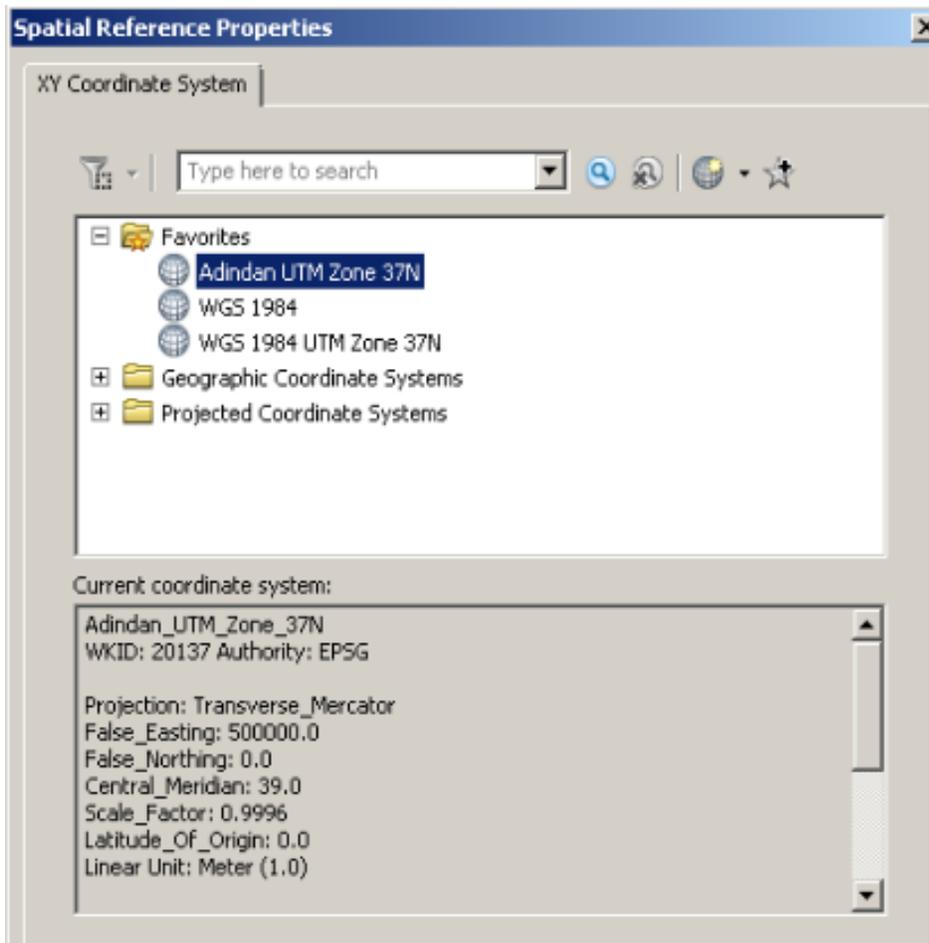


Change the **Name** (default is New\_Shapefile) to something meaningful, for example **'Boundary\_of\_village\_xyz'**.

- Change the **Feature Type** to **Polygon** (default is **Point**)

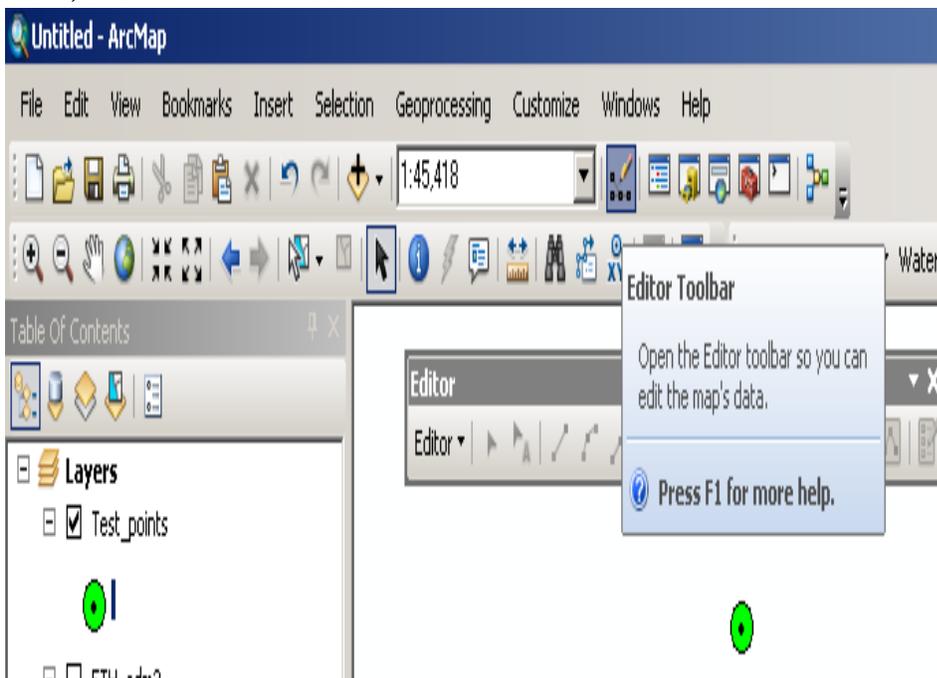


- Select appropriate Coordinate system (default is **Unknown Coordinate System**) by clicking on **Edit**. For example, you can select project coordinate system such as **Adindan\_UTM\_Zone\_37N** by clicking on the folders **Projected Coordinate System > UTM > Africa**, then selecting **zone 37N**.

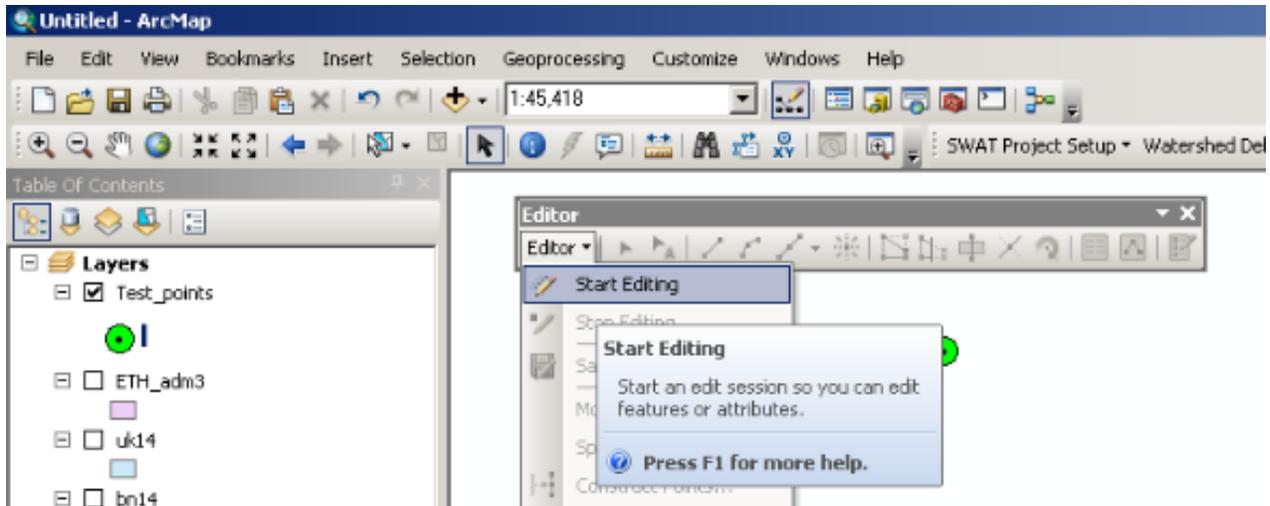


Finally, click **Ok**

Now, click on **Editor Toolbar**



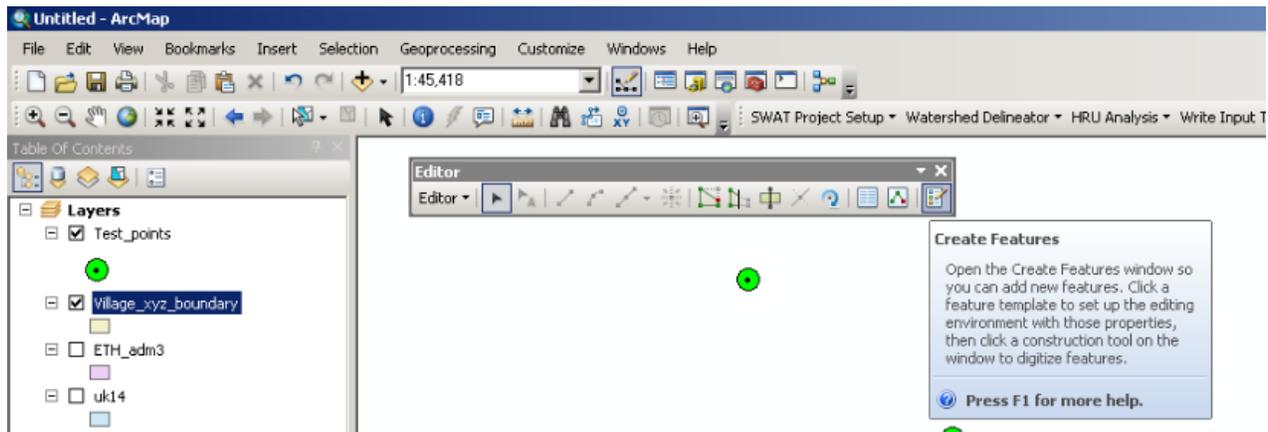
Click on the drop-down arrow and select **Start Editing**



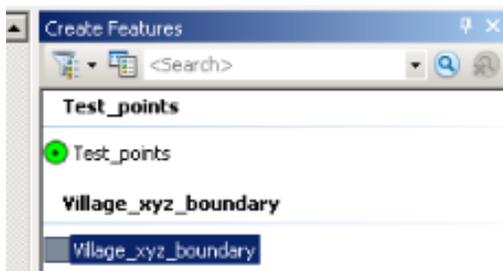
Select the new polygon file you created

'**Village\_xyz\_boundary**'. Click on Create Features from the

**Editor Toolbar**

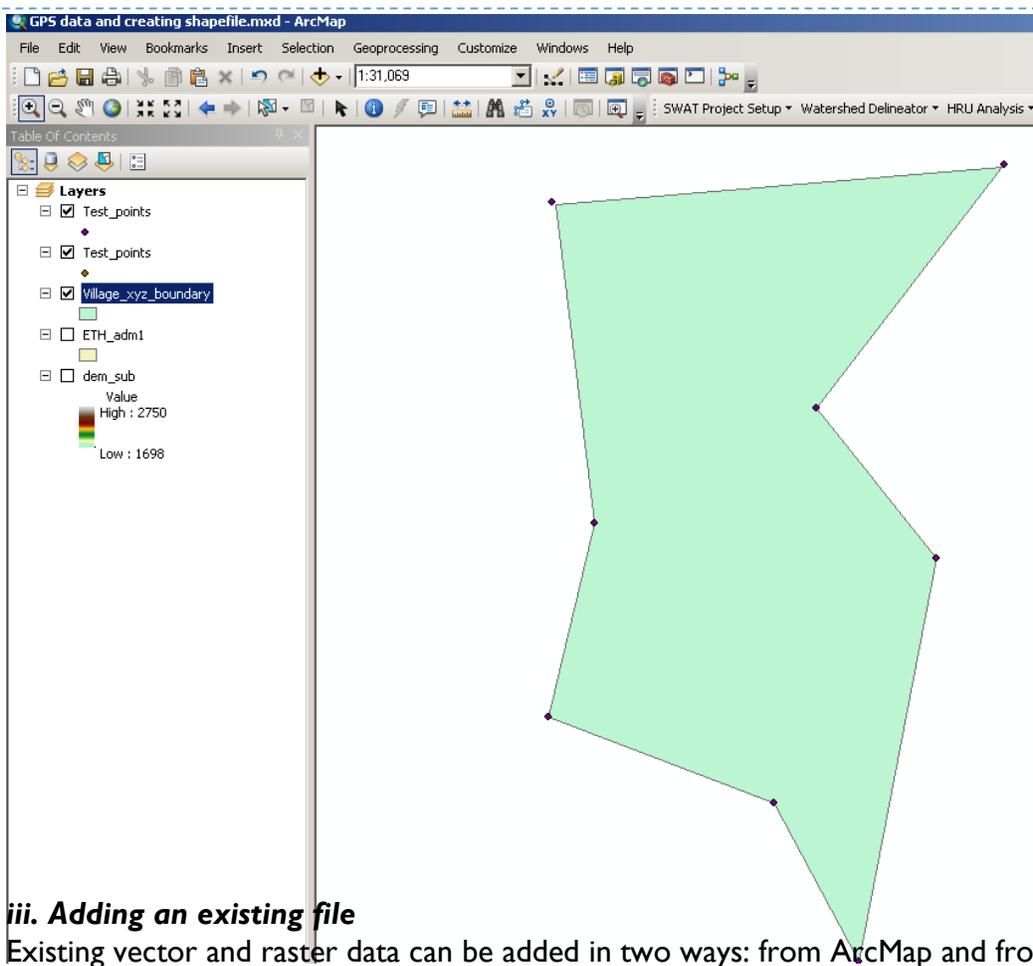


- The name of the file will be displayed on the Create Features window on the right-hand side. Then click on that file name (**Village\_xyz\_boundary**). Then at the bottom of the same window, under **Construction Tools**, click on **Polygon**





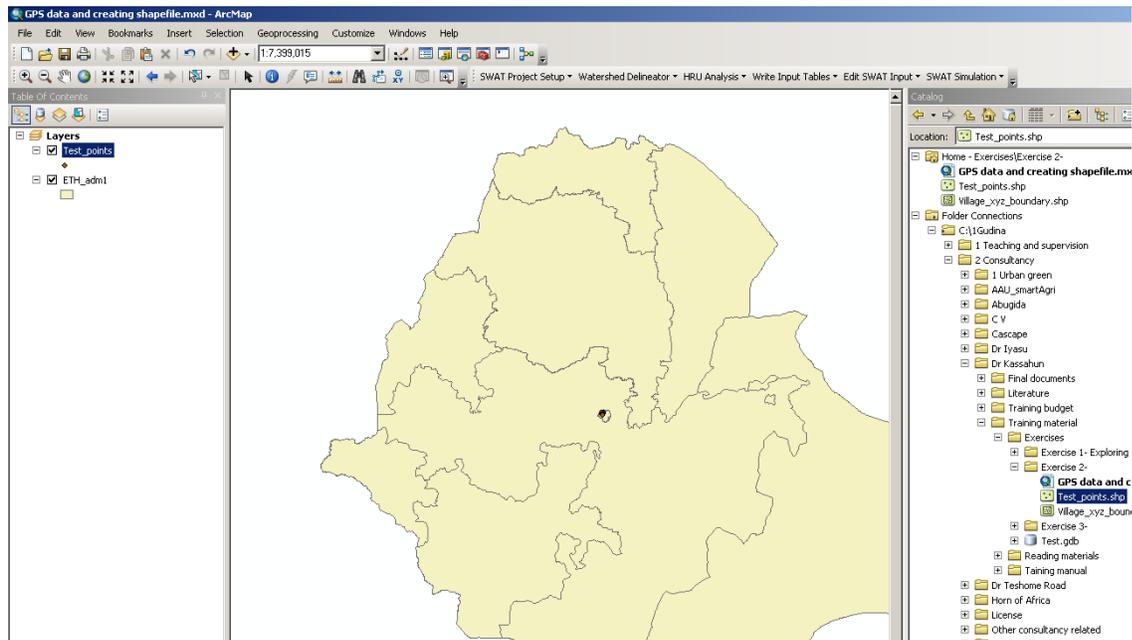
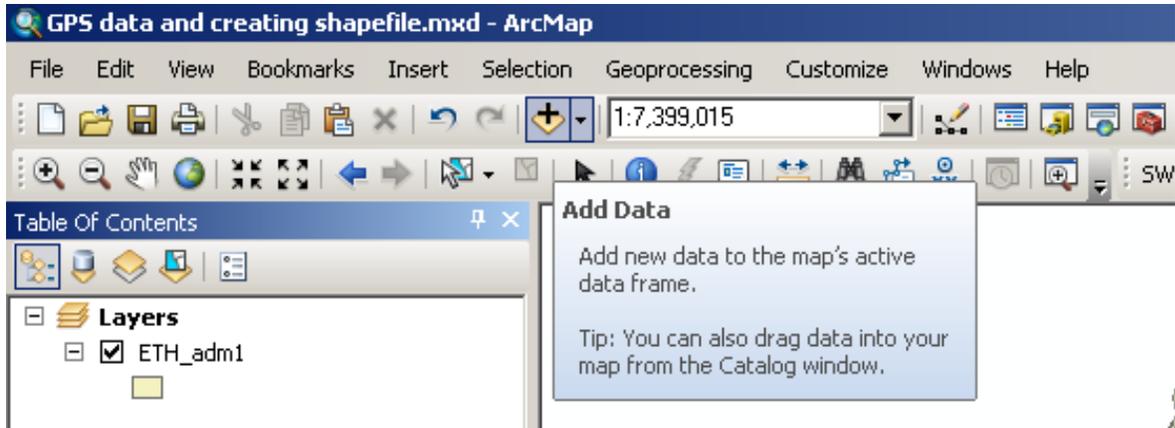
- Move the cursor over the point data, note that the cursor has changed to + sign. Now, you are ready to begin sketching your polygon by connecting the points. To finish the sketch, double click on the last vertex.
- Click on the dropdown arrow next to **Editor**, click **Save Edits**, then **Stop Editing**.



### iii. Adding an existing file

Existing vector and raster data can be added in two ways: from ArcMap and from ArcCatalog:

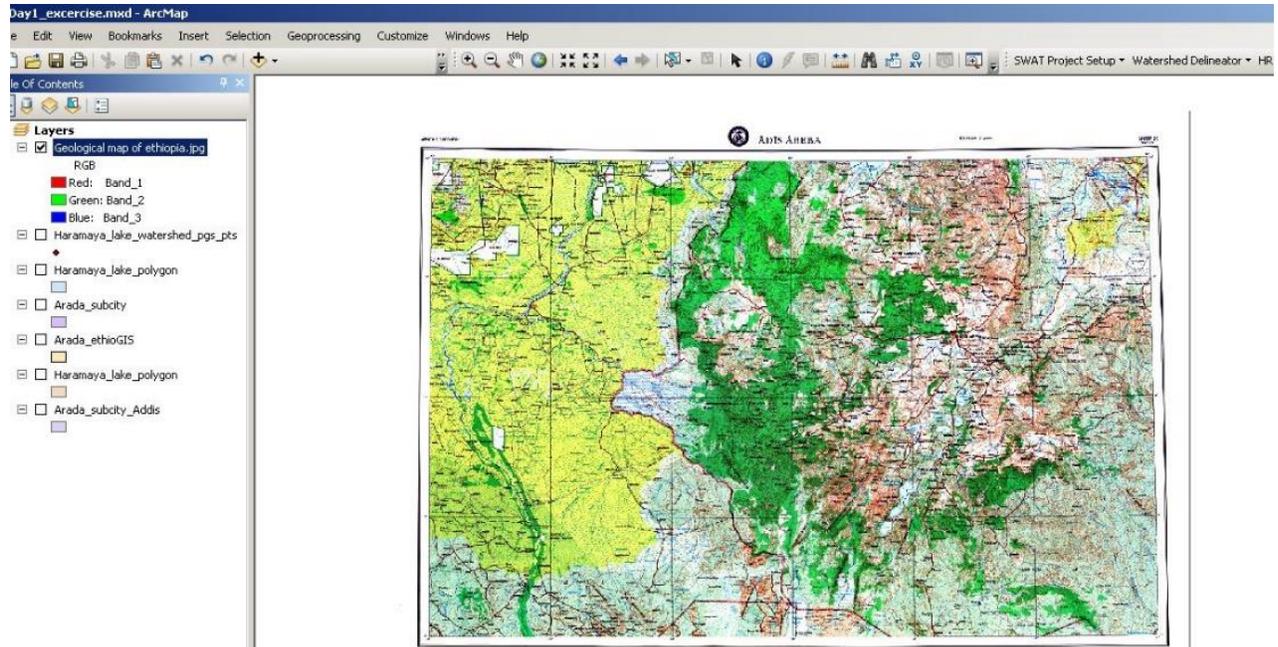
- From ArcMap: Click on **Add Data**. Navigate to your working director, and select the file you want to add.
- From ArcCatalog: Open ArcCatalog, navigate to your working director, select the file, drag and drop to data frame of Arcmap.



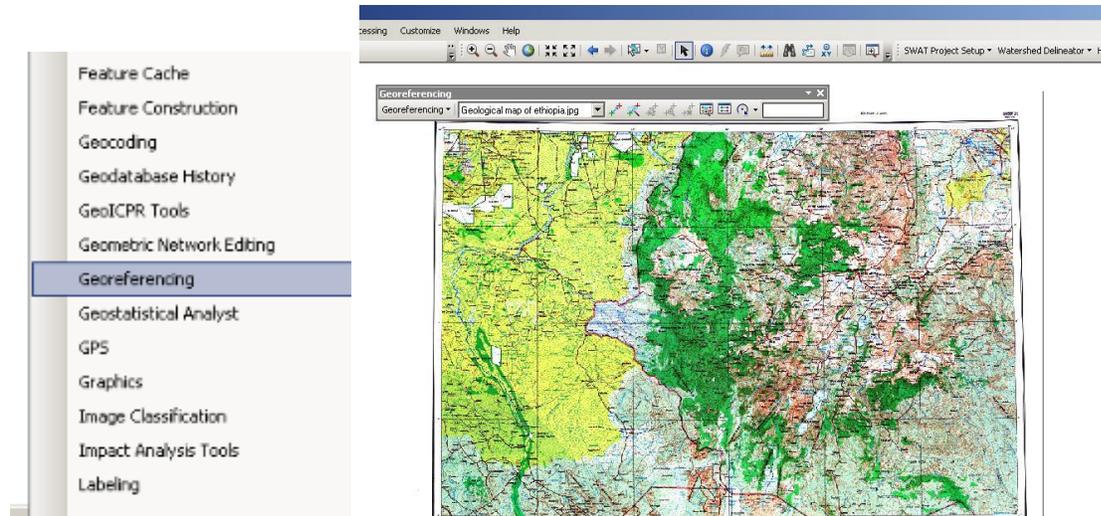
#### ***iv. Georeferencing and digitizing***

Sources of geographic data can also be scanned maps and photographs, which are not georeferenced. Assume you have a paper version of Ethiopian geological map. You need to scan it or take photo of it, and georeferenced so that you convert the paper version into GIS data.

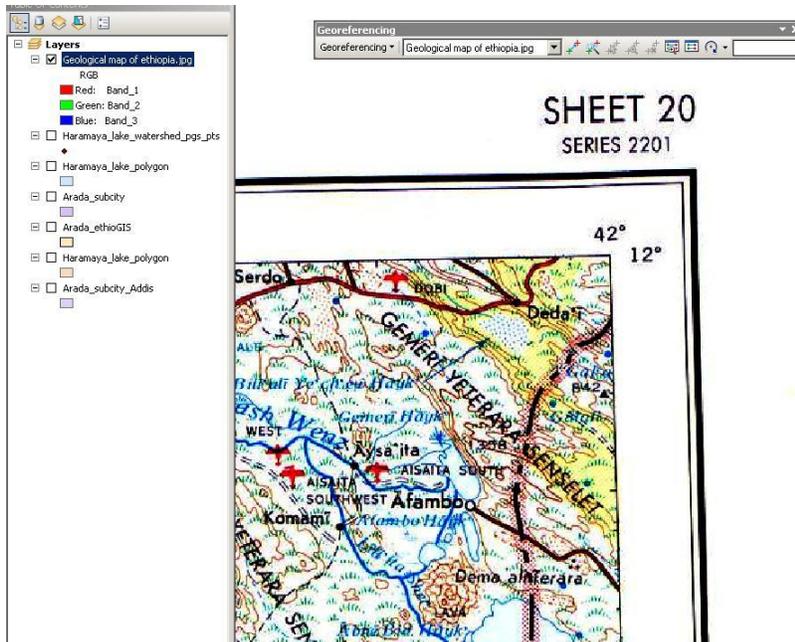
- Add scanned geology map of Ethiopia



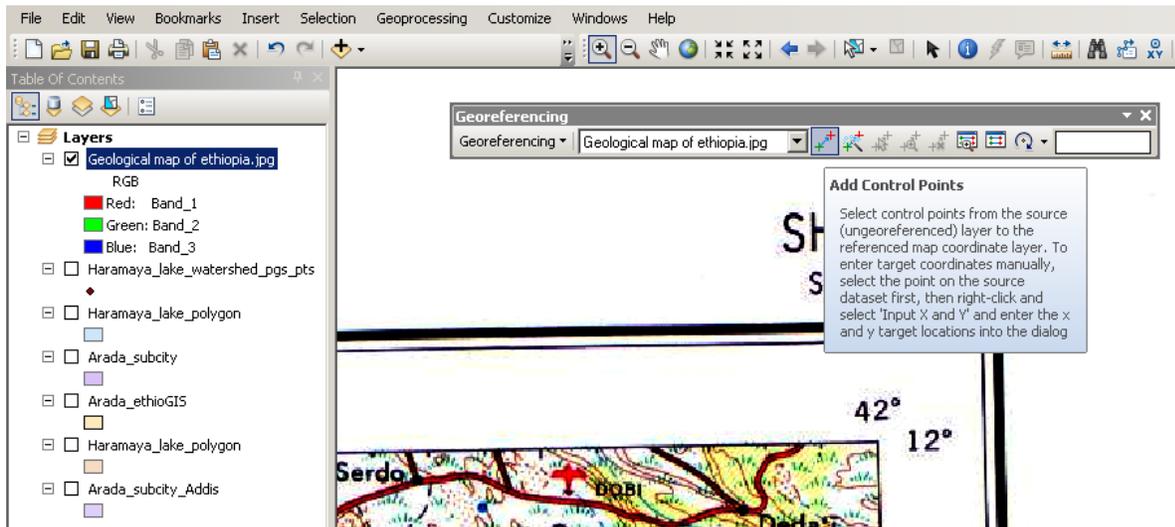
Right click on empty space of menu bar > Georeferencing



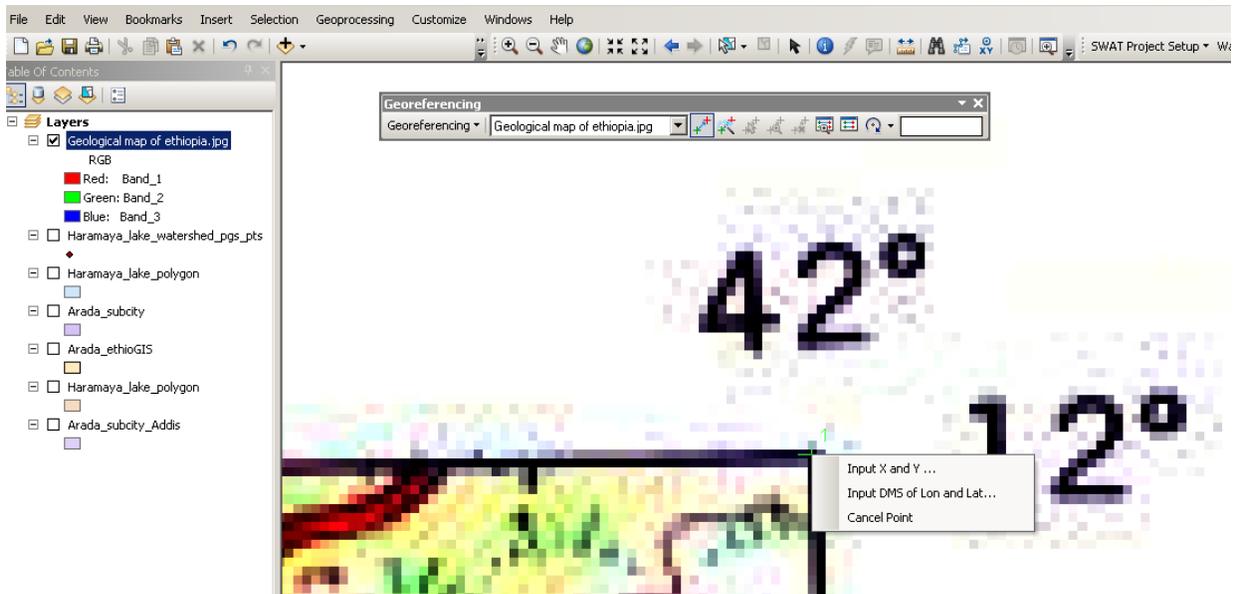
Zoom in to top right corner of the scanned document and note the coordinate of the intersection of x and y axes (42 long and 12 lat). Similarly zoom in to each the four corners and see the coordinates.



Go to the Georeferencing tool bar and click on **Add Control Points**



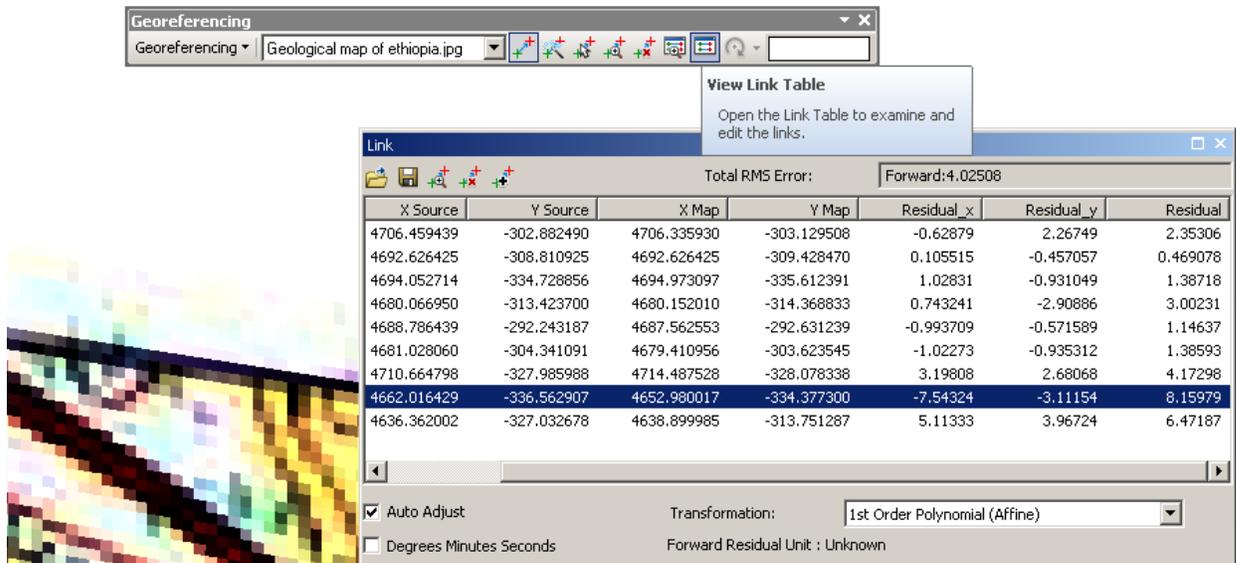
Click on the intersection corner of 42 E and 12 N, click on **Input X and Y**



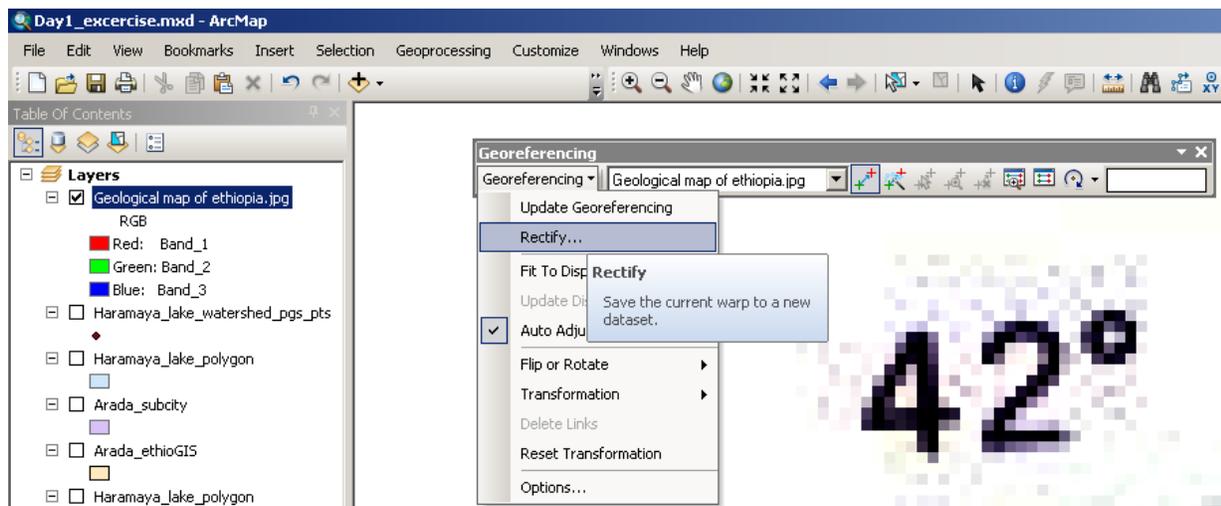
- In the X box, write 42, and in the Y write 12, then click **Ok**



- Repeat same procedure to collect more control points at all corners and some points at multiple locations inside the map.
- Inspect the magnitude of error by clicking on **View Link Table**. RMS error should be minimal, if the error is large, identify the control point which is causing the largest error and remove it, then take another control point. Examine the improvements in terms of minimizing RMS error.



- After collecting at least four control points, click on a drop down arrow next to the **Georeferencing** tool and click **Rectify**, then save the georeferenced raster.



## v. Satellite imagery

Remotely sensed satellite imagery are very important sources of geospatial data. Some of imagery are free and others are commercial.

Examples of free earth observation and weather satellite imagery

- Landsat 1-8
- MODIS Aqua and Terra
- Sentinel
- TRMM

Examples of commercial satellite data

- Ikonos
- Quickbird
- Lidar and Radar data from different sensors and platforms

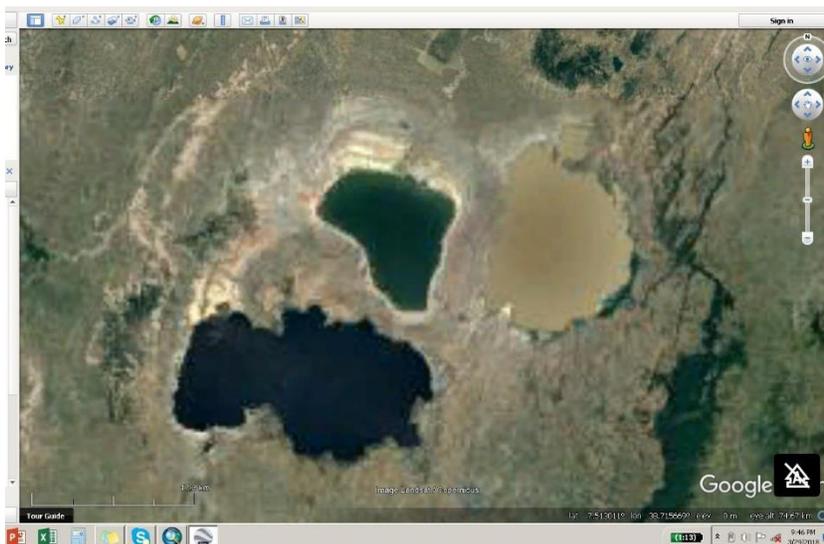
Access to free satellite imagery and other data

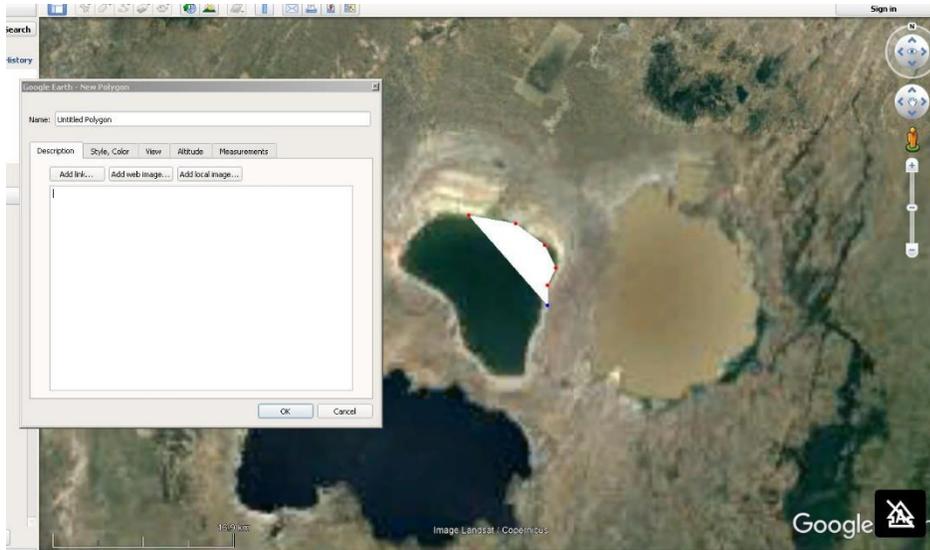
- Go to the [earthexplorer.usgs.gov](http://earthexplorer.usgs.gov), create an account, search for free satellite data such  
Landsat and DEM, download the data

**vi. Google earth**

High spatial resolution imagery are made available to the public through Google Earth ®

- Creating points, lines and polygons through online digitizing
- Download Google Earth, open it, type in the name of location of your interest inside search box, Google Earth will automatically zoom into your area of interest
- Identify feature of your interest, example, road connecting Bishoftu and Dukem, boundary of Lake Langano, boundary of a particular forest, etc.
- Digitize point, lines and polygon,

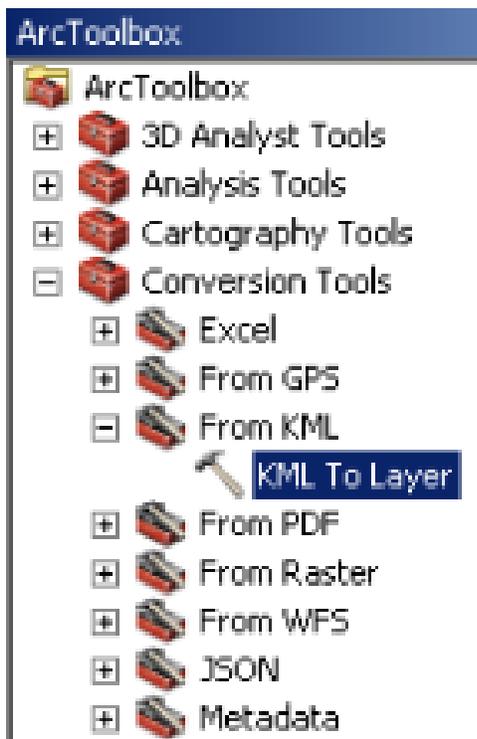




Save the digitized polygon. The files will be saved in kmz/kml file format. ArcGIS has tool that can convert the kmz/kml to shp file.

Convert the kmz/kml by:

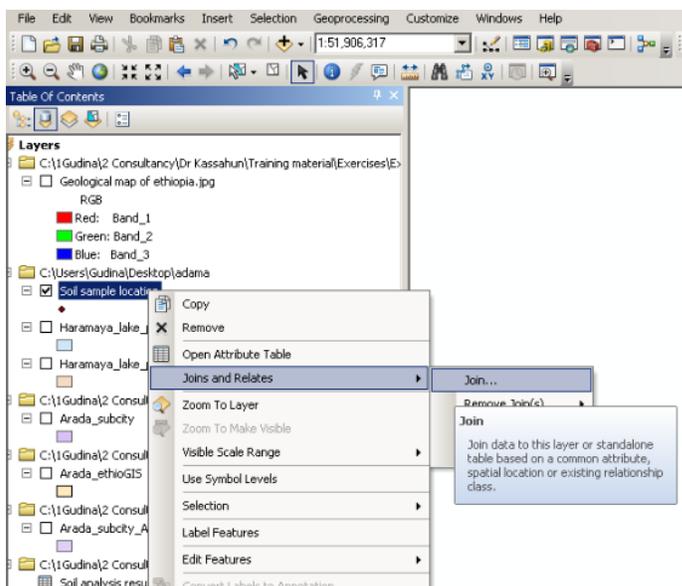
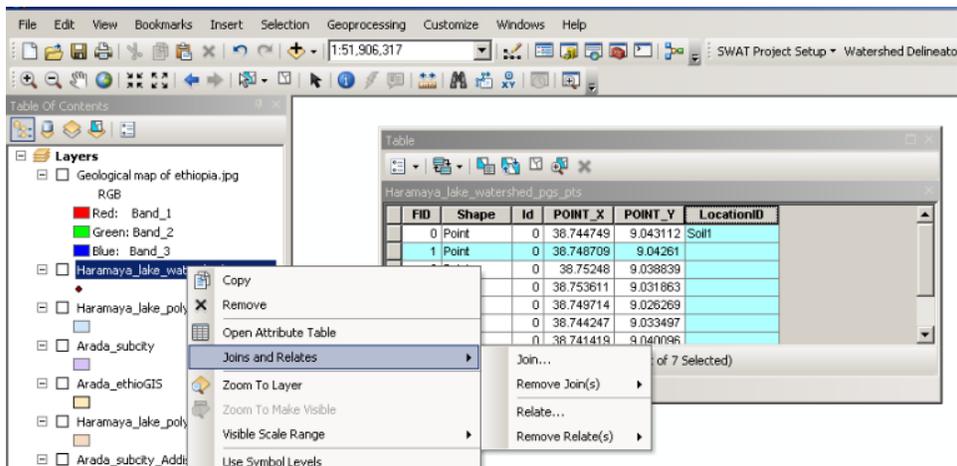
*Clicking Toolbox > Conversion Tools > From KML To Layer*



## 5.10 Data Management

### 5.10.1 Attribute Table

Quantitative and qualitative data associated with geographic location, eg soil properties at location x, rainfall amount at met station y. Assume you have collected soil samples at 5 locations and characterized pH, OM, and N. It is highly likely that you collect the sample, give it sample id, and send it to a lab. If you want to map result of these soil properties, you have to perform Join and Relates. Add the soil analysis result spreadsheet, eg excel sheet to arcmap (Add data), then link it with point shape file using **Join and Relates**



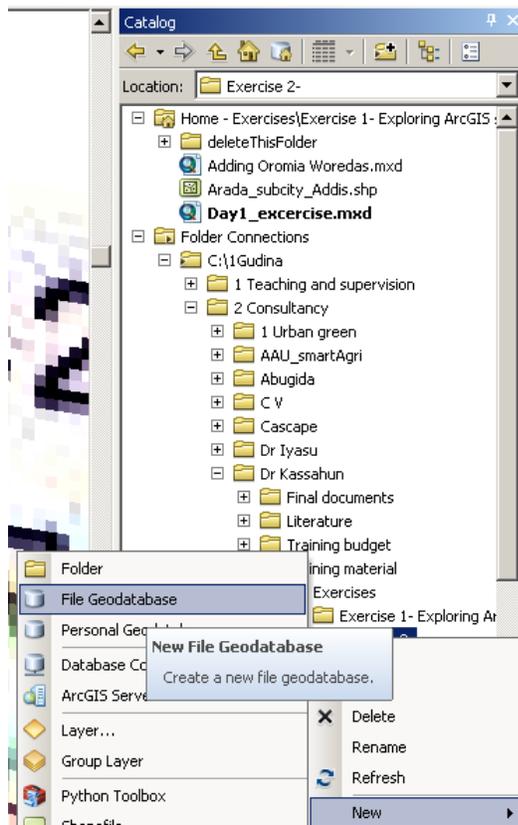
## 5.11 Building Geodatabase

ArcGIS geodatabase is a collection of geographic datasets of various types held in a common file system folder, a Microsoft Access database, or a multiuser relational DBMS (such as Oracle, Microsoft SQL Server, PostgreSQL, Informix, or IBM DB2). Geodatabases come in many sizes, have varying numbers of users and can scale from small, single-user databases built on files up to larger

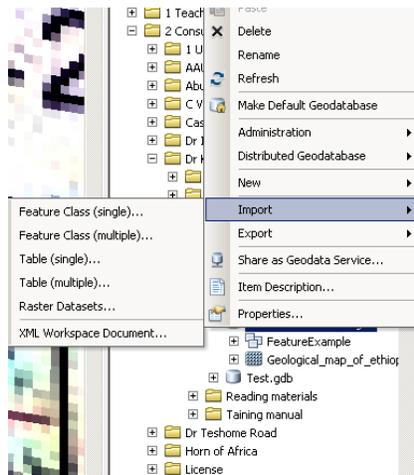
workgroup, department, and enterprise geodatabases accessed by many users.

