Guideline in Integrated Spatial Planning for Sustainable Development in Lao PDR

Swedish International Development Cooperation Agency
Sida

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Guideline in Integrated Spatial Planning
for Sustainable Development in Lao PDR

Water Resources and Environment Administration
P.O Box 7864
Vientiane Capital, Lao PDR
Phone +856 21 222 752 • Fax +856 21 219 354

Swedish International Development Cooperation Agency
Sida

Authors:
Mr. Singsavanh Singkavongxay Director of Environment Data and Information Division, Dept of Environment, WREA sing@ecoslaos.com
Mr. Peter Gammelgaard Jensen, GrontmijCarl Bro, Team Leader SEM II Project pgcbi@gmail.com
Mr. Nils Bull, Head of Head of the Water and Soil Department, Copenhagen County, Denmark
Commissioned by

Water Resources and Environment Administration, (WREA)
Vientiane Capital, Lao PDR
P.O BOX 7864
Tel: (+856) 21 222 752

Prepared by

Strengthening Environment Management Phase II, (SEM II Project)
Vientiane Capital, Lao PDR
P.O BOX 7864
Tel: (+856) 21 222 752

Technical Assistance

Grontmij International AB
Norra Bulltoftavägen 65 A
SE-212 09 MALMÖ, SWEDEN
Tel: +46 (0)10 480 00 00
www.grontmij.se

Funded by

Swedish International Development Cooperation Agency, (Sida)
Vientiane Capital, Lao PDR
P.O BOX 800
Tel: (+856) 21 315 003
Foreword

This “Guideline in Integrated Spatial Planning for Sustainable Development” has been prepared as part of the comprehensive capacity development project titled Strengthening Environmental Management Phase II, SEM II, undertaken by the Water Resources and Environment Administration, Lao PDR and funded by the Swedish International Development Cooperation Agency, Sida.

The Guideline is prepared to support training of government officials in Lao PDR in the development and use of integrated spatial planning as an instrument towards sustainable development and better integration of environment, economic development and initiatives on climate change adaptation and mitigation.

Environment and Development are often seen as two opposites – Even today 20 years after the concept of Sustainable Development was introduced on the political arena the idea that we must sacrifice environment to gain development has survived. However, there are in fact methods and tools that we can apply to ensure that environment and development go hand in hand through an integrated process. Such kinds of approaches are even more needed with climate change impacts happening.

In the developed as well as in the developing world a variety of policies and methods have been implemented to ensure better protection of the environment; Environmental Impact Assessment is one of the best known methods applied all over the World. But EIA does not solve the fundamental question about what kind of development we want and where. Other methods are needed and one of them is known as Integrated Spatial Planning or ISP. ISP combines identification of development potentials with Strategic Environmental Assessment – it is strategy development integrating environment and climate change issues “on the fly”.

In Lao PDR – one of the least developed countries in the World, two ISP projects have been carried out – in Oudomxay and Champassak Provinces respectively and two more ISPs are under preparation in Attapeu and Phongsaly. The ISP projects were initiated by the Water Resources and Environment Administration (WREA), Lao PDR and carried out by the district and provincial governments of the provinces. WREA with support from SEM II Project has provided training, technical assistance and funding to the provinces and districts involved.

This Guideline presents how ISP may be one of the tools necessary for countries in the developing world faced with the fundamental challenge on how to properly integrate sector development plans (infrastructure, energy, mining, industry, agriculture, urban, tourism), with environmental protection and sound management of natural resources.

For Oudomxay Province, the ISP aims at maximizing the province’ strategic location in northern Lao PDR and attract needed investment and development assistance while protecting its environment and natural resources. The hope is that the ISP will help the province to build and increase its environmental understanding and awareness; and help Oudomxay to ensure that developments and investments are socially, economically and environmentally sound.
Furthermore, ISP could be a tool for integrating climate change adaptation and mitigation into development planning. This is very much needed because not only are climate change initiatives often carried out in isolation and in a fragmented way, but there are indeed huge potentials for combining adaptation and mitigation together with environmental protection and economic development. This approach is also known as “Low Carbon Green Growth”.

Indeed spatial planning has the special potential to integrate the three interdependent dimensions of sustainable development: economic, social and environmental.

