



Food and Agriculture
Organization of the
United Nations



GUIDEBOOK

Township land use planning

Central Dry Zone



Sustainable cropland and forest management
in priority agro-ecosystems of Myanmar

Project Symbol: GCP/MYA/017/GFF



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GUIDEBOOK

FOR

TOWNSHIP LAND USE PLANNING

CENTRAL DRY ZONE

Food and Agriculture Organization of the United Nations

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Acronyms

CFI	Community Forestry Instructions
CSA	Climate-smart agriculture
DALMS	Department of Agricultural Land Management and Statistics
DOA	Department of Agriculture
DRD	Department of Rural Development
FD	Forest Department
FPIC	Free, prior and informed consent
GAD	General Administration Department
LBVID	Livestock Breeding and Veterinary Department
LGP	Length of growing period
LUP	Land use planning
MRV	Measuring, reporting and verification
NGO	Non-governmental organization
NLUP	National Land Use Policy
SFM	Sustainable forest management
SLM	Sustainable Land Management
TLUC	Township land use committee
TLUP	Township land use planning
VFV	Vacant, Fallow, and Virgin land

Introduction

Determine the planning goals

Organize the land use planning work, by developing a road map for all activities.

The land use planning approach used in this guidebook focuses on documenting and promoting sustainable management of the strategic natural resources (land, water, forests, grazing land, etc.) within the townships of Nyaung-U and Kyaukpadaung in Mandalay region of Myanmar. This guidebook breaks down the complex process of land use planning into simple actionable steps for easy implementation at the township levels. In order to promote sustainable agricultural and forestry practices, this guidebook provides instructional approaches for involving rural communities and land resource users. The involvement of the local communities will be determined by the strategic goals of the planned management of the natural resources and the extent of participation required from the local communities and land resource users. The NLUP and the CFI are some of the policy providing for the participation of the local communities, but the extent of their involvement will depend on the land use planning goals, objectives, availability of resources, and the expressed interest of the communities. For the REDD+ projects, follow the approved FPIC guidelines¹ to engage the local communities. The townships are required to determine the level of participation of the local communities. This guidebook assumes that the Land Use Plans (LUPs) will be reviewed every 10 years. However, it is important to draft short term (2-3 years), Mid-term (5 years), and long term (10 years) strategic planning goals.

Drafting strategic goals and terms of reference.

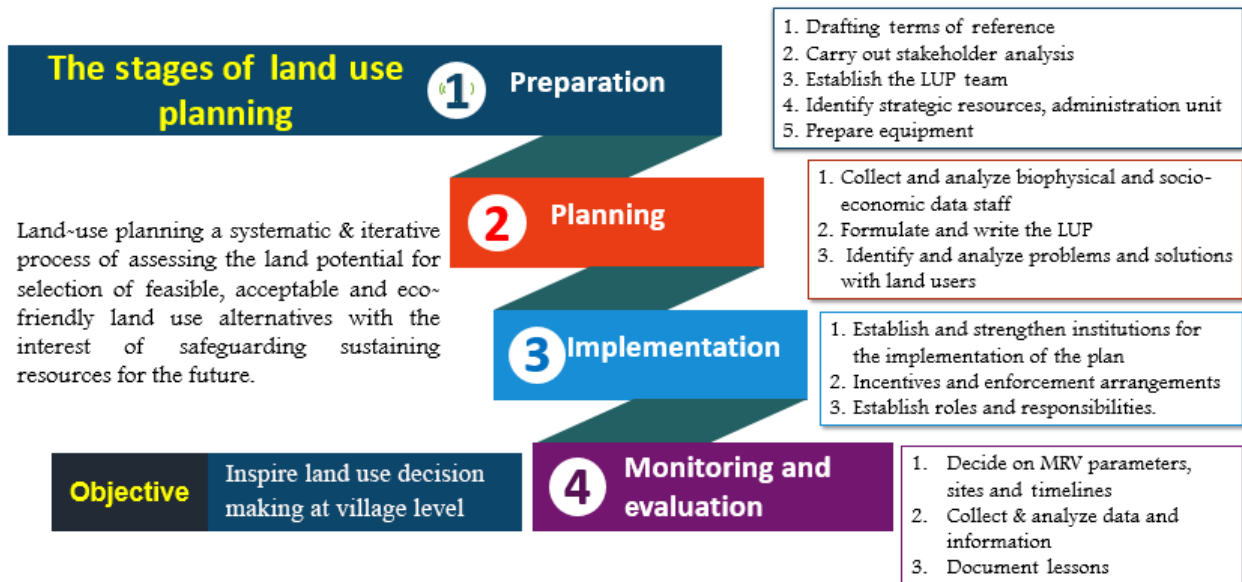
Formulating the strategic goals and terms of reference for developing land use plans at the township level forms the critical foundational step that should be carried out carefully. This step determines the approaches to be used, stakeholders involved, the time and resources to be employed and most importantly the success of the implementation of the land use plans. It is critical to involve all important stakeholders including state lead agencies, university researchers, land resource users, and relevant NGOs to review the strategic plan. The main constraining factor in this stage is the availability of resources in terms of time and funds and therefore the strategic goals should be tailored accordingly. Due to high uncertainties at this level, any misconception may be propagated through to plan implementation.

The focus of planning for village tracts is done at the following levels of planning:

- a) Village tract
- b) Community-level (the group of village tracts)
- c) Strategic resource planning (the group of village tracts)
- d) Watershed (the group of village tracts)

¹ UN-REDD PROGRAMME 2013; Guidelines on Free, Prior and Informed Consent for Myanmar; <http://www.myanmar-redd.org/wp-content/uploads/2017/10/FPIC-Guidelines.pdf>

The organization of land use planning activities is divided into four stages, namely: the preparation stage, land use planning stage, implementation stage, and the monitoring and evaluation stage. In addition, two-level of planning is envisioned through this guidebook: the township planning, which is mainly a top-down approach, and the community level planning that is mainly a combination of bottom-up and top-down approaches. The selection of activities, respective roles, methods, participation, and resource allocation should be done in accordance with the set target, goals, objectives, and strategic natural resource management practices.



STAGE ONE:

Preparation



Drafting terms of reference

The district land use Committee will nominate, the Township Land Use Committee (TLUC), which is mandated and required to hold an official meeting with the township government offices as (DALMS, DOA, GAD, DRD, FD, Fisheries Department, and other offices at the township level. The TLUC will develop the TORs for the LUP and identify the main stakeholders

including NGOs, credit and cooperative organizations, government lead agencies, universities, and research institutes. The following guidelines can be used to run the meeting:

- 1) Send out invitations to the stakeholder participating in the meeting at least one week before the meeting date. The invitation letter explains the agenda and the importance of their contribution.
- 2) The agenda of the meeting should include the following:
 - a) Discuss the importance of the LUP process and emphasize on the participatory approach.
 - b) The steps to be undertaken as described in the manual.
 - c) An open list of key stakeholders for a discussion on who should be included in the planning process.
 - d) List of the key issues for consideration in the LUP.
 - e) The timeline for producing the land use plan.
- 3) Use the opportunity to distribute the manual to the participants.
- 4) List of the Action points and main points of discussion from the meeting, decisions made, timeline, and the next steps shared with the participants in one week after the meeting.

Objective

The main objective of this meeting is to make sure all key stakeholders are identified in the land use planning process.

Results of the meeting

The output of this meeting includes, a report and minutes, and a list of the key stakeholders to invite to the following stakeholder meeting.



Analyze and engage stakeholders

1) Hold a meeting with key stakeholders

Identification of major stakeholders in land resource management is the first step in stakeholder analysis. This is important for the LUP process to gain ownership by the concerned parties and to build synergies among the mandated institutions. Any entity, individual, organization, group, or institution that is affected or interested in any activity and or transaction related to land use qualifies for consideration. The Township Land Use Committee is required to hold a meeting with key stakeholders to confirm how and who should be included. The following guidelines can be used to run the meeting.

- 1) Send out invitations, explaining the agenda of the meeting, the importance of participant contribution at least one week before the meeting date.
- 2) The agenda of the meeting should include the following:

Objective

The objective is for you to confirm that all relevant stakeholders have been identified and will be included in the village tract land use planning process.

- a) Discuss the importance of the LUP process and emphasize on the participatory approach.
 - b) The steps to be undertaken as described in the Manual.
 - c) Agree on the list of the key issues for consideration in the LUP.
 - d) Agree on the timeline for producing the land use plan.
 - e) A discussion on the objectives of the LUP.
- 3) List of the action points and main points of discussion from the meeting, decisions made, timeline, and the next steps shared with the participants in one week after the meeting.

Results of the meeting

- 1) Confirmed list of main stakeholders to involve in the participatory land use planning process.
- 2) Brief explanation of the roles, major land use and natural resource used in the village tract.
- 3) A draft list for LUP team members.
- 4) An agreed upon list of objectives for the LUP.

The objectives of township land use planning



2) Carry out awareness-raising meetings and discussions on land use planning

The township land use committee is required to carry out awareness creation with key stakeholders. The awareness-raising can be included in meetings with each stakeholder group (government agencies, institutions, NGOs, research organizations and universities or local communities) and can be combined to save on resources. The following guidelines can be used to run the meeting.

(i) Identify and select a representative or focal point for each stakeholder group. This is the person to be invited to the meetings on behalf of the stakeholder group.

He/ She should be ready to act as the contact person sharing information, minutes' actions, and mobilize stakeholder group members. The focal person should be able to organize meetings within his/her group.

(ii) Ask the representative to invite about 5- 15 members of his/her group to a meeting to discuss the land use planning process. The invitation letters explaining the agenda and the important contribution of the participants in the meeting should be sent one week before the meeting date.

(iii) The agenda of the meeting should include the following:

Results of the meeting

- 1) The general awareness established amongst key stakeholders.
- 2) The land use planning process and activities.
- 3) A list of participants.
- 4) A summary of the meetings and decisions documented.