It is the physical store of geographic information, primarily using a database management system (DBMS) or file system. You can access and work with this physical instance of your collection of datasets either through ArcGIS or through a database management system using SQL.

Geodatabases have a comprehensive information model for representing and managing geographic information. This comprehensive information model is implemented as a series of tables holding feature classes, raster datasets, and attributes. In addition, advanced GIS data objects add GIS behavior; rules for managing spatial integrity; and tools for working with numerous spatial relationships of the core features, rasters, and attributes.



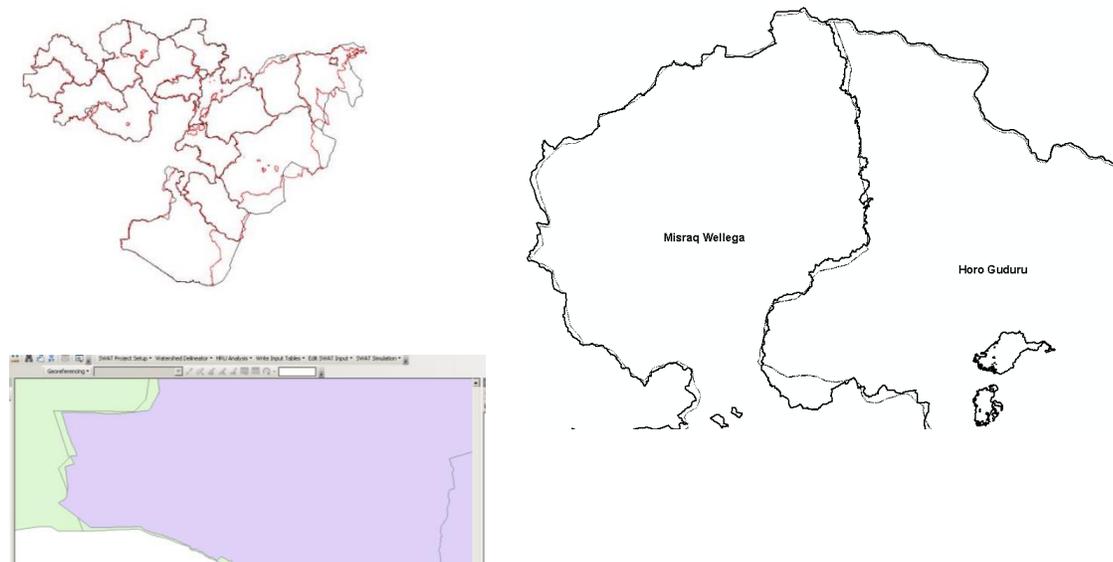
## Import files into geodatabase



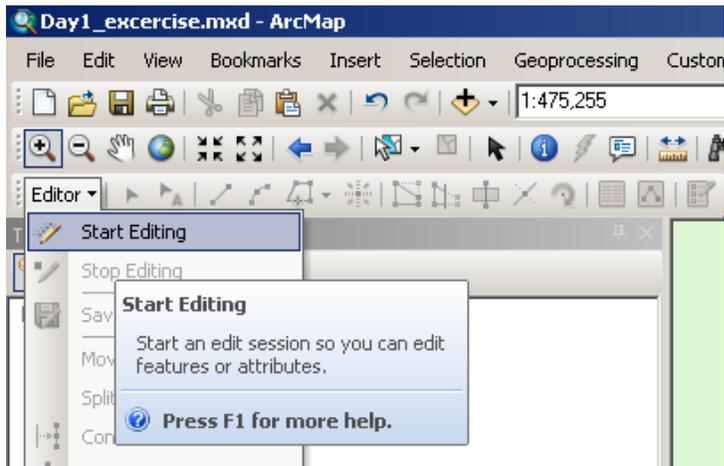
## 5.12 Chapter Four: Editing, Symbology And Map Layout

### 5.12.1 Editing shapefiles

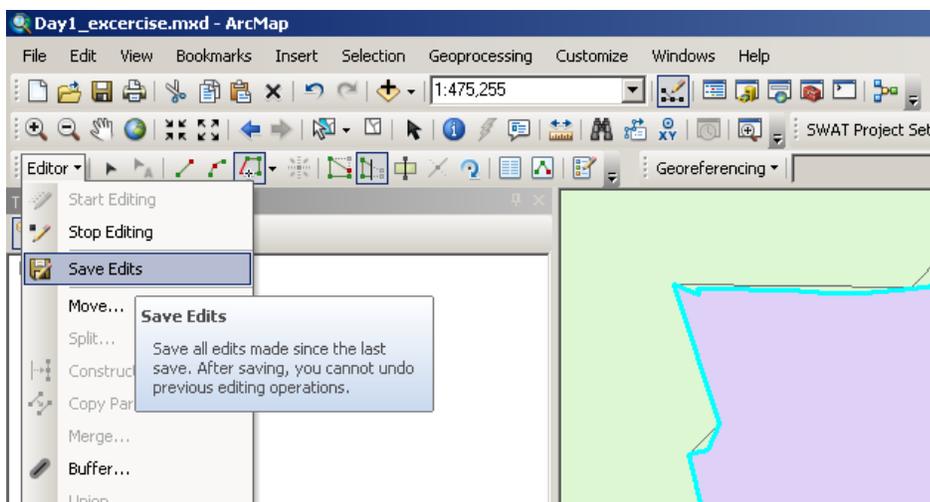
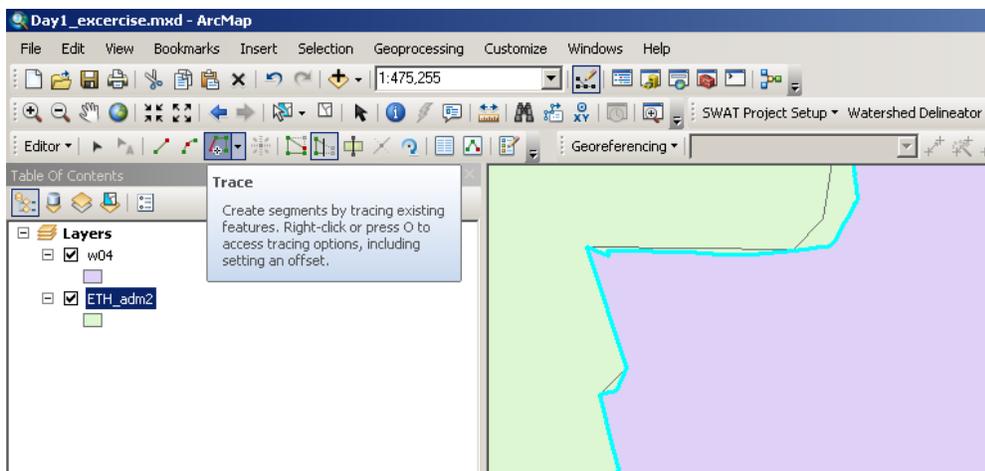
Often, maps from different sources may not match, hence editing could be important. For example, a thematic map showing soil properties of A woreda might not be matching with a map of land use of same woreda. In such cases, we may have to perform editing. The following shows mismatch between maps of Zones in Ethiopia



To edit, click on **Editor toolbar > Editor > Start Editing > click on the name of the file you want to edit > Ok**



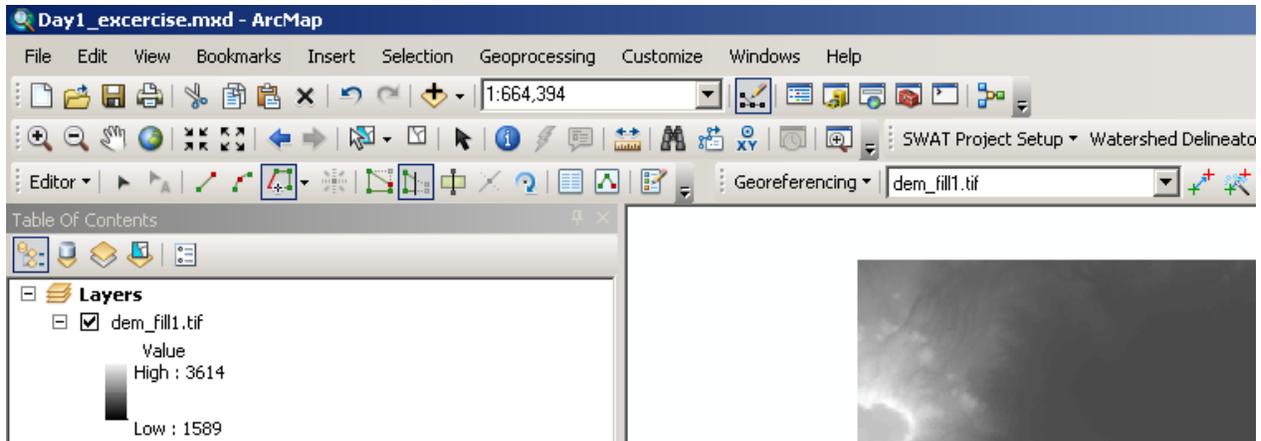
Select **Trace**,



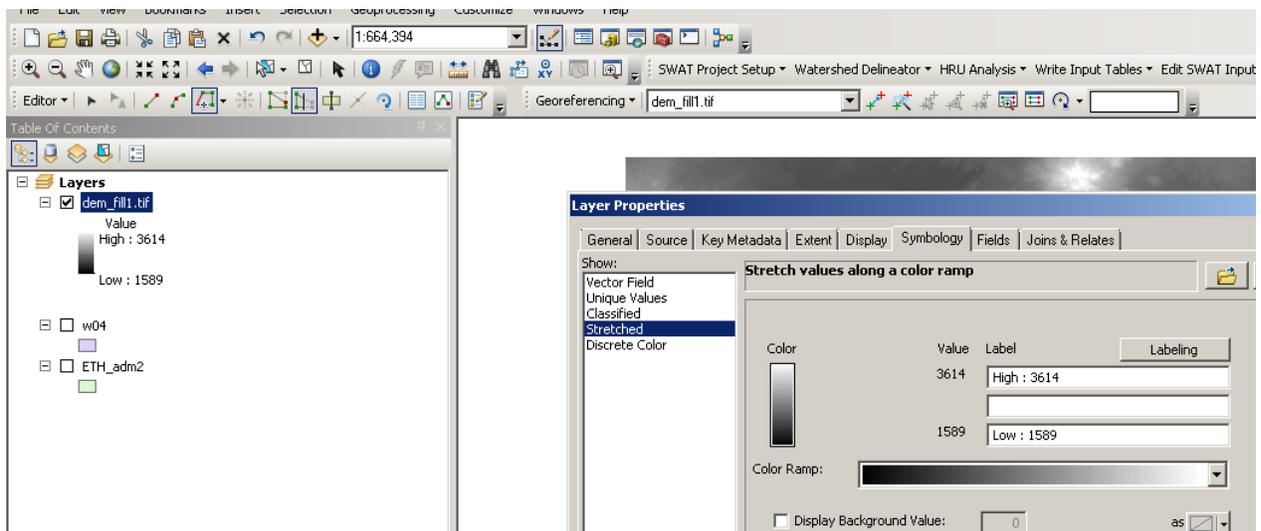
After finishing the edit, click **save** and Stop **Edit** to finish editing.

## 5.12.2 Symbology

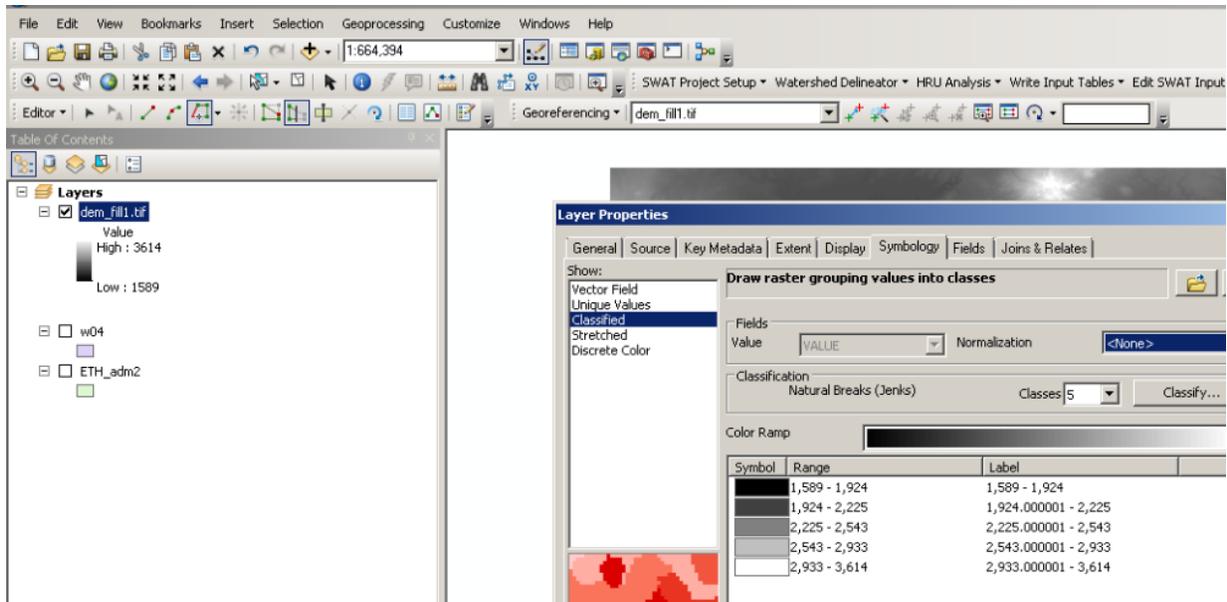
Open a DEM file



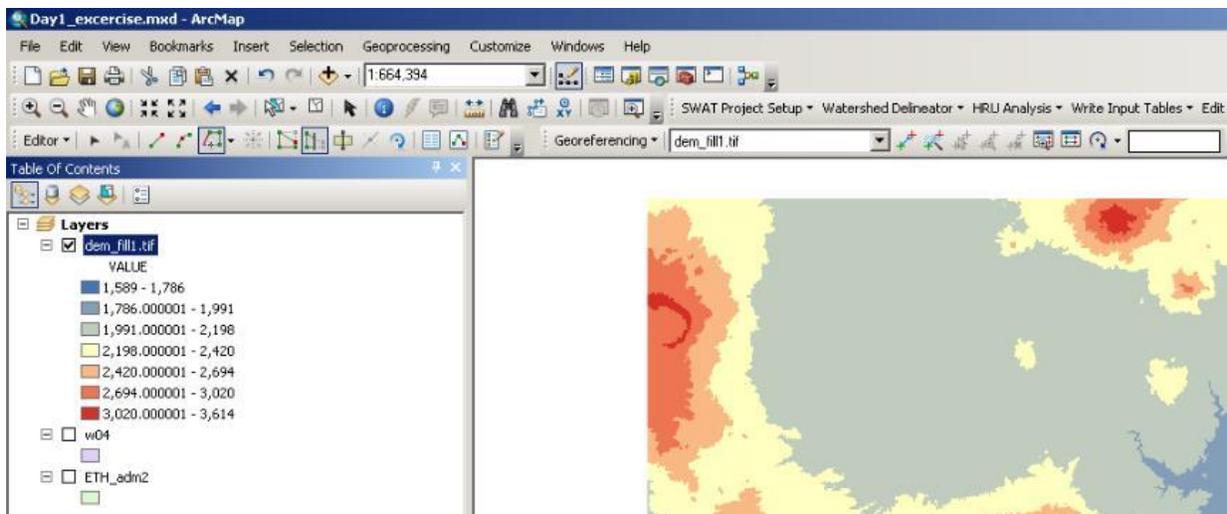
Note that the elevation is shown in grey scale. To change the symbology of this map, double click on the file, select **Symbology**



Select **Classified**

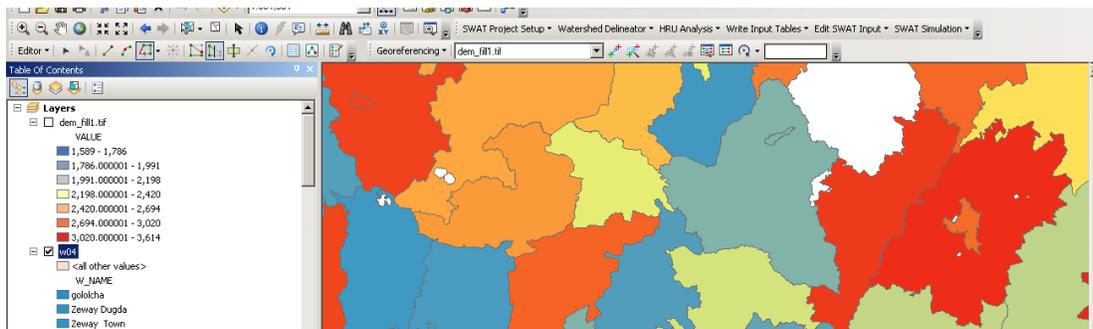
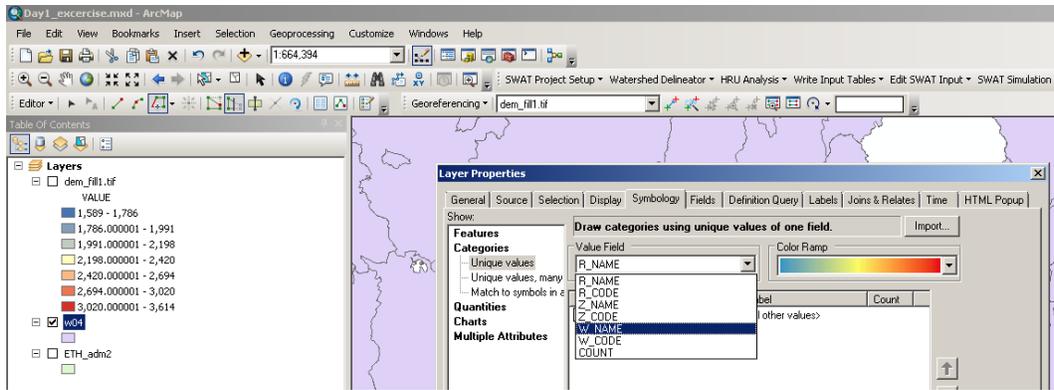


Specify the number of classes, select Color Ramp

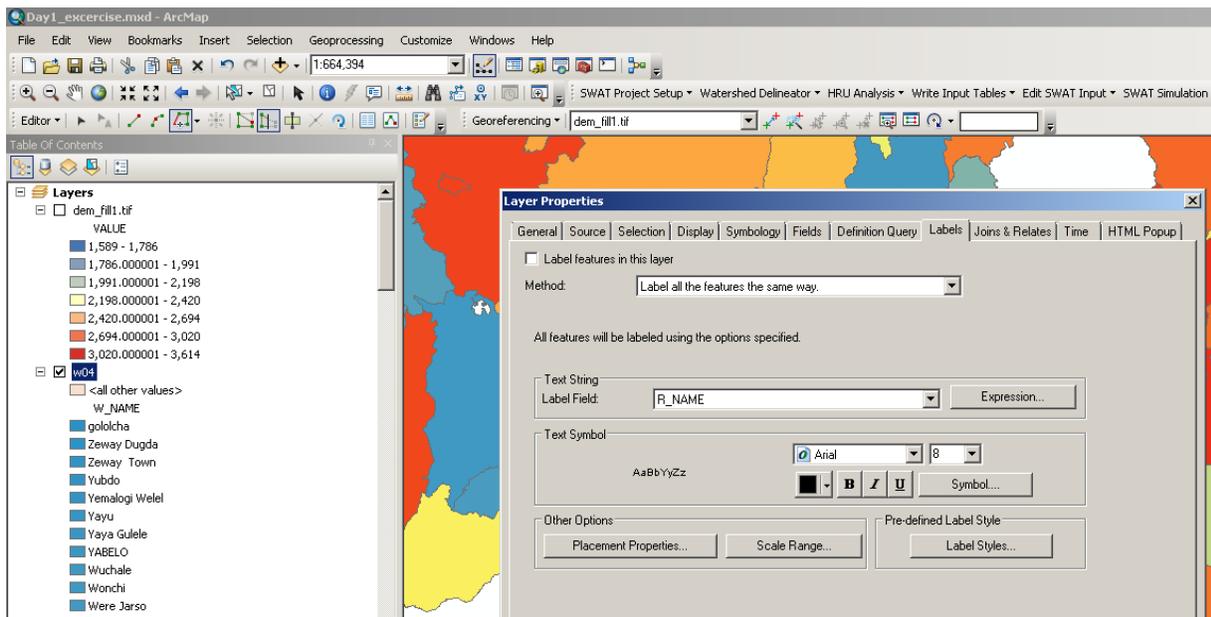


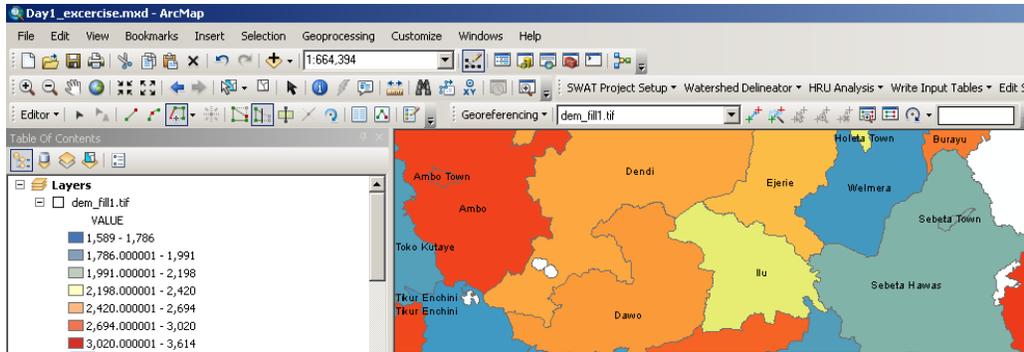
To change symbology of vector file, double click on the file, **Symbology, Category**, specify **Value**

**Field, Add All Values. Then select sy**



Label: Double click on the file name, **Label**, specify **Label Field**, tick to box **Label features in this layer**, then click **Ok**.



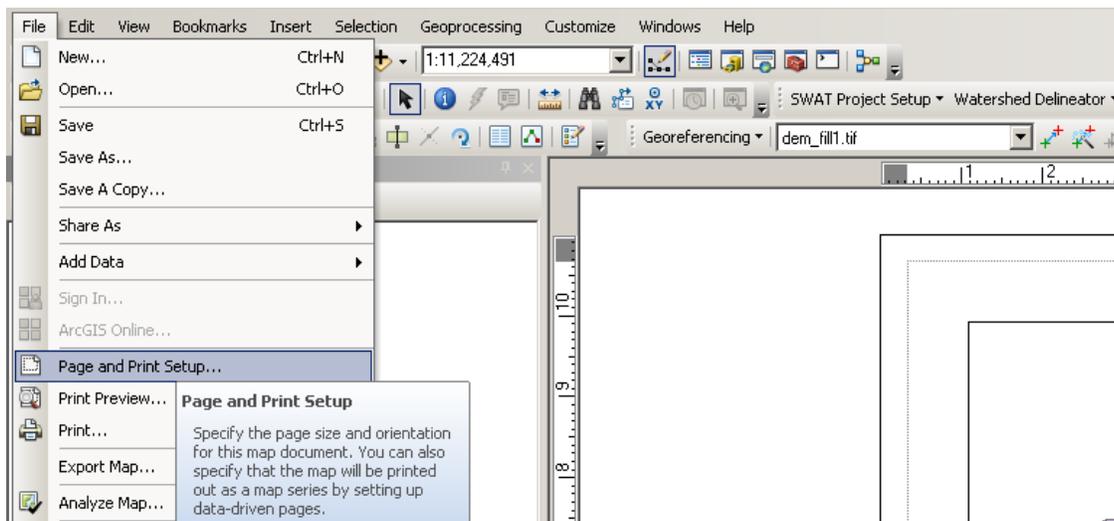


### 5.12.3 Cartography

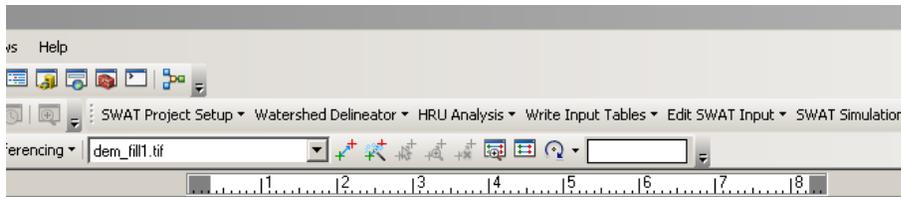
Open ArcMap, open files to be mapped, click on **Layout View**.



Go to **File, Page and print layout**

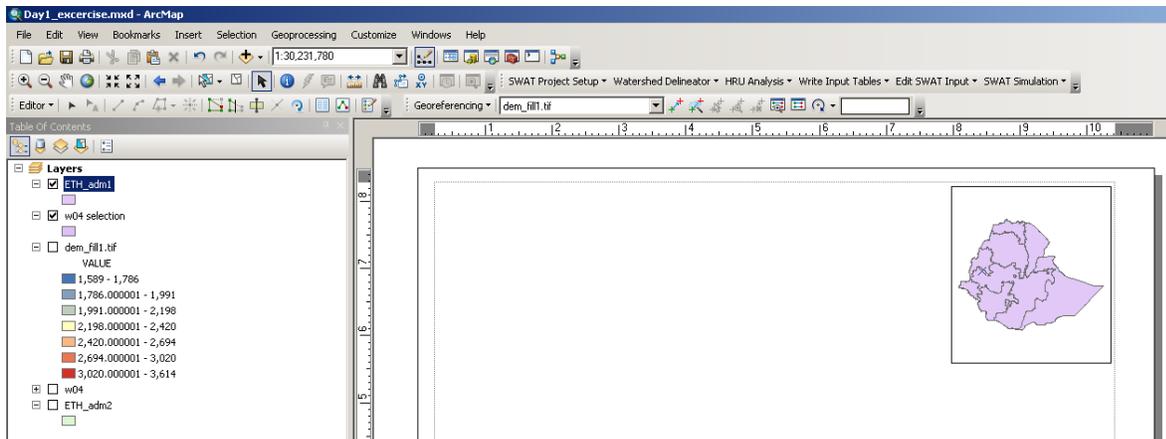


Select **Landscape**, then click **ok**



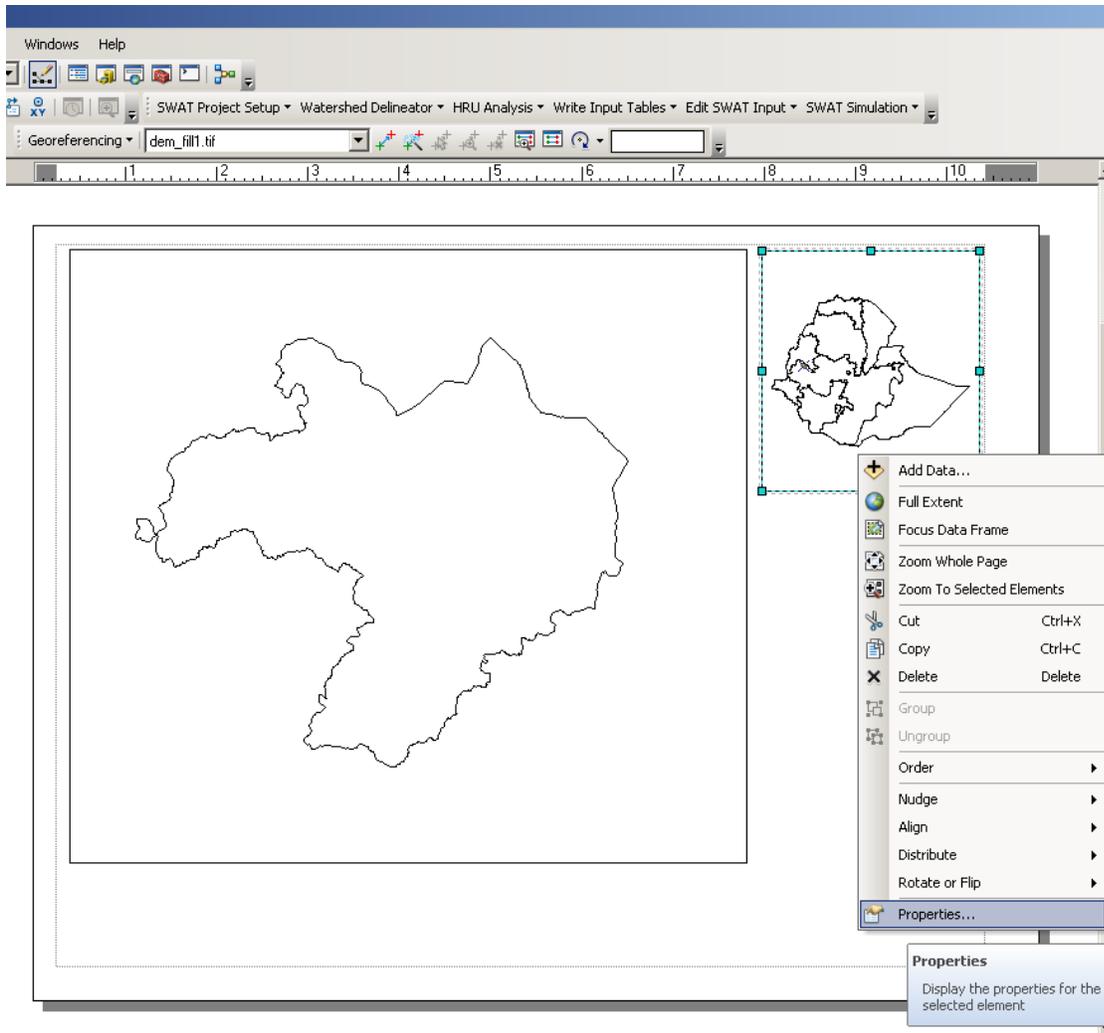
Resize the data frame

Move it to top right corner

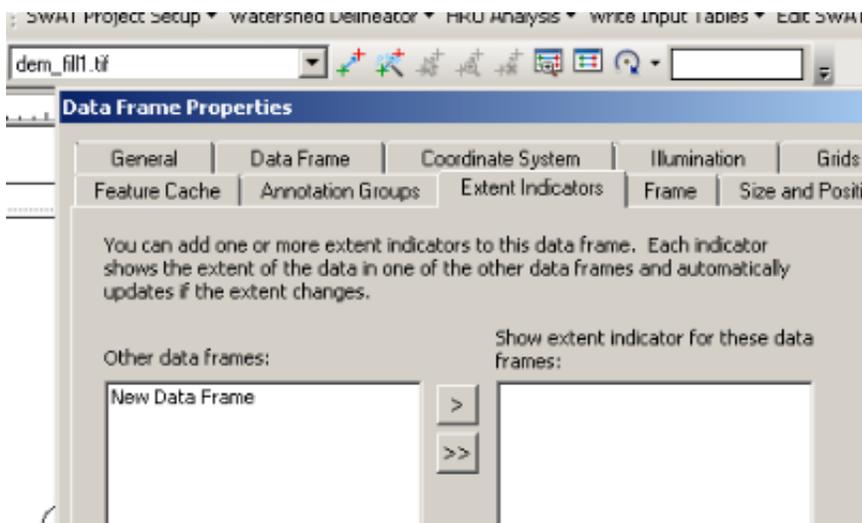


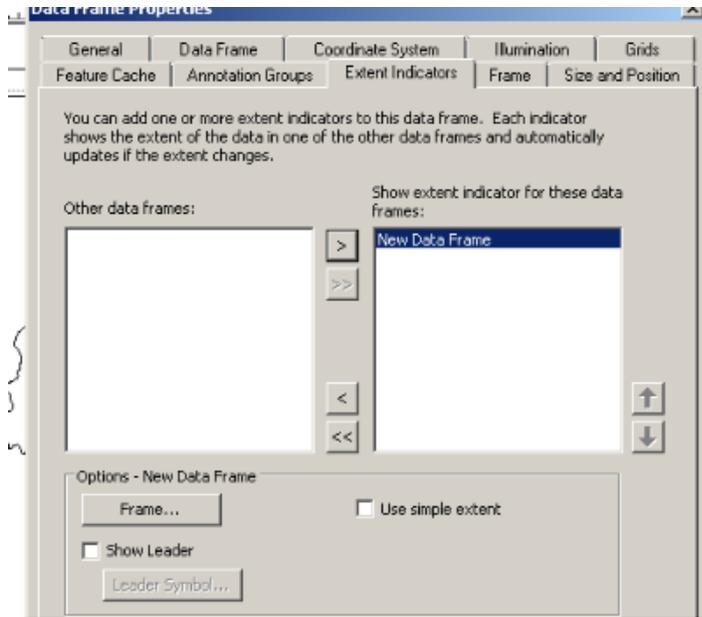
Go to **Insert, data frame**, then a new data frame will be added. Drag and drop the file you want to map into this data frame.

Right click on the overview map, properties

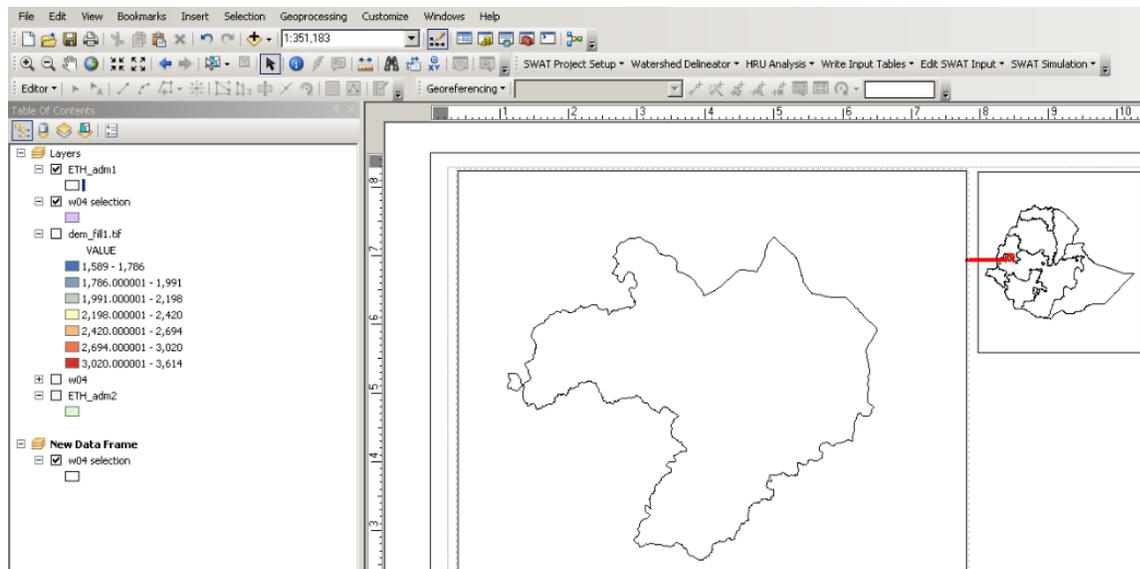


Extent indicator, select the name of the data frame, the extent of which you want to show on the overview map. Then click on the arrow pointing towards right hand side.

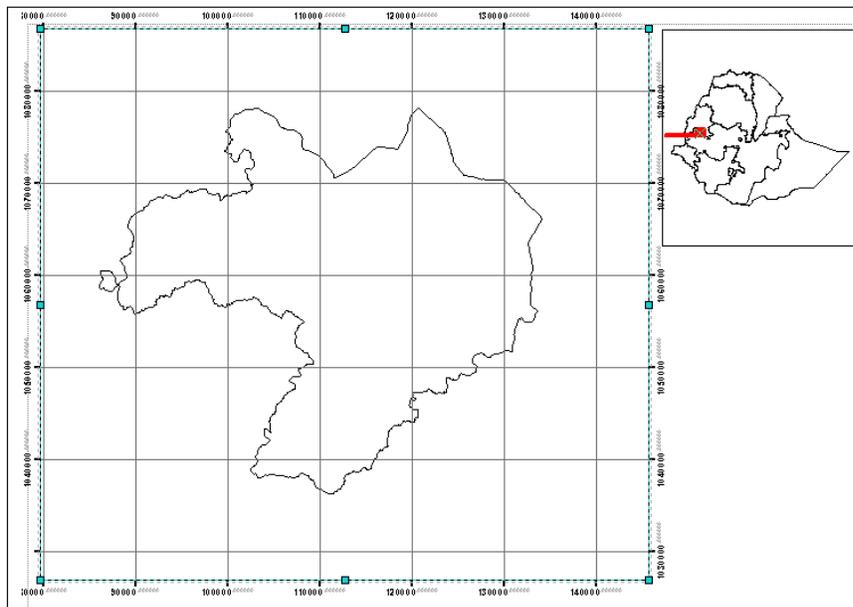




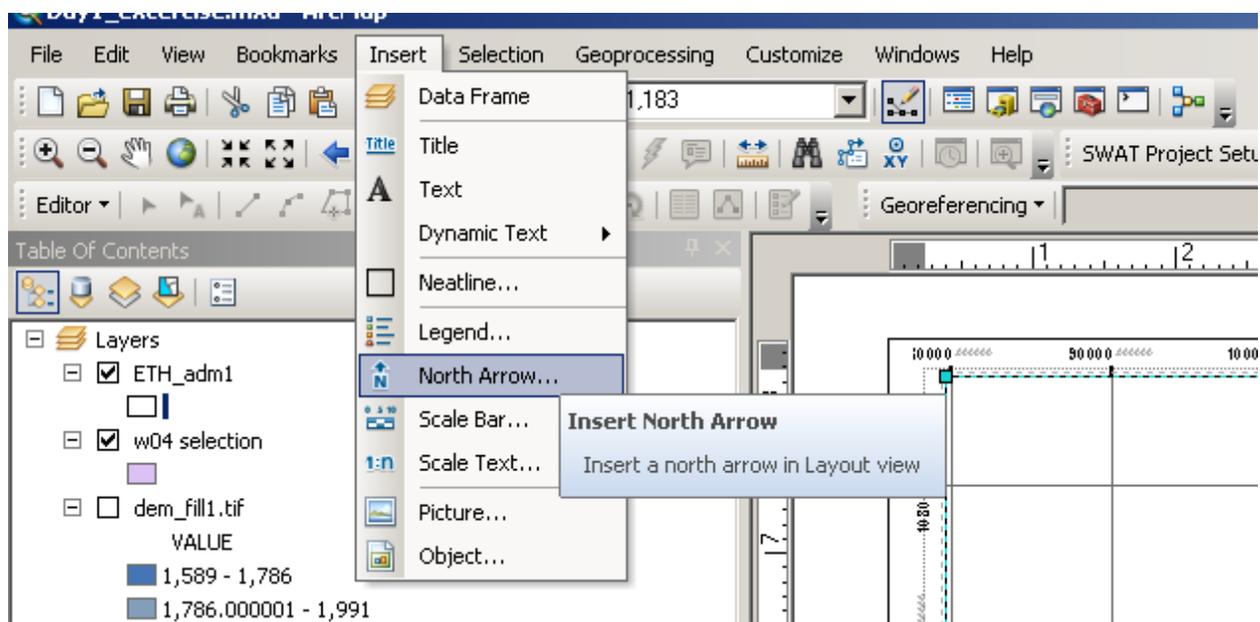
Check to box Show Leader, then click ok

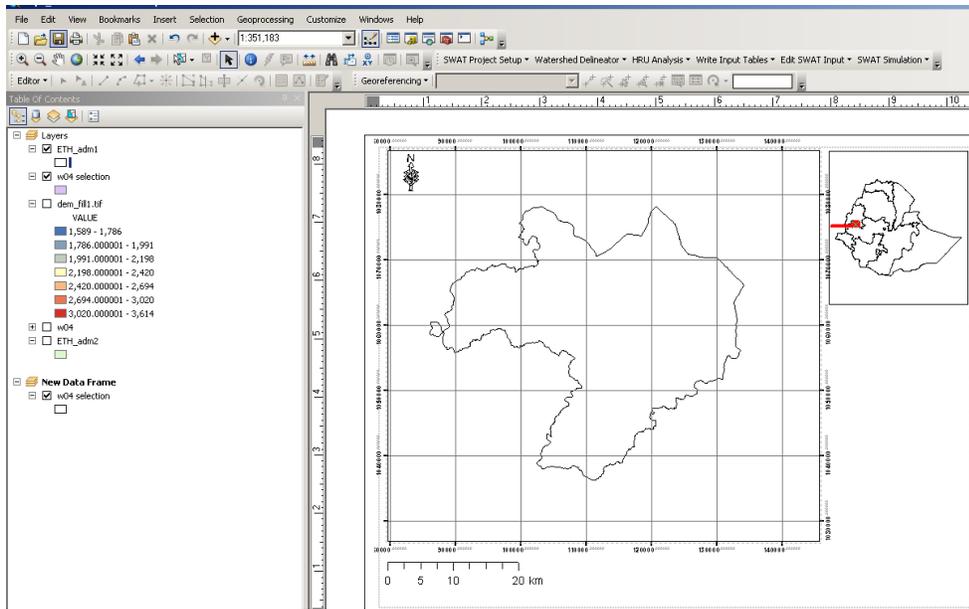


To insert grids of coordinates around the map, Click on the main map data frame, right click, properties, grid, new grid, measured grid, next, ok



To insert North arrow legend and scale bar, go to Insert





## 5.13 Chapter five: Remote sensing and image analysis

### a) Fundamentals of remote sensing

What is remote sensing?