This Guideline is the result of teamwork in the Training Team established under the SEM II Project by the Dept of Environment, WREA in April 2006. The Training Team comprised WREA officials, Local Consultants, Regional Experts from Khon Kaen University and International Experts from Grontmij |Carl Bro:

- Madam Dr Viengsavanh Douangsavanh, Director General Department of Environment, WREA
- Madam Bounkham Vorachit, Director General, ESIA Department, WREA
- Mr. Singsavanh Singkavongxai, Director of Environment Information and Data Management System Division, WREA;
- Assoc Prof Dr Wanpen Wirojanagud, Research Center for Environmental and Hazardous Waste Management, Department of Environmental Engineering, Faculty of Engineering, Khon Kaen University, Khon Kaen, 40002, Thailand;
- Mr. Nils Bull, Head of the Water and Soil Department, Copenhagen County, Denmark;
- Mr. Ritthirung Jungguth, Lecturer Faculty of Environment and Resource Studies, Mahasarakham University, Thailand;
- Ms Soudawee Keopaseuth, Environment Information and Data Management System Division, WREA;
- Mr. Peter G. Jensen, TA Team Leader SEM II Project, Grontmij |Carl Bro;

The training course, which this Guideline has been prepared for, is built on the principle that learning comes from practice, and therefore, during this training program, the trainees will have the opportunity to use maps and spatial data and develop their own integrated spatial plan for a province in Laos – based on actual data and information.

Vientiane Capital, April 2010
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Introduction to Integrated Spatial Planning

To understand integrated spatial planning we should look at three important aspects:

1. The planning process;
2. The plan itself; and
3. The use of the plan;

Integrated Spatial Planning or ISP is about planning for sustainable utilization of our surroundings or space and involves establishing a framework for land use, protection and enhancement of nature and environment, location of future residential and industrial areas and location and type of large investment projects.

It is the experience from all around the World that to have good environmental management, you need integrated planning. Integrated Spatial Planning is a prerequisite for good and sound environmental management.

This Guideline focuses on provincial and district level planning. An Integrated Spatial Plan on provincial and district level is based on a common overarching vision and development strategy for the area that the plan covers in our case a province or a district. The vision and development strategy is formed through a process of analyzing the potentials, needs and problems in each area and for every sector and interest.

It is a participatory process that unifies national and provincial priorities with potentials, needs and problems on the ground at provincial/district level. An ISP contains a Provincial/District Spatial Development Strategy with implementing measures, which can be in the form of regulations, zoning, incentives, constructions and projects designed specifically to promote the desired development and/or to avoid and move away from undesired development.
The central part of an ISP is a set of thematic planning maps on which the spatial development strategy and the implementing measures are visualized. The planning maps will show protected areas, sensitive and valuable natural and cultural assets, land use zoning for industry, agriculture, residential, forestry and infrastructure development projects and any other development that is preferred/not preferred or allowed/not allowed.

The ISP is thus a blueprint for sustainable environmental, social and economic development.

A spatial plan is not an action plan as we normally know it. A spatial plan is a regulatory instrument to integrate and balance competing or conflicting interests. The measures determined in the plan are designed specifically to promote the desired development or to avoid and move away from undesired development.

Box 1.1 shows some of the main planning issues often managed by spatial planning.

Integrated Spatial Planning has that special potential to integrate the three interdependent dimensions of sustainable development: namely economic, social and environmental; and act as a coordinating instrument across sector interests and policies.

Spatial planning can be a valuable tool to support sustainable development by basing the plans, measures and interventions on key sustainability principles.

Box 1.2 lists some examples of how spatial planning can support and contribute to sustainable development. The list presents overall sustainability principles and general planning measures divided into three main categories:

i) Environmental principles;

ii) Social principles; and

iii) Economic principles.

It is recognized that in the current context with climate change issues threatening social, economic and environmental development there is an urgent need to develop and demonstrate integrated approaches and mechanisms for implementation of policies and strategies for sustainable development, green growth and climate change mitigation and adaptation.

Green growth interventions as well as climate change initiatives include determining spatial and environmental factors. Therefore, Integrated Spatial Planning is a tool for spatial and environmental analysis combined with social and economic factors to ensure proper integration, synergy and co-benefits in determination of green growth and climate change interventions. Examples of this include the following:
i) Identification of suitable areas for reforestation or protection against degradation to support multiple purposes of carbon sequestration, water resources protection, mitigation of erosion, biodiversity and potential for local economic returns; while at the same time avoiding potential conflicts with other economic interests;

ii) Identification of suitable areas for biofuel crops ensuring that such areas do not replace food production and that the production is environmentally and socially sound and not in conflict with other critical interests of society;

iii) Alignment of infrastructure and delineation of production areas, and urban planning and zoning taking into account energy efficiency and conservation; and avoiding potential conflicts with other interests or threats from climate change e.g. flooding;

iv) Identification of potentials for energy efficiency in industry and buildings with the multiple purposes of reducing greenhouse gas emissions, reducing impacts of human health from air pollution, conducting proper energy planning and ensuring efficient use of technical and financial resources;

Furthermore, the Integrated Spatial Planning monitoring activities can provide a good basis for identification of climate change. The observations can give early warning that major adaptation or mitigation activities might be required; for example:

i) Mapping of changing forest area, number and size of forest fires, number of polluting industries, changes in traffic and changes in urban areas all indicate a possible change in the greenhouse gas account.; and

ii) Monitoring changes in dry and wet areas, changes in crop yield, season length, water supply, air and water temperature, river flow, river floods are also plausible indicators of climate change.
Spatial Planning

General planning issues

- THE PHYSICAL LAYOUT AND MAIN STRUCTURE
- PLAN FOR THE USE AND PROTECTION OF LAND, NATURE, FORESTS, WATER, AND MINERALS

Box 1.1 General Planning Issues

- Agricultural land interests.
- Wetlands, Nature preservation areas.
- Preservation of cultural heritage etc.
- Recreational areas.
- Areas for protection of water resources.
- Areas for exploitation of mineral resources.