Note: The objectives of township land use planning to be modified, elaborated and or explained to the participants in step 2 of the preparation Stage.

- a) Discuss the importance of the LUP process, and emphasize their participatory approach.
 - b) The steps to be undertaken as described in the manual.
 - c) List of the key issues for consideration in the village tract/township LUP.
 - d) The timeline for producing the land use plan and expected feedback from the group and the presented opportunities to get involved.
 - e) A discussion on the objectives of the LUP and the feedback from the stakeholder group.
- (iv) Share a proposed timeline for producing the plan.
- (v) List of the action points and main points of discussion from the meeting, decisions made, timeline, and the next steps shared with the participants in one week after the meeting.

Objective

The objective is to make different stakeholder groups aware of the village participatory land use planning process, and the opportunities to get involved.



Establish the township LUP team

1) Create the LUP team.

The District or Township Land Use Committee to formulate the LUP team from the staff of lead agency departments including the FD, DOA, DALMS, and GAD and other relevant departments. The township land use committee is required to carry out consultations with the key stakeholders to decide on members of the LUP Team. There is a prompt/dire need to limit the membership of the LUP to a manageable level and remain representative of the stakeholders. Carry out the following steps when creating the LUP team:

- (i) Select the researchers and experts from University, international/national organizations to take the facilitation or advisory roles.
- (ii) Select some facilitators who understand the local language and are well versed in the local community or township situation.
- (iii) Assign clear roles to all members and make sure all activities are well covered following the checklist provided.
- (iv) The team should include the following offices at the township level:
 - a) Land administration and land use experts (FD, DALMS, and GAD).
 - b) Agricultural experts for crop and livestock (DOA, DALMS, and LBVID), and Natural resources experts for soil and water conservation, rural development (FD, DALMS).
 - c) Village tract chairman or representative.
 - d) Woman representative for the Village tract.
 - e) Youth representative for the village tract.
 - f) Representatives from major stakeholder groups e.g. particular cooperatives/unions, investors, national park managers, and NGOs.
- (vi) The stakeholder group should confirm the selected team members.

Activity results

- 1) A team that has capacity to undertake the task and that includes representatives of local stakeholders.
- 2) Members who have read the LUP manual and understood the process.
- 3) Meeting organized with to ensure that everyone has understood what is required, and how to go about the process.

Objective

To identify the township LUP team, which is representative of stakeholders and skilled to produce a comprehensive LUP.

Roles of the LUP team



2) Establish thematic groups within the LUP team

The LUP thematic-groups



1. The LUP team is required to establish thematic groups from the LUP team members to deal with special themes in the LUP process.

2. This is done to ensure that no LUP Team members will need to be involved in all activities.

3. Determine the membership of the thematic groups using the professional qualifications of each member in order to achieve optimum contribution.

Figure 1 shows some suggested themes for the LUP groups

Figure 1: The land use planning thematic groups



Identify strategic resources, administrative units, prepare equipment, and materials

1) Hold a meeting to identify strategic resources, administrative units township resources

The LUP team to involve the selected land users including local leaders in a meeting. This meeting should be small with less than 20 people drawn from stratified areas of different land uses and or specific resources of interest i.e., forest areas, areas with VFV lands, waterbodies or irrigation practices, etc. in the community or strategic resource of interest. The township land resource thematic group to lead the meeting and sketch mapping while the land evaluation, forestry, soil and water conservation experts may also participate. Follow the guidelines should below.

1. Create a draft plan focusing on the strategic resources of the township with the support of the identified community leaders and/or experts in agriculture, forestry, and land use planning.
2. Check for the existing information and maps produced by the community and/or NGOs.
3. Make use of the available data and maps with the government agencies.
4. Organize a short (less than 4 hours) meeting for identifying and roughly map out the land resource distribution within the township boundary. The following considerations are important for the meeting:
 - a. Invite the participants one week before the meeting date.
 - b. Prepare necessary equipment and materials including marker pens, flipcharts, satellite imagery, topo maps, and stationery to map strategic resources like water, forests, agricultural practices, and major resource use issues and or needs including conflicts.
 - c. Digitization can be done at a later stage.
5. Explain the objective of the meeting clearly at the start of the meeting and make the participants know that this is the preliminary activity of a major land use planning activity.

Expected results

- 1) A participatory map (and short report) showing the approximate distribution of land resources in the Township and neighboring Township for trans-boundary shared resources.
- 2) Rough initial understanding of land resources including agriculture land and forestland distribution in preparation of a detailed mapping to be carried out in a later stage.

Objective

To identify and map communal, private, and public land resources in the township in addition to Transboundary sharing of natural resources.

6. Prepare an initial map identifying gaps for detailed mapping and focusing resources on the right and important activities.
7. Document all the resources within the township, the resource use needs from the local communities, the changing trend on the extent of the resources, any conflicts regarding resource use, and record any dependency on resource use on the neighbouring townships.

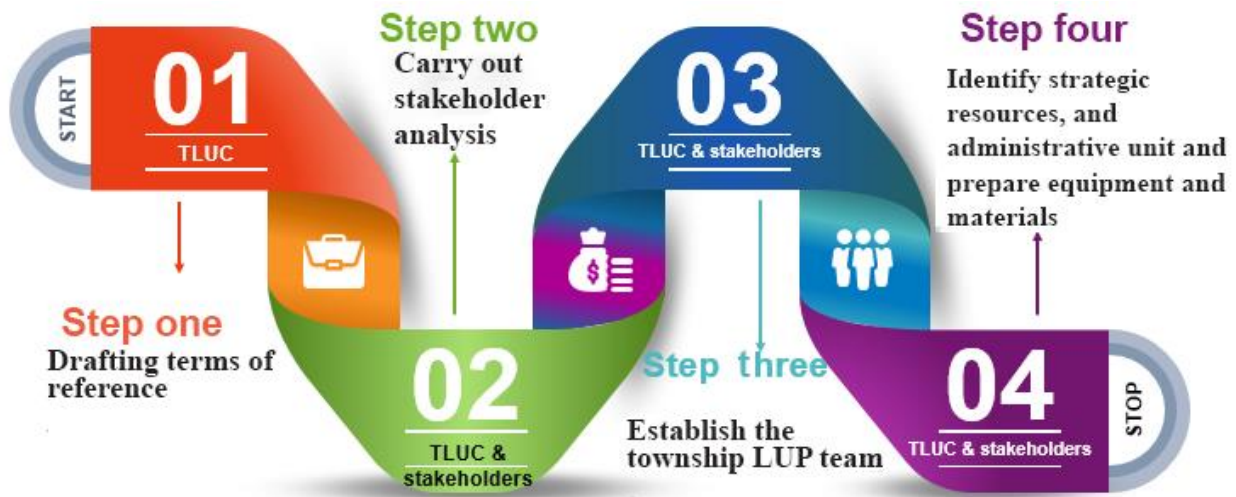


Figure 2: The steps for the preparation stage

Summary of the action points for the preparation stage

- 1) Hold an official meeting with the government at the Township level to confirm the main stakeholders.
- 2) Hold a meeting with key stakeholders to confirm how and who should be included.
- 3) Carry out awareness-raising meetings and discussions on land use planning meetings.
- 4) Establish a township LUP team and village tract committee.
- 5) Establish a sub-team from the LUP team skilled for coordination and facilitation.
- 6) Propose a budget for the planned activities.
- 7) Hold a meeting to identify and sketch-map township strategic resources and the villages of interest.

The activities for the preparation of LUP

Step One Preparation Stage	Step Two Preparation Stage	Step Three Preparation Stage	Step Four Preparation Stage	Step Five Preparation Stage
<p>Step 1: Facilitate initial discussions and agreement on the need for a land use plan</p> <p>Hold an office meeting with the government to at the Township level confirm that all main stakeholders are identified</p> <p>Responsibility Township land administration and use offices and other staff</p>	<p>Step 2: Carry out stakeholder analysis</p> <p>1.Hold meeting with main stakeholders 2.Carry out awareness raising and discussions on the LUP process with different stakeholder groups</p> <p>Responsibility Township land administration and use office and other staff, State/regional and national office</p>	<p>Step 3: Establish the LUP Team</p> <p>1.Establish the LUP Team with members 2.Establish a skilled Coordination/Facilitation Sub-Team 3.Check for adequate finance, availability of resources & budget 4.Develop work plan based on template giving roles</p> <p>Responsibility Township land administration and LUP Team/staff</p>	<p>Step 4: Identify and map traditional/local Village Tract management unit where present</p> <p>1.Hold meetings with local or customary leaders and experts 2.Carry out a participatory mapping of land resources 3.Transfer map information to GIS</p> <p>Responsibility 1.Local Land Resource sub-team 2.GIS and Mapping sub-Team</p>	<p>Step 5: Prepare equipment and materials required</p> <p>LULC, Topographic map (Scale 1:50,000:), Aerial or Satellite Imagery Drone/Camera/flip charts/ computers</p> <p>Responsibility 1. The Technical Land Evaluation and Water Team 2. GIS and Mapping sub-Team</p>

The checklist for material and equipment

a) Map/imagery Print outs (A0-Size)

1. Topographic map
2. Current aerial photographs
3. Google Earth imagery
4. Satellite images
5. Soil maps of the township
6. surface and groundwater maps
7. Vinyl sheet maps.

b) Equipment

1. GPS or mobile phones with GPS facility
2. Clinometer
3. Auger
4. Soil pH measuring kit
5. Measuring tape.

c) Stationery

1. Flip charts
2. Flip-chart pens (assorted colours)
3. Notebooks and pens
4. Flip-charts sticking/seal tapes
5. A4 and A0-size paper.