- The acquisition of information about a target without being in physical contact with it.
- Includes not only what is visual, but also what can't be seen with the eyes, including sound and heat.
- Information about an object is acquired through detecting and measuring:
  - Electromagnetic field reflected or emitted by the object
  - Acoustic waves reflected or perturbed by the object
  - Perturbations of the surrounding gravity or magnetic potential field due to the presence of the object.

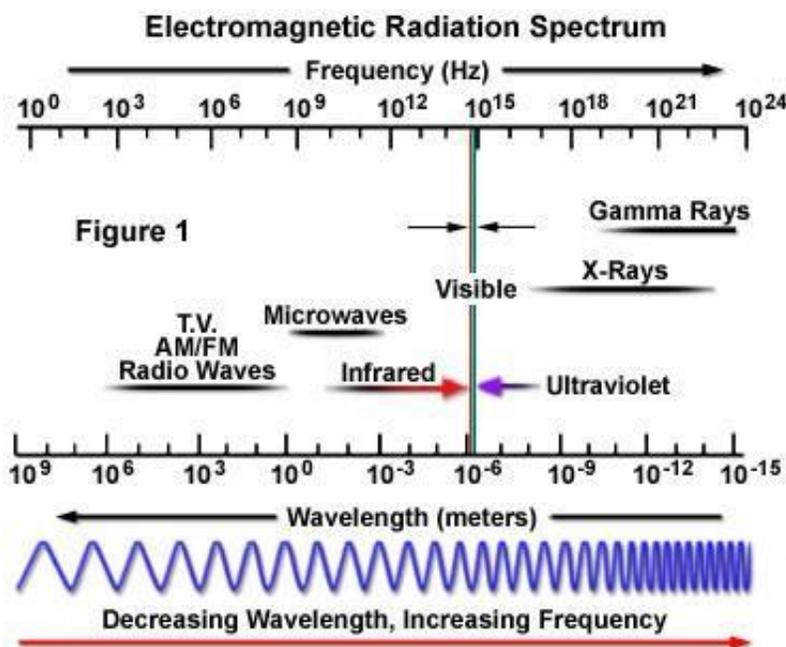
### b) Benefits of remote sensing technologies

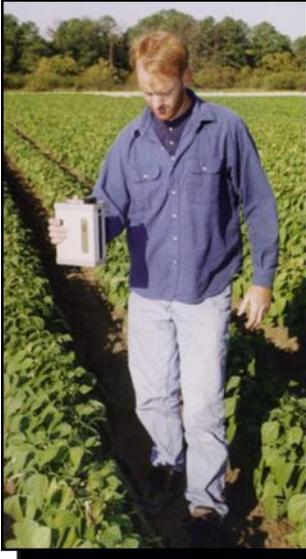
- Remote sensing has many advantages over ground-based survey in that **large tracts of land** can be surveyed at any one time, and areas of land (or sea) that are otherwise **inaccessible** can be monitored.
- The advent of satellite technology and multi/hyperspectral sensors has further enhanced this capability, with the ability to *capture images of very large areas of land in one pass*, and by collecting data about an environment that would normally **not be visible to the human eye**.
- Collect comparable data over a large area and repeated measurements over same area- *dynamics over space and time can be analyzed*

### c) Elements of remote sensing technologies

1. **Energy Source or Illumination (A)** - the first requirement for remote sensing is to have an energy source that illuminates or provides electromagnetic energy to the target of interest.
2. **Radiation and the Atmosphere (B)** - as the energy travels from its source to the target, it will come in contact with and interact with the atmosphere it passes through. This interaction may take place a

- second time as the energy travels from the target to the sensor.
3. Interaction with the Target (C) - once the energy makes its way to the target through the atmosphere, it interacts with the target depending on the properties of both the target and the radiation.
  4. Recording of Energy by the Sensor (D) - after the energy has been scattered by, or emitted from the target, we require a sensor (remote - not in contact with the target) to collect and record the electromagnetic radiation.
  5. Transmission, Reception, and Processing (E) - the energy recorded by the sensor has to be transmitted, often in electronic form, to a receiving and processing station where the data are processed into an image (hardcopy and/or digital).
  6. Interpretation and Analysis (F) - the processed image is interpreted, visually and/or digitally or electronically, to extract information about the target which was illuminated.
  7. Application (G) - the final element of the remote sensing process is achieved when we apply the information we have been able to extract from the imagery about the target to better understand it, reveal some new information, or assist in solving a particular problem.





There are different types of platforms:

- Ground based
  - Airborne
  - Spaceborne
- 
- **Landsat**
    - The first satellite designed specifically to monitor the Earth's surface, Landsat-1, was launched by NASA in 1972
    - **Landsat** was designed as an experiment to test the feasibility of collecting multi-spectral Earth observation data from an unmanned satellite platform.
    - Originally managed by NASA, responsibility for the Landsat program was transferred to NOAA in 1983. In 1985, the program became commercialized, providing data to civilian and applications users.



- **SPOT (Système Pour observation de la Terre)**

- a series of Earth observation imaging satellites designed and launched by CNES (Centre National d'Études Spatiales) of France, with support from Sweden and Belgium.
- SPOT-1 was launched in 1986, with successors following every three or four years.
- All satellites are in sun-synchronous, near-polar orbits at altitudes around 830 km above the Earth, which results in orbit repetition every 26 days
- They have equator crossing times around 10:30 AM local solar time
- SPOT was designed to be a commercial provider of Earth observation data, and was the first satellite to use along-track, or push broom scanning technology

- **MODIS (Moderate Resolution Spectroradiometer)**

- 2,330 km swath width, 1~2 day revisit with spatial resolutions of 250 m (band 1 and 2), 500 m (band 3 - 7) and 1000 m (band 8 -36). It has 36 spectral bands in red, near infrared, mid infrared, and thermal infrared regions.

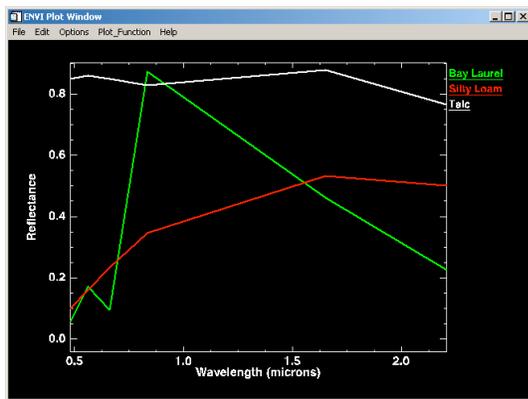
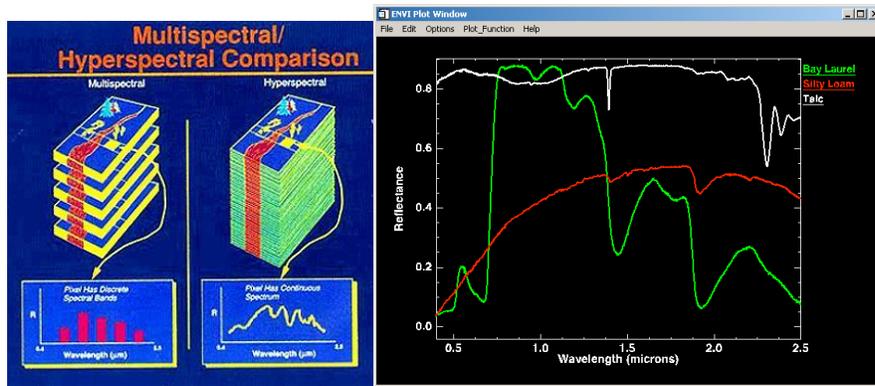
- **ASTER (Advanced Space borne Thermal Emission and Reflection Radiometer)**

- 60 km swath width, 16 day revisit and stereoscopic images with spatial resolutions of 15 meter visible and near infrared (VNIR) bands, 30 meter shortwave infrared (SWIR) bands and 90 meter thermal infrared (TIR) bands.

**d) Image resolution and land use/cover**

- **Spatial Resolution:** Refers to the smallest size objects on the ground that can be represented distinctly in an image.

**Spectral Resolution:** Refers to the number of spectral bands.



### Radiometric Resolution:



## 5.14 Land use/cover classification and change detection

There are several different land use/cover classification algorithms. Supervised and unsupervised classifications are the two of most commonly applied techniques.

We will implement both of these in ArcMap environment

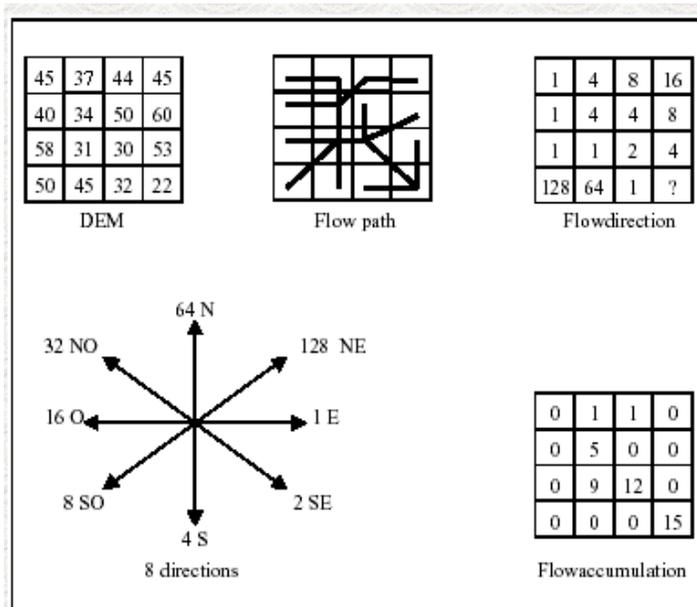
– Landsat satellite image will be processed and two major land use/cover types will be classified

1. Water catchment protection, hiking, and scouting
2. Water-catchment protection, water bottling, and marketing
3. Weaving and dying chemical production and marketing
4. Wetland protection and associated crocodile farming and marketing
5. Wetlands and associated butterfly farming

6. Wildlife parks, reserves, and associated tourism
7. Wildlife-attracted tourism and marketing,

### e) Wood crafting and marketing Topographic models

- Elevation data can be collected through ground-based survey tools.
- Satellite data are increasingly becoming sources of modelled elevation.
- Spatial resolution of elevation data vary from sub-meter to hundreds of meters.
- In this training, we will be using Digital Elevation Model (DEM) of 30m resolution, which can be freely downloaded from earthexplorer.usgs.gov
- Several topographic tools are available in ArcToolbox
- Several hydrological modeling can be undertaken using DEM.
- Understanding flow direction



### f) Topographic models using DEM data in ArcMap

- Go to the earthexplorer.usgs.gov and download DEM for your study area
- Extract/unzip
- Add the raster to ArcMap
- Examine the values of the raster by clicking inside any part of the raster data (use **Identify** tool)





## 5.15 Produce Slope, Aspect, and Contour maps

### a. Slope

For each cell, the **Slope** tool calculates the maximum rate of change in value from that cell to its neighbors. The maximum change in elevation over the distance between the cell and its eight neighbors identifies the steepest downhill descent from the cell.

Conceptually, the tool fits a plane to the z-values of a 3 x 3 cell neighborhood around the processing or center cell. The slope value of this plane is calculated using the average maximum technique. The direction the plane faces is the aspect for the processing cell. The lower the slope value, the flatter the terrain; the higher the slope value, the steeper the terrain.

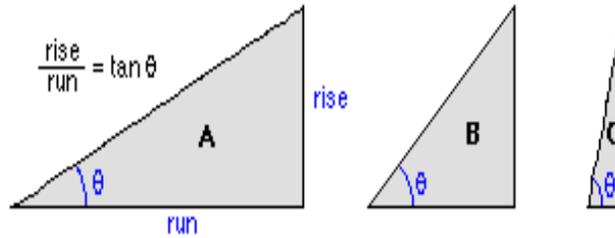
If there is a cell location in the neighborhood with a No Data z-value, the z-value of the center cell will be assigned to the location. At the edge of the raster, at least three cells (outside the raster's extent) will contain No Data as their z-values. These cells will be assigned the center cell's z-value.

The result is a flattening of the 3 x 3 plane fitted to these edge cells, which usually leads to a reduction in the slope.

The output slope raster can be calculated in two types of units, degrees or percent (percent rise). The percent rise can be better understood if you consider it as the rise divided by the run, multiplied by 100. Consider triangle B below. When the angle is 45 degrees, the rise is equal to the run, and the percent rise is 100 percent. As the slope angle approaches vertical (90 degrees), as in triangle C, the percent rise begins to approach infinity.

Degree of slope =  $\theta$

Percent of slope =  $\frac{\text{rise}}{\text{run}} * 100$



Degree of slope =

30

45

76

Percent of slope =

58

100

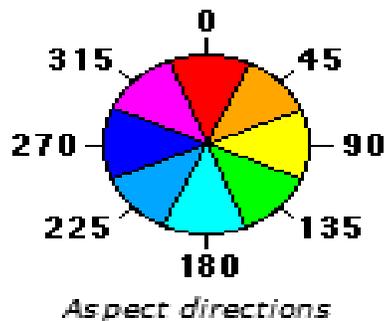
373

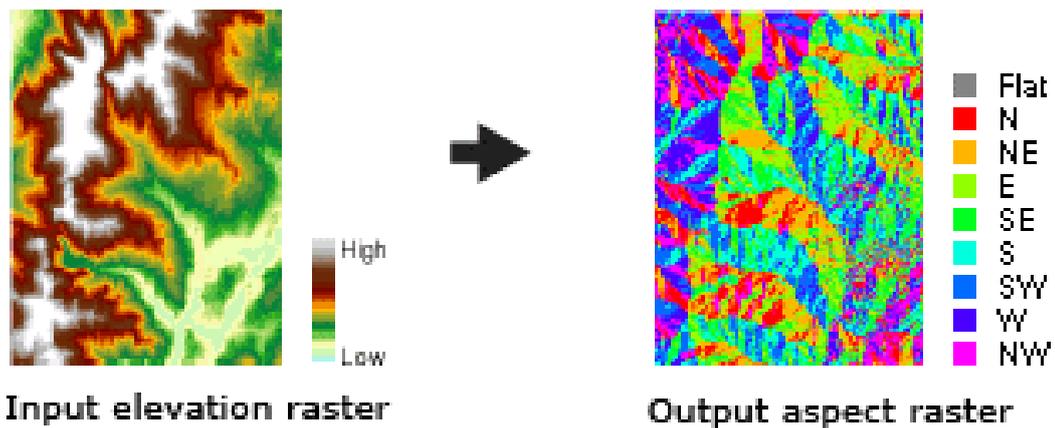
## b. Aspect

**Aspect** identifies the downslope direction of the maximum rate of change in value from each cell to its neighbors. It can be thought of as the slope direction. The values of each cell in the output raster indicate the compass direction that the surface faces at that location. It is measured clockwise in degrees from 0 (due north) to 360 (again due north), coming full circle. Flat areas having no downslope direction are given a value of -1.

The value of each cell in an aspect dataset indicates the direction the cell's slope faces. Conceptually, the Aspect tool fits a plane to the z-values of a 3 x 3 cell neighborhood around the processing or center cell. The direction the plane faces is the aspect for the processing cell.

The following diagram shows an input elevation dataset and the output aspect raster.





Knowing Aspect can help, for example:

- Calculate the solar illumination for each location in a region as part of a study to determine the diversity of life at each site.
- Identify areas of flat land to find an area for a plane to land in an emergency.

### c. Contour

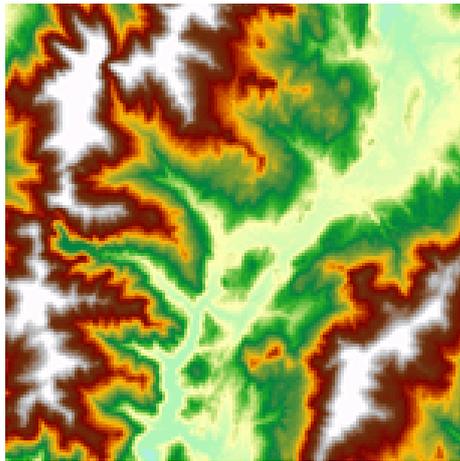
Contours are lines that connect locations of equal value in a raster dataset that represents continuous phenomena such as elevation, temperature, precipitation, pollution, or atmospheric pressure. The line features connect cells of a constant value in the input. Contour lines are often generally referred to as isolines but can also have specific terms depending on what is being measured. Some examples are isobars for pressure, isotherms for temperature, and isohyets for precipitation.

The distribution of the contour lines shows how values change across a surface. Where there is little change in a value, the lines are spaced farther apart. Where the values rise or fall rapidly, the lines are closer together.

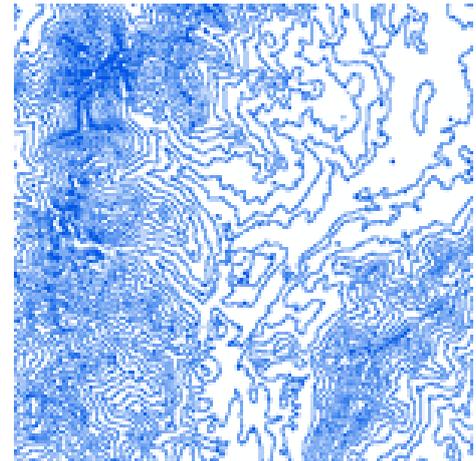
The contour creation tools are used to create a polyline feature dataset from an input raster. Contour lines are useful to:

- Identify which locations have the same elevation value.
- Simultaneously visualize flat and steep areas (distance between contours) and ridges and valleys (converging and diverging polylines).

The example below shows an input elevation dataset and the output contour dataset. The areas where the contours are closer together indicate the steeper locations. They correspond with the areas of higher elevation (in white on the input elevation dataset).



Input elevation raster



Output contours

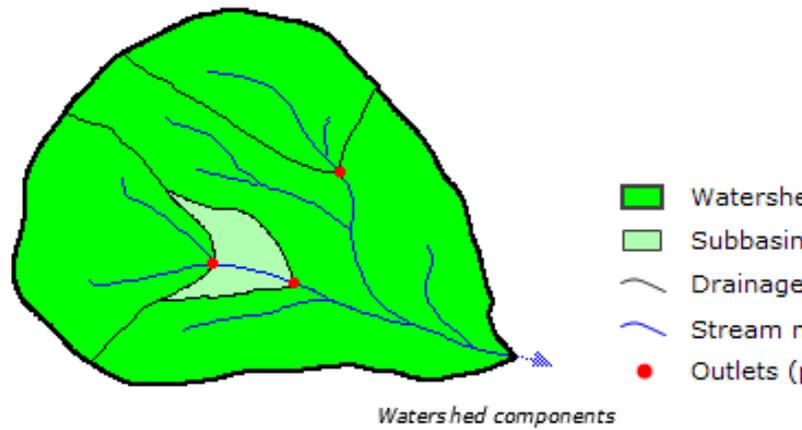
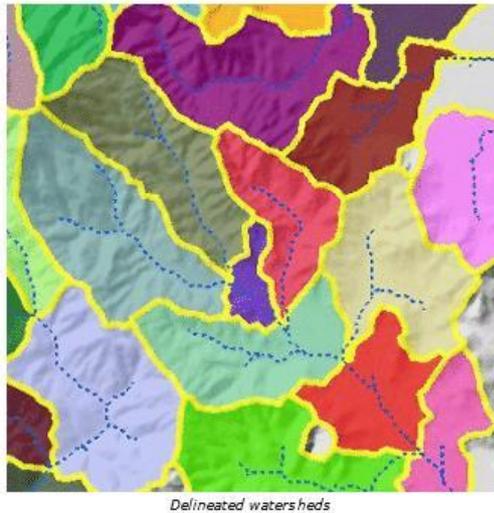
## 5.16 Hydrological Models

Several hydrological modelling tools are available in ArcGIS

- [-]  Spatial Analyst Tools
  - [+]  Conditional
  - [+]  Density
  - [+]  Distance
  - [+]  Extraction
  - [+]  Generalization
  - [+]  Groundwater
  - [-]  Hydrology
    -  Basin
    -  Fill
    -  Flow Accumulation
    -  Flow Direction
    -  Flow Length
    -  Sink
    -  Snap Pour Point
    -  Stream Link
    -  Stream Order
    -  Stream to Feature
    -  Watershed

### a. Watershed

A **watershed** is the upslope area that contributes flow—generally water—to a common outlet as concentrated drainage. It can be part of a larger watershed and can also contain smaller watersheds, called subbasins. The boundaries between watersheds are termed drainage divides. The outlet, or pour point, is the point on the surface at which water flows out of an area. It is the lowest point along the boundary of a watershed.



# D e l i

## neating watersheds

Watersheds can be delineated from a DEM by computing the flow direction and using it in the Watershed tool. Model builder in ArcMap can be used to delineate watershed and basins. Tools such as ArcHydro and ArcSwat are also easy-to-use plugins that can be used inside ArcMap. In this training, we will be using model builder and ArcSwat to delineate watershed and basis.

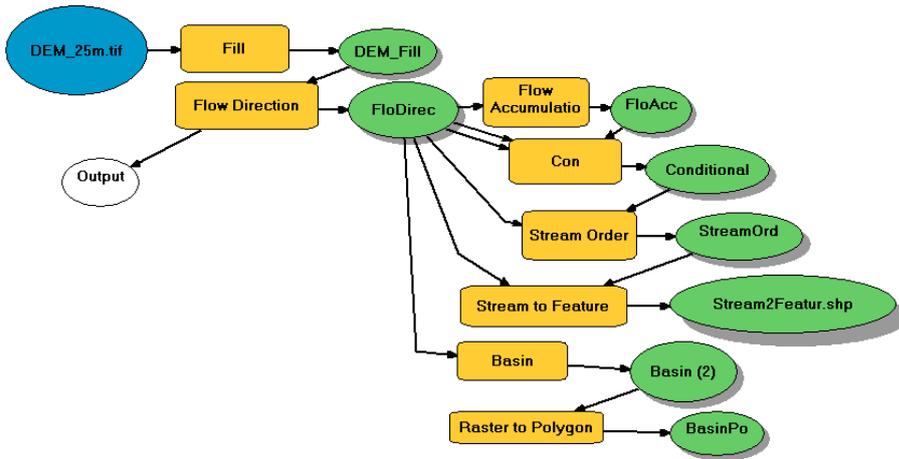
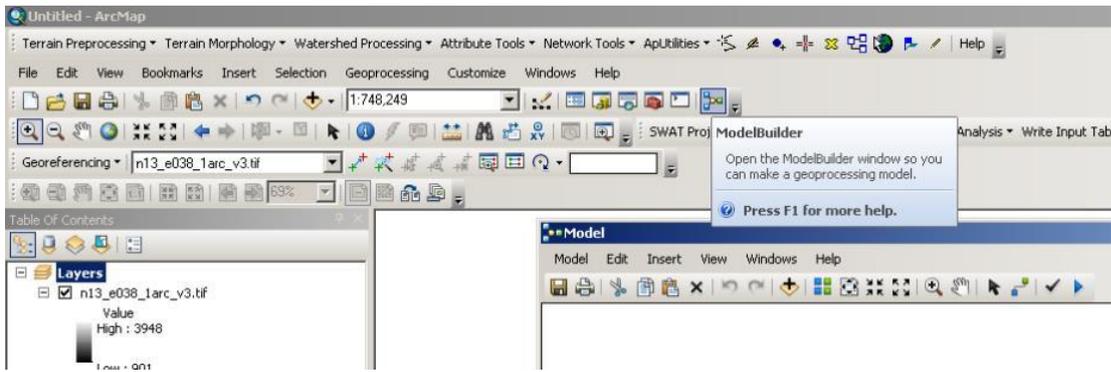
To determine the contributing area, a raster representing the direction of flow must first be created with the Flow Direction tool.

You will then need to provide the locations you wish to determine the catchment area for. Source locations may be features, such as dams or stream gauges, for which you want to determine characteristics of the contributing area. You can also use a flow accumulation threshold. When the threshold is used to define a watershed, the pour points for the watershed will be the junctions of a stream network derived from flow accumulation. Therefore, a flow accumulation raster must be specified as well as the minimum number of cells that constitute a stream (the threshold value).

## Watershed delineation

### Watershed delineation using model builder

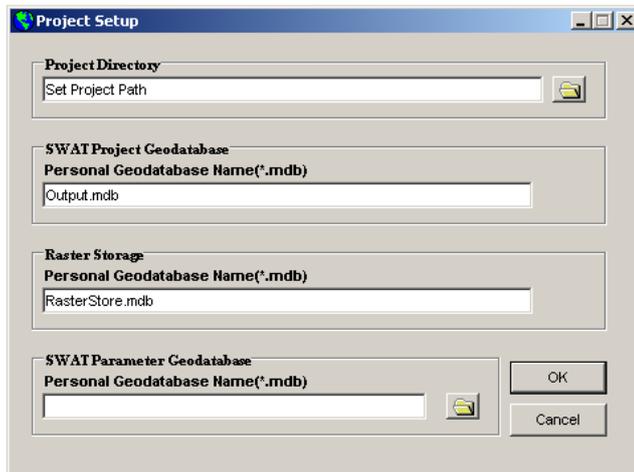
- Go to *ModelBuilder* and build the following model, use the DEM you downloaded

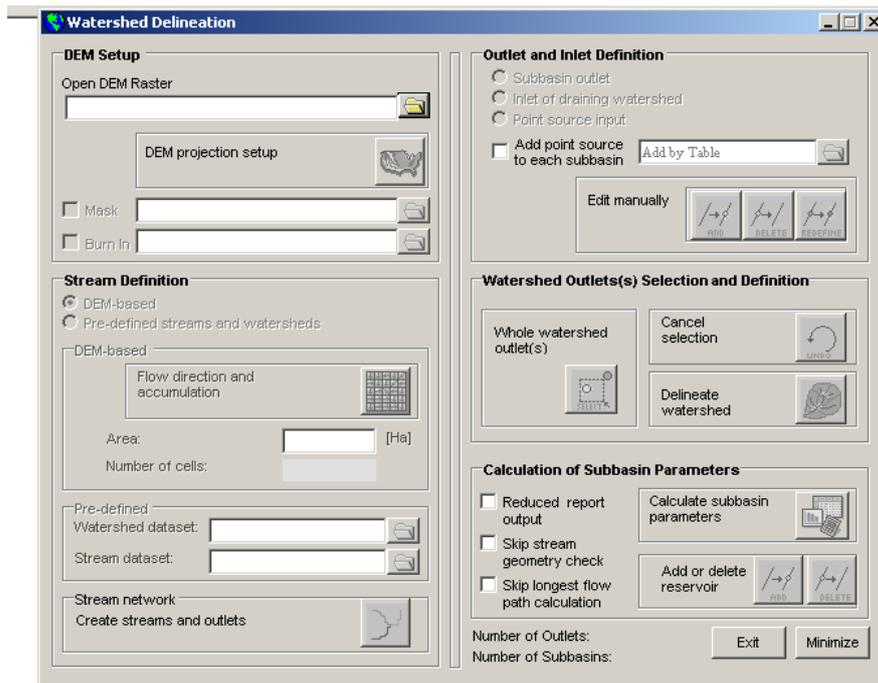


- Run the model by clicking the  icon

### Watershed delineation using ArcSwat

- Download ArcSwat (it is free) and install it
- Restart **ArcMap**
- Go to **Customize/Toolbars/ArcSwat**
- Click on **Swat Project Setup/New Swat Project**
- Specify project directory (this will automatically create geodatabases for your project)
- Click **Ok**
- Go to **Watershed delineator/Automatic watershed delineator**





- ✓ Specify DEM file
- ✓ Click on the grid icon next to **Flow Direction and accumulation** (will calculate area in Ha)
- ✓ Click on an icon next to **Create streams and outlets**
- ✓ Select the outlets of your interest by clicking on the icon next to **Whole watershed outlets**
- ✓ Click on icon next to **Delineate watershed**

## 5.17 Spatial analysis

Geostatistics is a class of statistics used to analyze and predict the values associated with spatial or spatiotemporal phenomena. It incorporates the spatial (and in some cases temporal) coordinates of the data within the analyses. Many geostatistical tools were originally developed as a practical means to describe spatial patterns and interpolate values for locations where samples were not taken. Those tools and methods have since evolved to not only provide interpolated values but also measures of uncertainty for those values. The measurement of uncertainty is critical to informed decision-making, as it provides information on the possible values (outcomes) for each location rather than just one interpolated value. Geostatistical analysis has also evolved from uni- to multivariate and offers mechanisms to incorporate secondary datasets that complement a (possibly sparse) primary variable of interest, thus allowing the construction of more accurate interpolation and uncertainty models.

Geo-statistics is widely used in many areas of science and engineering, for example:

- The mining industry uses geostatistics for several aspects of a project: initially to quantify mineral resources and evaluate the project's economic feasibility, then daily to decide which material is routed to the plant and which is waste, using updated information as it becomes available.

- In the environmental sciences, geostatistics is used to estimate pollutant levels to decide if they pose a threat to environmental or human health and warrant remediation.
- Relatively new applications in the field of soil science focus on mapping soil nutrient levels (nitrogen, phosphorus, potassium, and so on) and other indicators (such as electrical conductivity) in order to study their relationships to crop yield and prescribe precise amounts of fertilizer for each location in the field.
- Climate and meteorological applications include the prediction of temperatures, rainfall, and associated variables (such as acid rain).
- Most recently, there have been several applications of geostatistics in the area of public health, for example, the prediction of environmental contaminant levels and their relation to the incidence rates of cancer.

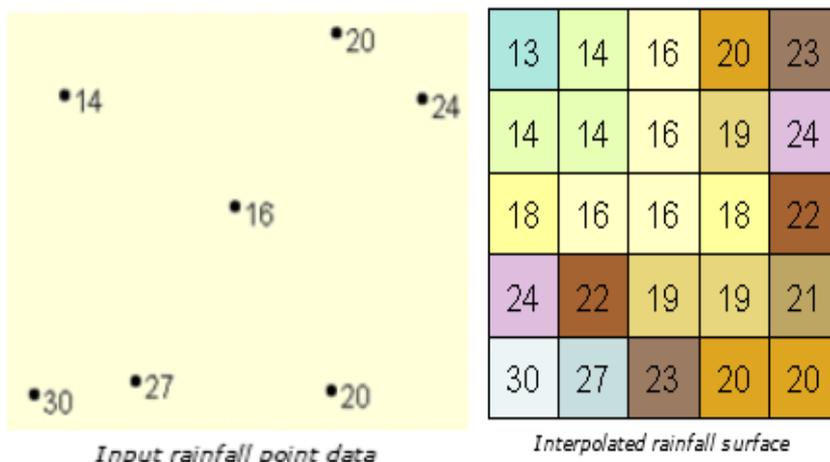
In all of these examples, the general context is that there is some phenomenon of interest occurring in the landscape (the level of contamination of soil, water, or air by a pollutant; the content of gold or some other metal in a mine; and so forth). Exhaustive studies are expensive and time-consuming, so the phenomenon is usually characterized by taking samples at different locations. Geostatistics is then used to produce predictions (and related measures of uncertainty of the predictions) for the unsampled locations

**Interpolation** predicts values for cells in a raster from a limited number of sample data points. It can be used to predict unknown values for any geographic point data, such as elevation, rainfall, chemical concentrations, and noise levels.

The assumption that makes interpolation a viable option is that spatially distributed objects are spatially correlated; in other words, things that are close together tend to have similar characteristics. For instance, if it is raining on one side of the street, you can predict with a high level of confidence that it is raining on the other side of the street. You would be less certain if it was raining across town and less confident still about the state of the weather in the next county.

Some typical examples of applications for the interpolation tools follow. The accompanying illustrations will show the distribution and values of sample points and the raster generated from them.

The input here is a point dataset of known rainfall-level values, shown by the illustration on the left. The illustration on the right shows a raster interpolated from these points. The unknown values are predicted with a mathematical formula that uses the values of nearby known points



## Some of the widely used interpolation methods

- Kriging
- IDW
- Spline

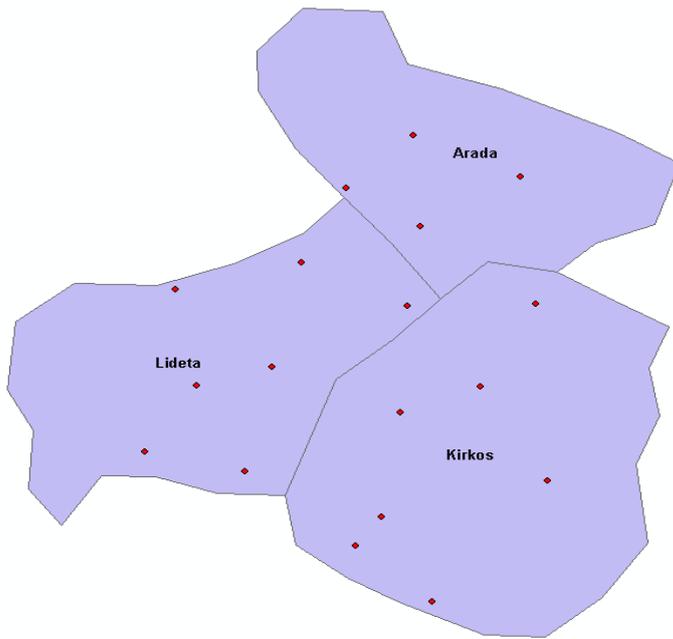
Kriging is an advanced geostatistical procedure that generates an estimated surface from a scattered set of points with z-values. Unlike other interpolation methods in the Interpolation toolset, to use the Kriging tool effectively involves an interactive investigation of the spatial behavior of the phenomenon represented by the z-values before you select the best estimation method for generating the output surface.

The IDW (inverse distance weighted) and Spline interpolation tools are referred to as deterministic interpolation methods because they are directly based on the surrounding measured values or on specified mathematical formulas that determine the smoothness of the resulting surface. A second family of interpolation methods consists of geostatistical methods, such as kriging, which are based on statistical models that include autocorrelation—that is, the statistical relationships among the measured points. Because of this, geostatistical techniques not only have the capability of producing a prediction surface but also provide some measure of the certainty or accuracy of the predictions.

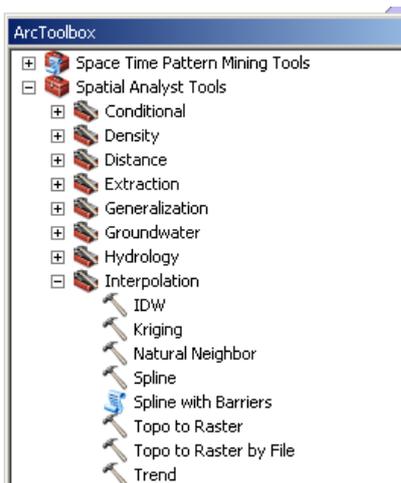
Kriging assumes that the distance or direction between sample points reflects a spatial correlation that can be used to explain variation in the surface. The Kriging tool fits a mathematical function to a specified number of points, or all points within a specified radius, to determine the output value for each location. Kriging is a multistep process; it includes exploratory statistical analysis of the data, variogram modeling, creating the surface, and (optionally) exploring a variance surface. Kriging is most appropriate when you know there is a spatially correlated distance or directional bias in the data.

### 5.18 Interpolation exercise

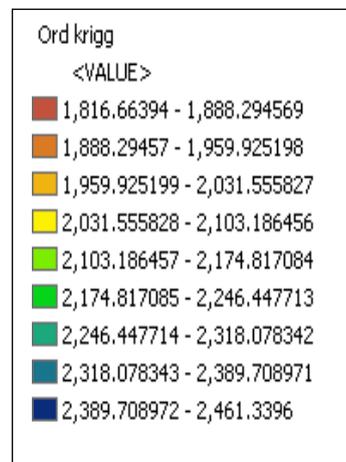
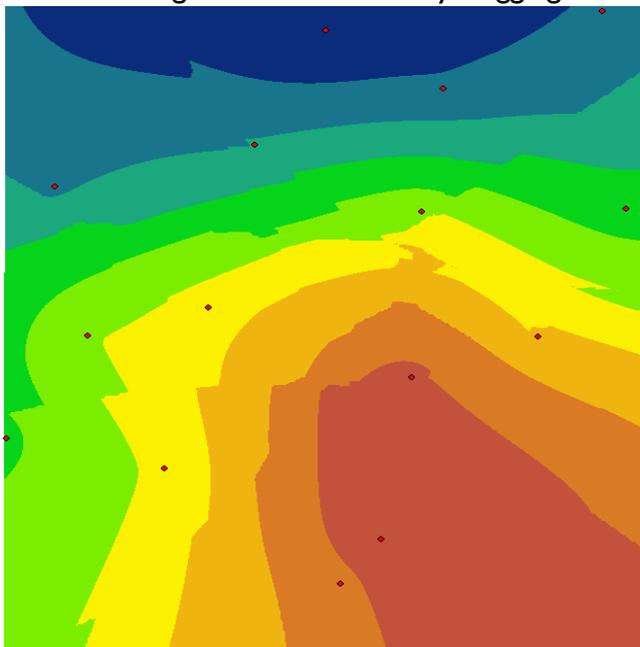
- Assume you have collected data, such as soil pH, Rainfall, etc at sample points
- If your interest is to produce a surface map based on the sample location, you need to apply interpolation to estimate values for unsampled locations
- Apply kriging, spline, and IDW interpolation to produce a surface map of a variable of your interest



- Go to **Spatial analyst tool/Interpolation/** and select different methods of interpolation by double clicking on the method of your choice



The following is result of ordinary krigging for annual rainfall

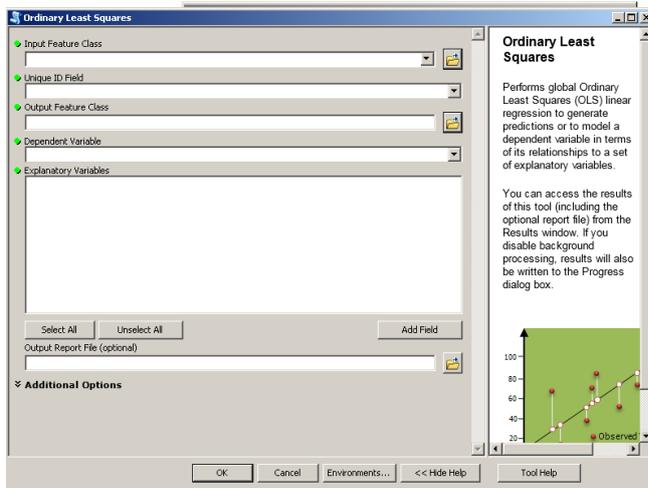
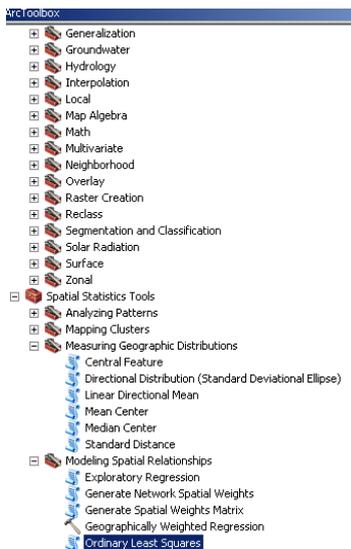


## 5.19 Model in Geospatial relationships

- You may have a research question such as 'What are the factors that affect soil N content?'
- Assume you have the following data for several locations:
  - o Rainfall, o Altitude o Slope and o Aspect
- If there is any valid assumption that support some form of cause-effect relationships among these factors and your response variable (dependent variable, soil N), you can model the relationship using, for example, OLS linear regression model.

### Spatial regression

- Add point data with your dependent and independent variables
- Go to **Spatial statistics tools/Modeling spatial relationships/Ordinary Least Square**
- Double click on the tool



- Specify
  - ✓ input file (point data)
  - ✓ unique ID field ( a field that identify each row of data)
  - ✓ Dependent variable (soil N)
  - ✓ Independent variables (RF, Slope, Altitude, Aspect)
  - ✓ Open the PDF report

## 6. Module 6: Integrated Rural Land Use Planning Methods and Approaches

### 6.1 Basic inputs

the first and immediate action to do in land use planning is obtaining UpToDate satellite imagery and delineating the administrative boundary of the land use planning unit such as woreda, zone, or region. This is followed by conducting land use land cover analysis from the high-resolution satellite imagery. Of course, the satellite imagery needs to be taken at a time when the sky is cloud-free. Currently, it is possible to get satellite imageries that are taken at the date when one prefers and there are many known vendors to do this. Prices are getting low and low. From such satellite imagery, the following need to be identified, delineated, and mapped and their specific areas get calculated.

	Land use types that cannot be allocated for other land use types	Area in hectare	Area in Km <sup>2</sup>	Area coverage in % of each and Planning Unit total
1.	Rock outcrops			
2.	Natural Forests,			
3.	Woodlands,			
4.	Plantation forests			
5.	Bush and shrub lands,			
6.	Worshipping places,			
7.	National Parks managed at National Level			
8.	National parks and sanctuaries managed at regional level			
9.	Biosphere reserves managed at regional level			
10.	Wildlife sanctuaries managed at federal level by EWCA			
11.	Wildlife reserve managed by the region			
12.	Controlled hunting area managed by the regions			
13.	Open Controlled Hunting areas managed by the region			
14.	Ecosystem conservation sites			
15.	Estate farms and associated factory sites			
16.	Residential areas			
17.	Rivers, riverbeds, and riverine forests			
18.	Roads of different levels			
19.	Cultural, socioeconomic, and economic designations such as <ul style="list-style-type: none"> <li>i. Villages,</li> <li>ii. Education institutions</li> <li>iii. Churches</li> <li>iv. Health facility institutions</li> <li>v. Mosques</li> <li>vi. Rural Markets</li> </ul>			
20.	Lands whose slope exceeds 60%			
21.	Other lands that are not to be re-allocated for any other uses due to national and international commitments, national and regional state proclamations, etc.			
Total area and percentage cover of each of the above land use types				

Please refer to some of such land use types that are already identified in the Oromia Region as of many years before. These are examples of such lands that need to be identified, rectified, and designated as part of the new Integrated Rural Land Use Plan of the Oromia region. From Wildlife-related land-use type alone, there have been some 30 land-use types as shown below.