- Urban zones
- Major transport facilities
- Large technical facilities
- Large public institutions
- Location of Industries
- Structure of retail trade
### Sustainable Development and Spatial Planning

Examples of how spatial planning can support sustainable development

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<thead>
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<th>Sustainability principles</th>
<th>Spatial planning</th>
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<tbody>
<tr>
<td><strong>Environmental Principles</strong></td>
<td><strong>Planning Measures</strong></td>
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<tr>
<td>- Maintaining or enhancing the natural resources;</td>
<td>- Land use zoning to locate development away from critical or sensitive nature and environment;</td>
</tr>
<tr>
<td>- Minimizing consumption of resources;</td>
<td>- Reserve and protect forests; wetlands; groundwater and cultural heritage;</td>
</tr>
<tr>
<td>- Improving the environmental quality;</td>
<td>- Reserve good soil for agriculture;</td>
</tr>
<tr>
<td></td>
<td>- Promote and encourage cleaner production in agriculture and industry;</td>
</tr>
<tr>
<td></td>
<td>- Promote or impose good standards of operation in agriculture and industry to prevent pollution of soil, water and air;</td>
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<td></td>
<td>- Locate new developments in close relation to existing settlements;</td>
</tr>
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<td></td>
<td>- Regulate exploitation of resources based on resource classification and permission system</td>
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<thead>
<tr>
<th><strong>Economic Principles</strong></th>
<th><strong>Planning Measures</strong></th>
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<tr>
<td>- Self-Sufficient economy</td>
<td>- Plan for the use of local resources for local production;</td>
</tr>
<tr>
<td>- Poverty alleviation</td>
<td>- Ensure sufficient land for local agricultural production;</td>
</tr>
<tr>
<td>- Prosperity</td>
<td>- Organize partnerships for solving problems and developing potentials;</td>
</tr>
<tr>
<td>- Sound international investment in Lao PDR</td>
<td>- Identify areas with valuable or degraded resources and find suitable practices based on local knowledge and research for protection, rehabilitation and utilization;</td>
</tr>
<tr>
<td></td>
<td>- Utilize local knowledge to develop measures/services that support a diversified agriculture and industrial production</td>
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<table>
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<tr>
<th><strong>Social Principles</strong></th>
<th><strong>Planning Measures</strong></th>
</tr>
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<tbody>
<tr>
<td>- Develop social capital</td>
<td>- Plan for green areas;</td>
</tr>
<tr>
<td>- Access to services and amenities</td>
<td>- Plan residential areas for good access people/work/school;</td>
</tr>
<tr>
<td>- Equity, transparency, democracy</td>
<td>- Involve NGOs, mass organizations etc in the planning process;</td>
</tr>
<tr>
<td>- Refrain from an unhealthy principle of “who comes first get first”</td>
<td>- Integrate local knowledge in the plan-making;</td>
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<tr>
<td></td>
<td>- Locate services to give easy access for people (public transport, education, health, etc)</td>
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### Box 1.2  Sustainable Development and Spatial Planning
The development of a spatial plan runs through three main work processes:

1. Baseline Data Analysis of the existing situation and problems and potentials;

2. Outlining objectives and strategies; and

3. Integration across sectors and synthesis of all aspects into a coherent balanced spatial framework

It is worth noticing that in real life the processes are not separate entities that can be dealt with in isolation from the others. It is an iterative process that runs through several loops before finalization.

Box 1.3 outlines the content and tasks in each of the main planning phases.
The Planning Process in Three Main Phases