Sample work plan to be done by the township for preparation of LUP

Stage One: Preparation for Land Use Planning (LUP)				
Step	Action Points	Responsibility	Timeline	Place
Step 1	Facilitate initial discussions and agreement on the need for a land use plan			
Action 1	Hold an office meeting with the government at the Township level confirm that all main stakeholders are identified.	Township land administration and use offices and other staff.		
Step 2	Carry out stakeholder analysis			
Action 2	Hold a meeting with the main stakeholders.	Township land administration and use office (FD and DALMS) and other staff, state/regional, and national office.		
Action 3	Carry out awareness-raising and discussions on the LUP process with different stakeholder groups.	Township land administration and use office (FD and DALMS) and other staff, state/regional, and national office.		
Step 3	Establish the LUP team			
Action 4	Establish the LUP team with members.	Responsibility: Township land administration and LUP team/staff.		
Action 5	Establish a skilled coordination/facilitation sub-team.			
Action 6	Check for adequate finance, availability of resources & budget.			
Action 7	Develop workplan based on the template provided in this guidebook and assign roles.			
Step 4	Identify and map Village Tracts and other administration/customary units			
Action 8	Step 4: 1. Hold meetings with the village tract and or customary leaders and experts.	Responsibility: 1. Local Land resource sub-team, 2.GIS, and mapping Sub-Team.		
Action 9	2.Carry out a participatory mapping of land resources.			
Action 10	3.Transfer map information to GIS.			

Step 5	Prepare equipment and materials required	
	<p>a) Map/imagery Print outs (A0-Size).</p> <ol style="list-style-type: none"> 1. Topographic map 2. Current aerial photographs 3. Google Earth imagery 4. Satellite images 5. Soil maps of the township 6. Surface and groundwater maps 7. Vinyl sheet maps. 	<p>Responsibility: 1. The technical land evaluation and water team, 2. GIS and Mapping sub-team.</p>
Action 11	<p>b) Equipment</p> <ol style="list-style-type: none"> 1. GPS or mobile phones with GPS facility 2. Clinometer 3. Auger 4. Soil pH measuring kit 5. Measuring tape. 	<p>Responsibility: 1. The technical land evaluation and water team, 2. GIS and Mapping sub-Team.</p>
	<p>c) Stationery</p> <ol style="list-style-type: none"> 1. Flip charts 2. Flip-chart pens (assorted colours) 3. Notebooks and pens 4. Flip-charts sticking/seal tapes 5. A4 and A0-size paper. 	<p>Responsibility: 1. The technical land evaluation and water team, 2. GIS and mapping sub-team.</p>

STAGE TWO:

Land Use Planning



Collect and analyze biophysical and socio-economic data

1) Carry out a participatory mapping of township strategic resources

The participants of this activity include the local land users, customary leaders, and

communities depending on how the natural resources support their livelihoods i.e. fodder production/collection, water, firewood collection, agriculture, etc. These participants can help in giving information on the needs and challenges with land-use types. The following guidelines should be applied for this task.

- (i) Decide on the list of participants:
 - a. Discuss with the local leaders to agree on the segments of the communities to be involved in the mapping. Use stakeholder representatives to ensure that the group is not unmanageable due to size.
 - b. Ensure that gender balance is achieved based on the percentage of resource users by gender.
- (ii) Decide on the location and date of the mapping exercise:
 - a. Based on the weather situation choose a convenient season i.e. Not rainy and not too hot
 - b. Complete the mapping within less than three days.
 - c. Choose participants from the local communities to avoid travels and to get more inclusive participation.
 - d. Carry out a reconnaissance survey of the area prior to the mapping exercise.
- (iii) Carry out an introductory meeting to:

Expected results (1)

- 1) A detailed hand-drawn map on flip charts and report, describing the strategic resources that include agricultural areas, water, forests, VFVs etc. in the township.
- 2) A detailed hand-drawn map on flip charts and report, describing the strategic resources that include agricultural areas, water, forests, VFVs etc. in the village tract.

- a. To introduce the mapping process and their importance in land use planning.
 - b. Explain that the mapping is part of a longer-term land use planning process that will ensure continued use and access of the resources by the local communities.
 - c. Explain the community's input in the mapping process in terms of time, resources, and effort.
 - d. Introduce the facilitation team for the mapping to build a cordial relationship with the community members.
 - e. Document every step through filming or taking photos with due respect to the local customs.
- (iv) Prepare the material and equipment for the mapping.
- a. Tools for navigating and collecting data in the forest i.e. for clearing the site.
 - b. If there is no sheltering facility carry out meetings in the local leadership office.
 - c. Flip charts and coloured marker pens for mapping.
 - d. Notepad and pens.
 - e. A camera for photo taking.
 - f. A drone for aerial mapping and GPS for feature coordinate collection.
 - g. Current land uses land cover maps of the area.
 - h. Satellite imagery or google earth imagery of the area.
- (v) Print the checklist for land resource mapping and ensure that all the features including boundaries of the villages involved, and various land uses are delineated.
- (vi) Make labels and a legend drafted map.
- (vii) Include the following details on the maps:
- a. Date and place the map is created.
 - b. A list of the mapping team and community members that produced the map.
 - c. Indicate the north arrow direction on the map.

Objective 1

To produce a more detailed map of strategic land resources including agricultural areas, water, forests, VFVs etc. in the township, and in selected village tracts.

Objective 2

To produce standard GIS map of strategic land resources including agricultural areas, water, forests, VFVs etc. in the township, and in selected village tracts.

2) Transfer data from participatory strategic resource maps to GIS

The information and data collected from the field are compiled into GIS maps through different methods depending on the available tools and access to online resources as google earth. The GIS and mapping sub-team and any person involved in the mapping exercise can have a session for converting the collected information into a GIS map.

The approach below should be used for the generating of GIS data.

- (i) Process the UAVs images:
- a. Process the UAV produced aerial imagery/photographs to ortho-mosaics.
 - b. Manipulate the resultant imagery using QGIS 3.10.3 software or newer versions.
 - c. Project the data to Universal Transverse Mercator (UTM), Zone 46 North (UTM 1984).
 - d. Use the ortho-photo/imagery to identify land uses in the selected village tracts or strategically mapped areas.
 - e. Visually interpret the ortho-photo and through on-screen digitization transfer the data collected in the field.
 - f. Present the resultant spatial data using a projector and maps for confirmation within the LUP team and the community involved in the mapping.
 - g. Identify the features, facilities, utilities, rivers, water bodies or points and infrastructure, etc. on the map and map them.
 - h. If the drone technology is not used in the mapping, free resources as google earth high-resolution imagery can be used to identify the mapped features and transfer them to GIS using the coordinates collected from the online imagery².
 - i. Alternatively use a GPS to collect the coordinates of the features and major landmarks to aid in transferring the paper map to GIS format.

Expected results (2)

- 1) A standard GIS map of Strategic land resources as used by community members in the township.
- 2) A standard GIS map of Strategic land resources as used by community members in the village tract.

² Downloading the imagery and or printing to A0 size paper



3) Develop baseline data of the township

Objective 3

To prepare baseline data and GIS format as preliminary step for developing land use map and plan.

Consider collecting both the primary data and ancillary (secondary) data. Note that the primary dataset collected by fieldwork is time and resource consuming. However, the ancillary data can easily be obtained from existing records and databases in the respective mandated institutions. Acquire these digital GIS data and information from OneMap and or the Myanmar Information Management Unit (MIMU). Further, generate information on the landscape features like current land cover and land uses from high satellite imagery

such as sentinel, landsat, and or UAV imagery. Where there are gaps or higher resolution data is required, carry out direct field data collection using a GPS. Acquire very higher resolution imagery by flying the UAV (DJI Mavic 2 Pro) in the project areas of interest, ie. Community forest areas, CSA implementation project sites, etc. Use open-source and free GIS software as QGIS.

If specific data is not available, the GIS steam can develop the baseline data using the following methods.

1. Digitize administrative boundaries from georeferenced topographic maps, open street maps, satellite imagery or google earth.

Expected results (3)

Township baseline data in GIS format layers.

2. Digitize features as infrastructure, river, dams, lakes, forests, mountains, from georeferenced topographic maps, open street maps, satellite imagery or google earth to produce the local community maps.
3. In the strategic projected areas, use the community maps generated in the land use planning preparation stage to map the project area into more detail based on the already acquired understanding of the area. You may also process the maps using the UAV imagery.

4) Develop homogenous land use planning units

GIS technology provides a platform for carrying out stratification. Stratify the land use planning units based on the land use type or interest using the current land use maps, aerial photographs, satellite images, ortho-photos, etc. in line with the strategic goals of the land use planning exercise and the policy implementation requirements. Apply the following guidelines to generate the required stratification of land units.

(i) Collect current mainframe data, information, and maps:

- a) Soil types and property maps
- b) Topographic data as the Digital Elevation Model (DEM and slope map)
- c) Administrative boundaries
- d) Aerial photos, ortho-photos, satellite imagery, and topographic maps
- e) Vegetation, land use land cover maps
- f) Invasive and endangered species data
- g) Geological maps
- h) Surface and groundwater resources
- i) Irrigation schemes
- j) Water catchment areas (water towers)
- k) Community participation out maps.

(ii) Divide the area into standard slope class units:

- a) Using the DEM classify the project area into suitable 4-6 slope classes using slope percentage or slope angle.
- b) Ensure the slope classes roughly conform to the landform of the project area or township to delineate areas of homogenous biophysical and geomorphological characteristics.
- c) In order to limit the units of land use mapping merge minor topographical differences.

(iii) Disaggregate the slope classes into landscape units.

(iv) Disaggregate soil-landscape categories into vegetation units.

(v) Aggregate minor categories into major classes to limit the land units to eight levels.

(vi) Save the land use planning units in the GIS format as a base layer for land use planning.

Expected results (4)

1. Soil distribution map.
2. Landscape/land form map.
3. Vegetation and land use map.

Objective (4)

To generate a map of homogenous land-use sub-units in the township stratified by soil type, climate, topography, land use type, vegetation to support detailed collection and siting strategic project areas.