- 1) **National Parks managed at National Level**
  1. Abijata Shala
  2. Awash
  3. Bale Mountains
- 2) **National parks and sanctuaries managed at the regional level**
  4. Arsi Mountain
  5. Yabello
  6. Dati Wolel
- 3) **Biosphere reserves managed at the regional level**
  7. Yayu as of 2011
  8. Yabello (1978)
- 4) **Wildlife sanctuaries managed at the federal level by EWCA**
  9. Babilie Elephant sanctuary as of 1962
  10. Senkile Swayne Hert Beest Sanctuary as of 1964
- 5) **Wildlife reserve managed by the region**
  11. Bale
- 6) **Controlled hunting area managed by the regions**
  12. Abasheba Demero as of 2004
  13. Adaba-Dodola as of 2010
  14. Aluto
  15. Arba-Gugu as of 2005
  16. Beshenena Oddo-gulu as of 2003
  17. Shedem Berbere as of 1988
  18. Dindin in ?
  19. Hanto 2001
  20. Hurufa Suma 2000
  21. Haro Aba Dika 2010
  22. Munessa as of 2003
  23. Shedem Debere 1988
  24. Sororo Torgum 2000
  25. Wergan Nula as of 2010
- 7) **Open Controlled Hunting areas managed by the region**
  26. Debere Libanos
  27. Gara Gunbi
  28. Gara Meti
  29. Jibat
  30. Sinana

**Second**, after analyzing and delineating each of the land-use types from the satellite imageries, it is especially important that to verify the satellite imagery analysis by conducting sample ground-truthing. This shall be followed by making all the corrections in a lie with the

findings from the ground verifications. Once the above-indicated land-use types are delineated, the remaining lands will need to go under different analysis by using several physical potentials- rectifying considerations that influence comparative economic, social, and environmental benefits.

In diagnosing the utility potential of the remaining lands, the first is to categorize these lands into different agroclimatic zones. 17 agroclimatic zones can be distinguished by the altitude and rainfall regime that each parcel of land belongs. Please refer to Table ----- for this delineation. The agroclimatic zone reflects two important growth-limiting factors: precipitation and altitude. Altitude limits the type of crop/plant that can do well in an area. For instance, a horticulture crop such as pear will not do well in dry hot lowlands even when an irrigation facility is made available. Crops such as Fabacean will grow much better in higher altitudes where frost is not limiting while lupines could do well even in frost zones. On the contrary, groundnuts and chickpeas will do better in lower altitude zones. The agroclimatic zone to which the land belongs is an important indicator in weighing a plot of land to which land-use type a site could be designated among other factors. Please refer to the Table and do categorize and map the candidate lands into the different agroclimatic zones that the lands belong.

Lands that belong to Dry Bertha to Dry Alpine Wurch will not grow crops or range-feed satisfactorily unless they are getting full irrigation while those lands situated in Moist Bereha to Moist Alpine Wurch could do well with supplementary irrigation. Lands that are situated in Wet Bertha to Wet Alpine Wurch can be farmed with only rainfed agriculture. The same analogy works when land is to be set aside for modern aquaculture & fishery development or intensive horticulture development.

Altitude above sea level in meters	Above 3700 meters above sea level (m asl)	Dry Alpine Wurch	Moist Alpine - Wurch	Wet Alpine Wurch
	3200 – 3700m asl	Dry Wurch	Moist Wurch (Kur)	Wet Wurch
	2300-3200 m	Dry Dega	Moist Dega	Wet Dega
	1,500 - 2300 m asl	Dry Weyna- Dega	Moist Weyna- Dega	Wet Weyna-Dega
	500 – 1500 m	Dry Kolla	Moist Kolla	Wet Kolla
	<500m asl	Dry Bereha	Moist Bereha	Wet Bereha
		<900 mm	900 – 1400mm	> 1400mm
Mean annual rainfall in mm per year				

**Table ----- Agroclimatic zones and maps with the following altitude in meters and rainfall regimes in millimeters**

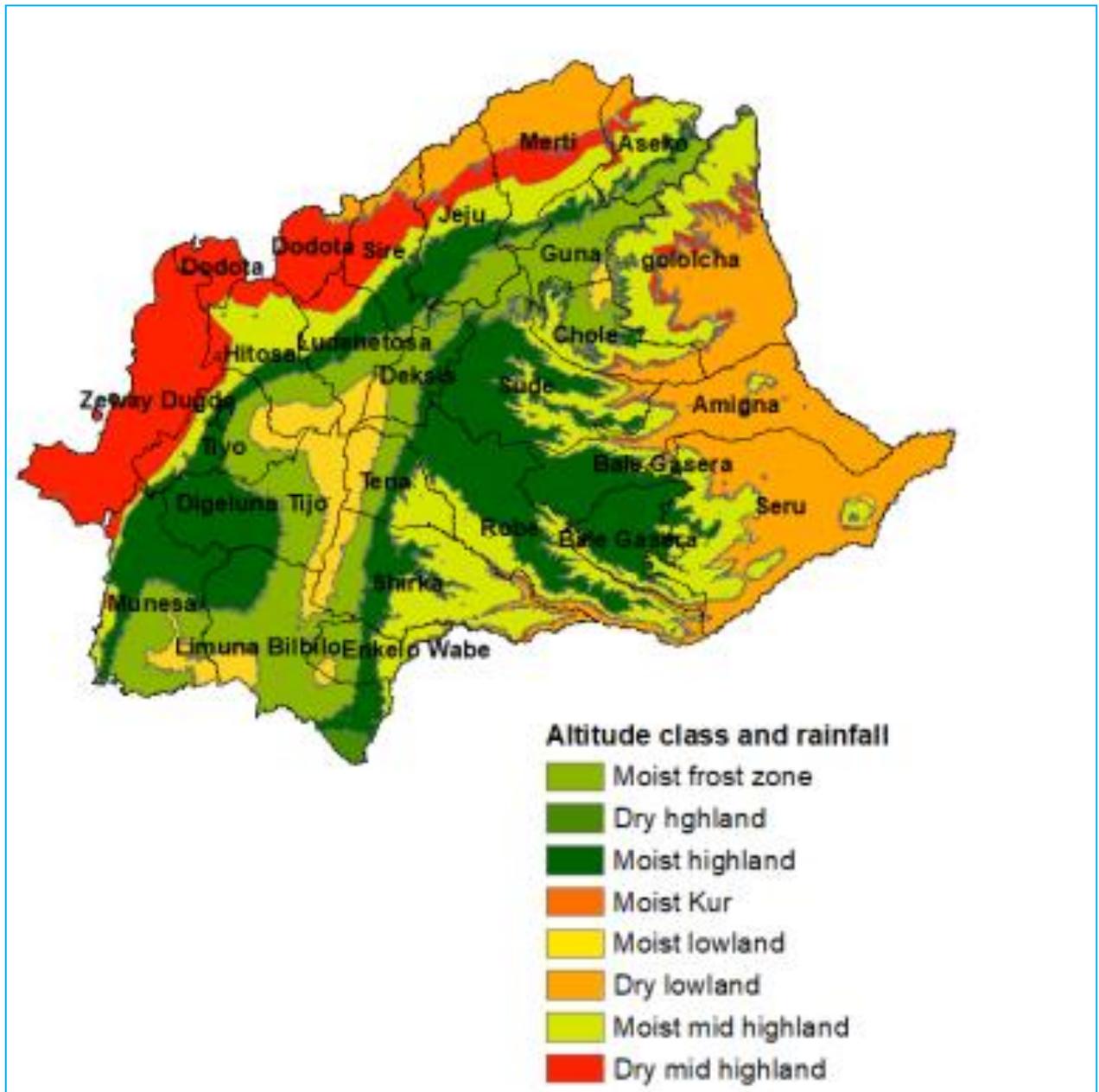


Figure ----- The agroclimatic zones of Arsi

Unfortunately, agroclimatic zone classification alone cannot be a limiting/distinguishing parameter in associating a given land category to a given land-use type. In addition to looking at the agroclimatic zone where a given land is situated, the inherent physical characteristic of the land (slope range and soil depth categories) would be an effective tool for prioritizing and allocating a given unit of land for given land use. For instance, lands that are soil-depth of less than 20 cm and slope ranges of less than 30% slope (can be allocated for range development while those lands of the same soil depth but in slopes 30 – 60% slope, can be used for rangeland development with a cut-and carry system. Therefore, such land-use distinguishing factors do not only let one associate with the type of land use; but also with the type of land management that one needs to consider.

	Slope in %						
		<2	2-16	16-30	30 - 45	45-60	>60
Soil dept dim centimeters	>100	1	2	3	7	11	16
	50 - 100	4	5	6	8	12	17
	20 -50	9	10	13	14	15	18
	<20	19	20	21	22	23	24

**Table. ----- Land prioritization units that are defined by joint characters of Soil depth and slope categories to be used as a tool in land use planning using GIS**

For instance,

- a. Aquaculture and fishery development areas
- b. Agricultural lands
  - i. Conduit-irrigated agriculture
  - ii. Rain-irrigated Agriculture
- c. Horticulture
- d. Livestock Grazing lands
2. Support inputs to integrated land use planning
  - a. Cadastral
  - b. Interpretations and environmental education
  - c. Transportation facilities
3. Socioeconomic considerations
  - a. Using social science and land use planning
  - b. Gender and land use planning
4. Land-based resources in integrated land use planning
  - a. Forestry
    - i. Natural forest
      1. Timber production forest lands
      2. Gum and resin forest lands
      3. Ecosystem conservation forest lands
      4. Water-catchment forest lands
      5. Herbal and other medicinal forest lands
      6. Riverine forest
    - ii. Plantation forest
      1. Plantations of industrial uses
      2. Forest plantations of ecosystem conservation use
      3. Plantations of recreation and amenity use
  - b. Recreation and visitor services
  - c. Comprehensive trails and travel management
  - d. Lands and realty
  - e. Coal
  - f. Oil shale
  - g. Fluid minerals: oil and gas, tar sands, and geothermal resources
  - h. Lockable minerals

- i. Mineral materials
- j. None-energy leasable
- 5. Special land use designations
  - a. Administrative designations
  - b. Cultural, socioeconomic, and economic designations
    - i. Education institutions (schools, colleges, and universities)
    - ii. Churches
    - iii. Health facility institutions (Clinique, health centers and hospitals)
    - iv. Mosques
    - v. Markets

Training modules (Units, elements, segments, sections, or parts)

Module I: Course Introduction

- I.1 Dealing with Pre-requisite subjects
- I.2 Dealing with integrated Land Use Planning

Module 10. Resource-specific Decisions

- 1. Land use planning focused decisions
- 2. Implementation-focused decisions
- 3. Notices, consultations, and hearings

## 6.2 The planning processes

Chapter 5 is devoted to the illustration of the preparatory actions (PART I) to be conducted for the planning action (part II) that are grouped into two major parts. Part one is proposed to be financed by Sida-support (€ 2.9627 million) while the support for **PART 2** (€ 2.71 million) is already obtained from the Embassy of the Kingdom of the Netherlands (EKN) and EU-IGAD support.

### **g) Part I: Building Capacity: Preparatory Actions**

PART ONE is the preparatory part which is to be supported by funding from Swedish International Development Agency (Sida). Financially, it is worth €2.9627 million. This preparatory action is mainly focused on organizing, training, and building the capacity of the direct beneficiaries (communities and the private sector) and the facilitators (regional and zonal-level LAUEPA office and staffs, and other relevant government institutions such as members of the federal and regional planning steering committees and federal and regional planning technical committee members). Part One also deals with additional planning preparatory actions such as taking preparatory measures for avoiding conflicts, establishing data management centers, preparatory actions needed for recruitment, and deployment of planning expert team who will be guiding the planning process. It also deals with support to MELCA-Ethiopia which is separately funded by Sida but will be concurrently piloting the ILUP-in action at Majang zone. Part one deals mainly with the soft system part which is preparing:

- ✓ the direct beneficiaries for driving the planning process
- ✓ The relevant government institutions and staffs who will be facilitating the process and
- ✓ The planning expert team who will be guiding the process
- ✓ Conflict avoidance system for producing workable integrated land use plan

### **6.3 Developing effective participative ILUP development and auditing scheme**

Oromia regional state has been marginalized for decades. Conducting stakeholder-driven and expert-guided integrated land use and development plan requires building the capacity of the major stakeholders from the grassroots community to the highest authority levels. In reality, developing integrated land use and development plans at the regional level and even at the federal level is new to Ethiopia. Therefore, building the capacity and conducting the planning exercise requires capacity building and sensitization from bottom-up and top-to-down.

As shown in this Schematic Representation (Figure 8), the stratified 10-livelihood sector community groups and local and private-sector investors will drive the planning process. They will be capacitated to articulate and present their interest and choices from given options. They will be given different alternatives and land use options in comparison to their chosen land use options that are answerable to their livelihood growth and economic and social interests as valid to their specific land type and zones. Like Community groups, local and private-sector investors will be provided with different alternatives and options for them to choose in consideration of land-sensitivity classes, sustainability potentials as well as social, economic and environmental implications. Expert advice will be given by the ILUP Expert Team to these community and private-sector investors so that they can make informed decisions and options.

The entire planning process will be guided by the ILUP Expert Team which is also working with zonal, regional and federal-level technical committee ILUP experts. The ILUP expert team will produce a comprehensive plan in draft form for the various land use categories with illustrated explanation and discuss it with the regional LAUEPA and OEFCCA experts before it is presented to the regional and federal Steering committee meeting for comment and resolution on pending matters sector by sector. The draft comprehensive plan and report will be prepared by accommodating comments from the regional LAUEPA office.

The regional-level steering committee is composed of the relevant bureau heads of the region and will be chaired by the regional president. It will periodically examine the final sector-specific draft plan reports and give directives with regards to its congruence to the relevant sector-specific regional policy and laws. It will facilitate the involvement of zonal, Woreda, and Kebele level authorities so that the ILUP Experts will get the necessary backing. The same steering committee will examine the draft plan in consideration of established and approved regional social and economic development priorities and guide on best choices for competing alternatives. It will facilitate the involvement of zonal, Woreda, and Kebele level authorities so that the ILUP Experts will get the necessary backing. The steering committee will also officially approve both the final sector-specific and comprehensive plans.

The federal-level steering committee will authorize the land use and development study by lead the facilitation of OEFCCA. It will oversee the final sector-specific and comprehensive land use and development planning process with regards to its fitness to national level land use and development policies, guidelines strategic actions. The steering committees will give the necessary guidance to the concerned parties for incorporating the zonal and special Woreda-level plans into their economic development plans. The federal-level steering committees will also be responsible for enshrining the draft policies and laws that are proposed for enforcing the implementation of the ILUP. The federal-level steering committee will also examine the overall relevance of the regional land use and development master plan and its relevance to the development of a similar land-use plan to other sister regions.

The regional level technical committee will be composed of technical experts of the relevant bureaus and will be technically responsible for facilitating the land use and development planning at the regional level. It makes sure that the sector-specific plans are in line with the

technical specifications of the different sectors of the region. The technical committee will examine the technical quality of the work and pass them to the federal level Steering Committee for final endorsement at the national level.

The federal-level technical committee will be composed of technical experts of the relevant ministries and departments will be technically responsible for facilitating the land use and development planning. It will make sure that the sector-specific plans are in line with the technical specifications of the different sectors. The technical committee will examine the technical quality of the work and pass them to the federal level Steering Committee for final endorsement at the national level. Final approval of the plans and authorization of signatories will be chairpersons of the regional and federal Steering Committee.

Land use and development planning is a continuous process that will be continually perfected as more knowledge and information is obtained for best reconciling competing claims and land use demands. Often, claims are more than optimal land use potentials and beyond sustainability of the humane environment.

In a more subtle strategic stakeholder-driven ILUP development, a common ground will have to be sought in each step of the planning process by involving the stakeholders in a consultative process for resolve. Each must be appreciating the process and outcome by owning and keenly participating in the planning process. Therefore, this preparatory process is devoted to sensitization, building planning teams, and getting the planning methods and scope of work internalized by all beneficiaries for their active participation and approval. As shown in Figure 6 above, the zonal and regional level ILUPs will involve all parties from the federal level to the zonal level community groups where sector-specific community members are widely represented. Details on how these parties get involved is illustrated more in the paragraphs below.

#### **6.4 Organizing, Capacitating, and Engaging Facilitation Actors**

In the ILUP process, the government institutions and staff are assumed to be facilitators. Facilitation, by 'definition', is easing, simplifying, enabling, and assisting for things to accelerate as intended. Therefore, at federal, regional and zonal and Kebele levels, the government institutions, and staff will be involved in ILUP for enabling and accelerating the ILUP work. The commitment of this participatory ILUP development is having the beneficiaries drive while the ILUP-Expert Team is guiding and the government body facilitates the process. But this can be realized when the beneficiaries are effectively and officially engaged in the planning process from beginning to end. Such engagement will allow beneficiaries to table their issues for getting it accommodated and own the plan. It will avoid unnecessary complaints and unmediated conflicts. ILUP process is at large identifying land-use conflicts, and resolving them through consultation and trade-off analysis. Finally, it will locate and demarcate boundaries of land use entities with definitive use and identified beneficiary.

The engagement of authorities as facilitators from the beginning to the end would enable to resolve issues before it gets out of proportion and would facilitate smoother validation of the result. It gives more possibility for owning it and for using it as own facilitation guide in land use and land administration advisory decisions. It assures that ILUP will be mainstreamed with the development plan of the regional government for assured adoption and implementation.

Facilitation engagement of the technical staff with the grassroots communities and investors will help the direct beneficiaries to be continually in the driving seat and for owning the process. Issues of conflict will be resolved before the final plan is out. An agreeable plan results. However, for the communities and the technical staff to drive the process, capacity is requisite. Therefore, the major primary focus of the Participatory ILUP Development is engaging and building the capacity of the stakeholders.

After getting involved in the joint planning action, each of the subject matter specialists comes with a prioritized subject-specific land use plan for those lands that are not excluded because they are already occupied by unchangeable land-use types such as forestry, riverine, or sanctuary. Prioritization ranks are equally agreed to be in three levels: best-suited land use, moderately-suited land use, or marginally-suited land use. Each of such subject matter specialists will have to come with socially, economically, and environmentally justifiable parameters.

After each of the subject-matter specialists has completed their prioritized land use plans, each of them will have to come to a joint planning studio where the overlaps of each of the proposed land use plans can be disentangled. When there are two or more competing land-use types proposed for the same piece of land, each will justify why that land is to be allocated to given land use but not for the other land-use types. The final decision is given by weighing the economic, social, and environmental benefits.

### **6.5 Engaging federal-level steering committee**

OEFCCA is keenly interested to work with all parties at the beginning. Therefore, it has initiated MoUs to be signed with the Regional State Government of Oromia and the federal level Ministry of Agriculture and Rural Development (MoARD) for **endorsing and officially recognizing as well as supporting this ILUP effort**. In addition, the steering committee will be responsible for **facilitating the issuance of major enforcing policies** so that the ILUP is officially recognized and implemented. The Ministry has already shown interest in housing the OEFCCA Planning Expert Team within its building so that there is tangible and easy:

- a. Skill transfer and capacity building,
- b. The flow of information and knowledge
- c. Resolution to conflicting issues

Similarly, the field-level planning team of OEFCCA will also be housed together with the regional LAUEPA experts for ease of skill transfer and capacity building.

Conducting regional and federal-level sensitization workshops for policymakers and authorities on ILUP importance, ILUP agenda, scope, and coverage, as well as the roles and responsibilities of the Federal level Steering Committee, plus defining relevant federal level institutions is vital but for the planning and implementation of the plans. This will enable Establishing the federal level Steering committee (FSC). At the same time, Job descriptions and a common framework of engagement (CFE) must be prepared so that each federal level member institution identified in these workshops and recommended to form the FSCs will be abiding by the CFEs. The job description and CFE elements will guide the roles and responsibilities of the CFE in the ILUP development. The outcome of this preparatory effort is having FSC as a strong arm in the execution of the ILUP work and getting senior federal-level authorities on board for validation of the process. At the same time, this will give an opportunity for the planning-guide expert team an easy reach to the senior federal level representative and for providing alternative solutions in cases where issues for resolve are encountered.

The federal-level steering committee would also be joined periodically in its review meeting by the representatives of Sida and EKN which are financially supporting the ILUP process. This steering committee meeting will have a process evaluation, endorsement, and facilitation meeting at least once annually. .

## 6.6 The engaging federal level technical committee in the ILUP process

Having effectively sensitized technical experts who are, at the same time, members of the federal level government is very important for best-informed planning. Surely, as much as the Planning guide experts need to have a very good insight of the issues on the planning domain, the federal level technical experts need to have grasped the methodology and scope, and coverage of the ILUP development process. Sensitization and time-to-time consultation are vital. Therefore, OEFCCA has planned to hold several federal-level comprehensive sensitization workshops for senior experts on ILUP importance, ILUP agenda, production methodology, and roles and responsibilities of the FTC in the planning. It's believed that such workshops will help to establish modalities of engagement in the development in the ILUP process.

OEFCCA would also spent some preparatory time for defining roles, and responsibilities of the FTC and each federal level member institution, as well as in developing common framework of engagement (CFE) that will have to be agreed upon and signed for respect. The technical committee is the technical arm of the steering committee). The elements of the CFE will details the scope of work and engagement that each party would contribute for mutually advancing the ILUP development agenda and modalities of the planning sought.

## 6.7 The engaging regional-level steering committee in ILUP process

As much as federal level involvement is needed, regional-level involvement is very vital. This is ILUP to be produced for the Oromia region and it is necessary that the regional authorities are involved from the beginning to the end for **endorsing and officially supporting the ILUP development effort**. In addition, the regional steering committee will be responsible for **facilitating the issuance of major regional-level enforcing policies and for mainstreaming the Plan into the regional social and economic transformation plan of the region and that of the zones** so that the ILUP is officially recognized and implemented region-wide. In general, both the regional and federal level Steering Committees are to provide guidance and decisions in consideration of their respective policies, guidelines and laws. In view of this, OEFCCA has already established its office and core staffs in Oromia. Conducting regional level sensitization workshops for senior authorities on ILUP importance, ILUP agenda, production methodology and roles and responsibilities of Regional Steering Committee (RSC), engaging all relevant bureaus at the workshops will be very important for the planning process. In addition, these workshops would allow the Planning Expert Team of OEFCCA to identify experts/institutions that need to be part of the process. These are Land use and development planning experts who are to be hired by OEFCCA. They will be housed within the Ministry of Agriculture and Rural Development.

Based on the outcomes of the Sensitization workshops and consultations at regional level, the RSC, the committee will be prepared for consultation and approval of the resolve they arrive at by consensus. Similar to the FSC, a common framework of engagement for the involvement of members of the RSC which represent various regionally relevant bureaus will be developed for their approval. Building the capacity of the RSC members is vital for their effective roles in advancing this stakeholder-driven and expert-guided ILUP development. This will further strengthen the MOU developed between OEFCCA and the federal government. Having the established RSC to work together with the Planning Guide Expert Team will be very important for ease of recommending alternatives, getting guides, and resolving conflicting issues in a shorter period.

## **6.8 Engaging a regional-level technical committee in the ILUP process**

The envisaged ILUP is to serve as a guide in Oromia's land use planning and plan enforcement office for the careful, optimal, and responsible use of land as an entity entrusted to the current generation to be able to transfer it to the next generation at least at the quality that they borrowed it from the previous generation; while, at the same time, the land and its resources effectively contribute to their sustainable economic transformation of the current Oromians and the nation at large. Therefore, Oromians would have to be keenly and intelligently involved in the rational optimization of care and environmental sustainability concerns with land exploitation demands (which often cause use conflict) in consideration of a given time, economy and space location.

Therefore, the best ILUP could be developed if the land users of the Oromia region are given the driving seat while being guided by the best expert team. This will be realized in this project by purposely organizing, building their capacity, and engaging the community groups which represent various sectors of economic life in the land use planning exercise. This is why the regional level sensitization workshops are vital for the regional experts of various relevant bureaus such as water resources, livestock, and fisheries, transport, and road, forestry and environment, rural settlement, trade and business, tourism, investment, etc., to be sensitized on ILUP importance, ILUP agenda, scope and coverage of the ILUP development work, possible land-use conflicts, ILUP production methodology, and roles and responsibilities of RTC, etc.

The workshops will help for targeting and engaging relevant individuals from the above-mentioned bureaus and more to be part of the RTC team too. For such long-lasting and effective involvement, establishing the regional level able Regional Steering Committee, and defining roles, and being guided by a common framework of engagement (CFE) are very helpful. To this effect, OEFCCA must spend satisfactory time in sensitizing, and building the capacity of the Regional Technical Committee RTC experts. To build their capacity, they will be made counterparts to the Planning Team experts, will be given on-job training, and will be given assignments, will participate in the actual planning work, It is necessary that their effective role-playing in this stakeholder-driven and expert-guided ILUP development is ascertained through the many capacity-building responsibilities of the Planning Expert Team of HoA-REC.

Similar to the regional level FSC, the roles and responsibilities of the RSC would be detailed and commitment approved by signing the MOU developed in mutual agreement of the ILUP Expert Team of OEFCCA.

The success of the project implementation highly depends on the commitment and possibilities of fulfilling the manpower gap that currently exists. Therefore, the strength in the project's success can only be seen in parallel with the strength in building the manpower capacity both at LAUEPA, and community levels. The issue is worrisome in that OEFCCA cannot solely decide on manpower allocation at both region and district levels. The interim solution suggested for overcoming such a capacity gap is employing one all-rounded and experienced land use and development planner on a full-time basis at LAUEPA and involving as many regional experts as possible as the counterpart to the planning team. Please refer to the budget request for "strengthening LAUEPA office)

Because the activities and products of this project cut across several disciplines, coordination and harmony are needed to make the best use of knowledge and expertise in all disciplines. Many of these disciplines are best housed in various independent institutions. Significant coordination efforts between institutions are needed within the LAUEPA office

## **6.9 Engaging zonal ILUP-facilitation staff in ILUP making process**

The technical LAUEPA staffs are those who will be implementing the ILUP directives and actions. Therefore, they must be involved as drivers of the plan. Therefore, they will have to be included in the practical field study crew as well as in all presentations and demonstrations of the ILUP-in process. The ILUP is to be perfected through reviews and critiques from the beneficiaries. In this respect, engaging the zonal ILUP staff in all reviews, critiques and approval forum is very important. This engagement will make them ready to own the ILUP and arm them with all the knowledge they need to implement it as planned.

The effort in building the capacity of ILUP staff is very essential for facilitating the ILUP process and its implementation. This will be possible when the ILUP office is strengthened in quality staff, tools, equipment, and means of transport. The entry point is identifying and engaging the zonal and regional LAUEPA staff.

## **6.10 Building capacity of zonal-level relevant staff**

The zonal level staffs are key for understanding and implementing the ILUP on the ground. They are the ones who need to know most about the reasons why a certain land is not allocated for a certain use but not for any other. Therefore, if the implementation is to easy or no distortion is to occur, building the capacity and engaging the zonal experts is vital.

Training is conducted through workshops, seminars, and action teaching through expert-counterpart attachments on the essence, scope, and coverage, planning particulars and surveying, mapping, map reading, land sensitivity classification, methods of land use and development planning, land use conflict resolution.

Most will be understood when the staff is made to participate in the process. This can be easily implemented when the Expert-team is tutoring the zonal level technical staff in action. Official approval of their engagement can be obtained from the regional level steering committee that is planned to have been already engaged and who are aware of the benefit of the skill improvement for the zonal staff.

## **6.11 Building the capacity of regional level LAUEPA staffs**

Through the “organizing and engaging” effort the regional level technical committee will be established. However, for the regional technical committee experts to drive the ILUP process and implementation effectively with the zonal staff and in consultation and involvement of the grassroots communities, their capacity will have to be strengthened. Stakeholders would effectively and eagerly participate in the planning process if they are made aware of the agenda if they are clear about the interventions of planning, and what it means to their wellbeing and their environment. Therefore conducting “how-to” pieces of training and on-job explanation and elaboration with regards to ILUP’s essence, importance to their economic and social transformation, the ILUP agenda, scope and coverage of the ILUP development works, ILUP development methodology, and roles and responsibilities of each sector expert, the importance of the involvement relevant individuals from each sector-specific expertise is important. Already, a cross-country study tour has been conducted by LAUEPA experts and other relevant bureaus. This experience exchange will include community group leaders too. The planning team will involve experts from institutions such as ILA at Bashir-Dar University and relevant institutions of the Netherlands.

The capacity of LAUEPA staff and the institution is planned to be built in the preparatory period, before embarking on the ILUP process. The immediate focus will be on how the staff and the institution could effectively engage and actively participate in the development of the ILUP itself. At the same time, the specific expert staff that constitutes the regional technical committee will also be made counterparts to the experienced land use planning

experts. This will give a learning-in-action opportunity for improving their land use planning and development skills. However, capacity for successfully guiding the ILUP implementation process will require a more in-depth understanding of each subject and having own reflection on issues that pop up in the implementation period.

Exercising land administration, utilization and environmental protection as outlined in ILUP requires even more insight and expertise. In addition, it is a fact that the ILUP will be implemented by way of several projects of economic growth and environmental sustenance in the region. All these indicate that the capacity demand from the regional and zonal level LAUEPA is enormous. If ILUP is to be implemented successfully, building the capacity of the LAUEPA institution and its staff is a necessity, not a choice. This project has been planned and budgeted to concurrently support long-term training for 5 MSC level and 10 BSC students for the region. This is very important because being guided by the plan and implementing the many projects that are relevant for economic, ecologic, and social development is more diverse and complex which requires specialized training.

## **6.12 Strengthening regional LAUEPA office**

As it has been indicated elsewhere, OEFCCA is keenly interested in developing a living and working land use and development plan that can help in guarantying optimal use of land and land-based resources in Oromia. The major custodian for the use of this ILUP is the Land administration, utilization, and environmental protection authority (LAUEPA) office of the region. Therefore, the capacity of this institution very important.

When the regional LAUEPA experts are required to use and even guide the implementation of the ILUP, their office must be equipped with the necessary field vehicles, computers, and software, as well as field tools and equipment. Therefore, the capacity building budget requested will be used for such capacitation inputs. The authority office is encouraged and supported to be staffed with all the necessary experts too. A project top-up scheme is proposed and budgeted for realizing this initiative. Because of this capacity building and institutional strengthening requirement, the project has a budget of a total of 800,000 euros to support this Capacity Building and Institutional Strengthening effort of the ILUP facilitation institutions and staff.

The capacity-building role of this project will be intensively needed within the first three years when the capacity of direct beneficiaries and LAUEPA staff is being built intensively. In the next two years, the capacity-building role of OEFCCA decreases significantly because the capacity of the direct beneficiaries and the LAUEPA has reached a satisfactory level. In the last 5 years, the capacity-building role drastically diminishes because the capacity need is substituted significantly by the beneficiaries and LAUEPA staff. It is assumed that the capacity need will be effectively and fully be substituted by the regional LAUEPA office and staff as well the beneficiaries at the end of this last 5-year period. Please refer to **Figure 7** for this capacity shift through the 10-year project period.

## **6.13 Organizing, Training, And Engaging The Drivers Of The Ilup Proces<sup>3</sup>**

- I. The major intention of OEFCCA is to have the direct beneficiaries driving the ILUP process. Direct beneficiaries are local and international investors, sector-specific community groups, and public-domain project implementers. These are Public-domain projects include projects such as Wildlife and the environment. At the same time, OEFCCA knows that the direct beneficiaries would have to be guided by facilitator

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<sup>3</sup> *Drivers of the ILUP process are synonymous to 'the beneficiaries' characterized on page 1 of this proposal.*

experts and need a knowledge-house established within the region and zones. Therefore, building the capacity of the direct beneficiaries is essential for effectively driving the ILUP process.

There will be multiple awareness creation and empowerment workshops to be conducted for the various communities. Each is representing beneficiaries of each of the:

- 14 livelihood-sectors that are indicated in Table 1 at the following page.
- In each of the 8 'Like-Other Groups': Anuak, Nuer and Majang zones, itang special Woreda, Oromia autonomous city, Shabuye, and Ngalam invisible communities, and the highlanders;
- 6 Social-status representations of discussants (separated by gender, age group and wealth status)

Therefore, such workshops and capacity-building pieces of training will be conducted in a maximum of 672 (14 x 8 x 6) community consultative groups to be engaged in ILUP development for Oromia. On average, it is assumed that there will be 18 representative discussant individuals in each of the CCGs making the people to be involved in the ILUP process 12,096. This will enable the planning team to interact with 12,096 individuals from the direct beneficiary communities. Assuming that there will be 81,200 HH in Oromia when these numbers of represented participants are organized, trained, and engaged in driving the planning process, it will enable us to have about 11.17 % of the household population represented.

Each group will have a Common framework of engagement for members' participation in agreeable demarcation and possession of resources as well as delineation of boundaries by consensus for conflict-free use. The groups will be trained in group management and in the articulation of ideas plus about the benefits of conferring to their commonly agreed bylaws. In the planning process, all community groups are supported to attend and present their opinions in plan development workshops, plan reviews, and plan approval forums. Building the capacities of each member of the community groups is basic for their effective participation in driving this stakeholder-driven and expert-guided ILUP development

Among the capacity-building actions, letting each group member participate in study tours, planning workshops and training in participatory initiatives, field-level attachment studies, will be considered. The group members will also be trained in trade-off analysis, in comparing and contrasting options, and about resolving competing alternatives through consultations and consensus-building.

The overall goal of the ILUP development is improving the economic and social transformation of the entire peoples of Oromia on a sustainable basis by availing an effective land-use guide to be prepared in consideration of the issues of the direct beneficiaries. It is about producing a land use and development plan that meets the present needs of the people of Oromia without compromising the ability of their future generations in meeting their future needs. Sustained and continued economic transformation is most dependent on how people agreeably value, own, manage and utilize their land and land-based resources. Value to this resource could be added by a well-thought plan only if all the communities are given space for tabling their opinion freely and if the experts provide the forum for the communities to teach their generation-old knowledge on how they use the land and its resources for optimally accommodating it in the planning.

Such exercise must be conducted at the Anuak, Nuer, and Majang zones, Shabuye and the Ngalam communities, and the highlanders. Above are the 14 major livelihood-sector groups to be considered. Each is to be stratified into sub-groups of youth and adult, women and men as well as the wealthy and the poor. By doing so, communities marginalized

by their ethnic group, gender, wealth rank, and age class will be allowed to be heard and table their concerns and solutions to possibly make ILUP fit all. In addition, the planning will be based on a comprehensive study of local livelihoods and customary land tenure systems.

It is equally necessary that all-sector-involving community groups (CAGs) such as those involved in cereal farming, livestock keeping, fisheries, ethnobotany, honey production, rural trade, and business, etc., are established. To let them be actively involved in the planning process, they will be sensitized and effectively engaged in the ILUP development process as of the beginning. In addition to awareness creation and sensitization workshops, there shall be readers circles through which they developed their understanding of the ILUP, group governance, and how they air their opinions in an expert consultation. It is only after such efforts that the communities will get effectively engaged in this stakeholder-driven and expert-guided ILUP development.

'like-other groups': Anak, nuer and Majang zones, Itang special woreda, Oromia autonomous city, shabby, and ngalam invisible communities, and the highlanders, who are engaged in each of the following 14 peoples' livelihood sectors

**Further Qualification Criterion Of The Ccg By Representations Of Their Social-Status**

Gender		Age-Group		Wealth-Status	
Male	Female	Youth	Adult	Wealthy	The Poor

**Table 1. Stratification, Community Consultative/advisor groups who will be capacitated to drive the ILUP planning process**

For the effective engagement of every one of the communities, the program must be developed with each team for their availability, participation, and sharing. Developing a program of engagement between the ILUP Expert Team of OEFCCA and each of the committees is useful for an effective and tailored ILUP development agenda.

Communities effectively participate in the planning process if they are made aware of the agenda and what it means to their wellbeing. Therefore conducting at least 6 awareness creation and sensitization workshops at each of the 3 zones, Itang Special Woreda, Oromia autonomous city, Shabuye, Ngalam, and the Highlanders communities with regards to ILUP's essence, importance to their economic and social transformation, the ILUP agenda, scope and coverage of the ILUP development works, ILUP development methodology and roles and responsibilities of each sector-specific community groups, is very important.

As shown in Table 1 above, the project is keen on organizing, training, and involving women as one of the drivers of the ILUP process who are belonging to either of eh ethnic or social status groups. According to the same table, the opinions of 2016 individual women will be heard when they participate in the planning process in 672 women groups. They come from each of the Anuk, Nur, Majang ethnic groups, the Shabuye, and the Ngalam communities who

are recognized as invisible minorities or who are not given political space at the zonal and regional levels.

Similarly, although better off economically, the Highlanders are also subjected to some exclusionary practices based on their lack of political representation at all levels. Recognizing the Highlanders as one of the community consultation groups is important. Therefore, the women also come from the Highlanders. This is important to avoid future potential conflicts. Current studies already indicate that there is a rising tension between the Highlanders and the indigenous communities on issues related to land-use conflicts.

Most effort will be made to mainstream gender throughout the land use planning and implementation process and translate the legal possibility of women into practical empowerment. In this effort,

- ✓ support will be given to community conversation on women's economic empowerment as part of combating gender inequality,
- ✓ Give as much voice to women as possible in the identification of the livelihood sector group which reflects local reality.
- ✓ Link up with National and Regional initiatives which address socio-economic issues related to women's equal access to and control over land through advocacy and awareness creation program

Communities in agriculture, livestock and bee farming, fisheries horticulture, timber processing, and rural business as well as herbalists and energy will be organized and consulted. They will be trained in in-house and field conditions. They will be encouraged to understand and reflect on the ILUP ideals and processes. As much as possible easy-to-understand demonstrations will be presented to them.

The major decisive work in the ILUP process is making sure that the stakeholder communities are actively participating in driving the ILUP process. This would guarantee the longevity of the ILUP as an outcome and smooth implementation of the plan. The very purpose of organizing, engaging, and capacitating the various stakeholders, is to make sure that they can actively participate in the ILUP process. The outcome of this effort could be measured by:

- ✓ Number of organized and trained livelihood-sector women, youth and men groups that are made a signatory to the commonly- agreed bylaws
- ✓ Number of decisions the groups were taking part in and approving in the ILUP studies
- ✓ Number of workshops, plan reviews and approval forums where group members attended
- ✓ Number and areas of land use types that are designated for improving the livelihoods of every livelihoods sector that each group is representing.

As it has been discussed under the “Challenges” section 4.2, there will be at least 20 women, 20 youth and 20 men and 20 elders, 20 well-to-do and 20 poor family groups representing their constituencies in each of the 3 zones, one special Woreda and within the City of Oromia to be organized, trained and involved in the planning process. They will be trained to articulate and table their opinion for recognition in the land use and development master plan.

The communities would value economic incentives more than organizing them, sensitizing them, training them, and attracting them for engagement. However, the economic incentive in their participation is the transportation and daily subsistence allowances they get while participating in meetings, In addition, many will be involved in field-level studies such as soil sampling, vegetation studies, and land-surveying as well as water sampling. The traditional

leaders and recognized community elders will also be involved in group formation and in resolving conflicts by joining the study crew.

The roles of local partners especially the private sector in the development of the master plan will be driving the ILUP process. It is indicating what would have to be considered whereas physical and socio-cultural conditions allow. They will be required to tell their plans/actions as it can have a great influence on the “landscape”. As it has been indicated in the M & E section of this document, detailed baseline data will be gathered both on physical factors and socioeconomics. This baseline data will be compared to the outcome of the project after the project or even mid-way.

For sure, the consequences of craving investors without genuinely integrated land-use planning may result in disaster. At the same time, having genuine investors who would eagerly implement what is to be studied and proposed by the ILUP process is a golden opportunity. To make it even prettier, their involvement is very essential. The planning team hopes and believes that the investors (especially the local investors) would be more than willing to participate and benefit from the results. Investment is often followed by concentrated and hired labour. The hired labour can have initial capital which triggers some chain developments.

As it has been indicated earlier, before ILUP, the investors have started being change agents and this will have to be studied and understood in the ILUP process. To catch up with the pace, it is necessary that the ILUP starts with their area of intervention and know the in and out of their land use intentions by having their representatives as part of the beneficiaries who need to inform their objectives and wishes. They must be fully on the board. The government, whose role is facilitation, would facilitate their involvement. Because a couple of the investors have already realized that they could have benefited from detailed land-suitability studies, it is very obvious they could appreciate the ILUP study which is also being conducted with no funding required on their part. Please note that the schematic representation of the different ILUP planning schemes shows that the representatives of the investment companies and the civil societies are part and parcel of the scheme.

It is also inevitable that the private sector partner’s manpower need would be higher than the local people’s skills because a substantial portion would involve highly mechanized technologies. But, the portion that requires basic skills will be substantial as compared to the sparse population in Oromia. Therefore, the people of Oromia must be trained in both basic- skills to get accommodated. Often basic skill pieces of training will not take more than 6 months. In addition, it might be necessary that skill requirement trends are studied and accommodated in long-term education plans. This will be the outcome of the ILUP where one of the 13 growth and transformation projects would be identifying and preparing a bankable proposal on social-service development.

As it is indicated above, the investors would bring skilled manpower from outside of the region. Because the job opportunity, even for basic skills, will be higher than locally available, basic skill owners would also come by their own and be hired in the investment schemes. However, both the “insiders” and the “outsiders” cause change to each often developing a mixed culture and more harmonized than initial. There will not be completed because there will be job opportunity more than they can handle. Therefore, the conflict will not be significant.

## **6.14 Avoiding Conflict Between All Sectors of Communities**

Land use and development planning, in its nature, is the identification of areas of conflict, presentation of best alternatives for consideration, and deciding on the best land-use option by consensus. But reaching a consensus between different parties or factions or communities is not easy unless this working procedure and commonly binding principles are not developed in the participation of each and if such are not respected and followed by each one. This is where organizing, training, and engaging the communities, as of the beginning of the ILUP process, is vital. Nearly 11.17 % of the 6 different communities who are stratified by ethnic lines who might have been involved in any of the 14 livelihood sectors will be made part of the planning team that identifies land-use conflicts, best alternatives for the good of their environment and their livelihoods, and participating in making an informed decision by consensus.