<table>
<thead>
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<th>PLANNING PHASES</th>
<th>Baseline Data Analysis</th>
<th>Objectives &amp; Strategies</th>
<th>Integration and Synthesis</th>
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</table>
| **Technical Tasks** | • Data Collection and reviewing  
                     • Establishing GIS and web-mapping  
                     • Analysis of data and checking validity  
                     • Analysis of problems and Potentials | • Prioritize problems & potentials  
                     • Outline strategy including objectives and principles | • Define criteria for planning maps  
                     • Transform data  
                     • Draft planning maps and measures  
                     • Balance competing or conflicting interests  
                     • Identify implementers/ responsible partners |
| **Participatory Methods** | • Consultations among Planners, Professionals and People with knowledge about local issues.  
                              • Public Forums  
                              • Opinion Poll | • Stakeholder workshops  
                     • Round table discussions,  
                     • Technical working group meetings  
                     • Collaboration Planning & Management Team meeting | • Technical working group meetings  
                     • Public information  
                     • Round table discussions  
                     • Partnership initiatives  
                     • Public Forums  
                     • Collaboration Planning & Management team meeting |
| **Results** | • GIS and web-mapping with baseline data and maps  
               • Description and mapping of current problems and potentials  
               • Listing and location of main problems | • Vision for the area and Strategy setting the direction of the plan  
                     • Decision on planning issues | • Planning Maps & Measures  
                     • Stakeholder agreement on plans and measures |

Box 1.3 Planning Process
Integration is a key concept in spatial planning. Ensuring integration can be done in several ways; there is technical integration, organizational integration, management integration, and integration of understanding and more:

Integration of data and terminology

Data integration is about ensuring that all agencies and organizations involved in planning have and use the same data set. If they don’t use the same data they may reach different conclusions and will have difficulties agreeing. It also refers to ensuring that the same set of technical standards is used for data analysis, making maps, etc.

Integration through organization

Organizational integration refers to involving all relevant partners in planning committees, working groups etc.

Integration through procedures

Integration can also be facilitated through management and procedures and processes. This involves participatory planning methods such as public forums, public awareness raising, consultation with stakeholders, problem tree analysis, participatory mapping, etc. Likewise, this also concerns management procedures for the whole planning process e.g. defining roles and responsibilities of the agencies and organizations concerned, and procedures for giving information and responding to draft plans.

An important aspect of integration is creating a common understanding of planning concepts, goals and strategies. A central part of this is about having the same understanding of the terminology used during meetings, negotiations and in documents.

Integration of solutions

Finally, integration of solutions shall ensure that solutions proposed in the plan support both environmental, social and economic sustainability principles or as a minimum do not get in the way of solving other problems or have negative impact on other issues or geographical areas.

Implementation and use of the Spatial Plan

When the Spatial Plan has been completed and approved it is ready for use. As mentioned earlier the Plan shall help ensure that development progresses in the desired direction and that nature and environment are protected, rehabilitated and utilized in a sustainable manner in accordance with relevant policies, laws and national or provincial strategies.

Thus the main functions of an ISP are:

- Direct public investments to geographic areas and types of activities/projects stated in the plan and in accordance with National and Provincial Socio-Economic Development Plans;
- Provide a common coherent framework for administration in concerned government organizations at provincial and district level; this includes administrative issues such as: i) permits for high polluting activities; ii)
permission to extract natural resources; and iii) location of new residential areas, industrial zones and landfills;

Serve as a framework for environmental impact assessment (EIA) of proposed development projects and for strategic environmental assessment (SEA) of proposed programs and plans.

Attract private investments through promotion activities, research, and incentives directed towards geographic areas and project types stated in the plan in accordance with National and Provincial Socio-Economic Development Plans;

Ensure protection of valuable or sensitive environment, nature; and cultural heritage;

Help private investors find suitable locations for their investment projects;

Present to the public the preferred development in the province using plain non-technical language and maps that are simple and easy to understand;

Enhance coordination between government organizations both horizontally at provincial/district level; and vertically between central and local administrations;
Organization of the Planning Process

Experience from undertaking ISP in Oudomxay and Champassak indicates that an effective organization should comprise the following:

**Provincial level**

i) Provincial ISP Committee to oversee and supervise the planning progress chaired by Head of Provincial Cabinet or Vice Governor. The members of the committee should include all concerned sectors;

ii) Technical Team (PTT) to manage the daily operations of the ISP development and coordinate implementation. The way in which this is organized may vary from province to province, but it may be most appropriate to anchor the PTT at the Provincial Division for Planning and Investment. The important point is that the team consists of dedicated and competent officials with clear assignments and clear mandates to carry out their functions;

**District level**

iii) District ISP Policy Committee;

iv) District ISP Technical Committee or Working Group chaired by the Vice District Governor and with members from all concerned line divisions.

**Capacity building and technical assistance**

The first generation ISPs will require both capacity building and technical assistance. Since 2006, WREA has developed considerable technical capacity in ISP and is capable of leading a Core Technical Team (CTT) comprising technical competent officials from government organizations including MPI, WREA and NLMA, MAF and possibly other concerned agencies.
The roles and responsibilities of the CTT are as follows:

i) Training and capacity building in ISP for the Provincial/District ISP Technical Teams;

ii) Review and commenting on ISPs;

iii) Ensure that national level strategies, concerns and priorities are considered in the ISPs;

iv) Develop and disseminate ISP Guideline;

v) Develop GIS and databases for the ISPs;

vi) Map production for the ISPs;

The CTT will carry out an ISP training course for the Provincial Technical Teams and key members of the District Working Groups in order to make them capable of training and assisting the provincial and district level officials; and guide the development of the district and provincial ISPs.