5) Collect information for a land capability and suitability assessment

Land Capability Classification is carried out for the land use planning units to determine the potential functions and future land use types. It requires extensive data collection and is time and resource consuming. The three main factors that influence the capability of land include:

- (i) The level of risk associated with soil damage or use limitations, these include:
 - a) The level of management required for conservation and or controlling the limitations such as waterlogging/flooding, erosion and excess runoff, climatic limitations associated with edaphic characteristics.
 - b) The carrying capacity of the soil, which is related to the limitations or potential for supporting diverse crops or livestock without significant modification.
- (ii) Climatic factors such as minimum, maximum and mean temperature and rainfall determine the optimum growth conditions for crops and livestock production systems. These are the most important factors to be given first priority. Others include available moisture, water, soil attributes, stoniness, and slope.
- (iii) Land productivity is the potential for supporting a mix of land use types and suitability with human settlement, various land use trends and patterns, infrastructures, diverse agricultural systems for grazing and cropping, and land management practices.

Apply the following guidelines to generate the required stratification of land units.

- (i) Collect and process the following data if not covered in the previous steps:
 - a) Ensemble topographic data including the baseline information on landforms/landscape features and slope.
 - b) Ensemble soil characteristics data.
 - c) Collect information on vegetation including invasive species.
 - d) Collect data on climatic and environmental information including temperature, rainfall and water resource characteristics, length of the growth period, and irrigation areas.
- (ii) Depending on the time and resource available, collect primary data from the field on the above variables.
- (iii) If there are not enough resources, use freely available data on soil, climatic, vegetation characteristics, and land use land cover, this a simple, fast, and less costly approach.
 - a) Use the DEM to classify the project area into suitable 4-6 slope classes based on slope percentage.

Expected results (5)

1. Collected biophysical data.
2. Collected socio-economic.
3. Data processed for suitability analysis and land capability classification.

Objective (5)

To develop a land suitability and capability assessment maps at township level to determine important land use types.

Table 1 Slope Classes

Slope Classes	% Range	Code
Flat to almost flat	0-3	L1
Gently sloping	3-8	L2
Sloping	8-15	L3
Moderately steep	15-30	L4
Steep to very steep	>30	L5

b) Collect and categorize soil information and characteristics as shown in the following tables.

Table 2 soil depth categories.

Soil Depth Classes	Depth Range	Code
Very deep	>120	D1
Deep	100-120	D2
Moderately deep	51-100	D3
Shallow	30-50	D4
Very shallow	<30	D5

Table 3 Soil Erosion Level Categories

Erosion Classes	Description	Code
Nil	No erosion noticeable	E-0
Slight	Areas with minor rills and sheet flow Slightly exposed roots Low loss of topsoil Good/average soil cover	E-1
Moderate	Significant rills on the surface Significantly exposed tree roots Much topsoil is removed on slopes Poor soil cover	E-2
Severe	Existence of shallow gullies Frequently exposed roots Excessive removal of topsoils Poor soil cover	E-3
Very severe	The land area with significant gullies Thin topsoil layer Exposed roots Bare soil common Exposed bedrock	E-4

Table 4 Soil Texture categories

Textural group	Textural class	Code
Coarse	Sand	T-1
	Loamy sand	T-2
	Silt loam	T-3
Medium	Loam	T-4
	Clay loam	T-5
Fine	clay, silt clay	T-6
	Heavy clay	T-7

Table 5 Soil Drainage categories

Drainage Classes	% Range	Code
No water-logging	Well-drained soil	W-0
Intermittently/sometimes water-logged	Imperfectly drained Waterlogged in rainy periods for a few days	W-1
Regularly water-logged	Poorly drained flooded mostly in the rainy season	W-2
Swampy area	Very poorly drained Near-surface water table	W-3

Table 6 Stoniness/Coarse fragments Categories

Stoniness Classes	% Area Range	Code
No stone / few no rock	<15	St-0
Moderately stony/ moderately rocky	15-30	St-1
Stony/ rocky	31-50	St-2
Very stony/ Very rocky	51-90	St-3
Rock outcrop /rock outcrop	>90	St-4

Table 7 Soil Salinity categories

Salinity Classes	Range	Code
None-saline	< 2	1
Very slightly	2 – 4	2
Slightly saline	5 – 8	3
Moderately saline	9 – 15	4
Strongly saline	> 15	5

Table 8 Soil pH Categories

pH Classes	Range	Code
Extremely acidic	< 4.5	
Very strongly acidic	4-6-5.9	
Strong to medium acidic	6.0-6.4	
Neutral	6.5-7.4	
Slightly to medium alkaline	7.5-8.1	
Strongly alkaline	8.2-9.0	
Very strongly alkaline	> 9.0	



6) Map land and natural resource use and access

Determine the distributions of land resources using the land use land cover map developed. Use the following guidelines to map resource use and access:

1. Organize and hold a meeting with the resource users to discuss the levels of access and management:
 - a) Agree on the list of community representative.
 - b) Ensure that special groups and gender equity is observed and decide if the gender groups require separate meetings.
 - c) Agree on the meeting location and the time.
 - d) Hold an introductory session to create awareness of the exercise, the expected results, and the importance of the participant's contribution.

Objective 6
Document resource occurrence, distribution, access and management arrangements.

2. Map the access and management of the key resources:
 - a) Document how the assessment of the resources is controlled.
 - b) Account for any over-utilization or under-utilization.
 - c) Highlight the most important livelihoods and how it relates to the resources.
 - d) Discuss any changes in resource access over time.
 - e) Examine any existing resource use conflicts.
 - f) Document Gender access to the resources.

Expected results (6)

1. Detailed map and report describing the different land uses within the township.
2. Detailed map and report describing the different natural resources within the township.
3. Detailed map and report describing the different resource management and access.

7) Document Hazards and seasonal calendars

Document all significant anomaly events that are either below or above normal and record the cycle of recurrence in the Central Dry Zone. These events include prolonged droughts, flooding, fire, and invasion of pests, conflicts, and outbreaks of disease. Based on the discussion with the communities and available literature, report the impacts of such events on resource use and access by the local communities. Document any events of pollution on the aquatic system, sand and windstorms, and lightning. Develop a plan based on the hazard contingency measures, mitigation, and adaptation strategies focusing on the main hotspot areas of the particular hazard.

Document seasonal crop calendars with respect to climatic factors, labour availability, water accessibility and availability, and market prices. This can be guided by the local community's seasonal

Expected results (7)

1. Detailed map and report describing hazards within the township
2. Detailed map and report describing the trends & patterns of resources within the township
3. Schematic drawings of the patterns and trends across seasons and supporting documentation.

classification knowledge. Use the following guidelines to document the hazards and seasonal calendars.

(i) Document township hazards:

- a) Organize and hold a meeting with the resource users to discuss the frequency of the hazards.
- b) List the hazards events experienced in the community in 1, 5, 10, and 20 year timescales.
- c) Document the recurrence of the hazards.
- d) Inquire and document the impacts.
- e) Develop a list of possible coping, mitigation and adaptation mechanisms and strategies.
- f) Document the needs, plans, and aspirations of the community in dealing with the hazards.
- g) Map the hazard events and effects of drought, flood, and or conflict.

Objective 7

1. To document and understand hazards affecting the local communities or land users.
2. To document the trends & patterns of climate, resource use, hazards, agricultural production, prices labour availability and outputs.

(ii) Document the seasonal calendar:

- a) Divide the year into months, seasons, or other categories using the local knowledge.
- b) Draft the trends and patterns subject to the seasonal calendar.
- c) Document the seasonal changes for each month: January through to December.
- d) Document the trends and patterns of land use change for every season.
- e) Inquire if the seasons are becoming more proactive or less.
- f) Inquire of the any seasonal shifts.
- g) Document how the seasons affect the distribution and access of the resources.
- h) Report the seasons when the resources run out.
- i) Document the coping, mitigation, and adaptation based on the needs, aspirations, and livelihood of the local communities.
- j) Record the season related land use changes.
- k) Document changes in the droughts.

8) Carry out the timeline and trend analysis

Carry out trend analysis to show the changes in land use land cover and access to resources. This helps the team in identifying the hotspots of change and the trend will show if the situation is being controlled or it is getting worse or better. The changes can also indicate the effects of policy implementation and help in monitoring the progress of interventions.

The trend change is also used to indicate the trajectory of development. Discuss with the community on the key changes that have affected their livelihoods, access, and distribution of land and natural resources. The changes can range from government policies to climate events including wildfires, floods, and or droughts. Make frantic efforts to relate the changes or trends to the occurrence and access a forest cover, agricultural land, biodiversity, and energy sources. The following guidelines should be used to carry out trend analysis:

- (i) Document the changes and trends that have been experienced:

- a. Elaborate on how the changes have affected the resource availability and access.
 - b. Document resource control structures including decision making within the household, community or organization, and the township.
 - c. Decision-making at the individual, household, community/organisational level in relation to land.
 - d. Rank the changes and trends in terms of their effects on the demographics, socio-economic, and environmental characteristics, the access and availability of natural resources.
 - e. Document the relationships and linkages between various trends.
 - f. Document the effects of the changes on gender.
 - g. Document the trajectory of the trends whether getting worse or better and possibly do projections into the future.
- (ii) Compare the vegetation and land use change over time. This is important to identify areas with an extensive change in land cover and land use for more than 10, 20, or 30 years. Devise approaches for regenerating the degraded or overexploited areas through afforestation, reforestation, and enhancement or agroforestry and soil conservation. Excessively degraded and barren land can be reclaimed using approaches based on the causes and the extent of degradation and barrenness. Carry out land use land cover mapping over various timestamps and perform change analysis. Calculate and report areal changes and trend analysis.

Objective 8

1. To document key events and changes over time and document reasons and effects of these events and changes.
2. To identify past and current trends and patterns of vegetation and land use change in the township.