### **Figure 9. Capacity building support-trend through time**

Strong preparatory effort will be made for establishing Conflict Resolving Elders' Committees (CREC) in each of the four zones and in the special Woreda. The planning team will conduct workshop and training on causes of conflict, price of conflict, actions for avoiding conflict and on tradition-based negotiation skills

In addition, a concerted effort will be made for establishing conflict surveillance and early warning systems so that the cause of conflict is traced and identified before the conflict has become operational. The Ethiopian people in general and the elders of Oromia, in particular, are known for settling serious and devastating issues that modern societies could not resolve. But, of course, they will need to be supplemented by brochures and pamphlets on conflict-avoiding principles. This will help the elders not to settle the cause of conflict before happening only, but to also help them to be impartial in their resolving decisions.

This is a long-term effort that needs to follow throughout the planning processes. The outcome of the effort would be measured by:

- ✓ the number of consensus building or land use decision and/or approval forums that the sector- group participated and agreed upon, and
- ✓ Land use types that are considered in response to the proposal made by the groups and boundaries that are designated in agreement by every sector group,
- ✓ Bylaws that are commonly agreed to participation and decision-making principles are agreed and implemented as intended.

## **6.15 Deploying the ILUP Expert Team FOR guiding the ILUP process**

ILUP development requires various experts who can synthesize information and synergize thoughts for coming up with solid and all-encompassing ILUP that can serve in effectively guiding the sustainable continuity of the environment as well as the economic and social transformation of the region. Efforts could be in disarray if not effectively guided and coordinated. This requires the deployment of an experienced and effective coordinator too. This starts from the development of effective terms of reference for each of the experts in the planning team to be engaged in the study. Care is required in advertising and recruiting the ILUP-study expert team coordinator and subject-specific expert team members.

For successful ILUP development, having a suitable office and office facilities as well as field-level study equipment is essential. In this effort, assembling modern planning software such as GIS, combined with GPS and RS tools is necessary. Other data manipulation and spatial information processing software are also vital and the

UP is often visualized by geo-referenced maps, charts, and drawings and these require purchasing satellite imageries, other necessary hardware types such as computers, plotters, digitizers, and printers. There will be a lot of data collection work and samples will be collected for analysis. Therefore, signing the contract with reputable laboratories and financing the laboratory analysis of soils, geology, and vegetation samples is a must.

In addition to hard data collection, there will be lots of social investigative studies to be conducted at community levels. Therefore, purchasing 5 four-wheel-drive Toyota pickups to be stationed in each of the 4 zonal office offices of the agriculture and rural development and one at the Oromia OEFCCA office is important for the facilitation of field-level studies by the experts.

There will be lots of administrative work especially related to employing experts for their engagement in ILUP study both at the field level and office levels. Getting assembled all the necessary field-level study and sampling tools and equipment that are needed by each expert; conducting the purchase of such tools and equipment, and financing and coordinating the transportation of the study crew between Oromia and Addis require administrative and procurement budgets.

Establishing a Data /information Management Center, equipped with computers, computer networks, and other necessary supports to maintain automated and streamlined data management at the regional level in Oromia, HQ of OEFCCA and MoARD is especially important.

Though OEFCCA is strong on the technical environmental side, it has fully understood that OEFCCA will need to hire experienced experts who are professionals in socio-economic, infrastructure-based, and land-based issues and disciplines. Studying the dynamic security and conflict situation will be the take of the experts to be hired for the study. However, paying attention to the comparative study on the status of this dynamic security and conflict situation may be important in its mid-term and final evaluation period.

## 7. Module 7. : Integrated Urban Land-use planning Methods and Approaches

### 7.1 Introduction

The Oromia National Regional State, a waterworks design and supervision enterprise, prepared basin-based ILUP for the region aiming for efficient utilization of resources (both natural and man-made) to bring sustainable development. The ILUP was prepared between 2007 to 2018 this seems so late without realization of the plan for the aimed purpose. Therefore, the Oromia Forest Environment and Climate Change Authority outsourced the task to investigate the capacity gaps encountered so far which hindered the implementation of the plan. For the gap assessment task, four sample zones were selected, namely east Haragie, Borena, Illu Aba bora, and east Showa. From each zone, two woredas were selected. In the same manner, one kebeles from each woreda was also selected. In all selected areas fieldwork regarding the plan preparation process and implementation-related gaps were investigated. As part of the assessment the regional level assessment was also undertaken to understand the gaps observed at a higher level so far in using the plan. All the investigated findings of the gaps were submitted.

In this regard, the second task will be the preparation of the training manuals and module which will help as a capacity-building document. This aimed at giving ToT with the prepared manual and delivering the awareness creation to make the plan implementable land use plans at the grassroots level, so that, everyone will get aware of and sensitized about the details of Integrated Land Use Planning..

In addition, the training manuals and modules shall be supported by practical examples. For this purpose, one zone from the region was randomly selected. The selected zone is Arsi Zone of the Oromia National Regional State. For the time being it is difficult to write the existing context of the Asela town with detail existing urban land use categories. To do so it is very important to visit the town and better understand the context to incorporate the practices as input. I hope and expect there will be a field visit to be undertaken shortly. The location of the zone and woreda in this regard, this manual covered the urban planning sub-sector (integrated urban land use plan) only.

<b>Arsi Zone of the Oromia National Regional States (Sample Area For Training )</b>	
No of Woreda in the zone	26
No of Kebeles in the zone	563
No of Towns in the zone	36

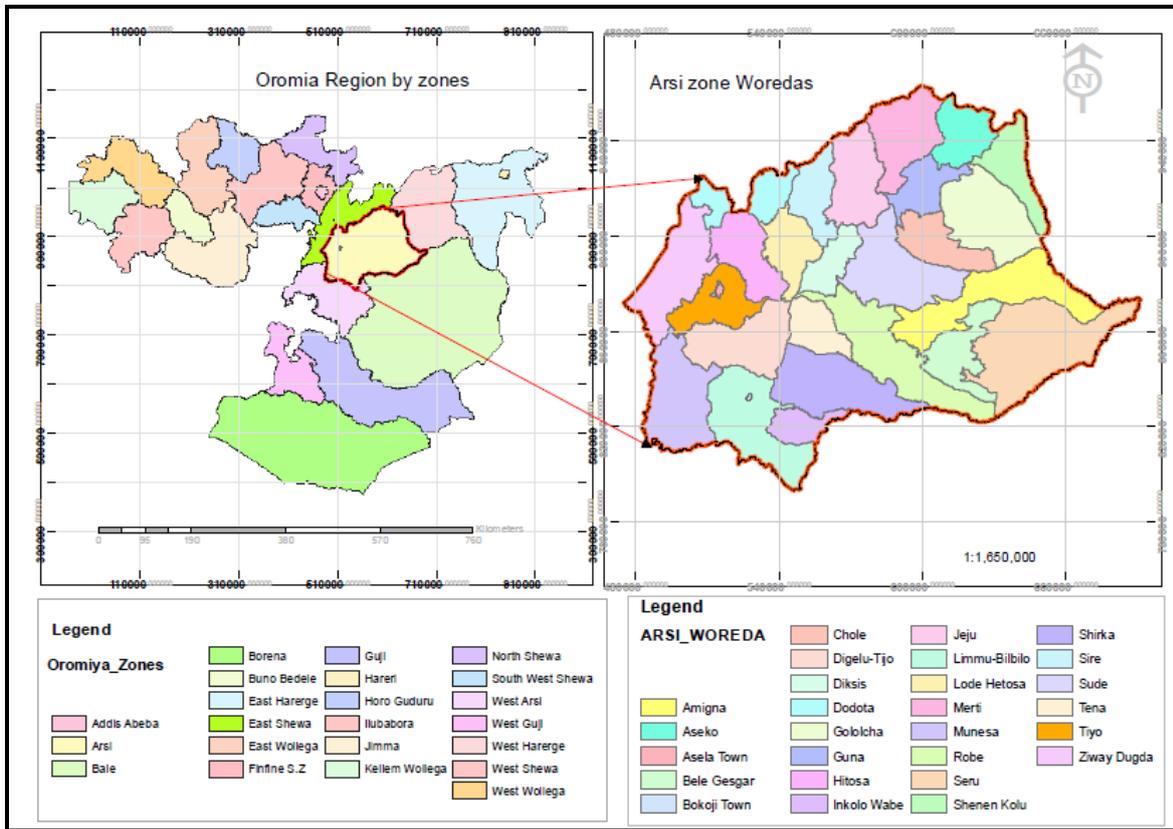


Figure 1: Map showing the physical location Arsi zone of the oromia national Regional state

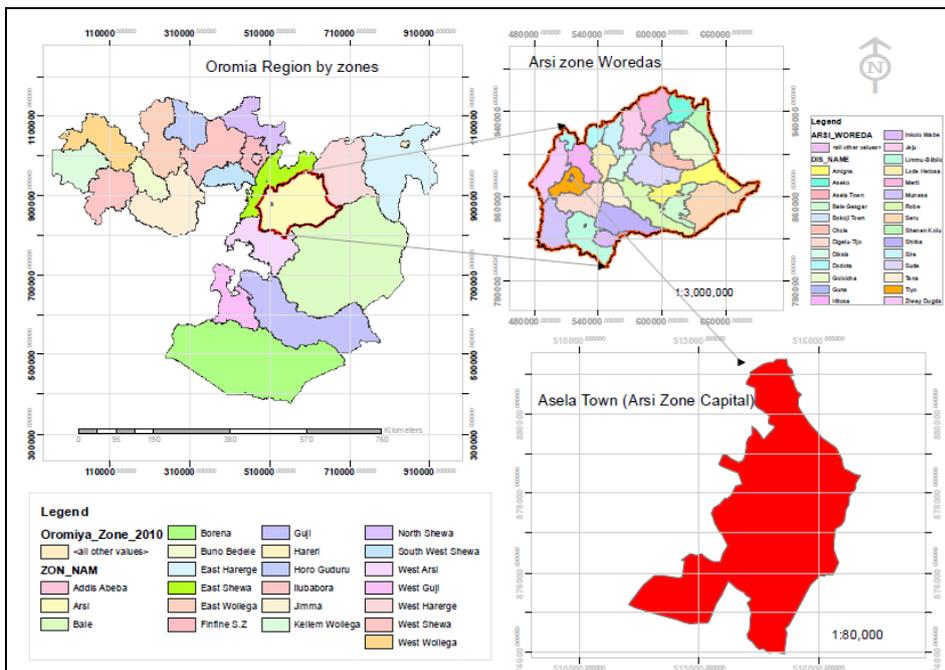
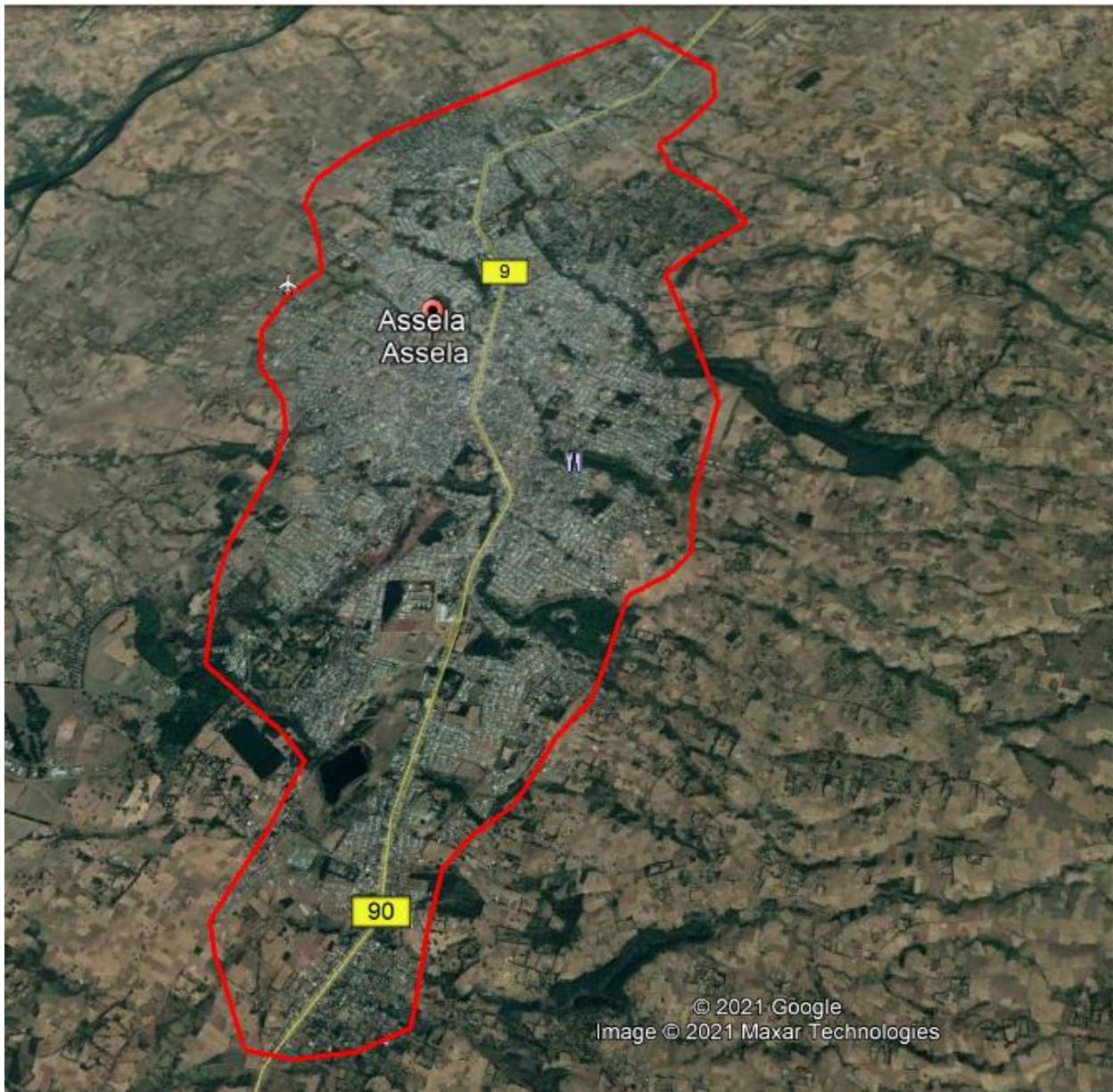


Figure 2: Map showing the location Asela town of the in the Arsi Zone

Road to Adama



Road to Bakoji

Area of the town -1698ha

## 7.2 Objectives

The main objectives are:

- Introduce and create awareness on the main urban land-use planning tools characteristically found in a regulation, namely: integrated development plans; spatial plans; zoning; subdivision; title deed condition; development permit areas; environmental assessment; protected areas; and other associated tools (such as planning principles and objectives; compulsory acquisition; market-based incentives; and biodiversity offsets).
- Create awareness of the characteristic form, nature and content of each of these land-use planning tools.
- Provide clarity on the characteristics institutional on each of these land-use planning tools.
- Advance knowledge of the key potential role of each of these land-use planning tools in integrating biodiversity and climate change issues, and urban areas, and the potential role of law in facilitating such integration.

- Construct insights on the prerequisites and opportunities for improved integration and practical skills on how to tangibly achieve it in reality.

### **7.3 Methods and Approaches**

Some of the good principles of the ILUP approach such as the things that the planning should be strategic, development-oriented, participatory, and integrative were considered and incorporated. Moreover, analysis/ methods and data collection in previous knowledge gap assessments undertaken in four Zone (Borena, Illu Ababora, East Show, and East Harargie) of the region is an important input for the preparation of this manual.

Under the primary data collection method, mainly questionnaires and checklists were employed and FGD shall be conducted. Data collection questionnaire shall be designed and distributed to officials and professionals which include city/town administrations, planning agencies (both under the Regional Bureaus, that are engaged in the implementation of Integrated land use plan /urban plans)

Relevant secondary data from secondary sources such as the national integrated land use plan road map, policies, and legal frameworks both at the federal and regional level were assessed, basin integrated land use plan was also used as input for the preparation of this document. Ministry of Urban Development and Construction, policy/program/ proclamation document,

### **7.4 Concept, General Provisions, Principles and Considerations**

#### **7.4.1 Concept**

##### **A. Definition**

Integrated urban land use plan is defined as a legally binding plan along with its explanatory texts formulated and drawn at the level of an entire urban boundary that sets out the basic minimum requirements regarding physical development the fulfilment of which could produce a coherent urban development in social, economic and spatial spheres. It is a framework that guides the development process in an integrated, holistic way.

##### **B. Physical Boundaries of Urban Centers**

According to the urban planning proclamation 574/2008, concerning physical boundaries of urban centres, the following have been important:

- Urban centres shall have their distinct boundaries /clear demarcation from rural areas
- The demarcation/ re-demarcation of boundary for a given urban centre shall be made, where necessary, by the concerned regional governments.

##### **C. Relevance**

An integrated urban land use plan is a technical, institutional, and policy framework, which with the active participation of all stakeholders, systematically identifies, prioritizes, and addresses socio-economic, environmental, and spatial urban development issues. It outlines intervention approaches and implementation programs to be undertaken to achieve city-wide and at influence area levels. It is one of the basic urban management tools, which professionals involved in urban development planning and implementation should use in their day-to-day activities.

## **7.4.2 GENERAL PROVISION**

### **Policy Provision**

As it was known there is no policy framework existed so far about integrated land use plans at the national level. But urban level land use plan (development plan) regulation has been specifically treated under urban plan proclamation no 574/2008. It tries to describe the land uses for major economic, social, cultural, and environmental activities and services in its operational span of 10 years of life. Such a plan envisages mandatory and optional regulations for permitted and prohibited land uses in the urban area. The land-use plan of any city/town can be classified into 9 general land use classes such as residence, commerce and trade, administration, services, manufacturing and storage, road and transport, recreation and environment, special function and urban agriculture main. Each land use class can be assigned based on 30, 30 40 urban development strategy (detail is on page 10 and 12)

### **The Urban Development Policy of Ethiopia:**

The main theme of the National Urban Development policy document stated in the document that the speed, extent, and focus of urban development is dependent on rural development and vice versa. According to the policy document, the main challenges facing urban areas in the country are poorly developed social and physical infrastructure; shortage and deterioration of housing; lack of recreation areas, inadequate municipal waste management; absence of well-integrated urban-rural linkage; unbalanced urban growth and weakly developed national and regional urban systems. The policy gives key emphasis to urban-rural and urban-urban linkages. But not properly realized yet. It emphasizes the importance of democracy and good governance for sustainable urban development. Problems of good governance reflected widely in the lack of accountability, transparency, and efficiency among municipal authorities and the sheer of public participation in the decision-making process are pointed out as the main obstacles for economic development. The other main areas of concern in this policy document are facilitating the participation of developers and the wider public in local economic development issues, establishing accountability and the rule of law, and provision of autonomy and power on municipal finance and expenditure to cities.

The overall vision of the policy is to ensure the growth and development of Ethiopian urban centres is guided by plans and to make the cities and towns competitive centres of integrated and sustainable development that are sufficiently responsive to the needs of their inhabitants. To do so cities and towns in the nation are expected to serve as centres of commerce, industry and the services that are essential to bringing about holistic and sustainable economic development. The policy document spells out specific policy recommendations for Micro and Small-Scale Enterprises (MSE), housing development, facilitating land and infrastructure delivery, social services, urban grading, planning and environmental protection, democracy, good governance, and capacity building.

### **The Urban Planning Proclamation**

The proclamation, i.e. “A Proclamation to Provide for Urban Plans (Proclamation No. 574/2008)” is declared in response to the need to regulate and guide urban centres by sound and visionary urban land use plans to bring about balanced and integrated national, regional and local development; to create a favourable and an enabling condition for public and private stakeholders to fully participate in the process of urban land use plan initiation, preparation and implementation based on national standards; to regulate the carrying out of development undertakings in urban centres without detrimental effects to the general wellbeing of the community as well as the protection of the natural environment; and to replace existing urban planning laws with comprehensive legislation which takes into account the federal structure of government and the central role of urban centres in urban plan preparation and implementation.

## The Five Years Growth and Transformation Plan (GTP)

According to the GTP, as regards urban land administration and urban planning that have a significant impact on achieving good governance in urban areas activities that greatly improve executing/ implementation capacity will be carried out. Towards this, on the urban planning side focus will be made on the following: promoting proper delineation of urban green areas, beautification, landscape design, and urban design works; developing appropriate systems for the management of solid and liquid wastes; carrying out continuous follow up on the control of urban land use plan; ensuring preparation and implementation of plans based on the urban planning law; making urban managers sufficiently aware of urban planning and implementation issues, etc. Strengthening the all-around participation of the people is paramount important to accelerate development and achieve good governance. To accelerate development through curbing poverty and bringing economic prosperity, it would be necessary to study and analyze the level of rural-urban and urban–urban linkages/ interactions

### The current 10-year perspective plans

The plan is also the current government direction which aims at increasing productivity through integration of urban and rural areas. Cities and towns centers of development

### 7.4.3 Principles

The following basic principles shall be adhered to in any process of integrated land use preparation and implementation. Therefore, any ILUP should consider the following as a principle:

- 1) Sharing the national vision and standard as well as capable of being implemented;
- 2) Consideration of interurban and urban-rural linkages;

**Table: the 30, 30, 40 Urban Land Use Plan proportions**

Category	Standard in %	Representative Codes	Major Components	Remark
Road and associated infrastructures	30	<ul style="list-style-type: none"> <li>• T-1, T-2, T-3, All roads, T-4</li> </ul>	<ul style="list-style-type: none"> <li>• Terminals, Dry ports, Parking,</li> <li>• PAS (principal arterial street), SAS (sub arterial street), CS (collector street), , LS(local street)</li> <li>• Trail &amp; Tram way</li> <li>• Pedestrian and bikeways.</li> </ul>	<ul style="list-style-type: none"> <li>• Street based green areas and related amenities, and utility lines are accommodated in the right of way.</li> </ul>
Green areas & Public Spaces	30	<ul style="list-style-type: none"> <li>• RE-1, RE-2, RE-3, RE-4</li> <li>• S-32, S-42, S-5,</li> <li>• A-2</li> <li>• SF-12, SF-14,</li> </ul>	<ul style="list-style-type: none"> <li>• Open spaces, Formal green, Sport centers,</li> <li>• Environmental (wet land and water bodies, other protection areas)</li> <li>• Institutions based sport facilities, Festivity areas,</li> <li>• Horticulture, apiculture</li> <li>• Urban agriculture</li> <li>• Biodiversity and ecological conservation area</li> <li>• Urban zoo</li> </ul>	<ul style="list-style-type: none"> <li>• Land uses that are designated for all sort of greenery</li> <li>• Recreational areas</li> <li>• Rivers, lakes and wetland</li> <li>• Agriculture areas</li> <li>• Green areas in High density &amp; special residential areas</li> </ul>
Building or settlements	40	<ul style="list-style-type: none"> <li>• R-1, R-2, R-3</li> <li>• AD-1, AD-2, AD-3</li> <li>• CO-1, CO-2, CO-3</li> <li>• M-1, M-2, M-3, M-4, M-5, M-</li> </ul>	<ul style="list-style-type: none"> <li>• Residential,</li> <li>• Government Institution, International Organization &amp; NGOs, unions, CBOs and parties</li> <li>• Commerce, Business &amp; trade, Financial Institutions.</li> <li>• Education, Health, Slaughterhouse, Fire and</li> </ul>	<ul style="list-style-type: none"> <li>• Land uses assumed to be calculated in relation to the concept of BAR (Built up area ratio to exclude green and open spaces in this case).</li> <li>• For Aircraft approaching area, high power tension</li> </ul>

		6, <ul style="list-style-type: none"> <li>S-1, S-2, S-31, S-33, S-34, S-35, S-36, S-41, S-43, S-44, S-6,</li> <li>A-1,</li> <li>SF-13, S-14, SF-16</li> </ul>	emergency, solid waste disposal site, Liquid waste transfer station, Liquid waste disposal site/treatment plant, Library, museum, historical site & Building, multipurpose hall , Youth center, Orphanage, handicap centers, <ul style="list-style-type: none"> <li>Manufacturing and storage</li> <li>Animal husbandry,</li> <li>Military camp, Palace, Embassy and the likes</li> </ul>	lines it depends on the situation or location. Either it could be in green areas or built up areas <ul style="list-style-type: none"> <li>Archaeological, quarry and sites could be in Built up areas</li> </ul>
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Principles.....continued

- 3) Delineation of spatial frame for urban centers because of efficient land utilization;
- 4) due attention to environmental protection
- 5) Ensuring participation of all stakeholders
- 6) Promotion of balanced and mixed development
- 7) Preservation and restoration of historical and cultural heritages;
- 8) Balance public and private interests;
- 9) Ensuring sustainable development.
- 10) Due attention to 30, 30, 40 strategy

Table: Details of the urban land use component for the category 40 %

Land use components	Proportion in percent (Out of the total 40%)	Remark
<ul style="list-style-type: none"> <li>Residence               <ul style="list-style-type: none"> <li>✓ Pure</li> <li>✓ Mixed</li> </ul> </li> </ul>	<b>50-6% (20-24/40)</b> 60 -70%) out of the total residence (30 - 40%) out of the total residence	
<ul style="list-style-type: none"> <li>Business &amp; commerce</li> </ul>	15-20% (6-8/40)	
<ul style="list-style-type: none"> <li>Social &amp; municipal service</li> </ul>	10-15% (4-6/40)	
<ul style="list-style-type: none"> <li>Manufacturing &amp; storage</li> </ul>	5-10 (2- 4/40)	
<ul style="list-style-type: none"> <li>Administration</li> </ul>	5 -7 % (2-2.8/40)	
<ul style="list-style-type: none"> <li>Urban agriculture (if built)</li> </ul>	1-3%(0.4 -1.2/40)	
<ul style="list-style-type: none"> <li>Special functions</li> </ul>	1-2%(0.4 -0.8/40)	

Source: Urban land-use plan guide line of Ethiopia 2017

NB: The proportion in the percentage is out of the total 40% of the land allocated for construction purposes. In this regard, the Residential land use function, for example, will comprise of 50-60% of the total land use category

## **7.4.4 Considerations**

### **A. Linkage Considerations with Sector Plans:**

Urban land-use plan preparation and implementation is a participatory process where sector organizations and institutions have an interest, and also play a role. All sectoral physical and socioeconomic development programs should be integrated both at the planning and implementation stages. At the implementation stage, city-wide land-use proposals should be scaled down and detailed out in local development plans and urban design. This again shall be prioritized and incorporated in fiscal plans of sector institutions and municipalities together with the required annual budgets.

### **B. Linkages between rural or urban Influence Area and city level land use Plan**

The team dealing with the task of preparation of city-wide plans should take into account socio-economic, administrative, physical, and spatial linkage with influence areas.

The following are the major linkages between the influence area study and city-wide land use plan.

- The housing component
- The environment, green area, and open spaces component
- The services integration
- The manufacturing and storage component
- The transport and infrastructure elements are the main one

### **E. Regulatory Considerations of the land use Plan**

- Any urban level land use plan should be approved legally otherwise it difficult for enforcement throughout the implementation when needed.

### **F. Financing Considerations**

Appropriate financing mechanisms should also be reviewed and forwarded for the implementation of the integrated land-use plan. Such financing schemes should at least consist of 15-35% contribution from the public. The following possibilities/ sources shall be assessed for financing the preparation, revision, and implementation of the land use plans

- CCG (Common Commodity Groups)
- Gradual payment from the public
- NGOs
- Grants and loan
- Block grants from the Federal government
- Allocation of the budget by the Regional government

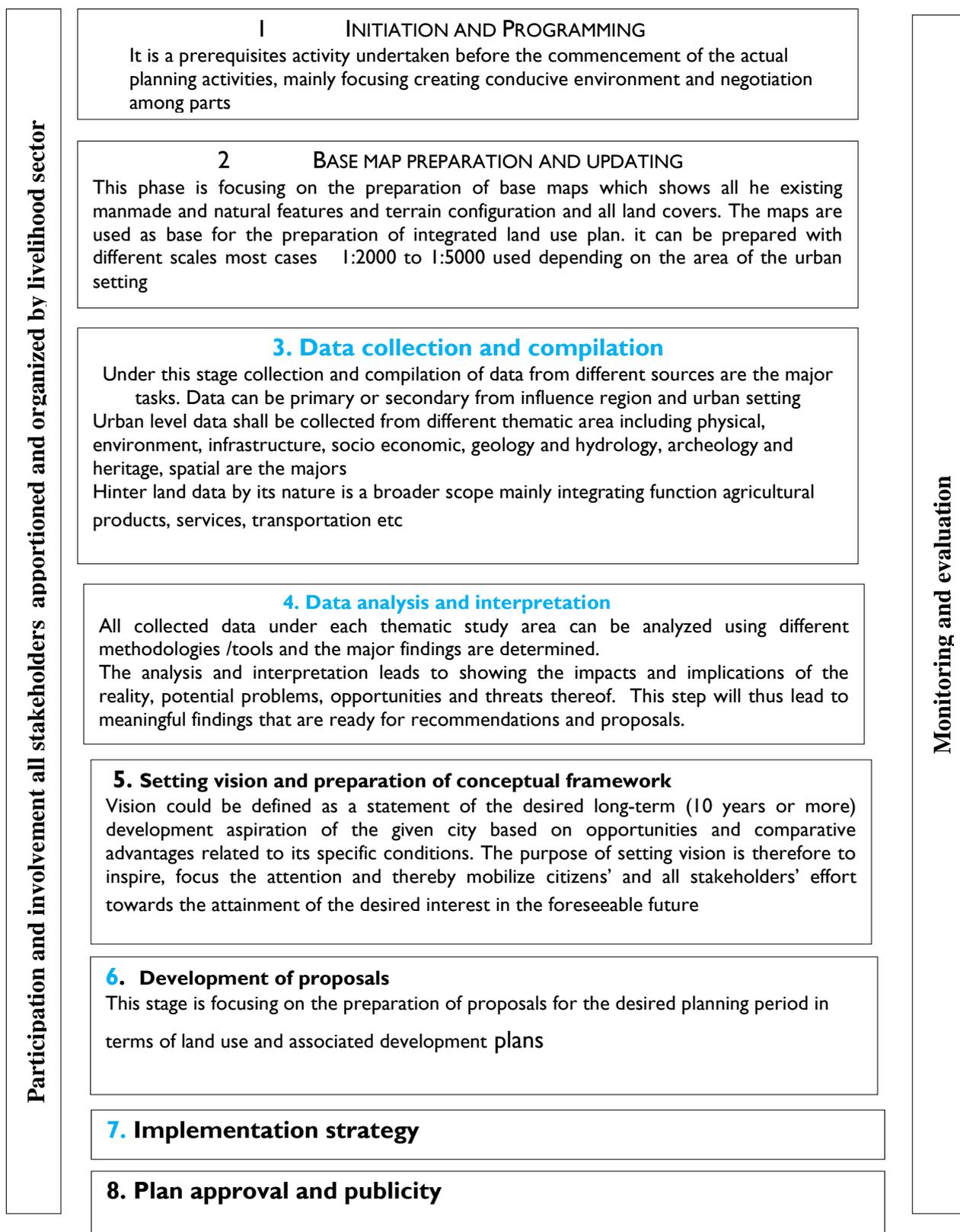
The required budget shall be prepared based on appropriate costing mechanisms. A project document consisting of intended activities, and financial requirements should be prepared and presented to all stakeholders, and donors.

### **G. Monitoring and Evaluation Considerations**

Monitoring and evaluation is an important stage in land use plan preparation and implementation. The following activities should be undertaken to ensure proper monitoring and evaluation:

- A proper institutional arrangement should be established for monitoring and evaluation.
- A clear working and reporting system should be defined to facilitate the task
- Appropriate timing and program for plan monitoring and evaluation should be identified.
- Monitoring and evaluation should be undertaken using the criteria defined.
- Feedbacks from monitoring and evaluation should be provided for appropriate professionals and decision-makers.
- The relevant section should follow up and ensures that such feedbacks are incorporated and documented appropriately.

## h) The Integrated Urban Land Use Plan Preparation process



### Note: Professional Mix for Urban Land Use Planning

Planning Team (I Consulting Expert Team from side-in or Expert/office bearer informant-team from top-down and urban land users organized as Common-commodity-centered grouped as CCGs))

- ✓ Urban Planner: - spatial planning
- ✓ Architect: - urban design
- ✓ Geographer/Regional planner: -Physical planning
- ✓ Environmentalist: - Environmental studies
- ✓ Historian/ Anthropologist/Archaeologist: - History, cultural and tourism study
- ✓ Sociologist/Demographer: - Demographic and sociological studies
- ✓ Economist/Regional Planner: Economic study
- ✓ Geologist/hydrologist: - Geological and hydrological study
- ✓ Civil Engineer/Sanitary Engineer:- Infrastructure and utility Planning
- ✓ Transport and mobility planner:- Transport and mobility planning
- ✓ Urban management:- governance issues and Municipal Capacity Study

#### **Surveying and cartographic crew**

- ✓ Senior GIS & Remote Sensing:- Surveying, Base Map Preparation, and Verification
- ✓ Senior Surveyor:- Surveying & Base map preparation and Verification
- ✓ Junior Surveyor: Surveying & base map Preparation
- ✓ Auto Cad and GIS expert:- Map Production

#### **Few of the Common-commodity -centered Urban dwellers (CCGs) involved in**

- ✓ Urban agriculture development and marketing
- ✓ Urban zoo development and marketing
- ✓ Urban recreation site development and marketing
- ✓ Warehouse and storage facility provision and marketing
- ✓ Health and sanitation development and marketing
- ✓ Urban infrastructure development and marketing

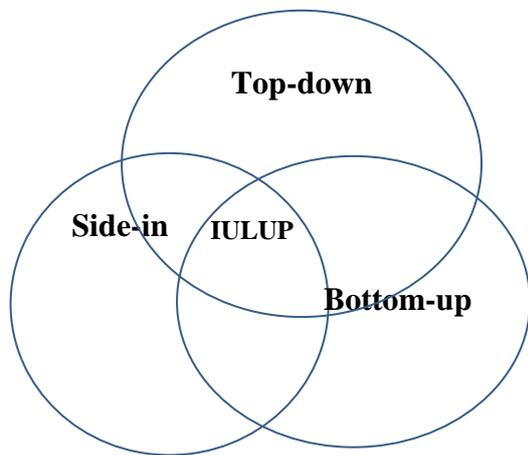
#### **i) Integrated Urban Land Use Plan Preparation Process**

#### **j) The Participatory Process**

The genesis of the idea of participation was simply a logical outcome of the shift to the integrated strategic planning approach. It is known that the central idea of the subject is the identification and prioritization of problems/issues since it is difficult to implement all projects at a time because of the capacity gaps.

Nowadays, it is also practically found out that if the decisions are left to the community/stakeholders, who live with the problems, the realization of plans have a better chance of being implemented and consequently improving the lives of citizens, which in fact should be the major objectives of the planning process. Moreover, participation increases a sense of ownership of the development plan, increases civic capacity and confidence among the community and in turn reducing suspicions and mistrust of authorities.

The theme of participatory/ collaborative planning is assuming more and more importance, attracting the attention of practitioners, and politicians as well as academics. This new paradigm of planning thought is based on closing the gap between theory and practice, and between planners and the public, they intend to serve. In this regard the integrated way of the participation process is assumed to be the best way for the realization of the projects as graphically indicated below.



**Key notes**  
**TOP DOWN**

These are planning facilitators like institutions who are responsible for guiding planning process. These includes members of the steering and technical committee they are organized at federal, regional and city levels

**BOTTOM UP**

They are planning drivers at the grass root level (communities of different classes and social groups)

In this case local communities are organized as CCGs(common commodity groups) that are organized based on the livelihood sectors. In this case major projects are listed and prioritized, organized and expected to drive the planning processes

**SIDE IN PLANNING GUIDE EXPERTS**

Professional consultants /experts who are responsible to study the subject based on their knowledge and experiences. For example local experts from respective sectoral offices and bureaux

**k) Part 4: The Implementation Strategy**

An efficient implementation strategy relies on a significant strengthening of the capacity building at regional, federal city levels as well as on an in-depth reshaping of legal frameworks, which this area tries to pinpoint the important ones.

Mainly the implementation process requires financial sources and mobilization, the involvement of several stakeholders, knowledge from different disciplines, and prioritization of issues for implementation, and follow-up and monitoring of the processes. The implementation strategy about integrated urban land use answers the question “how to implement”, “Who will implement”, and “When it will be implemented” for a prioritized list of land use elements (major attributes of the projects). As part of the manuals, all the following important elements should be known when thinking about implementation strategy (parts of ILUP)

**l) Capacity Building and Institutional Arrangements/coordination**

The load of work in the domain requires a good track and perfect training (short term, medium or long term) ground for juniors under close supervision of senior experts with prominent experiences is very important before implementation of any project. An institution particularly committed to the follow-up and supervision of the implementation of the land use plans has been established, which quite necessitates at the moment for setting up a specific structure for the preparation and realization of land use plans. Those who are organized to implement the prioritized projects (like CCGs) should create a smooth platform for communication.

**m) 4.2. Development Promotion and Building trust**

This part mainly focusing to work on:

- promotion of a clear and common vision of the role and benefits of each project for national, or local development;
- provision of a comprehensive ‘road map’ for public awareness
- greater recognition and increased allocation of resources to public awareness activities

- Increased networking among key stakeholders to optimize the use of human, materials, and financial resources.

#### **n) 4.3. Financial Sources and Mobilization**

Initial sources of finance are the biggest challenge to implement urban development proposals. It is assumed that, if the whole proposals are implemented and managed well, the center would finance itself sustainably and even generate revenue after some time. For the implementation of proposals, the financial sources are expected from the government, NGOs, donors, and grantees, CBOs the community, and any volunteers. Before mobilizing resources, detailed projects should be prepared for components to be submitted for resource mobilization.

#### **o) Policies and Legal Framework**

The minimum legal framework is necessary for controlling the overall implementation of the urban development proposals. Any existing and would be legal provisions (regulations, guidelines, directives, and manuals) related to urban land administration/ development guidelines, need to be duly considered in the implementation process. The legal issues which need clear understanding among all stakeholders may include those related to relocation, incentives, compensations & replacement costs, building permits, Land readjustment, dispute resolution, land required for public uses, environmental protection, urban open space development, common property protection, and administration, etc...

#### **p) 4.5. Phasing and Issues based implementation**

The implementation of urban development is process-oriented rather than being a one-time business. So, issues should be prioritized in a logical and systematic order for the simplification of the implementation processes.

**Table: Summary of project implementation phasing (sample for training)**

Lists of Detail projects (potential to create employment opportunity for the youth)	Unit of measurement	Unit cost	Total cost	Project schedule (implementation period and cost break down)										Roles & Responsible organs		
				Period & cost break down		Period & cost break down		Period & cost break down		Period & cost break down		Period & cost break down		Gov't	CCGs	
				Year 1	cost	Year 2	cost	Year 3	cost	Year 4	cost	Year 5	cost			
Construction of collector roads	km	xxxx	xxxx	xxxx	xxxx											
Construction of parks and open spaces	Square m	xxxx	xxxx	xxxx	xxxx											
Construction of urban zoo	Square m	xxxx	xxxx	xxxx	xxxx											
Construction of solid waste disposal site	no	xxxx	xxxx			xxxx	xxxx									
Developing road side and median green (landscaping)	m	xxxx	xxxx	xxxx	xxxx											
Construction of drainage line and culverts	m	xxxx	xxxx	xxxx	xxxx											
Construction of access road in NHD (cobble stone)	m	xxxx	xxxx			xxxx	xxxx									
Construction of Arterial asphalt road	km	xxxx	xxxx					xxxx	xxxx							
Landscaping and construct of steps, stairs and footpaths	m	xxxx	xxxx					xxxx	xxxx							
Install the necessary infrastructure such as water supply, electric power, drainage facilities etc	km	xxxx	xxxx					xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			
Construction of housing	No /units	xxxx	xxxx													
Grand total cost		xxxx	xxxx													

## 8. Module 8. Integrating Strategic Environmental Assessment (SEA) of the Integrated Land Use Plan (Urban and Rural)

### 8.1 General Introduction

This SEA training manual is prepared primarily to capture the concept and methodology of how to practically implement the Strategic Environmental Assessment (SEA) component of the already prepared Integrated Land Use Plan of Oromia National Regional State. It recognizes every section of the SEA document prepared at the sub-basin level which has very broad landscape coverage. However, the practical implementation of each section of the document should be understood by the trainees to interpret each environmental aspect and implement the SEA in the ILUP to the woreda level with relevant scale maps. However, such a plan map is missing at the sub-basin level.

Accordingly, some of the general and key issues regarding the concept of SEA and methods of integrating the SEA into the ILUP are emphasized. For illustration purposes, Arsi zone is selected and evaluated. The zone with its 26 woredas, 563 kebeles, 36 towns has varying ecological zones with essential natural resources as illustrated in Figure 1 below. Environmental issues related to national/regional; parks, wildlife sanctuaries, biospheres (with delineated core areas, buffer zones, and transition zones), controlled hunting areas, ecosystem conservation areas, wildlife reserves, community wildlife conservation areas, industrial forests, protection forests, open woodlands, moist evergreen forests, plantation forests, lowland savannah areas, roadside plantations, riverine forests, rangelands, rural settlements, roads, and roadside vegetation covers, water-bodies, dams/reservoirs, archaeological heritage, cultural heritage landscape, and tourism areas, sacred areas, irrigated commercial agriculture, estate farms and the like will environmentally be analyzed and illustrated in parallel with the LUP field data collection, planning and demonstration exercises. For further understanding, trainees are advised to first read and understand the sub-basin level SEA documents of their respective basins and are encouraged to come up with questions for discussions.

#### 8.1.1 SEA Concepts

Strategic environmental assessment refers to the analysis and forecast of existing or potential impacts on the environment, which have been described in the development strategy, planning, and proposal, to provide measures to control and reduce adverse impacts on the environment and to serve as a ground for and to be incorporated in such development strategy, planning and proposal to ensure the sustainable development.

#### 8.1.2 Definition

The most widely accepted definition of SEA states: “SEA is a systematic, ongoing process for evaluating, at the earliest appropriate stage of publicly accountable decision-making, the environmental quality, and consequences, of alternative visions and developments, and for providing a basis for planning or program initiatives, ensuring full integration of relevant biophysical, economic, social and political considerations” (Partidaria 2003).

### 8.1.3 SEA Status

SEA is a member of the large and diverse environmental assessments (EA) family which include Environmental Impact Assessment (EIA), Sustainability Impact Assessment (SIA), Regulatory Impact Assessment (RIA), and Habitats Assessment (HA).

At present, SEA is a “statutory” requirement in seven countries. SEA is a mandatory requirement for plans and programs developed or funded by various international organizations such as; the Canadian International Development Agency (CIDA), the European Bank of Reconstruction and Development (EBRD), and the World Bank. In addition, certain countries are undertaking non-statutory SEA of plans and programs.