The ISP training course consists of the following four modules corresponding to the main phases of the planning process:

1st Module 2 weeks intensive training workshop (introduction and overview, data collection, spatial analysis, understanding of social, economic and environmental issues in planning);

2nd Module 1 week training workshop based on the draft Base Line Analysis from the provinces (Spatial analysis, strategy formulation, SWOT, rapid Strategic Environmental Assessment);

3rd Module 1 week training workshop based on the draft Strategies and Planning Maps from the provinces (From strategy to plan, integration and balancing);

4th Module 1 week training workshop based on the final draft ISPs from the provinces (plan review, integration, implementation and administration, monitoring of ISP);

Provision of technical assistance from international and national Experts familiar with the ISP process is recommended.
A Quick Tour through Integrated Spatial Planning

“ISP is an essential tool in helping the province to realize government policies and sustainable development priorities, helping us to ensure that development and investments are socially, economically and environmentally sound.” Quote Mr. Sompheng Phaynaavong, Head of Oudomxay Provincial Cabinet, 28 September 2007

An Integrated Spatial Plan is a strategic framework for development and environmental protection. The plans are laid out using the district or province’s maps and indicate what kind of activities, operations, developments and constructions are feasible and preferred in certain areas, based on the specific geographical location, natural resources and population demographics, among other factors.

The plan guides investments and government policies from all sectors and interests in one shared desired direction in tandem with environmental impacts. The plan is a regulatory instrument to integrate and balance competing or conflicting interests. The measures determined in the plan are designed specifically to promote the desired development or to avoid and move away from undesired development. In this way, ISP can help to maximize the use of resources while developing strategic measures that will guard against potential impacts.

- Policy Dialogue
- ISP Workshop Launch
- Module 1 Training of the provincial and district officers (approx five offices per district)
- Baseline Analysis including (Chapter 4)
  - Data collection, mapping, data analysis,
GUIDELINE IN INTEGRATED SPATIAL PLANNING

- Mission to all districts in the province;
- Preparation of Baseline Analysis report and maps;

☑ Strategy Formulation (*Chapter 5*)
  - Consultation meetings;
  - Module 2 Training, Strategy formulation workshop and training;
  - Drafting Report and maps;

☑ Integration and Synthesis (*Chapter 6*)
  - District consultation meetings;
  - Missions (training and follow-up) to all districts in the province;
  - Module 3 Training and Provincial workshop
  - Completion of maps and reports;

☑ Preparation for implementation (*Chapter 7*)
  - Completion workshop;
  - Printing and dissemination;
  - Module 4 Training of Provincial and District officials in the use of the ISP

☑ Monitoring of implementation of the IEMPs
  - Monitoring missions to the districts;
  - Provincial progress and follow-up workshops;

The ISP process and activities have been demonstrated and tested in connection with the ISP pilot projects in Oudomxay and Champassak Provinces (including district level).

The Integrated Strategic Planning activities are a revolving process as international, national, provincial or local development, political decisions or new policies might require that the plan should be reviewed and if required revised. The process is illustrated in figure 3.1 below.
The plan shall mark all areas as zones for different use and development. The zones could be marked on transparency sheet for later overlay in the process or could be put into a layer in the GIS system.
Baseline Data Analysis

The Baseline Data Analysis shall provide an overview of the economic, social and environmental conditions in the province with an emphasis on trends, relations and impacts.

The preparation of a Baseline Data Analysis is the first step in the planning process and the intention is that the analysis shall provide an overview of the present situation as well as an estimated best guess of how the future might look if present trends continue. This shall include identification and assessment of significant impacts on environment, economy and social conditions. Another important outcome of this activity is a list of available data and evaluation of their usefulness.

For the purpose of this Case Work, the Baseline Analysis will concentrate on the following three components:

- Nature and Environment
- Business and Production
- People and Living

In the course of the data analysis phase a data and information system should be established. It is recommended to build the system on GIS and web-mapping.

The analytical framework for understanding the provincial planning process can be shown as the interaction between three processes; pressure created by human population and activity, state of nature and environment and the "response" by stakeholders to the situation. This relationship is shown in the following diagram:
Analytical Framework

It is advised to select a set of simple indicators that are easy to understand, and to present these indicators graphically, in tables and on maps.

In general indicators can be divided into three groups (related to the analytical framework): 1) Indicators of conditions or state; 2) Indicators of impacts or pressures; and 3) Indicators of performance (response). In the case of natural resources and environment indicators usually concern conditions or impacts (group 1 and 2).