9) Carry out Agronomic data collection

Collect Crop production to assist land use planning by selecting areas for climate-smart agriculture, soil conservation, and access to agricultural inputs and natural resources as water for irrigation. This section will also require revisiting the results from the other steps in order to save costs and time required in assembling the data and information. You are required to collect data on the following items:

- (i) Biophysical data and information as rainfall, temperature, LGP, and other climatic characteristics (See the step on land suitability).
- (ii) Collect data on the major crops cultivated indicating if it is annual or perennial, irrigated or rain-fed.
- (iii) Indicate the crop production and productivity based on areal coverage, crop type and variety (local/hybrid), amount of fertilizer, pesticide, and herbicide used per acre or hectare.

- (iv) Record the most common agronomic practices for land preparation, tillage practices, use of machinery, planting times, methods of planting, controlling weed, harvesting, and storage.
- (v) Document the cropping systems and practices or managing soil fertility like multiple, mono and intercropping, practicing of crop rotation, and use of fertilizers, crop residue, and or manure.
- (vi) Document the cropping patterns in an annual sequence and spatial arrangement of crops and fallow on a given area.
- (vii) Record the water usage and soil moisture conservation practices such as irrigation, and rainwater harvesting practices.
- (viii) Document any agricultural support services including agricultural extension, input supply and subsidy, research, support in processing, and marketing.
- (ix) Document the problems and constraints due to main pests and diseases, drought, weeds, flooding, and frost.
- (x) Document the production challenges such as storage, markets, etc.
- (xi) Classify crops into the following categories:
 - a) Cereals – wheat, barley, sorghum, maize, millet, etc.
 - b) Pulses – Chickpea, pigeon pea, green gram, etc.
 - c) Oil crops – mustard, linseed, sesame seed, sunflower, etc.
 - d) Fruit crops – banana, orange, pineapple, coconut, etc.
 - e) Vegetables – potato, tomato, cassava, onion, etc.
 - f) Special purpose – green manure (e.g. put nitrogen back into the soil), feed crops
 - g) Fibres – sisal, cotton, etc.
 - h) Stimulant crops
 - i) Commercial crops
 - j) Irrigated crops.
- (xii) Document the following factors affecting production:
 - a) Environmental factors:
 - Climate (temperature and rainfall).
 - Growing period.
 - Water drainage, moisture.
 - Frost (in highland areas only).
 - Soil including texture, chemical properties (e.g. pH), the fertility of the soil, depth as well as root growth or system of the crop.

Expected Results (9)

1. Detailed map and report describing the major crops in the township.
2. Detailed report describing the main crop pests and diseases in the township.
3. A list of chronological events and documented effects and impacts.
4. A series of maps showing trends and changes in trend of pests and diseases, with background information.

Objective 9

1. To identify and document crops grown in the township in order to inform land use planning in the future.
2. To collect agronomic data on crops grown in order to inform land use planning in the future in the Township.

- b) Chemical environments such as pollution from the soil, water, or air.
- c) Biological environments such as weeds, diseases, and insect pests.
- d) Socio-economic factors such as consumer preference and patterns i.e. what people like to eat.
- e) Living standards influencing:
 - Farm inputs, such as fertilizer and mechanization
 - Transportation
 - Income level
 - Market access
 - Storage.
- f) Crop factors:
 - Seed quality characteristics such as viability, purity, healthiness, size, and uniformity/sameness.
 - Genetic factors as product quality, yield potential, environmental adaptation, tolerance to the environment: and nutritional value including protein and or gluten content.

Objective (10)

1. To ensure that the township LUP accommodates and reflects national and regional policies, strategies, legislation and other documents.
2. To understand and organize different interest groups, parties and individuals having interest in land resource and land uses.
3. To define institutional roles and relationships.

10) Review the legal framework, institutional arrangements and make a recommendation

Carry out the final institutional, key stakeholder, and their relationship mapping in order to develop the township land use planning institutional framework or structure. You are required to collect data for mapping institutional arrangements following the steps below:

- (i) Provide the understanding and definition of the stakeholders at the community level and map their relationships.
- (ii) Provide the level of stakeholder decisions making at the community level and relationship mapping.
- (iii) Develop the structure of the institutional arrangements for land use decision making depending on the roles of the local organizations and the local people's perceptions and aspirations.
- (iv) Take note of the important community groups, NGOs, or government arms that have the trust of the community to engage effectively.

Based on the national and regional/state or district and township policies, strategies, and legislation: elaborate the support the LUP in development and its implementation at the township level with provision for participatory approaches. It is important to recognize the relevance of participatory approaches in the policies and make necessary adjustments to fulfil the commitments of the national and regional governments.

Expected Results (10)

1. A summary of key points on the legal framework relevant for township LUP and community participation.
2. A diagram indicating the different stakeholders, interest groups, their roles and relationships, with background information.

- (i) Identify the national or regional plans and strategies that require participatory means for delivery.
- (ii) Document opportunities for integrating both bottom-up and top-down approaches for the development planning processes, which is decentralized and participatory.
- (iii) A review of the legislation, regulation, policy, and guideline documents in a wider political, socio-economic context.



Summary of steps & actions for the preparation stage

- 1) Carry out a participatory mapping at the village tract level.
- 2) Develop a checklist for the township and village township resource mapping.
- 3) Matching up data and information from the participatory map to GIS.
- 4) Checklist of equipment and materials required.
- 5) Develop baseline data and maps and stratify land use planning based on the strategic resources of the township within the rural community.
- 6) Decide on methods and tools used to collect and process the required information.
- 7) Consider the applicability of using participatory tools as provided for within the land use planning policy and observing gender equity.
- 8) Carry out land capability & suitability classification.
- 9) Develop land use & natural resource maps.
- 10) Carry out transect and seasonal calendars in areas of strategic interests.
- 11) Carry out trend analysis of climatic factors as rainfall and temperature.
- 12) Carry out change analysis of the land use land cover and identify drivers of change.
- 13) Resource benefit analysis (optional).
- 14) Prepare socio-economic data i.e. livelihoods and demographic data.
- 15) Prepare forest inventory data (if available but forest boundaries can suffice) and agronomic data.
- 16) Stakeholder, institution and relationship mapping.
- 17) Review of legislation, policy, local and customary laws, and institutions, plus the knowledge of local land use.
- 18) Consolidate the different research reports and maps produced.
- 19) Prepare current land use map.
- 20) Identify and analyses different problems related to land use and land use planning.
- 21) Identify solutions for the problems and rank the alternative.
- 22) Engage the local communities to get feedback on their preferences on the land use alternative.
- 23) Formulate and write a land use plan.
- 24) Organize a review meeting to get feedback on the land use plan and revise the land use plan according to the comments and concerns.



Identify and analyze land use problems and solutions

1) Identifying and ranking the problems and solutions for township land use planning

Identify and rank the existing problems in the township, and those identified by the local community of land resource users. Use the problem tree to identify the problems, concerns and their causes, and prioritize the problems. A problem tree is a tool for breaking down problems into root causes. This tool provides a participatory approach for discussing problems and gives greater opportunity for participants to raise their opinions. You are required to carry out problem analysis using the following guidelines:

- (i) Draw a tree clearly showing the branches, trunk and, the roots.
- (ii) Represent the problem using the key trunk.
- (iii) Represent the causes using the roots.
- (iv) Prompt the community with the problems identified earlier and discuss the root causes.
- (v) Use stickers to mark the level of each cause.
- (vi) Discuss each trucked problem at a time.
- (vii) Rank the problem based on the losses and the likelihood of recurring frequently.

In order to analyze the identified solutions to these problems, work from the trunk upwards. Using a Solution Tree, identify potential solutions to the problems and their causes that the communities and other stakeholders face in land use planning, and prioritize the solutions. Using this participatory tool gives greater opportunity for participants to voice their opinions. You are required to carry out solution analysis using the following guidelines:

- (i) Start with the main solutions as you move up the branches.
- (ii) Use the major solutions identified earlier.
- (iii) Use stickers to indicate the solutions.
- (iv) Place the stickers along the main branches for similar solutions broken down from the main solution.
- (v) Paste the pieces of paper on the branches of the 'tree' showing a line of solutions: with the most detailed solutions at the very top of the branches. A useful way of achieving this is to keep asking "But how?" after each explanation.

Expected results 1

1. A summary of key points on problems.
2. A diagram and background information on the problems (and the solutions) that communities and other stakeholders face.
3. A list of problems and solutions prioritized or ranked by community members.