SEA is internationally recognized as the key instrument for integrating environmental and health concerns into strategic planning and decision-making. It promotes sustainable development principles and thus supports efforts towards the transition to a green economy. SEA should be applied during the preparation of **governmental strategic documents**<sup>4</sup> to ensure that the environmental and health implications of planned developments are analyzed and considered early in decision-making processes before the decisions are made. In addition, relevant authorities and the public should be properly consulted in the process. As a result, SEA increases the legitimacy of planning and decision-making processes and their outcomes.

### 8.1.4 Goals and objectives of the training

The goal of this training session is to familiarize the participants with the key concepts of SEA. After the training the participants will be able to:

- Explain what SEA is and why its application is important;
- Explain what kind of legal documents regulate SEA at the international and national levels;
- Outline the benefits and costs of SEA;
- Determine the actors in the SEA process;
- Describe key principles of effective SEA application; and
- Elaborate on the linkages between SEA, EIA;
- Understand how to integrate sea process into plan and program-making;
- Understand how to conduct sea,
- Understand how to prepare sea report,

### 8.1.5 Purposes of SEA

The purpose of SEA is to ensure that environmental considerations inform and are integrated into strategic decision-making in support of environmentally sound and sustainable

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<sup>4</sup> Strategic documents that are subject to SEA according to the Protocol in different countries have various names, including plans, programs, policies, concepts, conditions.

development. In particular, SEA assists authorities responsible for plans or programs, as well as decision-makers, to take into account:

- Key environmental trends, potentials, and constraints that may affect or may be affected by the plan or program.
- Environmental objectives and indicators that are relevant to the plan or program.
- Likely significant environmental effects of proposed options and the implementation of the plan or program.
- Measures to avoid, reduce or mitigate adverse effects and to enhance positive effects.
- Views and information from relevant authorities, the public, and, as relevant, potentially affected States.

### 8.1.6 Legal Documents required to regulate SEA

#### q) International Legal Documents

One example of internationally recognized legal document is the [European Commission's SEA Directive and the Protocol on SEA; such as the Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programs on the environment]. This SEA Directive/Protocol requires that SEA be applied to plans, programs, policies, and legislation.

**“The objective of this Directive is:** to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programs to promote sustainable development, by ensuring that, following this Directive, an environmental assessment is carried out of certain plans and programs which are likely to have significant effects on the environment.”

**There are several international conventions ratified by the Government of Ethiopia; Some of them which are relevant to the SEA are listed as follow:**

- The *UN Framework Convention on Climate Change* (UNFCCC) entered into force in 1994; almost all African countries have ratified it.
- The *Kyoto Protocol to the UNFCCC* is in force since 2005. It commits states through internationally binding emission reduction targets. The first commitment period was from 2008 to 2012.
- *UN Convention on Biological Diversity* (CBD): It entered into force in 1993; all African countries have ratified it/acceded to it (April 2014).
- *UN Convention on Migratory Species* (CMS, “Bonn Convention”): It entered into force in 1983; all but 9 African countries have ratified it/acceded to it (April 2014)
- *UN Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES, “Washington Convention”): It entered into force in 1975; almost all African countries have ratified it/acceded to it.

- *UNESCO World Heritage Convention*: It entered into force in 1975; almost all African countries have ratified it. It provides the basis for the designation and management of the more than 1000 World Heritage Sites – in 2015, 41 of them are Natural Heritage sites in Africa, some within biosphere reserves. This convention gives the entire world a shared responsibility for the conservation of these sites of “Outstanding Universal Value” (OUV).
- *Ramsar Convention*: entered into force in 1975; almost all African countries have ratified it/acceded to it (47 – in April 2014). This convention improves the protection of internationally important wetlands; around 150 wetlands in Africa have been designated as Ramsar sites already, some within biosphere reserves.
- The *Millennium Ecosystem Assessment (MA)* was a global report published in 2005, with a focus on the impacts of ecosystem changes on human well-being. The *Global Environment Outlook (GEO)* is a series of so far five global reports by UNEP. Similar to the GEO series, the *African Environment Outlook (AEO)* is the leading environmental assessment tool for Africa. Its third edition appeared in 2013. The *Economics of Ecosystems and Biodiversity (TEEB)* was another important global study published in 2010/2011 and an on-going initiative.
- *The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA or “Seed Treaty”)* entered into force in 2004. It has 45 state parties in Africa.
- The *UN Convention to Combat Desertification (UNCCD)* entered into force in 1996; almost all African countries have ratified it.
- *African Union: African Convention on the Conservation of Nature and Natural Resources (“Algiers Convention”)* entered into force in 1969 and was revised in Maputo in 2003. Around 30 African countries have ratified it/acceded to it.

### 8.1.7 National Legal Documents

As a supreme law of Ethiopia, all national policies, laws, and regulations, as well as institutional frameworks of the country, must comply with the constitutional provisions. The constitution of FDRE, proclamation 1/1995 contains several articles, which are relevant to environmental matters in connection with development objectives as well as to the Environment in general. Some of the laws and regulations relevant to SEA are elaborated as follow:

- ***Ethiopian National Road Map for Integrated Land Use Planning, 2018***
- ***The Rural Development Policy and Strategy, 2001***  
A National Rural Development Policy and Strategy has been issued by the Federal Democratic Republic of Ethiopia in November 2001. It is an overarching policy and strategy document that comprised statements about rural development, agriculture and natural resource interventions. The policy underscores agriculture-led economic development as a pathway feasible to Ethiopia to ensure rapid economic growth, optimize public benefits, reduce poverty and promote a market economy. The major policy directions include efficient use of land resources and formulation of area-specific development packages. The document underscores the need to rehabilitate degraded lands and forests.

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- ***Environmental Policy of Ethiopia (EPE), 1997***

The environmental policy of Ethiopia was approved in 1997. Currently, EFCCC is preparing a revised version of this policy, though a draft document is not ready yet. This is one of the policies developed in the country that has a direct relation to forest development and conservation. The policy aims at improving the quality of life of the people through sustainable development and utilization of natural resources. It also aspires to conserve traditional resource management practices. The policy included soil management and sustainable agriculture, forest and tree resource management, genetic, species, and ecosystem biodiversity conservation and management. The EPE has a strong element of encouraging people's participation in forest management. The policy addresses the complementarity of the roles of communities, private investors, and the state in forestry development. The policy emphasizes to the need to restricting forest resource utilization to the regeneration capacity. Thus, the policy attempts to ensure a sustainable supply of forest products without disrupting the social, economic, and ecological services.

This policy document also provides for, tenure security on land, investing in SLM technologies and conducting intensive agriculture. Moreover, the Policy stresses the uninterrupted and continuing access to the same land and natural resources (e.g. trees, water, wildlife, and grazing) on the part of farmers and pastoralists. It also recognizes the customary rights of access to and use of land and natural resource which are constitutionally acceptable, socially equitable, and are preferred by local communities.

- ***Proclamation for Establishment of environmental protection organs; Proclamation No. 295/2002***

The objective of this Proclamation is to assign responsibilities to separate organizations for environmental development and management activities on one hand, and environmental protection, regulations and monitoring on the other, to ensure sustainable use of environmental resources, thereby avoiding possible conflicts of interest and duplication of effort. It is also intended to establish a system that fosters coordinated but differentiated responsibilities among environmental protection agencies at federal and regional levels.

This Proclamation re-established the EPA developed to the Ministry of Environment, forest, and climate change and currently called, Environment, Forest and Climate Change Commission (EFCCC); as an autonomous public institution of the Federal Government of Ethiopia. It also empowers every competent agency to establish or designate an environmental unit (Sectoral Environmental Unit) that shall be responsible for coordination and follow-up so that the activities of the competent agency are in harmony with this Proclamation and with other environmental protection requirements. Furthermore, the Proclamation states that each regional state should establish an independent regional environmental agency or designates an existing agency that shall be responsible for environmental monitoring, protection, and regulation in their respective regional states.

- ***Environmental Impact Assessment Proclamation (EIA) No. 299/2002***

The provisions of this proclamation emphasize the importance of conducting an environmental impact assessment for all development projects and programs that fall in any category listed in any directive issued according to the EIA proclamation. The aim of this Proclamation (Proc. No. 299/2002) is to make an EIA mandatory for specified categories of activities undertaken either by the public or private sectors and is the legal tool for environmental planning, management, and monitoring.

▪ ***Proclamation on Environmental pollution control; Proc. No. 300/2002***

This proclamation is primarily based on the right of each citizen to have a healthy environment, as well as on the obligation to protect the environment of the Country and its primary objective is to provide the basis from which the relevant ambient environmental standards applicable to Ethiopia can be developed and to make the violation of these standards a punishable act. The Proclamation states that the “polluter pays” principle will be applied to all persons. Under this Proclamation, the EPA (**EFCCC**) is given the mandate for the creation of the function of Environmental Inspectors. These inspectors (to be assigned by EPA (**EFCCC**) or regional environmental agencies are given the authority to ensure the implementation and enforcement of environmental standards and related requirements.

▪ ***Water Resources Management Proclamation No 197/2000***

Ethiopian Water Resource Management Policy, Proclamation No 197/2000, was formulated in 1998 for comprehensive and integrated water resources management towards efficient, equitable, and optimal utilization of the available water resources for socio-economic development on a sustainable basis. The Proclamation defines the ownership of water resources, powers and duties of the Supervising Body, inventory of water resources and registry of actions, permits and professional licenses, fees, and water charges. According to the Proclamation, all water resources of the country are the common property of the Ethiopian people and the State. As provided in the Proclamation, the Supervising Body [the Ministry about water resources at central level, or any organ delegated by the Ministry] shall be responsible for the planning, management, utilization and protection of water resources. It shall also have the necessary power for the execution of its duties under the provisions of this Proclamation.

▪ ***The Ethiopian Public Health Proclamation No. 200/2000***

The Ethiopian Public Health Proclamation No. 200/2000 article 12 states that “no person shall dispose of solid, liquid or and other waste in a manner which contaminates the environment or affects the health of the society”. Article number 13 of this proclamation also states that “any city administration is responsible to provide public toilet and ensure its cleanliness”. Ministry of Health (Food, Medicine and Health Care Administration and Control Authority) Proclamation No. 661/2009 also clearly states: a) Waste Handling and Disposal under Article 30: and b) Availability of Toilet facilities under Article 31.

▪ ***Integrated Urban Sanitation and Hygiene Strategy; 2015***

The strategy which was endorsed in September 2015 focuses mainly on; Liquid waste service delivery, Solid waste service delivery, and Promotional and behavior change. Furthermore, the integrated urban sanitation and hygiene city master plan action plan preparation guideline for

preparing city sanitation plans in phases based on its action plan document has set prioritization of implementation; Phase 1-category 1 towns by 2017, Phase 2-category 2 towns by 2020, and Phase 3-category 3 towns by 2025, etc. including preparation of tailored ESIA guidelines relevant to sanitation facilities based on 8 towns WSSP.

▪ ***Forest Conservation and Utilization Policy and Strategy, 2007***

The Forest Development Conservation and Utilization Proclamation No.542/2007 is the latest forest law presently under implementation. The main objective of the Forest Conservation and Utilization Policy and Strategy is to improve the economic contribution of the forest sector and meeting the communities' demands for forest products. Moreover, the policy envisages enhancing the forest sector's economic contribution by promoting the engagement of the private sector and farmers. The policy substantiates the need to certify forest use rights which is an important provision to enhance the engagement of farmers, communities and the private sector. The policy also provides statements on the support that should be provided to create market opportunities for forest products. This policy and strategy document can be utilized for the implementation of REDD+ as it provides for; possibilities of income generation from forests for the communities, the establishment of participatory forest management schemes by engaging the local people, and issuance of forest ownership certificates for individuals, associations (e.g. forest use groups) and private investors. The proclamation recognizes two types of forest ownership, state and private forest ownership. It puts communal forest ownership under the category of private forest ownership.

▪ ***Proclamation for Development, Conservation and Utilization of Wildlife; Proclamation No 541/2007***

The aim of the proclamation is to enhance the contribution of the sector to the national economy and the local community by putting sustainable wildlife resources management in place. It states that the management and utilization of wildlife resources should be in line with the international conventions and agreements the country made. It also recognizes the need to enact laws in conformity with the federal arrangement. Moreover, it provides adequate provisions for the engagement of the local people and the private sector. The Proclamation vests the power of wildlife administration in both the Federal and Regional Governments. National parks that are nationally and globally significant and known to have representative ecological zones and embrace a great diversity of wildlife; national parks and wildlife sanctuaries that are inhabited by the country's endemic and endangered species; any wildlife conservation areas geographically situated within two or more regions; any trans-boundary wildlife conservation areas that may be established following agreements with neighbouring countries shall be designated and administered by the Federal Government.

▪ ***Proclamation for Access to Genetic Resources and Community Knowledge, and Community Rights; Proclamation No. 482 /2006***

This proclamation deals with access to genetic resources (by communities), community knowledge, and protection of these rights with the objectives to ensure the community's right to the benefits accrued from genetic resources and community knowledge. It provides communities with the right to regulate access to their community knowledge; an inalienable

right to use their genetic resources from their surroundings. The proclamation addresses key issues such as access rights, obligations, and types of benefit and benefit-sharing principles.

- ***Proclamation for Rural Land Administration and Land use; Proclamation No 456/2005***

The Rural Land Administration and Land use; Proclamation No 456/2005, came into effect in July 2005. The objective of the Proclamation is to conserve and develop natural resources in rural areas by promoting sustainable land use practices. To encourage farmers and pastoralists to implement measures to guard against soil erosion, the Proclamation introduces a Rural Land Holding Certificate, which provides a level of security of tenure.

The MoA is charged with executing the Proclamation by providing support and co-coordinating the activities of the regional authorities. Regional governments must establish a competent organization to implement the rural land administration and land use law. According to the Proclamation where land, which has already been registered, is to be acquired for public works, compensation commensurate with the improvements made to the land shall be paid to the land use holder or substitute land shall be offered. The Proclamation imposes restrictions on the use of various categories of land, for example, wetland areas, steep slopes, land dissected by gullies, etc.

- ***Proclamation for Expropriation of Landholdings for Public Purposes and Payment of Compensation; Proclamation No. 455/2005***

The Federal Rural Land Administration and Utilization Proclamation No. 455/2005 recognizes the land use rights of private persons, communities, governmental and non-governmental organizations. These organs can be issued landholding certificates for a definite or indefinite period. Expropriation of landholdings for public purposes and payment of compensation law no. 455/2005 gives power to lower-level administrative institutions such as Woredas to seize rural or urban holdings for public purposes. The law includes statements on how the land can be leased to investors. The law issues compensation mechanisms not for the land as such, as the land belongs to the state, but for property situated on the land and for permanent improvements made to the land.

- ***Proclamation on Mining Operation (Proc. No. 52/1993)***

The mining proclamation No. 52/1993, part I, article 2(9) has classified the mine licenses for mineral operations into three license ranks: namely; prospecting license; Exploration license, and mine for minerals (exploitation) license. Again the license also further classified to artisanal mining, small scale mining, and large scale mining. Based on the location of mineral deposits, the mining operation is also categorized in surface and sub-surface mining. As per the guideline, the scope of EIA study of mineral and petroleum operations considers how the exploration, development, processing, and marketing of minerals will affect; Local human population, Local and regional wildlife population, local land use and overall ecology Change to land and water regimes and land contours. In addition, the guideline also indicates the disposal of mine waste and tailings, together with other issues such as transportation of product to market all have to be evaluated.

Proclamation No. 192/1980 created the *Forest and Wildlife Conservation and Development Authority* out of the former *Wildlife Conservation Organisation and the State Forest Development Agency*. This authority no longer exists and all its powers are with the Ministry of Agriculture, defined under Proclamation No. 691/2010. The Environmental Protection Authority (EPA) is an autonomous institution with powers and responsibilities as defined in Proclamation No. 9/1995 and later in No. 295/2002. Biodiversity conservation, in general, is taken care of by Proclamation No. 120/1998 which established the Institute of Biodiversity and Research as an autonomous body.

## 8.2 Protected areas related to laws

The regulations that rule the administration of the protected areas administered by EWCA are defined in **Regulation No. 163/2008**, Council of Ministers Regulations to Provide for Wildlife Development, Conservation, and Utilization. Regarding the protected areas, the following articles are important:

### **Art. 3: Boundaries of Wildlife Conservation Areas**

The existing boundaries of national parks, wildlife reserves, wildlife sanctuaries, wildlife-controlled hunting areas, community wildlife development, and protection and utilization areas shall be maintained or they may be re-delineated by the Federal and regional governments to improve their management.

**Art. 4:** Wildlife Conservation Areas to be administered by the Federal and Regional Governments according to sub-articles (1) are:

1. Bale Mountains National Park,
2. Awash National Park,
3. Senkele Swayne's Hartebeest Sanctuary,
4. Babille Elephant Sanctuary,

These Wildlife Conservation Areas shall be administered by the Authority; however, the Authority may, where necessary, delegate its powers to the appropriate organs of regional governments.

- ❖ Wildlife conservation areas other than those specified under sub-article (1) of this Article shall be administered by the regional governments and local communities.

### 8.2.1 Wildlife Sanctuaries and Wildlife Reserves:

No person shall carry out any of the following activities in a national park, wildlife sanctuary, or wildlife reserve unless otherwise provided in these Regulations:

- a. Possessing or transferring of any weapon;
- b. Hunting or fishing;

- c. Propelling any vehicle, aircraft, or boat;
- d. Picking, disturbing, destroying, damaging, or defacing any natural or man-made object;
- e. Undertaking agricultural activities or preparing land for cultivation;
- f. Allowing to graze and water domestic animals;
- g. Allowing, passing through, or keeping any domestic or wild animals;
- h. Undertake exploration and mining;
- i. Planting, cutting, chopping, removing, taking, damaging or transferring any plant species;
- j. Setting or attempting to set fire;
- k. Beekeeping or honey harvesting, removing or attempting to remove wildlife products;
- l. Constructing roads or other structures or spoiling or disturbing the existing natural landscapes;
- m. Using, spraying, or disposing of any pesticide or herbicide;
- n. Selling or offering for sale any goods or providing services;
- o. Displaying any notice or advertisement.

*For each area, the boundaries need to be defined. All boundaries need to be plotted correctly in a GIS; were available from legally-established coordinates, where natural (river) or physical (roads) boundaries are used, they could best be walked with a GPS.*

### 8.2.2 Biosphere reserves

Biosphere Reserves are areas of terrestrial and coastal/marine ecosystems, or a combination thereof, which are internationally recognized within the framework of UNESCO's Program on Man and the Biosphere. They are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere Reserves are designated by the International Coordinating Council of the Man and the Biosphere Program (MAB) Program at the request of the State concerned. Individual Biosphere Reserves remain under the sovereign jurisdiction of the State where they are situated.

Biosphere reserves aim to achieve integrated management of land, fresh and marine waters, and living resources by putting in place bioregional planning schemes based on integrating conservation into development through appropriate zoning. While countries maintain flexibility at the national levels concerning the definition of zones, the zonation needs to ensure that biosphere reserves effectively combine conservation, sustainable use of resources, and knowledge generation through integrated zonation and collaborative management.

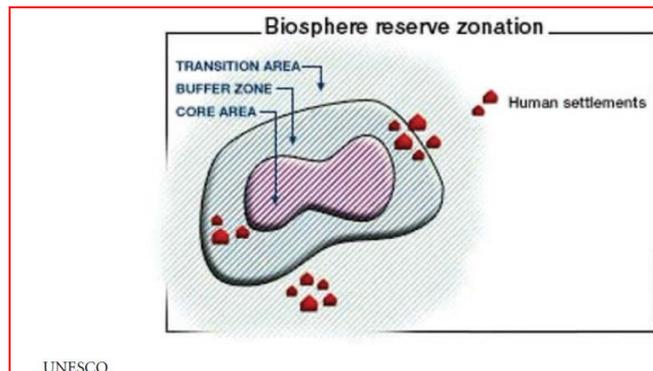
The zonation of each biosphere reserve should include:

- **Core area(s):** securely protected sites for conserving biological diversity, monitoring minimally disturbed ecosystems, and undertaking non-destructive research and other low-impact uses (such as education). In addition to its conservation function, the core area contributes to a range of ecosystem services which, in terms of the development functions,

can be calculated in economic terms (e.g. carbon sequestration, soil stabilization, supply of clean water and air, etc.). Employment opportunities can also complement conservation goals (e.g. environmental education, research, environmental rehabilitation and conservation measures, recreation, and eco-tourism).

- **Buffer zone(s):** which usually surrounds or adjoins the core areas, and is used for cooperative activities compatible with sound ecological practices, including environmental education, recreation, ecotourism, and applied and basic research. In addition to the buffering function related to the core areas, buffer zones can have their own intrinsic, 'stand-alone' functions for maintaining anthropogenic, biological, and cultural diversity. They can also have an important connectivity function in a larger spatial context as they connect biodiversity components within core areas with those in transition areas.
- **Transition area:** area with a central function in sustainable development which may contain a variety of agricultural activities, settlements, and other uses and in which local communities, management agencies, scientists, non-governmental organizations, cultural groups, economic interests, and other stakeholders work together to manage and sustainably develop the area's resources.

UNESCO introduced the Biosphere Reserve concept with a two-tier hierarchy for buffering protected areas: a "buffer zone" where land use is restricted to activities that are compatible with the protection of the core area, and a "transition area" where appropriate economic activities are permitted and where sustainable resource management practices can be developed, which today are often called "sustainable-use areas" or "zones of cooperation" (see Figure below).



**Figure 2: UNESCO's concept of buffering protected areas**

### Size of buffer zones

The preferred size of a buffer zone is variable, depending on the objectives, availability of land, traditional land-use systems, threats, and opportunities. From an ecological point of view, the larger the buffer zone and the more it can be seen as an extension of the protected area, the better for the conservation area and its biodiversity, including natural processes.

**Experiences from other countries:** Nepal and Cameroon are two countries where the buffer zone concept has been laid out in legal terms. In Nepal, the Buffer Zone Management Regulations (1996)<sup>13</sup> define the buffer zone as an area outside the protected area under the warden (assisted by a buffer zone development council). In Cameroon, the law defines the buffer zone as the area of 1km outside the boundaries of the nature park (Ebregt A. and Pol De Greve P De. (2000).

In areas traditionally used by the local population for NTFP (non-timber forest products) collection, buffer zones that include areas of shifting cultivation and timber extraction areas will have to be large enough to sustainably support these traditional use systems. A buffer zone that gradually degrades does not serve its purpose. Assessment and monitoring, therefore, will be very important in determining the effectiveness of a buffer zone.

Traditional use zones functioning as buffer zones can be located inside as well as outside the conservation area. Economic buffer zones, such as tea, rubber, fruit, and timber plantations, may be of any size. In many cases, these were created long ago, and they are usually situated outside the conservation areas. Cultural buffer zones can be any size. Culturally significant areas such as sacred places/groves and cemeteries are well protected and make excellent buffer zones. The real size of a buffer zone is often the result of negotiations between the various stakeholders and very much depends on the availability of land. However, in a stratified society, there is the danger that these negotiations are dominated by the most powerful inhabitants. It is therefore crucial that all stakeholders are fully involved in defining the buffer zone area.

### **Ethiopian Legislation regarding Biodiversity conservation**

Proclamation No. 192/1980 created the *Forest and Wildlife Conservation and Development Authority* out of the former *Wildlife Conservation Organisation and the State Forest Development Agency*. This authority no longer exists and all its powers are authorized under the Ministry of Agriculture, defined under Proclamation No. 691/2010. The Environmental Protection Authority (EPA) is an autonomous institution with powers and responsibilities as defined in Proclamation No. 9/1995 and later in No. 295/2002. Biodiversity conservation, in general, is taken care of by Proclamation No. 120/1998 that established the Institute of Biodiversity and Research as an autonomous body.

### **8.2.3 National Forest Priority Areas (NFPA) in Oromia**

Out of the 82 national forest Priority areas registered, 51 are found in Oromia. Please refer to the list below. Four of these 51 forest areas are found in Arsi zone. Please refer to Nos. 5, 12, 14, and 35 lists in the following Table. These are 1)Arba Gugu Forest, 2) Cillalo-Gallema Forest, 3) Din Din Forest, and 4) Munessa-Shashemene Forest as listed in Table ----- below.

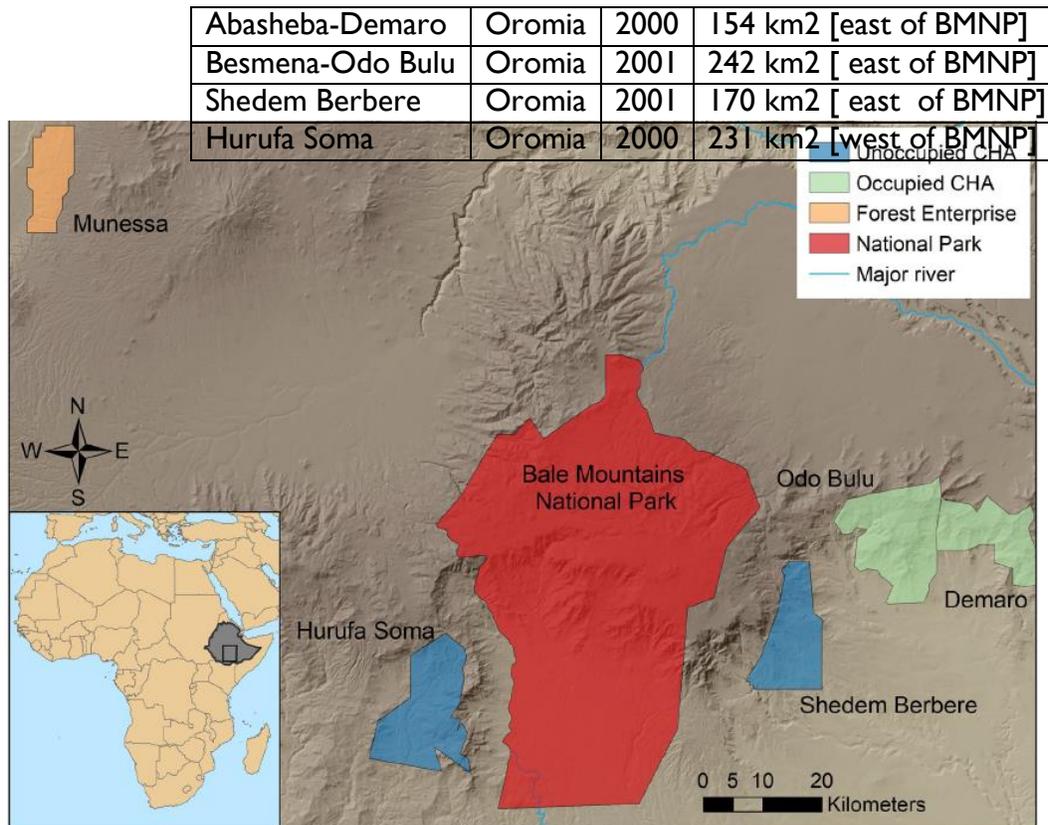
**Table I: National Forest Priority Areas (NFPA) and other High Forests in Oromia to be set aside as designated land use priority**

NR NAME	REGION (OLD)	REGION (NEW)	STATUS 1997
1. Abelti-Gibe Forest	Keffa / Shoa	Oromia / Southern	1
2. Adaba Dodola Lajo Forest	Bale	Ororrna	2

3.	Aloshe-Batu Forest	Bale	Oromia	2
4.	Anferara-Wadera Forest	Sidamo / Bale	Southern	1
5.	Arba Gugu Forest	Arsi	Oromia	1
6.	Babya-Fola Forest	Keffa-	Oromia	1
7.	Belete-Gera Forest	Keffa / Ilubabor	Oromia	1
8.	Bore-Anferara Forest	Sidamo	Southern /Oromia	1
9.	Butagera Fores	Shoa	Southern	2
10.	Butugi-Melka-Jebdu Forest	Harerge	Afar /Dire Dawa	1
11.	Chato-Sengi-Dengeb Forest	Welega	Oromia	1
12.	Cillalo-Gallema Forest	Arsi	Oromia	2
13.	Chilmo-Gaje Forest	Shoa	Oromia	1
14.	Din Din Forest	Arsi / Harerge	Oromia	1
15.	Gara-Muleta Forest	Harerge	Oromia	1
16.	Gebre Dima Forest	Illubabor	Southern / Oromia	2
17.	Gedo Forest	Shoa	Oromia	2
18.	Gergedda Forest	Welega	Oromia	1
19.	Gidame Forest	Welega	Oromia	2
20.	Godere Forest	Ilubabor	Southern / Gambela / Oromia	1
21.	Gore Bele Forest	Bale	Oromia	2
22.	Harena-Kokossa Forest	Bale	Oromia	2
23.	Jarso-Gursum Forest	Harerge	Oromia / Dire Dawa	1
24.	Jibat-Mute-Jegenfo Forest	Shoa	Oromia	1
25.	Jelo-Muktar-Metakesha-Ades Forest	Harerge	Oromia	1
26.	Jurgo-Wattu Forest	Welega	Oromia	1
27.	Komto Waja Tsege Forest	Welega	Oromia	1
28.	Konchi Forest	Welega	Oromia	2
29.	Kubayo Forest	Bale/Arsi/Hererge	Oromia	1
30.	Linche Dali Gewe Forest	Wellega	Oromia	2
31.	Megada Forest	Sidamo	Oromia	1
32.	Mena-Angetu Forest	Bale	Oromia	1
33.	Menagesha-Suba Forest	Shoa	Oromia	1
34.	Mocha Forest	Illubabor	Oromia / Southern / Gambela	1
35.	Munessa-Shashemene Forest	Arsi / Sidamo	Oromia	1
36.	Negele Forest	Sidamo / Bale	Oromia	1
37.	Sibo-Tale Kobo Forest	Illubabor	Oromia / Southern	2
38.	Sigmo-Geba Forest	Illubabor	Oromia	1
39.	Tiro Botter Becho Forest	Keffa	Oromia	1
40.	Saylem-Wangus Forest	Illubabor	Oromia / Southern	2
41.	Yabelo-Arero Forest	Sidamo	Oromia	1

42. Yayu Forest	Illubabor	Oromia	2
43. Yerer-Dire Gerbicha	Shoa	Oromia	1
44. Zukuala Forest	Shoa	Oromia	1
45. Abey Albasa Forest	Shoa	Oromia	3
46. Dengego-Hawale Forest	Harerge	Dire Dawa/Oromia	3
47. Lake Hora Forest	Shoa	Oromia	3
48. Mega Forest	Sidamo	Oromia	4
49. Sululta-Bereh Forest	Shoa	Oromia	4
50. Tinishu Gesha Forest	Illubabor	Southern	3
51. Noname	Bale	Oromia	2

Figure 3: shows the location of the protected areas in the Bale Mountain region of the southeastern highlands of Ethiopia including the Bale Mountains National Park, Munessa-Shashamane state forest enterprise (found in Arsi zone), and the four Controlled Hunting Areas (CHA); two occupied (Abasheba-Demaro and Besmena-Odo Bulu) and two unoccupied (Hurufa Soma, Shedem Berbere). Abasheba-Demaro and Besmena-Odo Bulu are Controlled Hunting Areas situated adjacent to each other on the east side of the Bale Mountains. These are land-use types that can not be allocated for any alternative candidate land use type in the ILUP making process.



Source: Young et al., (2020)

### 8.3 Regional Legal Framework: Oromia Region

Article 52 (2) (d) states that regional states shall have the functions of administering land and other natural resources by federal laws. Regional states can enact their laws facilitating the administration of natural resources. For instance, the Forest Development, Conservation and Utilization Proclamation No. 542/2005 in its Article 8(3) provides that: “The designation and demarcation of a state forest ... shall be proclaimed by the legislation of the concerned regional state. “This is in addition to the power bestowed upon the regional states by the federal forest law, Article 18 (1), which states that “each Regional State shall have the power to administer any state forest in the region following this proclamation.” The FDRE Constitution also provides the regional states with the power to formulate their respective policies; raise their revenue as well as plan and execute their forest development activities under the framework of the overall policies of the federal government.

### 8.4 Regional Environmental Protection Agencies and proclamations

*EPA proclamation No.295/2002* states that each National Regional States shall establish an independent Regional Environmental Agency or designate an existing agency based on the Ethiopian Environmental Policy and Conservation Strategy to ensure the environmental protection activities and environmental impact assessment. The national provisions indicate that Federal EPA (currently Environment, Forest and Climate Change Commission) devolves responsibilities to the regional environmental body, especially for projects that fully fall under the jurisdiction of the Regional Governments. In light of this, the regional environmental body is entitled to coordinate the formulation, implementation, review, and revision of regional conservation strategies, and also environmental monitoring, protection, and regulation. The proclamation also states that regional environmental agencies shall ensure implementation of federal environmental standards or, as may be appropriate, issue and implement their no less stringent standards.

As to the present integrated land use plan, Oromia Rural Land Administration and Use Bureau (ORLAUB) and Oromia Environment, Forest and Climate Change Authority are responsible for Land use and environmental protection matters in the Region together with zonal line sectors. Oromia Environment, forest, and climate change Authority are responsible for the review and approval of EIA of development proposals under the mandate of the regional government, administration, and follow-up of the implementation of EIA/SESA recommendations. Hence, the Authority should work in close cooperation with its zonal line sectors and other stakeholders to ensure that the adverse environmental effects of development proposals are properly identified and their mitigation or management actions incorporated in the project design or planning and implemented at the right time.

Some of the major laws and regulations of the Oromiya region are:

- Oromiya forest proclamation No. 72/2003,
- Regulation to Provide for the Establishment of the Oromiya Regional State Forest Enterprises Supervising Agency, No. 84/2007.

Proclamation No. 130/ 2007: Proclamation to amend the proclamation No. 56/2002, 70/2003, 103/2005 of Oromia Rural Land Use and Administration

The following Articles are relevant to SEA:

Article 18. Land Use Planning and Use of Sloppy and Gully Land s

Article 19. Conservation of Farmland

Article 20. Wetland Management

Article 21. Dams and Reservoir Areas

Article 22 . Protected and Demarcated Land

1. The government can demarcate and hold wildlife sanctuaries, parks, forest areas, mining areas, and lakes, etc. necessary for the existence of many living things .
2. As per Sub-Article I of this Article, the demarcated areas shall be made to contribute to sustainable economic development.
3. Delineation, demarcation, development, protection and rehabilitation and conservation of protected land shall be done by the participation of the local community.
4. The condition by which the local community may share the benefit from the protected areas shall be arranged.

Article 23. Patches of Forest Land

Patches of natural forest lands shall be identified, demarcated, protected, conserved, and sustainably used by the local community.

Article 24. Management of Remnant Mother Trees

Land users are obliged to conserve and protect mother trees found on their holdings.

Article 26. Responsibility of Oromia Agricultural and Rural Development Bureau

Oromia Agricultural and Rural Development Bureau are responsible for the execution of this proclamation.

## 8.5 Benefits of SEA

SEA helps the decision-making authorities to consider; key environmental or sustainability trends, potentials, and opportunities; Environmental or sustainability issues and objectives relevant to PPP; likely significant environmental (and possibly also economic and social) effects of proposed options & implementation of PPPs; to identify pros and cons of various alternative options and to take measures to avoid, reduce or mitigate adverse effects & to enhance positive effects. Besides; SEA saves time & money in strategic decision-making, it increases public support for planners and decision-makers as well as it improves the quality of strategic decision-making.

*It should be noted that costs for carrying out the SEA for a specific plan or program should be covered by the authority responsible for preparation of this plan or program (and thus responsible for ensuring the SEA application as well). If the responsible planning authority does not understand the SEA process and does not integrate it with its planning process, it will not be able to make much use of the SEA recommendations and results.*

SEA, if properly implemented, should result in the following benefits:

- Improved protection of the environment and management of natural resources;
- Improved quality of plan- and program-making and strategic documents;
- Increased efficiency of decision-making;
- Identification of new opportunities for development;
- Cost-saving and preventing costly mistakes;
- Strengthened governance; and Transboundary cooperation.

The financial costs of SEA may significantly vary depending on the character and detail of the plan or program assessed, the number of alternatives evaluated, the scope of public involvement (the extent of consultation process), among other factors. *Conducting the assessment (i.e. carry out the analyses, prepare the SEA report, etc.) is usually assigned to external consultants.*

## **8.6 Effectiveness/good practice principles**

To deliver the benefits of SEA, a set of general guiding principles for the effective application of SEA are described as follow:

- SEA should be undertaken by the authority responsible for a plan or program and be integrated into and customized to the logic of the plan- or program-making process.
- SEA should be applied as early as possible in the decision-making process when all the alternatives and options remain open for consideration.
- SEA should focus on the key issues that matter in the relevant stages of the plan- or program-making process. This will facilitate the process being undertaken in a timely, cost-effective and credible manner.
- SEA should evaluate a reasonable range of alternatives, recognizing that their scope will vary with the level of decision-making. Wherever possible and appropriate, it should identify the best practicable environmental option.
- SEA should provide appropriate opportunities for the involvement of key stakeholders and the public, beginning at an early stage in the process and carried out through clear procedures. Ideally, it should employ easy-to-use consultation techniques that are suitable for the target groups.
- SEA should be carried out with appropriate and cost-effective methods and techniques of analysis. It should achieve its objectives within the limits of the available information, time and resources, and should gather information only in the amount and detail necessary for sound decision-making.

## **8.7 Actors in SEA**

- Planning authorities are authorities responsible for the preparation of plans or programs, submitting them for adoption and/or for their implementation. They should

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ensure that SEA is carried for plans or programs and are responsible for its quality and meeting legal provisions.

- Environmental and health authorities are those governmental and/or public authorities in charge of relevant environmental and health issues. They should be involved in the SEA process and have an opportunity to provide comments on a plan or program as well as on the SEA report. In some SEA systems, there is also a SEA competent authority, which is in charge of the coordination of the SEA process and issuing the final SEA statement.
- Decision-makers are governmental and/or public bodies in charge of approving or adopting the plan or program following relevant legal provisions and administrative structure. It can be Government or Parliament at the national level, regional and municipal councils, etc. In terms of SEA, decision-makers should consider SEA findings and conclusions in their decisions.
- The public can be defined as one or more physical or legal persons and their associations, organizations, or groups. The public should have early, timely, and effective opportunities to participate in SEA process when all options are open and comments provided should be considered in a plan/program and the SEA.
- Foreign countries should be involved in SEA process in case a certain plan or program is likely to have transboundary effects.

## **8.8 Linkages and differences between SEA and EIA**

SEA applies to ‘strategic’ planning documents and processes, such as a policy, plan or program, while EIA is applied to individual development projects. SEA can be applied in a range of situations that may differ in terms of their ‘strategicness’, and the range of different SEA applications is much wider than the range of project EIA applications. Figure I summarizes the changing focus of SEA, depending on how far away from the project level it is applied. At lower tiers, SEA is likely to be based on a more rigorous EIA-based approach, and at higher tiers, it is likely to be more flexible and high-level (and possibly non-EIA-based).

Methods and techniques applied vary, depending on the specific situation of application. At lower tiers, methods and techniques typically used in EIA may be useful and appropriately applied. At higher tiers, methods and techniques typically applied within policy-making may be more appropriate, such as forecasting, backcasting and visioning. Furthermore, some methods and techniques may be applied at both, higher and lower tiers, including, for example, checklists, matrices and impact trees. Generally speaking, quantification within the assessment is more difficult to achieve at higher tiers that come with a greater degree of uncertainty.

	SEA ←————→ EIA			
	←———— 'Higher tiers' / 'Lower tiers' ———→			
	Policy	Plan	Programme	Project
<b>Decision making level</b>	Strategic, visionary, conceptual		Immediate, operational	
<b>Nature of action</b>	General		Detailed	
<b>Outputs</b>	Macroscopic, cumulative, unclear		Microscopic, localised	
<b>Scale of impacts</b>	Long to medium term		Medium to short-term	
<b>Time scale</b>	Sustainable development strategies, state of the environment reports, visions		Field work, sample analysis	
<b>Key data sources</b>	More qualitative		More quantitative	
<b>Type of data</b>	Area wide, political, regulative, technological, fiscal, economic		Specific locations, design, construction, operation	
<b>Alternatives</b>	More uncertainty		More rigor	
<b>Rigor of analysis</b>	Sustainability benchmarks (criteria and objectives)		Legal restrictions and best practice	
<b>Assessment benchmarks</b>	Mediator for negotiations		Advocator of values and norms Technician, using stakeholder values	
<b>Role of practitioner</b>	More vague, distant		More reactivative (NIMBY)	
<b>Public perception</b>				

**Figure 4: Linkages and differences between SEA and EIA**

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## 8.9 How To Integrate Sea Process Into Plan And program-making

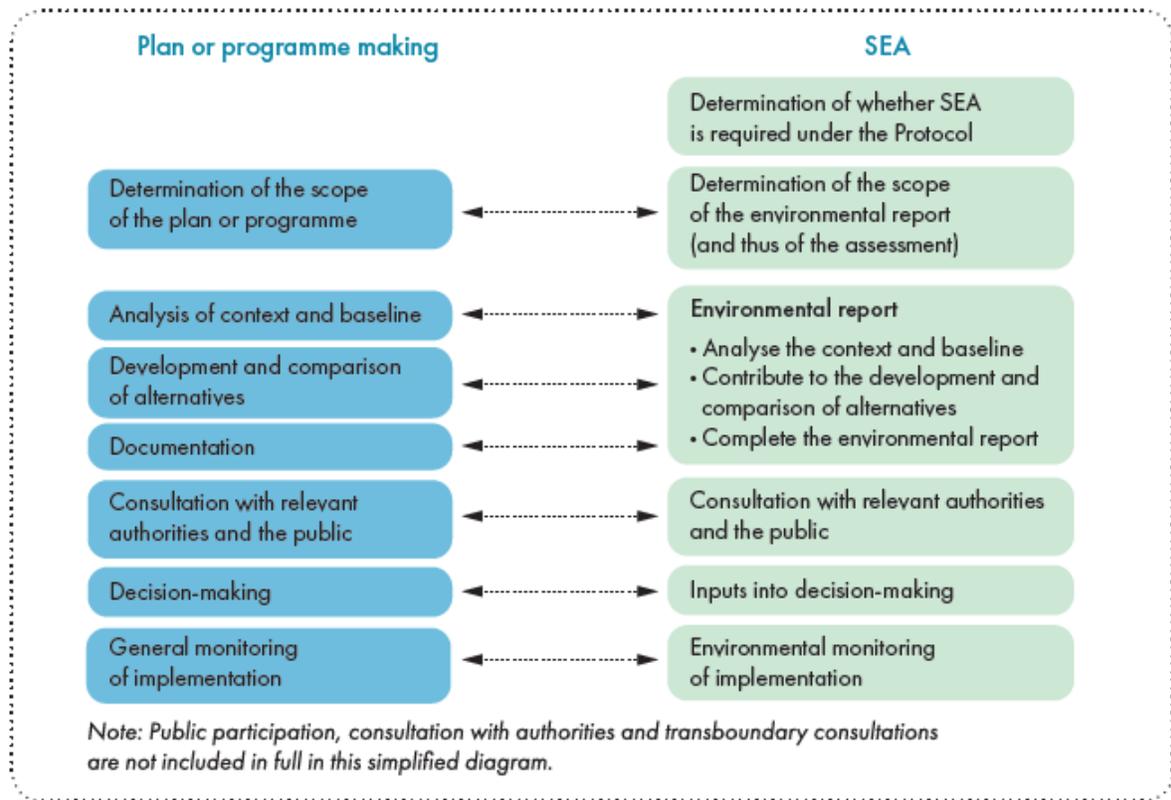
### 8.9.1 Why integrate SEA into plan- and program-making?