In selecting indicators, there are two main considerations: On the one hand, the indicator should be easy to understand for all partners and the public; and on the other hand the indicator should also show and represent the real situation or trend as accurately as possible. These two criteria do not always come together, because
while a simple indicator may conform to the first criterion, a more sophisticated, advanced and technically correct indicator may be needed to serve the second criterion.

It is worth bearing in mind that for the purpose of giving information to the public and creating public participation simple indicators (the first type) are very useful. Technical or complex indicators - on the other hand - are useful for professionals when conducting technical assessments.

Other relevant considerations for selecting indicators are listed below.

The indicator should be:

- related to sustainable development principles and existing National or Provincial strategies/targets;
- based on reliable data that are regularly collected and updated;
- leading to the setting of targets;
- significant and relevant to the problem or issue in question;
- relevant and meaningful to the planning partners and the public.
Nature and Environment

Nature and environment is an inseparable element in quality of life as it forms the basis for both production and living.

Data Collection

Nature and environment are traditionally divided into the following categories:

- Soil, Land, Topography, Landscape, Land use;
- Minerals; Oil and Gas;
- Forest, Wetlands, Flora and Fauna;
- Inland Surface Water Bodies;
- Groundwater;
- Water Bodies;
- Air, Climate;
- Cultural Heritage;
- Administrative boundaries related to nature and environment;

Data collection should be aimed at defining location, quantity and quality.

Analysis of trends

The analysis should aim at identifying changes and trends in physical conditions (quality/quantity/distribution/diversity) of e.g. air, water, forest and soil; pointing out causes and effects of these changes and trends and locating the geographic areas exposed to change.
Boxes 2.1-2.4 give some examples and help to define the depth and breadth of the analysis.

Maps in Annex 3

Examples of maps are inserted in Annex 3.

Keep in mind that we are not doing scientific research – we are simply trying to get an overview of the situation.
Box 2.1 Forest

Data analysis for spatial planning on provincial level

Technical Tasks

- Study the maps and data and characterize the province in terms of nature and environment.
- Discuss and list the types of nature/environment that you believe should be protected.
- Mark these areas on a transparency or as a GIS layer.
- Note which criteria you used to define these areas (tourism, bio diversity etc.).
- Data transformation grouping forest types in a few categories.
- Compare forest cover over a longer period of time and assess the trend
- Compare with targets
- Study if there are any known or expected climate change adaptations that need to be considered in the integrated spatial planning process.
- Climate Change adaptation with respect to issues such as increased risk of flooding, erosion, sedimentation, soil degradation, risk for landslides or draught.
- Prepare maps and graphs.
- Assess the causes to the trend in forest cover

Important Data

- Existing Forest
- National, Provincial and District Protected Areas
- National parks, wild life sanctuaries
- Watershed classification
- Production Forest areas
- Industrial tree plantation areas and types
- Biodiversity

Key Result

- Map showing existing forest, National, Provincial and District Protected Areas
- Map showing watershed classification
- Presentation of trend in forest cover

Participatory Methods

- Public Forum
- Field studies, consulting with farmer networks and local administrators
- Technical meetings among professionals
Box 2.2  Soil and Land

Data analysis for spatial planning on provincial level

Technical Tasks
- Compare land use data over a long period of time and assess the trend
- Assess and point out areas with risk of soil degradation
- Assess and point out areas with very good soil quality
- Find out the main causes to the trends in soil quality/land use/drought
- Study if there are any known or expected climate change adaptations that need to be considered in the integrated spatial planning process.
- Climate Change adaptation with respect to issues such as increased risk of flooding, erosion, sedimentation, soil degradation, risk for landslides or draught.
- Potential solutions to soil/land problems

Important Data
- Land use
- Soil types and groups
- Economic mineral deposits
- Land forms and topography
- Local knowledge on soil quality
- Drought risk areas
- Flood prone areas

Key Result
- Map of land use
- Map of soil degradation risk
- Map of drought risk areas
- Map of flood prone areas
- Description of main causes/effects and potential solutions

Participatory Methods
- Public Forum
- Field studies, consultations with farmer networks and local administrators, extension work
- Technical meetings among professionals
Box 2.3 Surface Water

Data analysis for spatial planning on provincial level

**Technical Tasks**
- Assess trend in water quality
- Assess trend in water consumption
- Compare water quality with standards and classifications
- Point out areas where good water quality is particularly Important
- Point out flood prone areas
- Study if there are any known or expected climate change adaptations that need to be considered in the integrated spatial planning process.
- Climate Change adaptation with respect to issues such as increased risk of flooding, risk for landslides or draught.