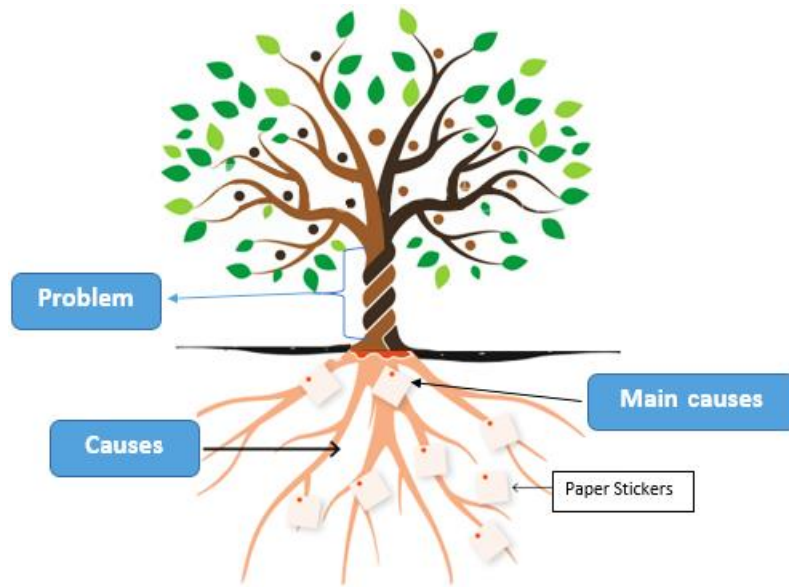


Figure 3: The problem tree

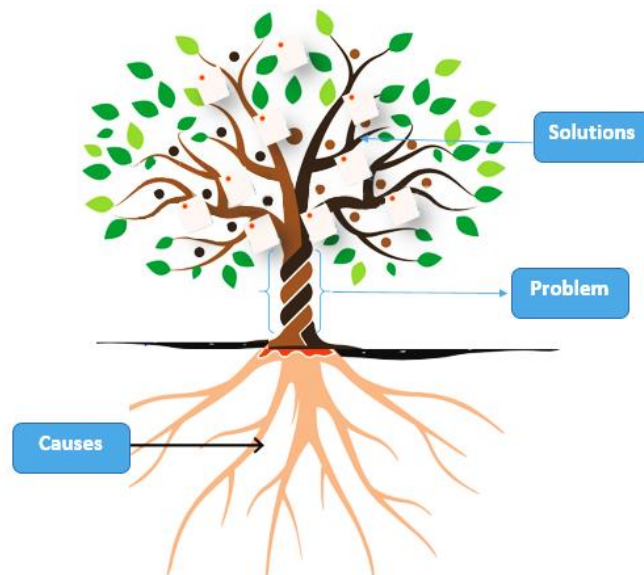


Figure 4: The solution tree

2) Identify, prioritize land uses and draft township land use plan

This involves the coordination and facilitation, land resources, and the agriculture and land use sub-team, identifying and prioritizing land uses especially those that are involved in strategic or project-based management. The community participants and the local land users are involved in the process. You are required to carry out prioritization strategies on land uses using the following guidelines:

Expected Results (2)

1. A summary of the listed land use priorities.
2. Prioritization of different land uses.
3. Township land use plan.

1. Hold a meeting with involved local communities and stakeholders to make decisions on the different strategic land uses.
2. Share summaries of the information collected through the different investigation methods focused on group discussions in the previous meetings.
3. Define the general objectives of the strategic and or project intervention through land use planning.
4. Engage the community in strategic planning by making short, midterm, and long-term plans ranging from 2 – 30 years. Note that, the plan will need to be revised after about 10 years depending on the lifetime of the proposed strategic plan.
5. Document the goods and services that the land users are interested in achieving or providing.
6. Document the aspiration and needs that the land users have in their projected perspective into the future.
7. Record the planned objectives in terms of the following:
 - a) Managing land degradation and erosion.
 - b) Maximizing forage production for livestock.
 - c) Maximizing water conservation.
 - d) Optimizing food crop production and or livelihoods and income generation.
8. Describe the envisioned landscape features and the means to achieve it. The following are just examples of the considerations:
 - a) The abundant variety of species that can support livelihoods.
 - b) Minimized bare soil.
 - c) Trees and shrubs of a variety of ages and sizes.
 - d) Abundant wildlife of a variety of species.
 - e) Plants that are meant for enriching the soil (nitrogen fixing) and intercropping (cover crops).
 - f) Perennials will caution the communities in cases of annual crop failures.
9. Rank the selected strategic land use options based on the preferences attached by land users to each of the options.

Objective 2

1. To make decisions on different land uses for inclusion in the in the township LUP, based on information collected, analysis of problems, and solutions.



Formulate and write the LUP

1) Prepare the township and village tract land use map

Prepare the township and or village tract land use plan by Coordinating and facilitating the sub-team to compile the information collected. The team should start writing the plan once all the information has been collected including the ranking of felt problems and potential

solutions.

(i) The following are the key themes to be included in the plan:

- a) Description of the township and the village tract.
- b) Elaboration of the data collection methodologies used.
- c) Summary of the records of all collected data and information.
- d) Ranking of the problem and solution identified.
- e) Data and information analysis and the resulting recommendations.
- f) Indicator of the sustainability factors for the land use options.
- g) Logframe analysis, work plan, and budget.

(ii) The technical data to include the plan:

- a) The current land uses the Land cover map as a starting point.
- b) Land capability and suitability classification and map.
- c) Strategic land resources map.
- d) The vegetation inventory in local names.
- e) land use land cover changes and maps.
- f) Supply and distribution map of water resources.
- g) Biophysical characteristics of soil types/physical properties.
- h) Results socio-economic analysis.
- i) Socio-economic infrastructures map.
- j) Future land uses and development map.

(iii) Presentation of data and information analysis:

- a) Continuously review the ideas for improved land use options emerging from the stakeholder participatory process.
- b) Apply the solutions that have emanated from local communities, experts, and other stakeholder engagement.
- c) Screen the land use options for consistency with stakeholder objectives, for acceptability and broad feasibility according to the resources needed for their implementation.
- d) Focus on the planning for the "**doing nothing option**" to benchmark against the results of active change.

Expected Results 1

1. Township land use map.
2. Village tract land use map.

Objectives

1. Prepare a township participatory land use map.
2. Prepare village tract land use map.

e) Use tools as the 'fishbone' analysis to display the reason for planning. Figure 5 below shows an example of illustrating the causes and effects of the felt problems. This also helps to identify the land potentials and required management practices.

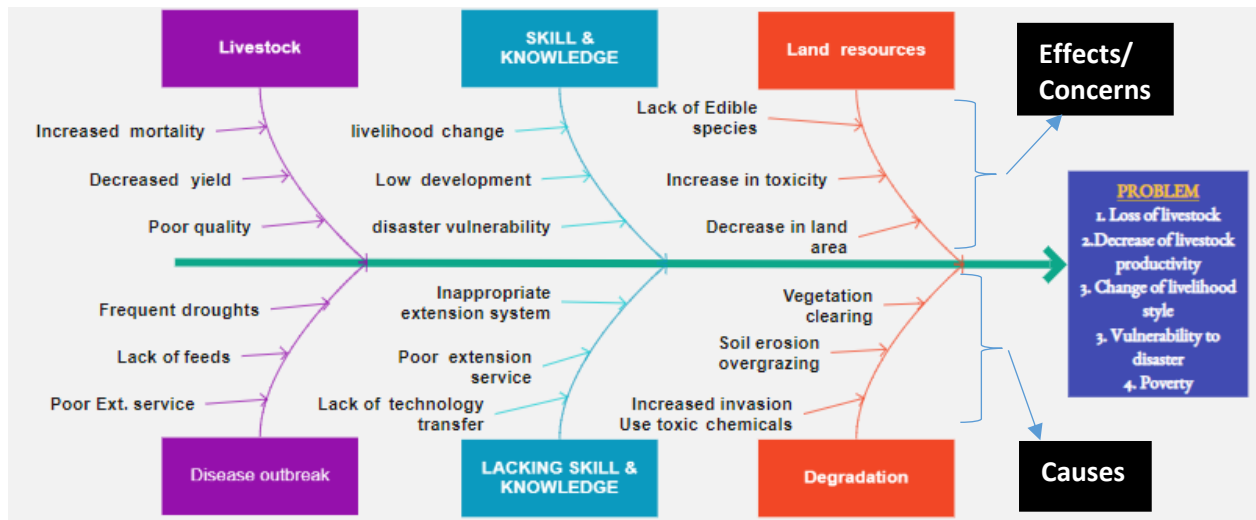


Figure 5: Presentation of results of problem and solution analysis using the 'Fishbone' diagram.

- (iv) Identify land resource potentials and required management practices:
 - a) Identify and list the required improvements based on the challenges, problems, and options as illustrated in the land capability/suitability classification.
 - b) Use the ranking of the problems and solutions to prioritize improvements of the land resources.
 - c) Enlist potentials and management requirements for specific land units.
- (v) Appraising the sustainability factors of land use options:
 - a) Appraise land use options based on the financial and economic viability: social acceptability and potential impacts on the environment.
 - b) Vet the sustainability of each option and constraints for implementation based on the following perspectives:
 - i Economic viability
 - ii Social impact
 - iii Environmental impact.

2) Prepare a Township land use map showing any proposed land use change or map

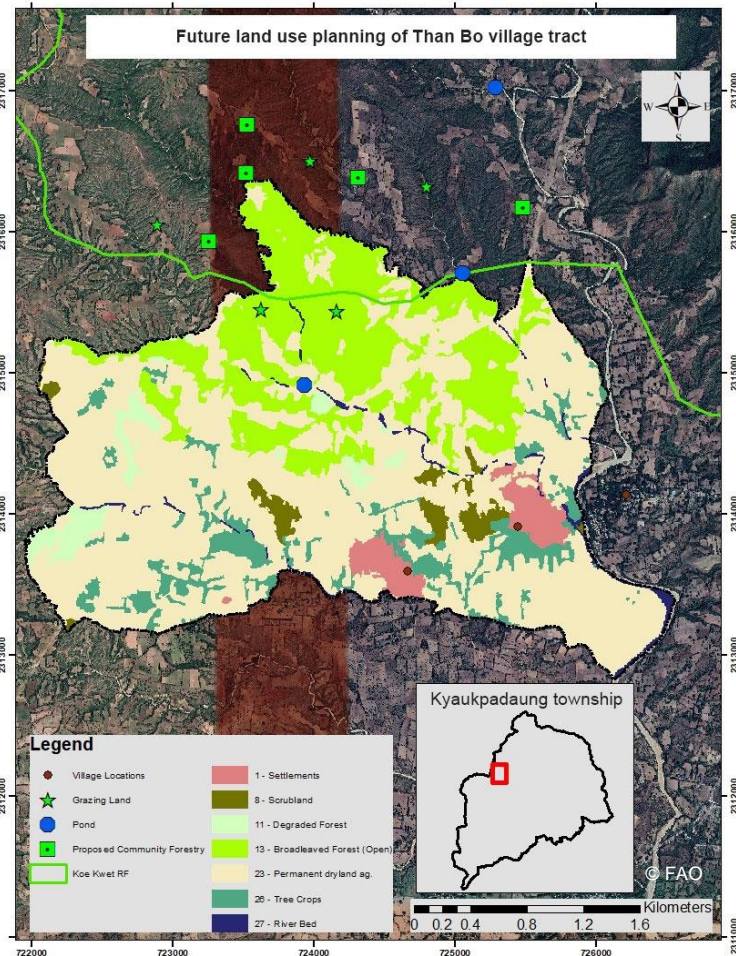
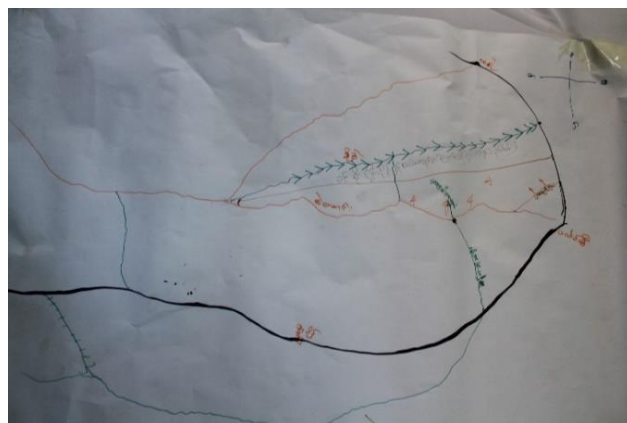
The current land use map is the base layer for the township land use plan. It can be adapted as it is or can be changed to depict any changes in accordance with the planned land use. Follow these steps preparing the land use plan:

- (i) Hold a meeting for the LUP team at the township level to build a consensus on the required changes on the current land use map.