The goal of integrating SEA into the plan- or program-making is to provide early and effective inputs and to ensure that environmental, health, and sustainability considerations are taken into account in the development of plans or programs.

#### **Typical tasks of plan or program-making and integration with SEA**

The process of integrating SEA with Plan- or program-making is usually an iterative process involving the following tasks:

- The scope of the plan or program is normally clarified during initiation when the expected nature of the plan or program, its broad objectives and the issues to be addressed are determined.
- The analysis of the context and baseline usually includes the review of the existing environmental and socio-economic conditions, current development trends, constraints and opportunities for future development, and other specific issues that should be taken into account and addressed in the plan or program.
- The formulation and comparison of alternatives of the plan or program often take place through consideration of optional objectives of the plan or program, optional priorities proposed in the plan or program, options for activities proposed to implement these objectives or options for implementation arrangements.
- Documentation, i.e., the preparation of an environmental report or SEA report, may include defining the roles and responsibilities for the implementation of the plan or program and designing monitoring arrangements.
- Consultation with the relevant authorities and the public (including transboundary consultations for plans or programs that may have transboundary effects).
- The draft plan or program is then finalized for decision-making.
- Monitoring of implementation.



**Figure 5: Logical links between plan and program making and SEA elements**

### 8.9.2 Generic SEA process stages

Although each SEA process should be unique and tailored to the specifics of its subject plan or program, there are several common analytical stages, which are typically performed within the SEA process, namely:

- Screening (determining if SEA is required to be applied to the certain plan or program);
- Scoping (setting the scope for the SEA, including a work-plan);
- Baseline analysis (analysis of the context, existing conditions, and trends);
- Impact evaluation, including alternatives, and formulation of mitigation measures (including monitoring);
- Compiling the SEA report (or 'Environmental Report' as per the Protocol on SEA);
- Quality control of the SEA report,
- Inputs into decision-making; and
- Environmental monitoring of implementation.

Alongside the above stages, consultations with stakeholders should be conducted in certain stages. At the end, the conclusions and recommendations provided by the SEA need to be considered in decision-making (i.e. the approval of the plan or program).

### 8.9.3 Integration modes and their strengths and weaknesses

The extent of the integration of SEA into plan- and program-making can vary. Some documents describe three basic integration modes as shown below:

SEA and plan / programme integration mode	Strengths	Weaknesses
SEA and plan or programme-making are independent processes; SEA is applied to the draft plan or programme document just before the consent decision is given	<ul style="list-style-type: none"> <li>• Incorporation of SEA recommendations in the final plan or programme</li> </ul>	<ul style="list-style-type: none"> <li>• SEA does not influence the development of the plan or programme.</li> <li>• Duplication of effort</li> <li>• Duplication in the commenting/consultation process</li> <li>• Significantly delays the plan or programme-making process.</li> <li>• Non-compliant with the Protocol on SEA and SEA Directive</li> </ul>
SEA and plan or programme-making are partially integrated and run as parallel processes that logically connect at various core stages. This mode is depicted in Figure 5.	<ul style="list-style-type: none"> <li>• Reduces delays</li> <li>• Saves resources (joint data collection, joint consultations with authorities and the public)</li> <li>• Early consideration of different viewpoints</li> <li>• Compliant with the Protocol on SEA and SEA Directive</li> </ul>	<ul style="list-style-type: none"> <li>• Increases demands on the SEA team in terms of following the planning process</li> <li>• Need for strong coordination between SEA and planning team</li> <li>• Need to adapt SEA workplan to any changes in the plan- or programme-making process</li> </ul>
SEA and plan or programme-making are fully integrated (SEA experts and planning experts work together as one team that develops the plan or programme)	<ul style="list-style-type: none"> <li>• As above (for the partially integrated mode)</li> <li>• Builds trust between stakeholders that may normally have different attitudes and values</li> <li>• Compliant with the Protocol on SEA and SEA Directive</li> </ul>	<ul style="list-style-type: none"> <li>• SEA experts in the overall plan- or programme-making team may become fully co-opted in the planning process, or may be marginalized</li> <li>• Teamwork may result in internal agreements and trade-offs that are not transparent to outside stakeholders</li> </ul>

**Figure 6: Three basic integration modes of SEA with PP**

There is no single best approach to linking SEA with a plan- or program-making. However, it has been demonstrated that the SEAs that are separated from planning tend to be less effective and are unlikely to provide a sufficient basis for complying with the Protocol on SEA. Partial or full integration of SEAs into plan- or program-making seems to offer suitable frameworks for the application of the Protocol. The choice of approach depends on the specific conditions in each plan- or program-making process. Sometimes partial integration would be more effective than full integration; on other occasions, the reverse may be true (UNECE 2012). For example, in higher-level (strategy or policy) situations, SEA and planning may be fully integrated, while in plan situations, a partial integration approach may be preferable, particularly in the interest of a balanced view on the various assessment aspects and transparency (Fischer 2007).

## 8.10 How To Conduct Sea?

**SEA process is divided into several topics as follows:**

1. Screening;
2. Scoping;
3. Baseline analysis;
4. Effect assessment and mitigation measures (including alternatives);
5. Preparation of SEA report;
6. Quality Assurance / Quality Control;
7. SEA monitoring;
8. Stakeholder consultations; and
9. SEA and decision-making.

### 8.10.1 Screening

#### **r) What is screening in SEA and why it is needed?**

Screening is the determination of whether implementation of a PPP would be likely to have significant environmental effects on the environment. The process of deciding whether a PPP requires SEA.

The screening procedure aims to identify if SEA needs to be applied for a specific plan or program. Many human activities may cause environmental and health impacts. However, SEA is supposed to address mainly significant effects. Thus, the screening identifies whether SEA needs to be applied for a specific plan or program. Screening is very important for the efficiency of the entire SEA system. A well-defined screening procedure focuses resources upon those plans and programs that might potentially lead to significant environmental and health effects and excludes those plans or programs with only minor (or without) environmental and health consequences from the SEA systems.

#### **s) How to conduct screening: approach and method**

There are various approaches to be used for conducting the screening. Often the screening is based on the list of criteria, which would help to identify if a certain plan or program should be subject to SEA. In many SEA systems, the screening additionally involves consultations with relevant environmental and health authorities. At times, the screening is conducted directly by the SEA competent authority based on the information (e.g., ‘application’ or notification) submitted by the planning agency. To determine whether SEA is required under the Protocol on SEA, it is necessary to first determine whether the plan or program falls within the Protocol’s definition of a plan or program. Plans and programs must be both “required by legislative, regulatory or administrative provisions” and “subject to preparation and/or adoption by an authority or prepared by an authority for adoption, through a formal procedure, by a parliament or a government” .

**SEA is required for:** The plan or program prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning, or land use.

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Or if the PP is prepared by an authority for adoption through a legislative procedure by Parliament or Government, or if it is required by legislative, regulatory, or administrative provisions.

**SEA is not required:** If the plan or program determines the use of a small area at a local level or if it is a minor modification to a plan or program.

SEA should not be applied for ad-hoc documents, which are not formalized through the legal decisions or approval by a governmental authority.

Plans and programs whose sole purpose is national defense or civil emergencies are not subject to SEA, nor are financial or budget plans or programs.

### **t) Scoping**

Scoping defines the information content in terms of both the topics to be considered and the depth or detail of the information to be presented on each topic. The issues identified in the scoping will guide the evaluation of the environmental baseline, the assessment of the likely effects and consideration of possible alternatives or options. Therefore, the scoping procedure is a key step for an effective SEA, as a well-defined scope of the assessment enables the SEA to focus on the key problems and thus minimizes financial, time and human resources. Thus, the overall aim of scoping is to ensure that the SEA report is correctly focused and provides enough relevant information on what really matters.

The practice shows that scoping reports provide a useful basis for consultations at the scoping stage. The Protocol on SEA furthermore stipulates that environmental and health authorities must be consulted during scoping, and the public should be provided with opportunities to participate. The output of the scoping stage can be also understood as the detailed Terms of Reference for further analyses and the SEA report.

#### **How to conduct scoping**

Scoping starts from the list of general environmental and health themes. This list can be guided by relevant legislation (e.g. a legal framework for environmental protection can be used to define the environmental components. For each theme, the specific issues should be identified, which are relevant to the plan or program being assessed together with describing the territorial scope. Scoping then normally moves from a long list of concerns to a shortlist of potentially significant issues. In this context, it also needs to be pointed out that in practice the scoping is closely linked to baseline analysis.

Defining the scope of the assessment is often followed by a baseline analysis that leads to more precise identification of the key issues and problems. For SEA, especially in the case of development strategies, it is also beneficial to identify existing objectives relevant to the key issues, which are stipulated by strategic or legal documents (e.g. a national environmental policy, international treaties, etc.). It will help (i) to identify linkages between the proposed plan or program and other strategic documents, (ii) substantiate selection of the key issues. If there are

objectives stipulated by an approved formal document, it means that it is generally significant and thus reasonable to be addressed in SEA.

As mentioned above, the scoping results will determine the focus of the entire SEA, and therefore it is highly recommended to conduct consultations with relevant stakeholders at this stage. The inputs from consultations will help to achieve consensus in the early stage of SEA on what the scope of the assessment should be. The scoping results can be summarized in the scoping report. In many countries the information to be included in the scoping report are stipulated in relevant SEA legislation. In some countries, the SEA regulations require the responsible environmental and health authorities to review the scoping reports and to issue a Scoping Opinion or Scoping Statement.

**Table 2: Example of the scoping opinion/statement form**

<b>General themes to be considered in SEA</b>	<b>Key specific Environmental issues related to ILUP</b>	<b>Relevant Environmental objectives</b>
<ul style="list-style-type: none"> <li>▪ <b>Protected Forest</b></li> <li>▪ <b>Biospheres</b></li> <li>▪ <b>Wildlife sanctuaries</b></li> </ul>	<ul style="list-style-type: none"> <li>· Agricultural encroachment</li> <li>· Illegal settlement</li> </ul>	<ul style="list-style-type: none"> <li>· Preservation of flora and fauna biodiversity</li> <li>· Preservation of functions and status of ecosystems</li> <li>· Improvement of conditions in the settlement</li> <li>· Standard buffer zones</li> </ul>
<b>Cultural and Tourism sites</b>	Destruction of cultural sites	Preservation and improvement of cultural-landscape parameters
<b>Soil</b>	<ul style="list-style-type: none"> <li>· Soil pollution from agriculture</li> <li>· Water erosion</li> </ul>	<ul style="list-style-type: none"> <li>· Reduce excessive use of agriculture land and green-fields,</li> <li>· Reduce agricultural land use for urban development and economic activities (industrial sites, shopping centers)</li> <li>· Reduce soil erosion and soil pollution from agricultural activities; determine appropriate slope gradient,</li> </ul>
<b>Water /Lakes/ Wetlands</b>	<ul style="list-style-type: none"> <li>· Water pollution from agriculture</li> <li>· Drinking water supply</li> <li>· Water demand for irrigation</li> <li>· Floods</li> <li>· Diminishing wetlands</li> <li>· Destruction of aquatic animals</li> </ul>	<ul style="list-style-type: none"> <li>· Sufficient Protection plan for water resources to protect from pollution caused by agriculture and industry</li> <li>· Provide sufficient protection plan against floods</li> <li>· Propose sufficient buffer zones for water bodies</li> </ul>
<b>Stakeholder cooperation</b>	Public — private partnership	<ul style="list-style-type: none"> <li>· Establish legal and institutional conditions for the public private partnership</li> <li>· Rising public responsibility in environmental issues</li> </ul>
<b>Etc.....</b>		.
		.
		.

## **8.11 Baseline Analysis**

The baseline analysis comprises a set of activities to be accomplished for the collection, selection, and evaluation of the baseline data (i.e. data on the existing environmental and socio-

economic conditions) and their further documentation in the SEA Report. The baseline analysis in SEA provides a basis for further assessment of likely effects, formulation of mitigation measures, and monitoring schemes. It starts during the SEA scoping stages, builds on the results of scoping, and can lead to better identification of the key issues, the key problems relevant to the plan or program, and the territory likely to be affected. The baseline analysis helps to estimate the likely future evolution of the relevant environmental and health issues in case the plan or program is not implemented (and thus provides a 'baseline' for assessing how implementing the plan or program can affect the environment and health in the future).

### **8.1.1.1 Approach to baseline data collection and selection**

Baseline information should address long-term trends and understand the forces behind the trends. SEA quite often can rely on the existing data and available information. However, it is important to carefully consider what information is required and what the most appropriate level of detail is. In addition, the data and information collected should be as recent and accurate as possible.

Not all the baseline data available should be collected for each SEA, rather the selection of baseline information focus only on aspects that are relevant to the environmental and health issues identified during the scoping. The data and information to be collected should address the aspects which:

- are relevant to the area or region for which the plan or program is developed; and
- cover the environmental and health issues identified during scoping (i.e. those which can be significantly affected by the plan or program implementation);

#### **How to conduct a baseline analysis**

Baseline analysis in SEA should be undertaken for each key issue identified in scoping, and should:

- Describe the current conditions;
- Describe past trends;
- Identify the main drivers influencing the trends so far, and
- Based on the above, outline the likely evolution of the trends in the future (without implementing the plan or program being assessed).

Baseline analysis in SEA should, to the extent possible, address the following questions:

- What are the legal and policy targets for a given environmental or health issue?
- What are the key characteristics of the study area?
- What are the key areas and problems that need special protection or increased attention?
- What has been the trend so far a given environmental or health issue?

- How far is the current situation from any established objective or targets? What is driving these trends? Which of these drivers can be significantly influenced by the proposed plan or program?
- How will the future trend evolve without the proposed plan or program? Will it be influenced by major developments that have been already approved but not implemented yet, such as climate change, changes in the regulatory or policy framework, economic incentives, etc? What are the key emerging risks?
- What are the major implications (if any) for the SEA and the planning process? E.g. the baseline analysis may result in proposing an alternative option to be considered in the plan- or program-making process.

There are driving forces that influence a variety of factors such as economic development, legal and regulatory framework, implementation of sectoral programs, and/or large infrastructure projects. The most important drivers have to be considered when describing a likely future evolution. Although many uncertainties are surrounding the likely future trends, the SEA should outline the future trends as best as possible, using the most recent and accurate data available to describe the best and worst scenarios. However, it is also important to indicate the uncertainties that may limit the accuracy of the baseline analysis.

### **Tools For The Baseline Analysis**

A baseline analysis may include both quantitative and qualitative information, and it is often useful to combine both types of information. Depending on the nature of the assessment, the methods and tools to be used to describe and analyze the baseline situation range from simple approaches, such as checklists, matrixes, Geographic Information System (GIS) maps and overlays, and professional/expert judgment to sophisticated mathematical modelling (e.g. preparation of noise maps, dispersion of pollutants in the air).

### **Sources of baseline information**

Typical sources of information for the baseline analysis in SEA include:

- State of the environment reports that offer a broad view on the state of the environment at the regional and national levels (which could be static and thus should be reviewed for several years);
- the information included in other relevant strategies, plans, or programs that can be used after its verification and update;
- existing and available information from environmental monitoring conducted for research and other purposes;
- experts opinions (discussions, questionnaires);
- available information from governmental institutions at different levels and in different sectors; and
- Records of monitoring activities conducted during environmental assessment by environmental authorities.

### 8.11.2 Effect Assessment and Mitigation Measures (Including Alternatives)

#### u) Approaches and Methods of Identifying and predicting effects

The effect of strategic action is defined by the difference in environmental or sustainability conditions with and without the strategic action. To identify the effects the following questions should be asked: Will changes occur about the environmental components and health of the proposed plan or program? What kind of changes? Prediction involves describing the identified effects (i.e., changes) in terms of their magnitude, geographical scale, the period over which they will occur, whether they are permanent or temporary, positive or negative, probable or improbable, frequent or rare, and whether or not there are secondary, cumulative and/or synergistic effects.

Predictions do not have to be expressed in quantitative terms. Hard data may enable the experts or authorities to make detailed quantitative predictions, and this can be particularly useful where a plan or program’s effects are uncertain, close to a threshold, or cumulative. However quantification is not always practicable, and qualitative predictions can be equally valid and appropriate. Qualitative does not mean ‘guessed’. Predictions need to be supported by evidence, such as references to any research, discussions or consultation which helped the SEA team to reach their conclusions. Rating techniques are often used for qualitative estimates of effects and their systematic comparison.

Selected applicable methods or analytical tools	Their application within the SEA process				
	Identification of Issues and impacts	Context and baseline analysis	Contributing to development of alternatives	Assessment of impacts	Comparing key options for decision-making
Spatial analyses/ Geographical information systems (GIS)	✓	✓	✓	✓	✓
Trends analysis/ extrapolation	✓	✓	✓	✓	✓
Multi-criteria analysis			✓	✓	✓
Cost-benefit analysis			✓		✓
Comparative risk assessment			✓	✓	✓
Modelling		✓	✓	✓	✓

Figure 7: A short overview of methods and tools, which can be used for effect analysis,

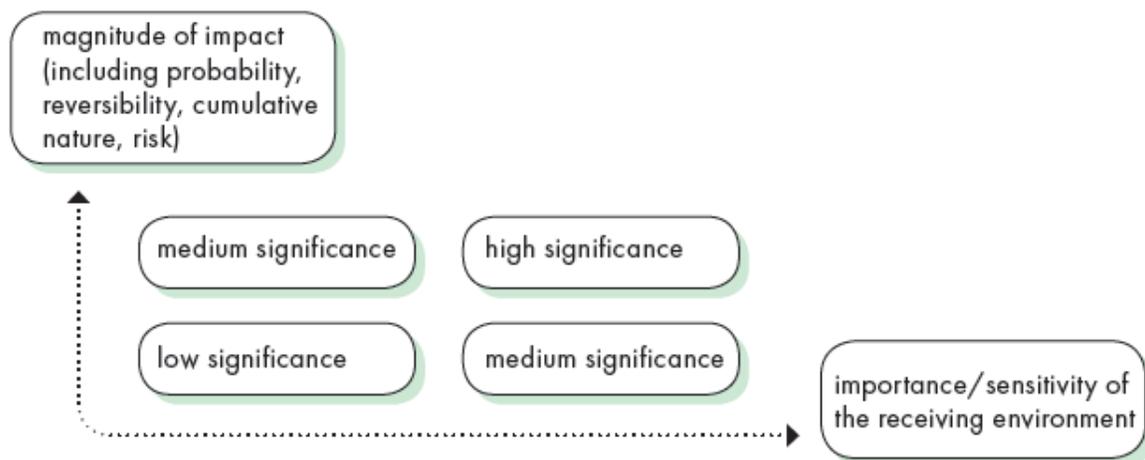
### 8.11.3 Effects Evaluation

Evaluation involves determining whether the predicted effect is significant or not: this requires an element of judgment. It may also be helpful to refer to the baseline information and indicators defined in the baseline analysis. In practice, a frequently used approach to evaluation

is to bring together (possibly as an effect significance matrix) the following parameters: In practice, a frequently used approach to evaluation is to bring together (possibly as an effect significance matrix) the following parameters:

- the magnitude of the predicted effect (greater area, longer duration etc. = more significant) from the effect prediction stage, and
- the value and sensitivity of the receiving environment (already stressed, more sensitive, etc. = more significant).
- The value and sensitivity of the receiving environment can be determined through e.g.:
  - designations such as National Parks;
  - other measures of value or vulnerability, e.g. how many people use the area or whether any rare species are present in the area;
  - standards and thresholds: whether standards (e.g. for air quality) are already being exceeded; and
  - public or stakeholder values: what is significant to residents.

The output of the effect evaluation is a yes (significant impact) or no (insignificant impact) statement. If the gradation of effects is important, a rubrics-based range can be introduced via which it is possible to evaluate the effects as being of e.g., low (minor), medium (moderate) or high (major) significance (Figure ----).



**Figure 8: Determining effect significance**

**Table 3: Determining effect significance with respect to each environmental aspect/effect**

Environmental aspects/Effect indicators		Magnitude of impact (including probability, reversibility, cumulative nature, risk)			Importance/sensitivity of the receiving environment		
		Low significance	Medium significance	High significance	Low significance	Medium significance	High significance
National park	-illegal settlement			X			X
	-highway road/railway			X			X
	Agricultural encroachment						
Biosphere	-illegal settlement			X			X
	Agricultural encroachment			X			X
	highway road/railway			X			X
Etc...							

Evaluation of priorities and objectives should also address synergies and conflicts between the environment and health objectives (as identified in the scoping stage) and the objectives and priorities proposed in the plan or program. This might lead to suggestions or modifications to the proposed objectives and priorities to increase the consistency between the plan or program with the environmental and health objectives of earlier approved strategies.

#### 8.11.4 Formulating and assessing alternatives

The SEA process plays an important role in identifying and generating reasonable alternatives. Alternatives should be sufficiently distinct to highlight the different environmental implications of each, allowing for meaningful comparisons to be made at a strategic level. The SEA should primarily focus on baseline trends and how likely the future trends would be affected by the implementation of the plan or program and all its alternatives. The predicted effects of alternatives should be compared with the likely future evolution as described in the baseline analysis, to determine their ranking in terms of their environmental and health effects (Table 3).

**Table 4: A possible matrix for comparing alternatives**

Environmental theme	Alternatives	
	Alternative 1	Alternative 2
Flora and fauna		
Protected area (ha.)	++	+
Disturbance to protected area	+	-
Water		
Surface water quality	+	--
Surface water quantity	+/-	?

Symbols: + positive; - negative; 0 neutral; ? uncertain; + minor; ++ major; +/- both positive and negative

### 8.11.5 Mitigation

Following the effect analysis, SEA has to formulate measures to avoid, mitigate or compensate for the likely significant adverse impacts, as well as to enhance possible positive effects. Mitigation can take a wide range of forms, including:

- Changes to the alternative concerned, (e.g. replacing a road connection with a railway);
- Changes to the plan or program as a whole (the overall design of a given development proposal);
- Changes to a specific proposal within the plan or program;
- Inclusion of new provisions within the plan or program;
- Technical measures to be applied during the implementation stage (e.g. buffer zones application of design principles);
- Identifying issues to be addressed in project EIAs; and
- Proposals for changing other plans and programs.

### Practical guide

- Evaluation and recommendations formulated by the SEA concerning the plan or program have to be properly communicated to planners. It needs to be substantiated by proper justification and explanation, to encourage the integration of SEA suggestions into the plan or program from the planners' side.
- Provide a clear ranking of alternatives from the environmental effects point of view.
- Document how the alternatives have been narrowed down and state the reasons for rejecting or selecting certain alternatives.
- Link mitigation measures to the effects identified.
- Optimally, mitigation measures should be integrated in the plan or program design.
- Consultations with relevant governmental authorities are recommended to obtain agreement on the mitigation actions proposed.
- Don't forget to make note of any uncertainties and a lack of data or information.

## 8.12 PREPARATION OF SEA REPORT

### 8.12.1 What is SEA Report (or Environmental Report) and why it is needed?

This SEA stage aims to prepare a readable SEA Report (or 'Environmental Report', according to the Protocol), which provides all the information, data, conclusions, and recommendations clearly and understandably. The SEA report is necessary not only to summarize all the findings and conclusions of the SEA but also to enable efficient consultations with relevant authorities

and other stakeholders and to demonstrate how the inputs from SEA have been integrated into the draft plan or program.

### **8.12.2 Approach**

The SEA Report is a keystone document used for consultation with all relevant stakeholders, and thus it needs to be well organized and reader-friendly. A high-quality SEA Report helps to ensure effective communication with stakeholders, a greater understanding of the information provided by the SEA, and improved chances that the suggestions and conclusions in the SEA will be agreed upon by the stakeholders. The SEA Report is not a purely academic or scientific study; its main messages should be conveyed and made apparent to the relevant stakeholders for their consideration. More detailed information is provided in the annexes to this Manual.

Conclusions and recommendations have to be formulated; i.e. the SEA Report needs to explicitly describe (i) what is suggested (mitigation measures, monitoring schemes, conditions to be adopted by decision-makers, etc.), (ii) why it is suggested (e.g. to minimize certain adverse effects), and (iii) who or which institutions should perform these actions (the planning agency, project developer, environmental agencies, decision-makers, etc.).

### **8.12.3 Contents of the SEA report**

The SEA report should contain the following:

- The contents and the main objectives of the plan or program and its link with other plans or programs.
- The relevant aspects of the current state of the environment, including health, and the likely evolution thereof should the plan or program not be implemented.
- The characteristics of the environment, including health, in areas likely to be significantly affected.
- The environmental, including health, problems
- that are relevant to the plan or program.
- The environmental, including health, objectives established at international, national, and other levels which are relevant to the plan or program, and how these objectives and other environmental, including health, considerations have been taken into account during its preparation.
- The likely significant environmental, including health, effects 36 as defined in article 2, paragraph 7.
- Measures to prevent, reduce or mitigate any significant adverse effects on the environment, including health, which may result from the implementation of the plan or program.
- An outline of the reasons for selecting the alternatives dealt with and a description of how the assessment was undertaken including difficulties encountered in providing the information to be included such as technical deficiencies or lack of knowledge.

- Measures envisaged for monitoring environmental, including health, effects of the implementation of the plan or program.
- The likely significant transboundary environmental, including health, effects.
- A non-technical summary of the information provided.

Ideally, the report should also indicate if, and how, any inputs from the SEA have been accepted and integrated into the draft plan or program.

In addition, information that may be needed for reference or for detailed review by technical experts should be included in the appendices to the SEA Report. The appendices may also contain the list of authorities, agencies or individuals consulted during the SEA process, an explanation of terms (glossary), etc. The information in the appendices should be properly referenced to in the SEA Report.

**Table 5: Possible structure and the related contents of the SEA Report**

<b>Contents</b>	<b>Details</b>
Summary	<ul style="list-style-type: none"> <li>▪ Summary of the SEA process</li> <li>▪ Summary of the likely significant effects of the plan or program</li> <li>▪ Statement on the difference the process has made to-date</li> <li>▪ How to comment on the report</li> </ul>
Methodology used	<ul style="list-style-type: none"> <li>▪ The approach adopted in the SEA</li> <li>▪ Who was consulted, and when</li> <li>▪ Difficulties encountered in compiling information or carrying out the assessment</li> </ul>
Background	<ul style="list-style-type: none"> <li>▪ Purpose of the SEA</li> <li>▪ Objectives of the plan or program</li> </ul>
SEA objectives, baseline and context	<ul style="list-style-type: none"> <li>▪ Links to other international, national, regional and local plans and programs, and relevant environmental objectives including how these have been taken into account</li> <li>▪ Description of baseline characteristics and predicted future baseline</li> <li>▪ Environmental issues and problems</li> <li>▪ Limitations of the data, assumptions made etc.</li> <li>▪ SEA objectives, targets and indicators</li> </ul>
Plan or Program issues and alternatives	<ul style="list-style-type: none"> <li>▪ Main strategic alternatives considered and how they were identified</li> <li>▪ Comparison of the significant environmental effects of the alternatives</li> <li>▪ How environmental issues were considered in choosing the preferred strategic alternatives</li> <li>▪ Other alternatives considered and why they were rejected</li> <li>▪ Any proposed mitigation measures</li> </ul>
Plan or program policies	<ul style="list-style-type: none"> <li>▪ Significant environmental effects of the policies and proposals</li> </ul>

	<ul style="list-style-type: none"> <li>▪ How environmental problems were considered in developing the policies and proposals</li> <li>▪ Proposed mitigation measures</li> <li>▪ Uncertainties and risks</li> </ul>
Implementation	<ul style="list-style-type: none"> <li>▪ Links to other tiers of plans and programs and the project level (environmental impact assessment, design guidance etc.)</li> <li>▪ Proposals for monitoring</li> </ul>

#### 8.12.4 Information to Be Contained In An Environmental Report

The following information shall be included in an environmental report –

- an outline of the contents and main objectives of the plan and relationship with other relevant plans;
- the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;
- the environmental characteristics of areas likely to be significantly affected;
- any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of particular environmental importance, such as areas designated according to the Forest, wildlife----
- the environmental protection objectives, established at the national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation;
- the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;
- the measures envisaged to prevent, reduce, and as fully as possible offset any significant adverse effects on the environment of implementing the plan;
- an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;

#### Note:

- Adjust the structure of the SEA Report as relevant to the nature and content of the plan or program that is the subject of the assessment.
- Provide information on the SEA process management outlining how the process was conducted, if there were any consultations with relevant authorities and/or other stakeholders, how the outcomes of these consultations were considered in the SEA report, and so forth.

- Don't forget to indicate which suggestions have been already integrated in the final draft of the plan or program during the planning process.
- Indicate any uncertainties and a lack of data and information.

## 8.13 Quality Assurance/Quality Control

### 8.13.1 Aim and definition

The aim of the quality assurance/quality control step in SEA is to ensure that the SEA process has provided reliable and objective information to be considered when adopting the plan or program and has communicated this information effectively to stakeholders. Quality assurance focuses on preventing potential deficiencies, while quality control is more output-oriented and focuses on the identification of deficiencies. Two objects of quality assurance/quality control can be distinguished, i.e.:

- the SEA report; or
- the entire SEA process (including the SEA administrative procedure).

The quality control in SEA should not be focused only on the SEA report, but on the entire SEA process, especially on its interaction with the planning process and integration of SEA recommendations in the draft plan or program as the expected 'end-result of SEA. The quality of SEA consists of many aspects, e.g., communication between SEA and planning teams, availability and appropriateness of data and information, the use of effective impacts' evaluation tools and techniques, means of stakeholders' consultations and participation, and an extent of integration of the SEA findings into the plan or program.

### 8.13.2 Who is responsible and when to do quality control?

The same authority that prepared the environmental report might also be responsible for assuring its quality. The environmental authority responsible for reviewing the SEA report, if such exists, might also take on the task of quality control, or an independent commission might be set up or an existing audit commission might have its mandate extended.

In some countries, environmental and health authorities are responsible for reviewing the scoping reports and issuing the so-called Scoping Opinions or Scoping Statements. Such Scoping Opinions or Statements can be considered as a quality control tool in the early stages of the SEA process. An example of the Scoping Opinion form is given in Box I above (under scoping).

#### **Box I:** Example of The Scoping Opinion/Statement Form

##### **Scoping Opinion Form**

##### **Identification data:**

Document title: **Integrated Land Use Plan**

Planning authority: **Bureau of Land Administration and Use of Oromia**

**Zone:** \_\_\_\_\_

**Wereda:**

Nature of the document, purpose and objectives:

- Indication of legal basis (e.g. Strategy required by the **NATIONAL ROAD MAP** code)
- Outline of objectives and expected content/structure of the document
- Indication of the nature of planned interventions (**e.g. Agricultural land, investments, Protected areas, Biospheres, plantation forest areas, Urban land use, socio economic infrastructure projects, etc.....**)
- Indication of planning process milestones and deadlines (e. g. expected approval by the government: **year** \_\_\_\_\_ **Month** \_\_\_\_\_)

**Area covered/Territory of application:**

- Administrative units where the ILUP Document is to be implemented (e.g. zone, woreda, or settlement)
- **Scoping process:**
  - Indication of key milestones so far
  - E.g. Scoping report submitted on ... year, the public was entitled to submit their opinions and comments with the period of ... year, etc.
- **Received comments**
  - List of opinions received during the scoping process (can be provided as an annex to the scoping opinion)
  - Indication of how the comments have been considered in the scoping opinion (e.g. explaining that some suggestions have been included among issues to be further addressed, or that responses to certain opinions will be presented in the SEA report)
- **Scoping opinion:**
  - Overview of environmental and health issues that shall be further analyzed in the SEA (optimally indicating also the level of detail – which can vary from very general (e.g. water quality),
  - Overview of strategic documents or environmental policy objectives to be included in the compliance analysis within the SEA (e.g. Assess the compliance of the proposed Strategy within the document ‘National Program for Biodiversity protection’, namely with its goal to “preserve the integrity and ecological functions in protected areas”).
  - List of stakeholders who should be consulted in the further stage of SEA (e.g. regional authority X, NGO Y, Research institute Z)
  - Recommendations for the further consultation process including possible activities beyond the legal requirements (e.g., one public hearing on the draft strategic document and SEA report shall be organized in the capital city, while two additional workshops can be recommended to be conducted in two of the potentially most affected districts)
- Any requirements regarding the assessment of alternatives (e.g. indication of a need for developing and/or analyzing certain alternatives, e.g. specific transport corridors alternatives should be developed and assessed to avoid likely effects on populated areas)
- Recommendations regarding analytical methods or tools to be used in the SEA (e.g. spatial analysis of the likely conflicts between protected areas and planned infrastructure).

It should also be noted that consultations with public can be considered as another type of quality control. Often, public discussion reveals insufficiencies or errors in the SEA report, or misinterpretation of conclusions, etc.

### 8.13.3 Approaches

Requires preparation of a set of review criteria. These are a series of questions (or statements that can be used as questions), which provide a check on whether the SEA report or process has been undertaken properly. Review criteria can focus on the SEA report, and help to ensure that it discusses everything that it should.

#### **Box 2: Quality assurance checklist** **Objectives and context**

- The plan's or program's purpose and objectives are made clear.
- Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.
- SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.
- Links with other related plans, programs and policies are identified and explained.
- Conflicts that exist between SEA objectives and plan objectives and between SEA objectives and other plan objectives are identified and described

#### **Scoping**

- Relevant authorities with environmental, including health, responsibilities are consulted in appropriate ways and at appropriate times on the content and scope of the environmental report.
- The assessment focuses on significant issues.
- Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.
- Reasons are given for eliminating issues from further consideration.

#### **Alternatives**

- Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.
- Alternatives include "do minimum" and/or "business as usual" scenarios wherever relevant.
- The environmental effects (both adverse and beneficial) of each alternative are identified and compared.
- Inconsistencies between the alternatives and other relevant plans, programs or policies are identified and explained.
- Reasons are given for selection or elimination of alternatives.

#### **Baseline information**

- Relevant aspects of the current state of the environment and their likely evolution

without the plan or program are described.

- Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.
- Difficulties such as deficiencies in information or methods are explained.

### **Prediction and evaluation of likely significant environmental effects**

- Effects identified include the types listed in the Protocol (human health, flora, fauna, biodiversity, soil, climate, air, water, landscape, natural sites, material assets and cultural heritage), as relevant; other likely environmental effects are also covered, as appropriate.
- Both positive and negative effects are considered, and the duration of effects (short, medium or long term) is addressed.
- Likely secondary, cumulative and synergistic effects are identified where practicable.
  - Interrelationships between effects are considered where practicable.
  - The prediction and evaluation of effects make use of relevant accepted standards, regulations, and thresholds.
  - Methods used to evaluate the effects are described.

### **Mitigation measures**

- Measures envisaged preventing, reduce and offset any significant adverse effects of implementing the plan or program are indicated.
- Issues to be taken into account in project consents are identified.

### **The environmental report**

- Is clear and concise in its layout and presentation.
- Uses simple, clear language and avoids or explains technical terms.
- Uses maps and other illustrations where appropriate.
- Explains the methodology used.
- Explains who was consulted and what methods of consultation were used.
- Identifies sources of information, including expert judgement and matters of opinion.
- Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered and any changes to the plan resulting from the SEA.

### **Consultation**

- The SEA is consulted on as an integral part of the plan-making process.
- Relevant authorities with environmental, including health, responsibilities and the public likely to be affected by, or having an interest in, the plan or program are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and environmental report.

### **Decision-making and information on the decision**

- The environmental report and the opinions of those consulted are taken into account in finalizing and adopting the plan or program.
- An explanation is given of how they have been taken into account.
- Reasons are given for choosing the plan or program as adopted, in the light of other reasonable alternatives considered.

### **Monitoring measures**

- Measures proposed for monitoring are clear, practicable, and linked to the indicators and objectives used in the SEA.
- Monitoring is used, where appropriate, during the implementation of the plan or program to make good deficiencies in baseline information in the SEA.
- Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions that prove to be incorrect.)
- Proposals are made for action in response to significant adverse effects.

#### **Note:**

- Understand quality assurance/quality control as a support to SEA conclusions and recommendations, rather than a critique focusing on minor details;
- Enable the public to comment on the quality of SEA reports and also provide room in the procedure to integrate these comments into the final SEA report before decision-making.

## **8.14 SEA Monitoring**

### **8.14.1 Key formal requirements**

Monitoring is crucial for securing environmentally friendly and sustainability-led delivery of plans or programs and the learning process.

It is required that the SEA report should contain measures envisaged for monitoring the significant environmental (and health) effects of the implementation of the adopted plan or program.

### **8.14.2 Monitoring is used to:**

- Compare predicted and actual effects, thus providing information on the implementation of the plan or program;
- Provide experience to help improve future SEAs (i.e., as a quality control tool);

- Check that environmental conditions imposed by the authorities are being complied with;
- Check that the plan or program is implemented as described, including the prescribed measures to prevent, reduce or compensate adverse effects.

### **8.14.3 SEA monitoring program**

Monitoring is not sufficient on its own to continuously incorporate environmental considerations into the implementation of plans or programs or to provide information about environmental and health effects to stakeholders. To ensure this, a SEA monitoring (or SEA follow up) program should be designed that would include:

- 1) Monitoring of: environmental and health effects during the implementation of the plan and program; and how the mitigation measures proposed by the SEA are implemented;
- 2) evaluation of the monitoring results and taking response actions (by the actors who are implementing the plan or program should be able to take appropriate response measures); and
- 3) communication (the results of monitoring be made available to the stakeholders).

### **8.14.4 How to design the SEA monitoring program**

The SEA Report should suggest indicators to enable the monitoring of the main likely effects identified in the assessment.

The responsibility for the SEA monitoring process should cover the following:

- Monitoring activity to be undertaken
- Responsibility for undertaking the monitoring
- When the monitoring needs to be carried out (dates and frequency)
- How results should be presented and in what format
- Status of monitoring and any problems encountered.

It should be noted that the SEA monitoring program design depends on the scope, content of a specific plan or program that needs to be monitored, as well as on administrative level and legal requirements.

### **8.14.5 Links between the SEA monitoring delivery and implementation of the plan or program**

The SEA monitoring activities and reporting should be optimally integrated in the overall monitoring scheme for the implementation of the plan or program and/or linked to the regular revisions of a plan or program. This needs to be discussed already during the SEA process when designing the monitoring scheme.

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### 8.14.6 Who should be responsible for SEA monitoring delivery?

Responsibilities to monitor environmental and health effects during the implementation of the plan or program are legally assigned to the agency coordinating its implementation. Thus, when designing a monitoring arrangement, it has to be decided whether the tasks should be performed by the same authority or body implementing the plan or program or by different authorities or bodies, e.g. environmental authorities.

It stems from practice, however, that the agency implementing a plan or program holds the key role in monitoring the implementation of both the plan or program and the SEA monitoring program.

### 8.14.7 Approaches and tools

As previously mentioned, monitoring is linked to the environmental baseline, effect evaluation, and mitigation measures. The basic tool for SEA monitoring is based on the use of indicators that are tailored to each identified issue across the environmental and health themes in SEA (or, depending on the methods used, to SEA objectives).

#### Other examples of indicators:

- Indicators for driving forces to describe the social, demographic, and economic developments in societies and the corresponding changes in lifestyles, etc.
- Pressure indicators describe developments in the release of substances, physical and biological agents, the use of resources, and the use of land.
- State indicators to describe the quantity and quality of physical, biological, or chemical phenomena in a certain area. They may, for instance, describe the wildlife resources.
- Impact indicators to be used to describe, which impact results from the driving forces.
- Response indicators refer to responses by groups and individuals in society, as well as government, attempts to prevent, compensate, ameliorate or adapt changes in the state of the environment.

Table 6 below illustrates a typical structure for monitoring.



**Table 6: Developing structure for Environmental monitoring**

<b>SEA Topic/ Thematic area</b>	<b>Aspects</b>	<b>Significant environmental effect</b>	<b>SEA objectives</b>	<b>Possible SEA indicators</b>	<b>Proposed monitoring</b>
Biodiversity, fauna and flora	Encroachment -Agriculture, -settlement, -illegal hunting	Disturbance, loss of habitats, species and genetic diversity - Alien invasive species (AIS)	To protect and where possible enhance flora and fauna <ul style="list-style-type: none"> <li>▪ avoid damage to designated wildlife and geological sites and protected species</li> <li>▪ maintain biodiversity, avoiding irreversible losses</li> <li>▪ restore the full range of characteristic habitats and species to viable levels</li> <li>▪ reverse the long term decline in farmland birds</li> <li>▪ ensure the sustainable management of key wildlife sites and the ecological processes on which they depend</li> <li>▪ provide opportunities for people to visit and appreciate wildlife and wild places</li> </ul>	<ul style="list-style-type: none"> <li>▪ reported levels of damage to designated sites/species</li> <li>▪ achievement of Biodiversity Action Plan targets reported condition of nationally important wildlife sites, Sites of Special Scientific Interest (SSSIs) etc</li> <li>▪ achievement of 'Accessible Natural Green-space Standards'</li> <li>▪ number/area of Local Nature Reserves</li> </ul>	Monitoring of the quantity of habitat losses and gains using: <ul style="list-style-type: none"> <li>▪ modeling (annual);</li> <li>▪ aerial photography (at least on a 5 yearly basis).</li> </ul>
Land/soil	<ul style="list-style-type: none"> <li>▪ Land tenure/ownership</li> <li>▪ Erosion</li> <li>▪ overgrazing,</li> <li>▪ Land management:: land use planning and classification, poor agricultural practices, marginal lands,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Land degradation</li> <li>▪ water scarcity</li> <li>▪ desertification,</li> <li>▪ loss of arable land</li> </ul>	Sustainable soil fertility, Sustainable land management,	Hectares of land degraded	Monitoring of: agricultural practice, recommended slope for crop cultivation, terracing, animal feed production, zero grazing, tree plantation

Forests and Woodlands	-Agriculture, -settlement, -dependence on forest products	<ul style="list-style-type: none"> <li>▪ Deforestation and declining forest quality</li> <li>▪ Incomplete inventorying, monitoring and management</li> <li>▪ unsustainable exploitation of forest resources</li> </ul>	<ul style="list-style-type: none"> <li>- Forest conservation:</li> <li>- Catchment protection:</li> <li>- Afforestation</li> </ul>	<ul style="list-style-type: none"> <li>▪ area protected</li> <li>▪ area afforested</li> </ul>	Forest inventory
the historic environment	Mining	Potential to unearth or damage buried archaeological features	To protect the historic environment	<ul style="list-style-type: none"> <li>-report of the extent of respecting the boundary of the historic environment</li> <li>-report of the extent of damage</li> </ul>	appropriate archaeological assessments and watching briefs
Etc....					