**Important Data**
- Water bodies, lakes, rivers, streams
- Irrigation canals
- Water quality data
- Water pumping stations
- Catchment areas
- Water consumption data
- Water quality classifications and standards
- Sources of pollution
- Protected water bodies
- Existing and future dams and reservoirs (hydropower/irrigation)

**Key Result**
- Map of drought risk areas
- Map of flood prone areas
- Map and description of water quality
- Map showing water bodies with high risk of pollution
- Map showing main usage of water bodies
- Overview of surface water consumption

**Participatory Methods**
- Public forum in critical area (water issues)
- Field studies and consultation with villagers, village headmen, environmental volunteers and local administrators
- Technical meetings among professionals
Box 2.4  Groundwater

Data analysis for spatial planning on provincial level

Technical Tasks

- Analyze and present indicators of yield and water quality in the aquifers
- Transform yield and quality data into a few simple categories
- Identify recharge and discharge areas
- Determine direction of groundwater flow

Important Data

- Aquifers
- Groundwater yield and quality (well data)
- Topography and groundwater table
- Groundwater extraction
- Location of wells
- Geological layers

Key Result

- Map showing aquifer yield
- Map showing aquifer water quality
- Cross-section of geological layers
- Groundwater recharge and discharge areas and flow direction

Participatory methods

- Consultations with stakeholders
- Public Forum
- Technical meeting
Business and Production

Business and production is a main factor in economy and development, but also in exploitation of resources and generation of waste.

The main data items are listed below:

**Data Collection**
- Gross Provincial Product (GPP), Gross Regional Product (GRP) and Gross Domestic Product (GDP) over a longer period of time (10 years);
- Number, size, and type of enterprises in each major sector;
- Employment/unemployment figures;
- Number of employed persons in each major sector and number of employed persons by type of industry;
- Number of industrial establishments and employees by type and size of establishments;
- Number and location of industries and other large technical facilities that may cause pollution such as oil products depots, storage of fertilizers, toxic or hazardous chemicals, and waste disposal and treatment plants,
- Concession Areas and operations in the concession area

**Analysis of trends and impacts**
Box 2.5 highlights some important characteristics of Business and Production.
Box 2.5 Business & Production

Data analysis for spatial planning on provincial level

Technical Tasks
- Indicate the economic contribution of the main sectors
- Present employment figures in terms of number of employed persons by sector, by type of enterprise and by size
- Analyze the structure of the main sectors in terms of size and type
- Present the geographic distribution of industrial enterprise by type
- Study maps and data and characterize the province in terms of potentials for business and production development.
- Discuss and mark the following areas/localities on a transparency or GIS layer:
  - Areas with potential for agriculture;
  - Areas with potential for plantations e.g. rubber;
  - Areas or localities with potential for extraction of raw materials and mineral resources;
  - Areas or localities with potential for industrial development;
  - Areas or localities with potential for tourism;
- Note the criteria you used for defining and marking these areas/localities;
- Analyze important factors for development of business and production

Important Data
- GPP and GDP - 10 year period
- Investment data
- Number, Size, Type of enterprises
- Employment/unemployment figures
- Location of industries
- Production volume in the main sectors over a 10 year period
- Concession areas

Key Results
- Map showing location of industries
- Map showing concession areas
- Graphic presentation of main sectors in terms of economy, employment, volume
- Description of the structure and type of main sectors
- Description of main factors for development of business & production
  (agriculture/forestry/plantations/industry/mining/hydropower)

Participatory Methods
- Stakeholder consultations
- Technical meetings among professionals
As indicated in Box 2.5, general economy could be analyzed by conducting a simple comparison of the sectors’ contribution to the Gross Provincial Product (GPP) and how this has developed over a longer period of time, say 10 years. This could further be compared to the Gross Domestic Product (GDP).

The analysis of the employment structure should indicate whether there is a general labor problem - unemployment or lack of labor. Furthermore, by comparing with the economic situation, we may see whether growth sectors employ an equivalent large proportion of the workforce; and whether economically declining sectors holds a proportional part of the workforce.

In terms of spatial planning the most interesting part of this analysis is the structural analysis and geographic distribution. The structural part concerns size and type of enterprises. Size could be in terms of employees, production volume/value, area (e.g. for farms) or storage capacity (e.g. oil depots). This should indicate whether the sectors are dominated by, e.g. SMEs or a few large enterprises and also whether there is a tendency towards concentrating production in fewer larger units or? The types of enterprises would indicate whether the production is diversified or relying on a few production types.

The geographic distribution helps identify areas with potential high pollution and pressure on environment and resources. This would also indicate areas with high demand on infrastructure, energy etc. Knowing about the structure and location pattern of enterprises in each sector can help us to define useful measures and regulations.

Information about planned and ongoing projects concerning business development and promotion should be gathered. This information can supplement the analysis and help us characterize the trends.
People and Living

This comprises population distribution and composition, and categorization and ranking of settlements according to their size, provision or lack of services and urban functions.