Expected results 2

1. Township land use plan.
2. Village tract land use plan.

- (ii) Commission the GIS and mapping sub-team to geo-reference the proposed changes on land uses and put it on the map.



Adapted from reverse forest data from Forest Department, township boundary, village tract boundary, future land use land cover map and villages facilities produced by SLM project in 2020.

- (iii) Calculate and express the extents of the proposed new land uses in the area (acreage), length, and percentage.
- (iv) Categorize the proposed land uses and resource use into respective main land uses as Settlements, forestland, agriculture, grazing land, waterbody, etc.
- (v) Print the draft township proposed land use and or development map.
- (vi) Present the LUP to the township LUP-team for sharing, commenting, and finalizing.
- (vii) Present the final map and land use plan to the stakeholders.

Objective 2

1. Prepare a township participatory land use plan.
2. Prepare village tract land use plan.

3) Hold a key stakeholder meeting to present the LUP and get feedback

Hold the finalization meeting with all relevant stakeholders. The main purpose of this meeting is to create awareness of the final LUP and gather final input from the stakeholders in the form of concerns, comments, and approvals. Follow the guidelines below to run the meeting for the finalization of the Township land use plan:

1. Schedule the stakeholder meeting after Identifying a convenient location, time, and venue.
2. Invite the participants to the meeting and explain the purpose and importance of their participation one week before the schedule.
3. Ensure the agenda of the meeting includes the following:
 - a) Importance and strategic goals of the LUP.
 - b) Summarized steps used to produce the LUP.
 - c) The LUP and the map.
 - d) Focused group discussion on the key issues for consideration in improving the LUP.
 - e) A summary of key discussion points, proposed plan changes, and the next steps.
 - f) Approval if no major changes to be made.
 - g) If major changes are required before approval, schedule the approval meeting.

Expected results 3

1. A list of issues to be addressed before finalizing the plan.

Objective 3

1. To present the LUP to stakeholders for feedback.
2. To finalize the Plan.

The LUP preparation stage workplan activities

Stage Two: Produce LUP (Plan & Map)	Stage Two: Produce LUP (Plan & Map)	Stage Two: Produce LUP (Plan & Map)	Stage Two: Produce LUP (Plan & Map)	Stage Two: Produce LUP (Plan & Map)
<p>Step 6: Collect and analyse biophysical and socio-economic data</p> <p>1. Prepare a township base map and stratify land use planning units based on the natural resources and village tracts</p> <p>2. Hold meeting to select methods and tools for collecting required information for land capability & suitability classification</p> <p>Responsibility Coordination and facilitation team</p>	<p>Step 6: Collect and analyse biophysical and socio-economic data</p> <p>3. Plan for participatory tools and take account of gender</p> <p>4. Land use and natural resource & Hazard mapping and Land suitability/capability classification</p> <p>5. Landscape Transects & Seasonal calendar Trend analysis and LULC Changes</p> <p>Responsibility All sub team to take up own roles</p>	<p>Step 6: Collect and analyse biophysical and socio-economic data</p> <p>6. Stakeholder, institution and relationship mapping</p> <p>7. Agricultural inventory</p> <p>8. Village tract profile on socio-economic and demographics</p> <p>9. Document legislation, policy, local and customary laws and institutions, knowledge of local land users</p> <p>10. Prepare land use map</p> <p>Responsibility All sub team to take up own roles</p>	<p>Step 7: Identify and analyse problems and solutions with land users</p> <p>1. LUP team meeting to identify and rank problems for land use planning</p> <p>2. LUP team meeting to identify and rank solutions for land use planning</p> <p>3. Check for cross cutting issues as disasters, tenure settlement, conflicts etc.</p> <p>4. Ranking local land user's preferences for different land uses also consider livelihoods and policies</p> <p>Responsibility 1. LUP team</p>	<p>Step 8: Formulate and write the LUP</p> <p>1. LUP team meeting to check completeness of all data collected for writing the land use plan</p> <p>2. Prepare land use plan and map</p> <p>3. Organize meeting for feedback and revise the plan according to the comments & concerns raised</p> <p>Responsibility 1. LUP team 2. Key stakeholders</p>

Sample workplan for land use planning LUP

Stage two: Land use planning (LUP)				
Step	Action points	Responsibility	Timeline	Place
Step 6	Collect and analyze biophysical and socio-economic data			
Action 1	Prepare a township base map and stratify land use planning units based on the natural resources and village tracts.	Township LUP team		
Action 2	Hold a meeting to select methods and tools for collecting required information for land capability & suitability classification.			
Action 3	Plan for participatory tools and take account of gender.			
Action 4	Land use and natural resource & hazard mapping and land suitability/capability classification.			
Action 5	Landscape transects & seasonal calendar, trend analysis and LULC changes.			
Action 6	Stakeholder, institution and relationship mapping.			
Action 7	Agricultural inventory.			
Action 8	Village tract profile on socio-economic and demographics.			
Action 9	Document legislation, policy, local and customary laws and institutions, knowledge of local land users.			
Action 10	Prepare the land use map.			
Step 7	Identify and analyze problems and solutions with land users			
Action 1	LUP Team meeting to identify and rank problems for land use planning.	LUP team		
Action 2	LUP Team meeting to identify and rank solutions for land use planning.			
Action 3	Check for cross-cutting issues as disasters, tenure settlement, conflicts, etc.			
Action 4	Ranking local land user's preferences for different land uses also consider livelihoods and policies office.			

Step 8	Formulate and write the LUP:	
Action 1	LUP team meeting to check the completeness of all data collected for writing the land use plan.	<ol style="list-style-type: none"> 1. LUP team 2. Key stakeholders
Action 2	Prepare the land use plan and map.	
Action 3	Organize a meeting for feedback and revise the plan according to the comments & concerns raised.	
Action 4	Develop workplan based on the template and assign roles.	

STAGE THREE:

The implementation of the land use plan (LUP)

Implement the land use plan

The responsibility of the implementation lies in the Township Administration office. The LUP write up and plan serves as the guiding document for implementation at the Township level, Village tract level, and or strategically zoned out ecosystem levels for planning. The plan is used to coordinate the policymakers at the township level for implementation of selected land use options at the village tract and community-based land use resource management levels. Please take note of the following points:

- a) There is a need to focus on some interventions based zoning that may follow larger administrative units, watersheds, ecosystem boundaries and or strategic land use change areas for efficient implementations.
- b) All interventions must be defined clearly in the Land use plan and resources must be availed for every activity or plan for the implementation while involving the concerned community of relevant land users.
- c) The available resources should include feasible incentives and enforcement mechanisms.
- d) The incentives should be sufficient and attractive enough to ensure local communities' participation in implementing the plan.
- e) The incentives need to be articulated and realistically demonstrated from the initial steps to avoid the eruption of conflicts of interest at the final stage.
- f) The final stage must be used to cultivate the ownership of the plan as opposed to eroding it due to unmet expectations.

1) Incentives and or rewards

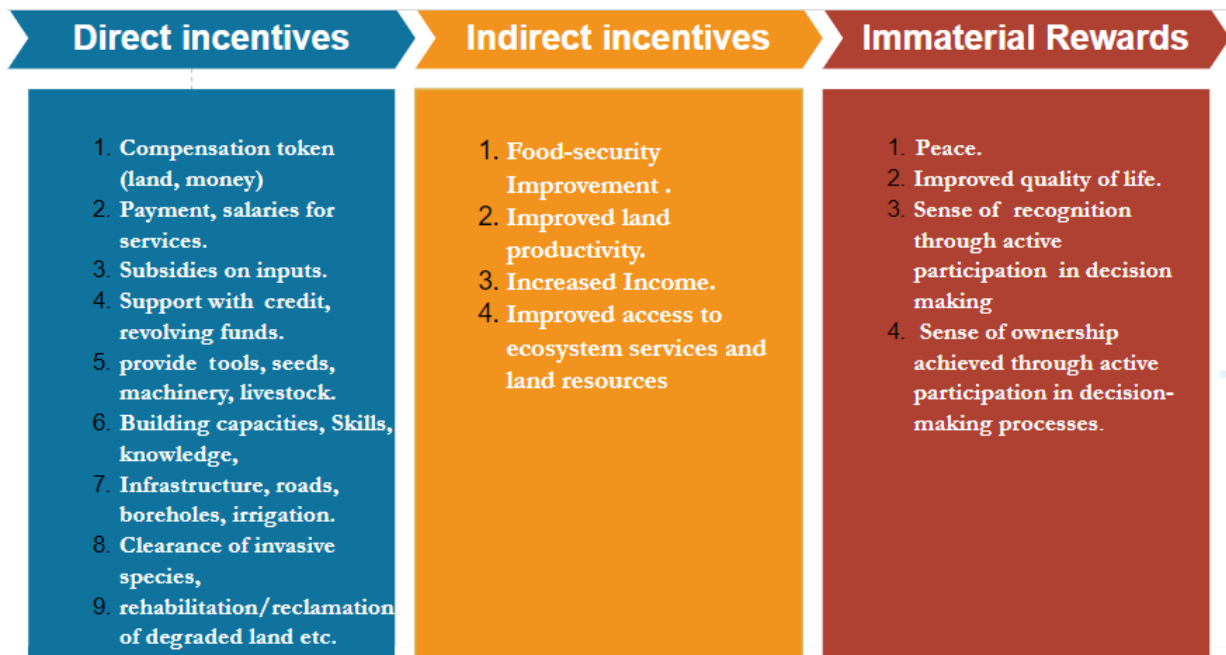
Some of the incentives for consideration to encourage and support community participation are shown in the figure below.