The information collected through this framework is then evaluated and interpreted by the responsible stakeholders holding the necessary mandate and possessing technical capacities. The data collection, processing, and storage involves the application of different tools and databases, e.g. GIS and other software, specialized governmental databases, existing national monitoring schemes, and various sectors databases. Further, the evaluated and stored data are used for managerial decisions and actions according to the objectives of SEA follow-up programs.

## **8.15 STAKEHOLDER CONSULTATIONS**

### **8.15.1 Why integrate stakeholder consultations into the SEA process?**

The goal of integrating stakeholder consultations into SEA is to provide for early, timely and effective involvement of all relevant stakeholders so that they can contribute their inputs into the SEA process when all options and alternatives are open. The consultations with the public and with the relevant authorities could be beneficial for improving the quality of the SEA report by obtaining new information and data or verifying the findings and conclusions. The consultations can reflect the values and attitudes of the public towards the plan or program undergoing SEA and support the implementation of the plan or program after its approval.

### **8.15.2 Identifying Key stakeholders for SEA process**

There are two main types of stakeholders defined in the Protocol on SEA: the public — involved via the public participation process and the authorities — engaged mainly through consultations with environmental and health authorities but may include other governmental national or local authorities, academia, unions, etc. In the case of significant transboundary environmental and health effects, transboundary consultations should be carried out with the affected countries.

To carry out efficient stakeholder consultations, it is critical to identify the key stakeholders to define the purpose of the consultations, to choose effective methods and tools for consultations and participation, and carefully plan the activities from the start of the SEA process. If and when the planning process itself includes stakeholder consultations it is important to integrate those with the stakeholder consultations within the SEA process so that overlaps will be avoided and both processes streamlined.

### **8.15.3 Public participation**

Public participation is an integral part of stakeholder consultations, and in many cases, the national legislation contains provisions on the rights of the public to participate in the SEA process.

The public is defined as relevant NGOs, one or more natural or legal persons, and, by national legislation or practice, their associations, organizations or groups.

#### **The Protocol for informing the public and consulting the public concerned**

- The proposed plan or program and its nature.
- The authority is responsible for its adoption.

- The envisaged procedure, including:
  - The commencement of the procedure;
  - The opportunities for the public to participate;
  - The time and venue of any envisaged public hearing;
  - The authority from which relevant information can be obtained and where the relevant information has been deposited for examination by the public;
  - The authority to which comments or questions can be submitted and the schedule for the transmittal of comments or questions; and
  - What environmental, including health, information relevant to the proposed plan or program is available.
- Whether the plan or program is likely to be subject to a transboundary assessment procedure.

**General requirements for public participation and guidance for their implementation**

General requirements	Implementation Guidance
<ul style="list-style-type: none"> <li>▪ Establish a transparent and fair framework for public participation in plans and programs relating to the environment</li> <li>▪ Identify the participating public</li> <li>▪ Conduct public participation early in the development of plans and programs relating to the environment</li> <li>▪ Give necessary information to the public</li> <li>▪ Establish reasonable time frames for public participation</li> <li>▪ Take due account of the outcome</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop a list or clear criteria for identifying plans, programs, and policies relating to the environment</li> <li>▪ Develop clear rules for participation</li> <li>▪ Develop mechanisms for notification</li> <li>▪ Set guidelines and standards for the quality of necessary information</li> <li>▪ Develop tools for the identification of the participating public</li> <li>▪ Supervise how public authorities take comments into account</li> <li>▪ Establish policies for public participation in policymaking</li> <li>▪ Flexibility in means (practical and/or other provisions)</li> <li>▪ Flexibility in setting time frames</li> <li>▪ Broad latitude in how to provide public participation in preparation of policies</li> </ul>

**8.15.4 Trans-boundary consultations**

Transboundary consultations shall be conducted when a proposed plan or program in one country (the Party of origin) is likely to have significant environmental effects on the territory of another country (the affected Party). Detailed arrangements for informing the public concerned and authorities in the affected Party, and for allowing them to forward their opinion on the draft plan or program and the environmental report should be made. The opinions of the public concerned and the environmental and health authorities in the affected Party have to be taken into due account, and they have to be informed of how their comments were taken into account.

**8.15.5 Stages of the SEA process with stakeholder consultations**

Each national and institutional system should provide for procedural arrangements and minimal requirements for stakeholder consultations within the SEA process. The Protocol on SEA envisages public participation and consultations with authorities in different stages of the SEA process as follows:

- Consultations with the public (public participation).
- The public concerned must have the opportunity to express its opinion on the draft plan or program and the environmental report within a reasonable time frame. In addition, the Protocol optionally provides for public participation in earlier stages:
  - Determination of significant effects, when determining whether SEA is required.
  - Scoping.  
Detailed arrangements for informing the public and consulting the public concerned have to be determined and made publicly available.
  - Consultations with authorities.
  - Consultation with environmental and health authorities:
    - Determination of significant effects, if required while determining whether SEA is required.
    - Scoping.
    - Environmental report.

The above stages are illustrative as consultations may occur not as distinct steps, but be merged or further split based on the logic of the SEA and the specific plan- or program-making process and their formal procedural stages.

#### **8.15.6 Methods and tools of stakeholder consultations**

The methods and tools for stakeholder consultations in the SEA process may vary. Some of the most common methods and tools for public participation are as follow. However, in addition to the tools described below other specific techniques could be applied to consult with authorities.

- Seeking written comments.
- Steering groups.
- Focus groups.
- Advisory committees.
- Interviews.
- Internet-based discussions.

In many cases, the role of the SEA authority controlling the process from formal point of view could be critical to introduce and maintain good practices for consultations, e.g. requiring a plan for stakeholder consultations from the SEA team.

### **8.16 SEA AND DECISION-MAKING**

Decision-makers should have information about likely environmental and health consequences related to their decision, i.e. the approval of the plan or program at the strategic level. One of the main purposes of SEA is exactly to ensure that environmental considerations inform and are integrated into strategic decision-making, and thus the SEA report should contain the information sufficient for the decision-makers to support their decisions. According to both the Protocol on SEA and the SEA Directive, in adopting a plan or program the decision-makers must take into account the conclusions of the SEA report, as well as the opinions expressed by the relevant environmental and health authorities, the public concerned, and any affected Parties.

### 8.16.1 Approach of decision-making

The decision-makers should always consider the SEA conclusions. To facilitate this, the SEA report should be submitted as an integral part of the plan or program. In some countries, based on the review of the SEA report, the agency coordinating the SEA process issues a final 'SEA document' such as SEA statements or SEA approval conditions. These final SEA documents are then used by the responsible decision-making body to make a decision (i.e. approval or rejection) on the plan or program. In other countries, the decision-making authorities have to consider conclusions provided directly by the SEA report when adopting a given plan or program. In particular, the Protocol on SEA and the SEA Directive stipulate that following the adoption of a plan or program, the relevant environmental and health authorities, the general public (not only the public concerned), and any affected Parties must be informed of the decision. Furthermore, the adopted plan or program must be made available to them together with a statement summarizing:

- How the environmental and health considerations (as presented in the SEA report) have been integrated into the adopted plan or program;
- How the stakeholders' opinions (as expressed by the public concerned in the case of the public) have been taken into account;
- The reasons why the plan or program has been adopted in the light of the reasonable alternatives considered.

Authorities must provide sufficient information about the conditions under which the above information is available and how it can be obtained. This could be done, for example, via information publications, announcements in government publications or on government websites, television or radio public service announcements.

### 8.16.2 Enhancing the decision-making process

In practice, the only way to ensure that the SEA conclusions are considered in decision-making is to integrate SEA inputs into the plan or program during the planning process. The planning process may include a sequence of 'small' decisions when certain choices, having environmental implications, are made. Some elements of the SEA process may be integrated within a plan- or program-making process. Therefore SEA can provide step-wise inputs to fit 'small' decisions depending on the extent and mode of its integration with plan or program-making.

Ideally, various analyses performed within SEA should inform the entire plan- or program-making process. The draft plan or program might therefore explain how the SEA has influenced the plan- or program-making process and 'small' decisions taken therein.

## Module 9: Mainstreaming land-use implementation projects for implementation of ILUP

### 8.17 Introduction

The meaning of “mainstreaming” revolves around integration, incorporation, generalization, inclusion, institutionalization, and refocusing, among others. Concerning ILUP mainstreaming, “incorporation’ seems to be the fittest. However, in this relationship, ILUP is the mainstream where the periodic GTP activities of the different bureaus/departments and agencies need to be incorporated with the realm of related land-use plans.

The basic objective of incorporating the GTPs to the ILUP is to implement the planned activities in the different implementing institutions into the different land-use plans. (targets) of the different institutions that are listed from one to thirty-one below. The five-year activities of such institutions will find their targets from the land-use plan. GTP activities by way of implementing sector activities that are planned in the land use plan. As it can be seen in the list below land use types that are planned under each planning unit need to be considered by the different concerned bureaus and get implemented down to Woreda/kebele level.

- |  |   |
|--|---|
| 1. Ministry of Federal and Pastoralist Development Affairs | 17. Bureau of Culture and Tourism   |
| 2. Bureau of Public Service and Human Resource Development | 18. Bureau of Finance and Economic Development                              |
| 3. Bureau of Agriculture and Natural Resources             | 19. Regional Planning Commission  |
| 4. Bureau of Livestock and Fisheries                       | 20. Ethiopian Institute of Environmental Forest and Climate Change Research |
| 5. Bureau of Industry                                      | 21. Bureau of Women and Children Affairs                                    |
| 6. Bureau of Transport                                     | 22. Bureau of Youth and Sports  |
| 7. Bureau of Communications and Information Technology     | 23. Office of Agricultural Transformation Agency                            |
| 8. Bureau of Urban Development and Housing                 | 24. Ethiopian Wildlife Conservation Authority                               |
| 9. Bureau of Construction                                  | 25. National and regional Meteorology Agencies                              |
| 10. Bureau of Water, Irrigation, and Electricity           | 26. Statistical Agency  |
| 11. Bureau of Mines, Petroleum and Natural Gas             | 27. Ethiopian Institute of Agricultural Research                            |
| 12. Bureau of Environment, Forest, and Climate Change      | 28. Institute of Biodiversity   |
| 13. Bureau of Public Enterprises                           | 29. Privatization and Public Enterprises Supervising Authority              |
| 14. Bureau of Education                                    | 30. Micro and Small Enterprises Development Agency                          |
| 15. Bureau of Health                                       | 31. Federal and Regional Investment Offices                                 |
| 16. Bureau of Labour and Social Affairs                    |   |

The whole purpose of the mainstreaming agenda is for the ILUP to serve as a pool from where the GTPs are to be drawn and get implemented by facilitation of the different bureaus, agencies, and organizations listed in the roadmap and **presented below** for reference. All mainstreaming and implementation will be catalyzed by the IILUP office who shall work by communicating with line bureaus of the region and departments of the respective zones and Woreda. The actual implementation will be through CCGs that are organized by their interest in common commodities and those more to be organized when additional project ideas emerge.

However, selecting CCG projects, incorporating the GTP milestones with the integrated land use plans, and facilitating their implementation by the CCGs is the subject of line bureaus, departments, other implementing institutions or agencies. The responsibilities of the ILUP facilitation offices that can mainstream with the timely GTPs are:

1. Making sure that the milestones of the GTPs that have repercussions on the specific subjects of the ILUPs, are in line with the scope and limit of the ILUP as approved by the GPNRS.
2. Continually preparing awareness creatin, sensitization, and knowledge-support seminars and workshops for each of the implementing institutions of the region and illustrating the potentials of the different land uses as planned and possible consequences if violated during implementation
3. Demarcating the boundaries of each of the land-use types as planned in the land use plan and transcribing the UTM references of each of the locations where directions change in the field
4. Preparing large scale and illustrated maps of each of the land uses as they occur at regional, zonal, and woreda levels and providing them to each of the responsible institutions
5. Preparing seminars at each of the concerned bureaus and departments at regional and zonal levels on potential CCG-based project ideas and possibilities for implementation
6. Preparing illustrated project ideas and implementation possibilities that are focused on each of the land-use types and organizing promotion meetings and seminars with related implementing institutions
7. Organizing Boy/Girl Scouts and clubs that can promote the safe and protected implementation of land use as they are planned
8. Preparing several primary, secondary and tertiary level investment projects ideas on many land use types and continually organizing a joint **Investment Promotion Seminar** between the investment office and the regional ILUP office for potential investors (foreign and domestic)
9. Conducting periodic surveillance and monitoring practices on the conformity of the land use plan with ground realities and enumerating issues for consideration in the next cycle of land use planning era to be repeated every five years.
10. Organizing geodetic-based environmental and social data gathering, filtering, synthesis, and feedback systems that can be used for the value-added implementation of the land use plans
11. Conducting periodic surveillance and studying the boundary-respect/violation happenings caused by the different projects, or any of the land utilization actions and
  - a. Conducting discussion with relevant guardian institutions of the boundary violating or land use changing parties and settling the case amicably
  - b. Filing a court case on those who violate the approved and officiated land use plans and making sure that the land use type is restored as planned.

- 
12. Providing/facilitating the necessary support so that the implementation of the GTP items are in congruence with the land use plan and the implementation projects are value-added.

The ILIUP should present the different pools at regional, zonal, and special woreda levels in the rural setting and urban development plans of each towns and the cities. Like the intention of the 2<sup>nd</sup> GTP, there is also strong intention in implementing the integrated land use plans at urban and rural settings, on the following intentions:

1. Creating and using productive technologies
2. Expanding the coverage of successful and productive technologies
3. Producing market-preferred productions
4. Expanding agriculture product market centers and marketing strategies
5. Expanding rain-irrigation-driven production/development approaches
6. Using natural resources safely and sustainably □

To this effect, because the intention of the GTPs is to be driven by the 6 listed intentions above, we believe that the different land-use types to be developed and mapped in the land use plans and albums of maps of each of the planning units will serve as a reference in implementing the GTPs in the current GTP and next three GTPs.

Implementation of the ILUPs both in rural and urban settings in the next 20 years will enable the region to avoid poverty and score on continued economic growth in both rural and urban settings. the following rural development directives are vital and listed in the GTP plans of many of the relevant bureaus.

1. Using labour-intensive development approaches
2. Securing the right land use plan and development strategy
3. Intensively using water resources
4. Following a development strategy that is based on ecological sustenance
5. Giving special considerations to areas that are susceptible to food insecurity
6. Encouraging private investors who are in development
7. Justifying that peoples participate and benefit in the development
8. Providing practical training that is based on theory and practice
9. Focusing on issues and activities that help integrated development

### **8.18 Implementation of ILUP as a Physical Plan**

The major task of the office of Land Use Planning and Oversight Office is demarcating every land-use type by physically demarcating their boundaries on the land as shown in the plan maps. This can be executed within the current GTP period (the next first five years). The total area extent of the land use plans that are identified and mapped both for the rural land use and the urban land use plans, maybe demarcated in the first GTP period. Implementation of the urban development plans that are to be indicated in the urban land use plans may continue throughout the coming 4 GTP periods (until 2040).

Major deliverables by phase	Types of Rural Roads as per the plan	2020-2025	20326-2030	2031-2035	2036-2040
		1 <sup>st</sup> phase	2 <sup>nd</sup> phase	3 <sup>rd</sup> phase	4 <sup>th</sup> phase
I. Demarcation	OROMIA REGION	30,430 km <sup>2</sup>	Boundary inspection and control	Boundary inspection and control	Boundary inspection and control
	Zone 1	----- km <sup>2</sup>	--	--	--
	Zone 2	----- km <sup>2</sup>	--	--	--
	Zone 3	----- km <sup>2</sup>	--	--	--
	Zone 4	----- km <sup>2</sup>	--	--	--
Boundary inspection and control	All administrative units	All administrative units	All administrative units	All administrative units	All administrative units

	Total	2020-2025 1 <sup>st</sup> phase	20326-2030 2 <sup>nd</sup> phase	2031-2035 3 <sup>rd</sup> phase	2036-2040 4 <sup>th</sup> phase	End
Physical land use by administrative Unit	Total Area in km <sup>2</sup>	50%	50%	--	--	Total in %
Zone 1:	-----	-----	-----	--	--	-----
Zone 2:	-----	-----	-----	--	--	-----
Zone 3:	-----	-----	-----	--	--	-----
Zone 4:	-----	-----	-----	--	--	-----
Zone 5:	-----	-----	-----	--	--	-----

### I Reconciled master land-use plan (ILUP) of the Oromia Region (demarcating every land use as planned)

Land-use type	Area in km <sup>2</sup>	2020-2025	20326-2030	2031-2035	2036-2040
		2 <sup>nd</sup> GTP	3 <sup>rd</sup> GTP	4 <sup>th</sup> GTP	5 <sup>th</sup> GTP
		Demarcating	Inspection & control.	Inspection & control.	Inspection & control
1. National Park	-----				
2. Suitable for Rain-fed Agriculture	-----	“	“	“	“
3. Industrial forest expansion and utilization	-----	“	“	“	“
4. Suitable for Irrigation/Commercial Agriculture	-----	“	“	“	“
5. Regional wildlife Park	-----	“	“	“	“
6. Range Land/Livestock	-----	“	“	“	“
7. Transitional Rain Forest	-----	“	“	“	“
8. Industrial Plantation Forest	-----	“	“	“	“
9. Protection Forest	-----	“	“	“	“
10. Wildlife Reserve	-----	“	“	“	“
11. Aquaculture Area	-----	“	“	“	“
12. Wetlands	-----	“	“	“	“

13. Rural Settlement	----	“	“	“	“
14. Moist Evergreen Afro-Montane Forest	----	“	“	“	“
15. Industrial forest with care	----	“	“	“	“
16. Combretum-Terminalia woodland and wooded grassland	----	“	“	“	“
17. Community Wildlife Conserved Area	----	“	“	“	“
18. Water bodies	----	“	“	“	“
19. Industrial mixed forest with care	-----	“	“	“	“
20. Riverine Forests	-----	“	“	“	“
21. Settlement	-----	“	“	“	“
22. Roadsides Woody Vegetation	-----	“	“	“	“
23.					
24.					
25.					
Total	-----				

**Note:** please note that land uses in the shaded region are the ones to be implemented in line with the formation of the CCGs and speed of the development in the planning unit during the 4 GTPs to come. This becomes a reality in line with the success of awareness creation, promotion of investment opportunities, and the formation of the CCGs.

## 2 Zonal level land ----- Zone land use plan

Major land Use	Detailed Land Use	Area in km2	2021-2025 2 <sup>nd</sup> GTP	20326-2030 3 <sup>rd</sup> GTP	2031-2035 4 <sup>th</sup> GTP	2036-2040 5 <sup>th</sup> GTP
			Demarcating	Inspection & control.	Inspection & control.	Inspection & control
Forest Land	1. Industrial forest	----	-----	-----	-----	-----
	2. Industrial forest with care	----	-----	-----	-----	-----
	3. Industrial mixed forest with care	----	-----	“	“	“
	4. Industrial Plantation Forest Development	----	-----	“	“	“
	5. Protection Forest	----	-----	“	“	“
	6. Riverine Forests	----	-----	“	“	“
	7. Roadsides Woody Vegetation	----	-----	“	“	“
Biodiversity and Ecological Conservation	8. Combretum-Terminalia woodland and wooded grassland (CTW) -protection	----	-----	“	“	“
	9. Moist Evergreen Afro-montane Forest (MAF)	----	-----	“	“	“
	10. Transitional Rain Forest (TRF)	----	-----	“	“	“
Wildlife Habitat	11. Community Wildlife Conserved Area	----	-----	“	“	“
	12. National Park	----	-----	“	“	“
	13. Regional Wildlife Park	----	-----	“	“	“
	14. Wildlife Reserve	----	-----	“	“	“
Agricultural Potential Area	15. Commercial Agriculture/Irrigation	----	-----	“	“	“

	16. Rainfed Agriculture-	-----	-----	“	“	“
Aquaculture Area	17. Aquaculture Area	-----	-----	“	“	“
Range Land/Livestock	18. Range Land/Livestock	-----	-----	“	“	“
Others	19. Settlement	-----	-----	“	“	“
	20. Waterbody	-----	-----	“	“	“
	21. Wetland	-----	-----	“	“	“
	22.					
	23.					
	24.					
	25.					
	26.					
	27.					
Total			-----	-----	“	“

**Note:**

Please note that land uses in the shaded region are the ones to be implemented in line with the formation of the CCGs and speed of the development in the planning unit in the 4 GTPs to come. This becomes a reality in line with the success of awareness creation, promotion work to be conducted on the investment opportunities, and the formation of the CCGs.

The CCGs who are going to be instrumental for implementing the plans to be indicated in the GTP periods

**3 Woreda level ----- Woreda Land Use plan**

Major land use	Detailed land use planned	Area in Km <sup>2</sup>	2020-2025 2 <sup>nd</sup> GTP	2026-2030 3 <sup>rd</sup> GTP	2031-2035 4 <sup>th</sup> GTP	2036-2040 5 <sup>th</sup> GTP	In %
			Demarcating	Inspection & control.	Inspection & control.	Inspection & control.	
<b>1.</b> Forest land	1. Industrial Plantation Forest Development	1.96	All	“	“	“	0.09
	2. Protection Forest	58.91	All	“	“	“	2.76
	3. Riverine Forests	26.71	All	“	“	“	1.25
	4. Roadsides Woody Vegetation	1.30	All	“	“	“	0.06
<b>2.</b> Wildlife Habitat	5. Community Wildlife Conserved Area	122.23	All	“	“	“	5.72
	6. Wildlife Reserve	5.61	All	“	“	“	0.26
<b>3.</b> Agricultural Potential Area	7. Commercial Agriculture/Irrigation	1025.19	All	“	“	“	47.97
	8. Rainfed Agriculture	177.23	All	“	“	“	8.29
<b>4.</b> Aquaculture Area	9. Aquaculture Area	95.70	All	“	“	“	4.48
<b>5.</b> Range Land/Livestock	10. Range Land/Livestock	381.81	All	“	“	“	17.87
<b>6.</b> Others	11. Settlement	75.40	All	“	“	“	3.53
	12. Waterbody	12.79	All	“	“	“	0.60
	13. Wetland	150.62	All	“	“	“	7.05
Total		2,135.46	99.93	All	“	“	99.93

Note: please note that land uses the shaded region are the ones to be implemented in line with the formation of the CCGs and speed of the development in the planning unit during the 4 GTPs to come. This

becomes a reality in line with the success of awareness creation, promotion of the investment opportunities, and the formation of the CCGs.

## PART II: Rural Road Construction And Maintenance Plan and implementation program

Types of Rural Roads as per the plan	Upgrade to the higher-level road	Km / phase				Totalin 20 years
		2020-2025 2 <sup>nd</sup> GTP phase	20326-2030 3 <sup>rd</sup> GTP phase	2031-2035 4 <sup>th</sup> GTP phase	2036-2040 5 <sup>th</sup> GTP phase	
1. All Weather Gravel	Asphalt Road	208.94	750.72	19.23	260.16	1239.05
2. Dry season Road	Gravel Road	216.5	53.51	53.51	0	323.52
3. Foot path	Gravel Road	382.8	80.66	0	0	463.46
4. Under construction	Garvel road	15.8	0	0	0	15.8
5. Maintenance	Asphalt Road	182.43	0	0	40.37	222.8

- I. integrated Land Use plan by plan implementing actors

### Module 10.

## 9. Module 10: Monitoring Land-Use Plan Implementations and Evaluation of The Aftereffects of the Land Use Plan

*resource requirements:* flip chart; colored markers; LCD projector and laptop  
length of the session -----1 day

### 9.1 Training Methodology

The trainer will apply the following methods:

- PowerPoint presentation
- the training will be conducted based on a participatory approach.

The training tools will include:

- mini-lectures, presentations, discussions, role-plays, and simulations.
- presentations will be followed by discussions, practical group exercises, and again, followed by discussions and presentations which are then led by the participants, to allow learning by doing on case issues to be presented by the instructor.
- encouraging interactive learning process, exchange of ideas and experiences assisted with practical sessions.

The objective of monitoring and evaluating ther Integrated land Use plan and Plan implementation is

- A. ensuring sustainability and harmonized land-use plans for improved and complimenting development
- B. supporting *economic transformation* of the people of the planning unit by

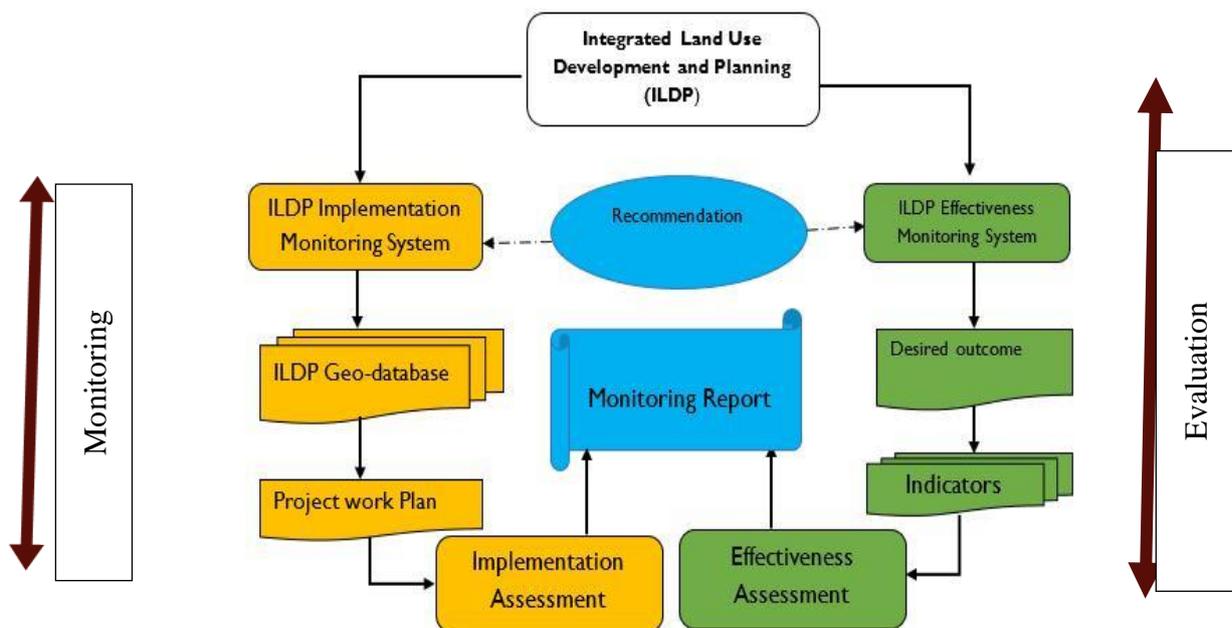
allocating land according to its use potential and preventing land-use conflicts.

- C. enabling speeded up and improved *social transformation* of the beneficiaries at all levels.
- D. guaranteeing a *sustainable environment* that can support the economic and social transformation agenda.

## 9.2 Components of the Monitoring Framework

1. THE Implementation monitoring system, and
  2. an effective monitoring system.
- ✓ the implementation monitoring system describes a process for defining ilup projects and tracking progress on project implementation.
  - ✓ the effectiveness monitoring system outlines steps for assessing whether the goals and objectives in an ILUP have been met as a result of project implementation

## 9.3 DUAL NATURE OF MONITORING AND EVALUATION



## 9.4 Requirements of tailored and effective monitoring and evaluation

The ILUP implementation monitoring will be supported by the help of IT based geo-database to track both

1. Spatial data: which indicates the location and the boundaries of the land parcel.
  2. Textual data: which indicates issues such as the land parcel planned for, size of the land parcel, periodic activities on the use of the parcel etc
- In effectiveness monitoring the goal and objectives of the ILUP will be assessed.
    - **Impact:** Improved Land Use and Resources in contributing to the social, economic and environmental transformation of the people and the physical environment

## 9.5 Outcome examples of ILUP

- a. Ensure sustainable and harmonized land-use plan implementation for improved and complimentary production.
- b. Improve livelihood opportunities: Economic and job opportunities in the planning Unit
  1. Timber: A prosperous forest industry with a sustainable supply of timber
  2. Tourism: A prosperous tourism industry offering high quality, natural tourism
- c. Ecosystem: Healthy ecosystems with a diversity and abundance of native species and habitats
- d. Minerals: A prosperous mining industry with access to the Crown land for exploration and development
- e. Improve infrastructure and services: Settlement, school and health centers, Energy and access roads, solid and liquid waste disposal site

## 9.6 Methods

- ✓ Participatory principles are used.
- ✓ Emphasis was placed on cost effective and effective yet efficient methodologies in accessing inputs.
- ✓ The design process requires building consensus & commitment and maintaining effective relationships with domain experts.
- ✓ The Lead consultant and all domain experts participated in selecting appropriate Indicators and setting targets, thereby enabling a clear understanding of the goals and the objectives of the project, understand how the objectives will be measured and regularly review M&E results.

## 9.7 Success indicators in Monitoring and Evaluation

- a) Availability of data base
  1. Organized database on each of the planned land use type
  2. Database on ILUP enforcing actors
  3. Database on ILUP user /implementing actors
  4. Availability of M&E Expert
  5. Availability of GIS Expert
- b) Availability of ICT infrastructure and capacity
  1. Availability of geodetic system
  2. Internet connectivity
  3. ICT Expert availability

### Exemplary lessons from Rwanda, Tanzania and Myanmar

Country	Institution responsible	Type of responsibilities
Rwanda	Rwanda Natural Resources Authority (RNRA)	Land Use Monitoring and Evaluation Unit evaluate the success of the National Land Use Planning in achieving its desired outcomes of directing most of the growth into the Urban Areas of the County, particularly in Urban Centers, and to limit growth in Rural and Resource Areas.

Tanzania	National Land Use Planning Commission	Monitoring and Evaluation is one of the departments under the commission that provide assistance to all land use planning and prepare land use monitoring plans, monitor their implementation and from time to time, evaluate them.
Myanmar	National Land use Council	The council comprise relevant ministers, Regional Bureau heads etc. The National Land use council is responsible for the establishment of Land Use Committee at all regions, to effectively and uniformly supervise and monitor the implementation of the National Land Use

## 9.8 Implementation Monitoring System

Monitoring land use implementation is best handled by establishment of Georeferenced database. Geo-database shall have spatial and textual component of information. The spatial part will include geo-references of the land. This will include information about:

- Land planned for (settlement, Agriculture, forest etc...)
- baseline and baseline year(2020)
- target and target year (2025/2030/2035/2040)
- unit of measurement (% , Count etc)
- planning unit
- accomplished
- etc

For the purpose of monitoring implementation, the ILUP activity indicators shall be developed/identified in line with:

- Relevance to the ILPD project
- Understandable and useable
- Helping to show the links among economy, environment and society

### Implementation monitoring: Eg, the Agriculture sector

**INDICATOR 1:** *Areas covered by Agriculture in compliance with ILUP*

Measurement unit: % or Ha

Purpose: To examine rates at which agricultural lands are being developed as per the plan.

Rationale: One of ILUP objectives is to protect agricultural land to preserve valuable agricultural land and increase productivity.

Periodic Targets: for 2025/2030/2035/2040-

**INDICATOR 2:** *Areas of Agriculture lost to other development*

Measurement unit: % or Ha

Purpose: To examine rates at which agricultural lands are being converted to other uses like the settlement.

Rationale: One of the ILUP objectives is to protect agricultural land to preserve valuable agricultural land and increase productivity.

Targets: 0% for 2025/2030/2035/2040.

The principle here is if land planned for Agriculture development in the land use plan is holding as planned.

**Area coverage of the different forest lands of each planning unit**

	Area in km2	Area in ha	coverage in percent	Remark for action
Open forest				
Agroforestry				
Protection forest				
Industrial forests				

**9.9 Progress Monitoring**

**INDICATOR 3: Forest cover**

**Measurement unit:** % or Ha

**Purpose:** To examine rates at which forests are being developed as per the plan.

**Rationale:** One of the ILUP objectives is to protect Forest cover for its social, economic and environmental benefits as planned.

**Targets:** for 2025/2030/2035/2040.

**INDICATOR 4: Forest land lost to other land uses**

**Measurement unit:** % or Ha

**Purpose:** To examine rates at which forest lands are being converted (deforestation) to other unplanned uses such as rural settlement, agriculture, etc.

**Rationale:** Hectare of land allocated for the forest as forests are key component of life-support in the planning unit. Forest loss in the region will have a significant negative impact.

**Targets:** 0% for 2025/2030/2035/2040. The principle here is not to take land out of Forest land use plans.

**People evacuated and relocated from environmentally sensitive areas such as from national parks and riverine ecosystems**

**INDICATOR 5: New settlement area established as per ILUP plan**

**Measurement unit:** Count

**Purpose:** To monitor the number of new settlement area as per ILUP plan

**Rationale:** Rural settlement equipped with basic infrastructures and facilities such as school, health services and road

**Targets:** for 2025/2030/2035/2040

**Indicator** **6: # of households relocated to new/existing planned settlement area**

**Measurement unit:** Number

**Purpose:** To examine households' movement from land planned to be evacuated

**Rationale:** when new planned settlements are established, and settlers will move from the unplanned areas

**Targets:** for 2025/2030/2035/2040

**Rate of increase to water supply and access to people**

**INDICATOR 7: Rural potable water supply coverage in standard of GTP-II**

**Measurement unit:** %

**Purpose:** To monitor the expansion of potable water coverage in the rural area

**Rationale:** Improve livelihood in rural Gambella region

**Targets:** for 2025/2030/2035/2040.

**Links with GTP-II:** HH-Increase in quality and access to safe drinking water and improving sanitary services

**INDICATOR 8: Urban potable water supply coverage in the standard of GTP-II**

**Measurement unit:** %

**Purpose:** To monitor the expansion of potable water coverage in an urban area

**Rationale:** Improve livelihood in the rural Gambella region

**Targets:** for 2025/2030/2035/2040.

**Links with GTP-II:** Increased quality of water and access to safe drinking water and improving sanitary services

**Monitoring Sanitation Plans**

**Indicator 17: Number of urban sanitation system constructed**

**Measurement unit:** count

**Purpose:** To monitor the number of sanitation systems constructed

**Rationale:** Improve livelihood in the rural Gambella region

**Targets:** for 2025/2030/2035/2040.

**Links with GTP-II:** Improve urban waste management and sewerage system

-----  
**Indicator 9: Coverage of ground and surface water hydrology information**

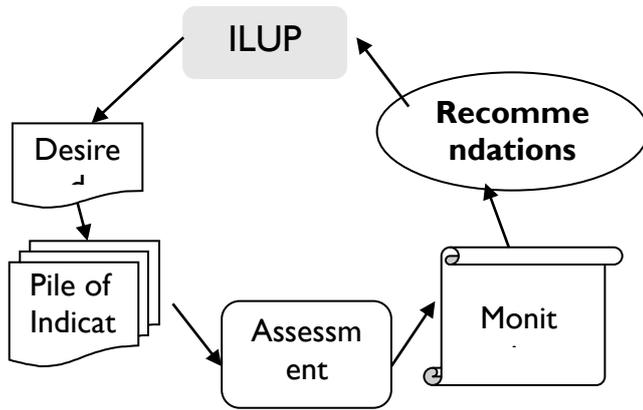
**Measurement unit:** %

**Purpose:** documented information regarding ground and surface water hydrology

**Rationale:** to know the potential ground and surface water for future use

**Targets:** for 2025/2030/2035/2040.

**Links with GTPII:** Developing surface and underground water hydrological information



Category	Desired outcomes
Socioeconomic	<ul style="list-style-type: none"> <li>• Improve livelihood opportunities: Economic and job opportunities in the region</li> <li>• Timber: A prosperous forest industry with a sustainable supply of timber</li> <li>• Tourism: A prosperous tourism industry offering high quality, natural tourism</li> <li>• A diverse range of tourism opportunities and uses across the region</li> <li>• Mining: A prosperous mining industry with access to top land for exploration and development</li> </ul>
Infrastructure	Improve infrastructure and services: School and health centers, Energy and access roads, solid and liquid waste disposal site
Environment	Ecosystem: Healthy ecosystems with a diversity and abundance of native species and habitats

**9.10 Guiding principles for selecting ILUP evaluation indicators**

- Importance for Ethiopian policy context - indicators should be relevant to policies and directly measure outcomes.
- Cost effective and timely - information must be collected in a cost-effective way
- Comprehensive - indicators should provide a broad overview of the economic, social and environmental 'health' of every planning unit.

1)

**Fish production (in thousand tons)**

1.	Sector	Fisheries and Aquaculture
2. nt	Measureme nt	Tons (thousand)
3.	Output	Increased Fish production

4.	Lead agency	Agriculture Bureau
5.	Primary owners benefiting from the land use	Fish production, packaging and marketing production groups operating implementing the aquaculture designated land use
6.	Potential Data source	Regional Investment Office,
7.	Frequency of evaluation	Yearly
8.	Links with SDG	Goal 2.1; 2.2; 2.3; 8.1
9.	Link with GTP/ Objectives	Enhancing the contribution of fish in food security by sustainably increasing the sector's production and productivity

## 2) Milk production and marketing CCG

1. Land use Sector	Livestock and range
2. Measurement	In liters (Million)
3. Output	Increased livestock and milk production on the land designated for range and livestock feed development
4. Lead agency	Bureau of Agriculture and Livestock
5. Supporting agency	
6. Potential Data source	Regional Investment Office,
7. Frequency	Yearly
8. Links with SDG	Goal 2.1; 2.2; 2.3; 8.1
9. Link with GTP/ Objectives	Enhancing the contribution of livestock in food security by sustainably increasing the sector's production and productivity

## 3) Meat production on lands planned for livestock production (grazing and brothing animals)

1. Sector	Livestock and range
2. Measurement	Tons (thousands)
3. Output	Increased livestock production
4. Lead agency	Bureau of Agriculture and Livestock
5. Supporting agency	
6. Potential Data source	Regional Investment Office,
7. Frequency	Yearly
8. Links with SDG	Goal 2.1; 2.2; 2.3; 8.1
9. Link with GTP/ Objectives	Enhancing the contribution of livestock in food security by sustainably increasing the sector's production and productivity

**4) Monitoring and evaluating the honey production -focused CCG performance**

1. Sector	Beekeeping and Honey Production
2. Measurement	Tons (thousand)
3. Output	Increased beekeeping production sector
4. Lead agency	Bureau of Agriculture and Livestock
5. Supporting agency	
6. Potential Data source	Regional Investment Office,
7. Frequency	Yearly
8. Links with SDG	Goal 2.1; 2.2;2.3; 8.1
9. Link with GTP/ Objectives	Enhancing the contribution of honey production in food security by sustainably increasing the sector's production and productivity

<b>5) Bee Wax production, adding value, and marketing</b>		
1.	Sector	Beekeeping and Honey Production
2.	Measurement	Tons (thousand)
3.	Output	Increased beekeeping production sector
4.	Lead agency	Bureau of Agriculture and Livestock
5.	Supporting agency	
6.	Potential Data source	Regional Investment Office,
7.	Frequency	
8.	<b>Links with SDG</b>	2.1; 2.2;2.3; 8.1
9.	<b>Link with GTP/ Objectives</b>	Enhancing the contribution of honey production in food security by sustainably increasing the sector's production and productivity

**6) Monitoring and evaluating the horticulture-focused CCG performance in ESE**

**A) Fruit production**

1. Sector	Socioeconomic
2. Measurement	Tons (thousands)
3. Output	Increased production of coffee
4. Lead agency	Bureau of Agriculture
5. Supporting agency	Coffee producing CCGs operating on land use planned ofr coffee production
6. Potential Data source	Bureau of Agriculture, CSA, Ethiopia Coffee Authority
7. Frequency	Yearly

8. Links with SDG	Goal 2.1, 2.3, 8.1, 17.11
9. Link with GTP/ Objectives	Ensure food security by increasing crop productivity

**7) M&E of the Coffee sector CCG performance**

Sector	Coffee production land
1. Measurement	Socioeconomic
2. Output	Tons (thousands)
3. Lead agency	Increased production of coffee
4. Supporting agency	Bureau of Agriculture
5. Potential Data source	
6. Frequency	Bureau of Agriculture, CSA, Ethiopia Coffee Authority
7. Links with SDG	Yearly
8. Link with GTP/ Objectives	Goal 2.1, 2.3, 8.1, 17.11
9. Link with the GTP objectives	

**8) Number of women who benefited from the CCGs**

1. Sector	Gender
2. Measurement	Count
3. Output	Better economic benefits for organized women
4. Lead agency of the M&E	Bureau of Women and Children
5. Supporting agency	Regional CCG support office
6. Potential Data source	Bureau of Women and Children, Regional cooperatives office, CSA
7. Frequency	Yearly
8. Links with SDG	Goal 1.4; 5.1; 8.10; 10.2
9. Link with GTP/ Objectives	

**9.11 Conclusions**

1. Ensure sustainable and harmonized land-use plan implementation for improved and complimentary production (economy), environmental sustenance, and social empowerment
2. Improve livelihood opportunities: Economic and job opportunities in the region.
3. Timber: A prosperous forest industry with a sustainable supply of timber
4. Tourism: A prosperous tourism industry offering high quality, natural tourism
5. A diverse range of tourism opportunities and uses across the region
6. Mining: A prosperous mining industry with access to top land for exploration and development
7. Ecosystem: Healthy ecosystems with a diversity and abundance of native species and habitats

- 
8. Improve infrastructure and services: Settlement, School and health centers, energy and access roads, solid and liquid waste disposal sites

**9.12 Discussion points for the Plenary**

1. How shall M&E be implemented, in whose participation ?
2. Which institution shall conduct M&E ?
3. Who shall be the main actor in the recruitment of the M&E experts?
4. Who shall pay for M&E?
5. How often should implementation evaluation be conducted ?
6. How neutral should M&E be?
7. Who is the main beneficiary ?
8. What will be the benefit from M&E for the CCGs ?

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