Expected results

1. Established institutional structures for the implementation of the plan.
2. Established institutional roles and responsibilities.

Objective

1. To set up enabling structures for implementation of the land use plan (LUP).



2) Enforcement arrangements

- a) The protected land use especially reserved and protected public forest that requires enforcement of policy and regulations.
- b) To control invasive species, use of certain fertilizers, chemicals/pesticides and or cultivation of invasive species is prohibited.
- c) The sprawling of settlements in high potential areas for agricultural production or hazard risk is prohibited.
- d) Develop regulations, laws, rules, and guidelines that are in line with the local by government laws and customary laws, to fit into the common acceptable land uses without disrupting livelihoods and community ways of livelihood.
- e) Document the by-laws agreed upon by communities, and share with all township inhabitants by raising awareness.
- f) Create committees and or groups to oversee the implementation of rules and regulations.
- g) Document all existing local laws for land resource protection, in addition to the customary and religious laws that are important for the implementation of LUP.

3) Implementation arrangements, roles, and responsibilities.

- a) Implement the LUP through the local community of land users at the watershed, ecosystem, or ward level while always focusing on the village tracts as the basic units of implementation.
- b) The design of the new structures should be acceptable and in line with the existing arrangements to cultivate ownership among the local communities to the Village tract level.
- c) Establish local committees for different activities with the membership of the local communities and other stakeholders.

Figure 6: Implementation roles and responsibilities at national, regional or state and district level

01	Provide guidance to the regional and state on the implementation of the plan.
02	Provide capacity building and technical support to develop and implement TLUP by of technical experts in state or region/district/township offices
03	Prioritise the spending of national budgets on LUP processes and implementation
04	Coordinate cross-regional or state (Cross-district or cross-township) activities and/or discussions on issues of relevance at the national/state or region/district/township level.
05	Develop enabling policy and legislation at national/state or region/district/township level that supports participatory land use planning and its implementation.
06	Develop enabling policy and legislation at national/state or region/district level that supports participatory land use planning and its implementation.
07	Provide oversight, supervision and monitoring of the LUP process and their implementation and ensure updates of the <u>TLUP</u> every 10 years
08	Retain copies of township land use plans for advising the development partners on how to support planned activities at regional or state/district/township level.

Figure 7: Implementation roles and responsibilities at the township level



1. Developing a pilot program

When a participatory process is involved in land use planning, tangible results must go beyond the production of the documents and maps. The interaction with the stakeholders who are involved in an extensive reflection, discussion, negotiation, and empowerment activities including identifying problems, and respective solutions: require actual implementation of the agreed upon activities. Implementation is commenced in phases starting from a selected pilot project site to actual activity. Remarkably, the planning process ends with the following activities:

- a) Plan on how to achieve the agreed objective(s).
- b) Plan for collaboration among institutions concerned.
- c) Finalize and keep the updated maps and reports.

- d) Develop an action plan clearly showing the following:
 - i What, where, when, and by whom,
 - ii The objectives, activities, outputs, benefits, and costs.
- e) Develop the M&E framework, proposals, and budgets to solicit funds for the Plan.
- f) Arrange for plan updating every 10 years by following this guidebook.

Sample workplan for land use planning LUP

Stage three: Preparing for implementation of the LUP				
Step	Action Points	Responsibility	Timeline	Place
Step 9	Develop a monitoring and evaluation system:			
Action 1	Implementation, promotion, and enforcement of plan.	Township LUP team		
Action 2	Develop M&E system and activities.			
Step 10	Prepare a Budget and Workplan for the implementation of the plan:			
Action 1	Develop a pilot program and workplan.	LUP team		
Step 11	Formulate and write the LUP:			
Action 1	Develop a pilot program and workplan.	1. LUP team 2. Key stakeholders.		
Action 2	Prepare the land use plan and map.			
Step 12	Present and finalize			
Action 4	Submit plan to district land administration and land use office and other stakeholders.			

STAGE FOUR:

Develop a monitoring and evaluation system

Develop monitoring and evaluation (M&E)

1) Register the monitoring objectives by deciding on the following:

- a) List the land use items for monitoring (important habitats).
- b) The lessons and patterns required for monitoring.
- c) Decide on the management and or restoration activities for monitoring.
- d) Highlight the hotspots for monitoring such as degraded areas.
- e) Enlist the characteristic to monitor for land use changes over the landscapes or specific areas of changes.
- f) Design a comparison approaches for areas under various management practices as bush clearing, fire, grazing regimes, regeneration or shifting cultivation.

Expected results

1. Monitoring and evaluation Plan.

2) Decide items to monitor :

- a) List the observable changes that will indicate unmet/met objectives.
- b) List all the early warning indicators for meeting the management objectives.
- c) Select the indicators for monitoring.
- d) Select the parameters for measuring the indicators.
- e) Indicate the species to monitor for changes i.e. cover density or biodiversity.

Objective

1. Develop an M&E system for the LUP.

3) Decide on the monitoring sites:

- a) List the land type and land use in the Plan.
- b) List areas that do not need monitoring, for instance, the soil and or vegetation types that are not important: or areas that are not representative of the landscape.
- c) List representative samples for locating monitoring sites.
- d) Compare areas with similar soil, slope, and currently under the same vegetation type.
- e) Choose **target** sites for monitoring hotspot areas of degradation or recovery in sensitive areas.
- f) Use **representative sites** to monitor changes in an entire landscape.
- g) Use **randomly stratified** sample sites if considering monitoring the whole township. Stratify the random sampling based on the various land use types and should be proportionate to the areal coverage of the land use.

4) Decide the frequency of monitoring:

- a) Use the same season when doing annual monitoring.
- b) Select the end of the rainy season to check for species diversity and erosion.

c) Select the dry period to observe land cover land use changes.

5) Document the monitoring plan:

- a) Provide a documented record to the stakeholders to understand the required data, monitoring plan, and interpretation of the monitoring results.
- b) Use maps, coordinates, and documented description of the sites.

6) Carry out data collection for monitoring.

7) Carry out the Interpretation of the results:

- a) Compare the indicator changes between annual data collection among monitoring sites.
- b) Determine the meaning of the changes on each indicator.
- c) Separate the changes that occur for targeted sensitive areas.
- d) Calculate the average change on the monitoring sites for every type of soil or vegetation.
- e) Discuss the observed changes based on how they meet the planning objectives.

8) Recording the lessons and take action based on the results:

- a) Record all lessons from the monitoring process.
- b) Act in accordance with the results and the objectives of the land use planning.
- c) Present the results and the interpretation of the local community and stakeholders.
- d) Build consensus on the changes, interpretation of the results and support any change in management that may be proposed.

Annex

Contents for township land use plan (LUP) report

- 1. Cover page**
 - 1.1. Title
 - 1.2. Name of the organization preparing the report
 - 1.3. Date of preparation.
- 2. Introduction**
 - 2.1. Background
 - 2.2. The objective of the LUP
 - 2.3. General objective
 - 2.4. Specific objectives.
- 3. Methodology**
 - 3.1. Township Description
 - 3.2. Description of the preparation phase, used tools, fieldwork, workshop, and validation forums
 - 3.3. Stakeholders analysis
 - 3.4. Description of major stakeholders
 - 3.5. List of the LUP team members
 - 3.6. Description of data collection and analysis
 - 3.7. Description of biophysical data collection and analysis
 - 3.8. Description of socio-economic data collection and analysis
 - 3.9. Description of agricultural and land resource assessment
 - 3.10. Description of land suitability and capability classification
 - 3.11. Description of problem and solutions.
- 4. Results and Discussion**
 - 4.1. Findings on biophysical resource assessment
 - 4.2. The bio-physical resource assessment result
 - 4.3. Maps: resource map, base map, soil map, slope map, land use/land cover map, etc.
 - 4.4. Findings on socio-economic survey
 - 4.5. The socio-economic resource assessment result
 - 4.6. Maps: social service and infrastructure maps etc.
 - 4.7. Findings on agricultural and land resource assessment
 - 4.8. Land resources assessment result community and conventional
 - 4.9. Land capability classification based on physical land resource evaluation
 - 4.10. The land capability evaluation result
 - 4.11. Land capability map
 - 4.12. Socio-economic evaluation based on land capability classification
 - 4.13. Alternative zoning evaluation and maps at each planning unit
 - 4.14. Overall evaluation and proposed land use with justifications including ranking
 - 4.15. Land use alternatives or options set (screened)
 - 4.16. Recommended proposed best land use option with proposed land use map
 - 4.17. Final proposed optimal land use and management options (with different maps).
 - 4.18. Sustainable land management measures of proposed land use with planning maps
 - 4.19. Action plan (and budget)
 - 4.20. Approval process
 - 4.21. Implementation arrangement and regulatory framework modalities
 - 4.22. Participatory monitoring and evaluation.
- 5. Summary of recommendations and conclusion**

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