Population Data

Population data are very important for spatial planning, because it can tell us where there will be high demand for housing, services and infrastructure; and where there will be growing pressure on environment and natural resources.

Focus should be on size and distribution and growth rate of the population. The analysis may be expanded to cover other characteristics such as age structure, occupation and employment, income and poverty, educational level, health, dependency ratio and crime rates.

Box 2.6 gives an overview of useful population analysis for spatial planning.
Box 2.6  People & Living

Data analysis for spatial planning on provincial level

**Technical Tasks**
- Location of human settlements
- Size and distribution of population by districts and municipal/non-municipal area
- Growth of population by districts and municipal/non-municipal area
- Study the maps and data provided and characterize the province in terms of demography. Identify population centers e.g. cluster of villages. Identify areas with growing/declining population. Identify areas with good/poor infrastructure (road network).
- If new harbors, bridges, roads or railways are under consideration these should also be identified.
- Mark the areas on transparency or as a GIS layer.
- Presentation of urban hierarchy.

**Important Data**
- Map with administrative boundaries, villages, towns and cities
- Census data
- Statistics concerning health, education, crime, income

**Key Results**
- Map showing population distribution and density
- Presentation of trends in (graphical, tables, maps) population growth, dependency ratio,

**Participatory Methods**
- Consultations with Village Leaders, Provincial and District officials
- Technical meeting with planners and administrators and experts
Population statistics and forecasting is a very large subject actually beyond the scope of this Guideline, and population forecasts should be approached with great caution and reviewed critically. Simple calculations can be done only to get an idea of where there may be significant increases or decreases in population.

Urban hierarchy is a way of classifying human settlements according to population size and existence of a range of public services and urban functions.

Socio-economic data and indicators are very useful for integrated planning. To show trends over time, data can be presented by district and year for the most recent 2, 6 and 10-year periods where available. Trends can be presented in tables, graphically or on a map.

Referring back to the Pressure-State-Response diagram, the "pressure" from human population and activity can be measured and monitored by means of indicators which represent various population characteristics and human activities. These indicators can be grouped under the headings of population, land use, household assets, housing, education, agriculture, energy, health, business activity and financial resources. These categories of indicators can be linked to planning issues and planning responses as shown in the table below. Please note that the table is only giving examples and is not a complete list of categories and indicators.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Main relationship</th>
<th>Possible interpretations</th>
<th>Planning decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population density/growth</td>
<td>Use of natural resources and infrastructure</td>
<td>Increasing population = pressure on resources</td>
<td>Increased priority on infrastructure, regulation/protection of resources</td>
</tr>
<tr>
<td>Population distribution</td>
<td>Need for infrastructure and services</td>
<td>Increasing urbanization = pressure on resources, infrastructure and facilities</td>
<td>Increased priority on infrastructure and facilities, developing rural areas</td>
</tr>
<tr>
<td>Migration</td>
<td>Attractiveness of an area</td>
<td>Out migration = low attractiveness/economic opportunity</td>
<td>Increased priority on infrastructure and facilities in rural areas</td>
</tr>
<tr>
<td>Dependency</td>
<td>Productivity</td>
<td>Increasing dependency = lower development potential, human resources</td>
<td>Increased priority on employment, HRD</td>
</tr>
<tr>
<td>Land use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human settlements/roads in protected areas</td>
<td>Environmental degradation and conflicts</td>
<td>Need for conflict resolution/resettlement/reclassification</td>
<td>Hold public hearings/reclassify land</td>
</tr>
<tr>
<td>Crops in protected areas</td>
<td>Land use conflicts</td>
<td>Need for conflict resolution/reclassification</td>
<td>Hold public hearings/reclassify land</td>
</tr>
</tbody>
</table>
## Household assets

<table>
<thead>
<tr>
<th>Land ownership</th>
<th>Changes in economic activity/wealth</th>
<th>Decreasing size of landholdings = land fragmentation, lower output of traditional crops</th>
<th>Increased priority on non-traditional crops, land use planning and regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt/savings</td>
<td>Cash deficit/surplus</td>
<td>Higher savings = rising living standards and development/investment potential</td>
<td>Priority on investment opportunities, business skills and support services</td>
</tr>
<tr>
<td>Wealth ranking</td>
<td>Wealth distribution</td>
<td>Disparity among areas</td>
<td>Need for comprehensive socio-economic development plan for poorest areas</td>
</tr>
</tbody>
</table>

### Labor and employment

<table>
<thead>
<tr>
<th>Household income</th>
<th>Economic trends/household resources</th>
<th>Higher income = higher material living standards</th>
<th>Increased priority on savings, support facilities and services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment and welfare</td>
<td>Demographic and economic effects</td>
<td>Higher unemployment/welfare = decline in human resources, productive potential</td>
<td>Targeted plan for skills development/ alternative employment</td>
</tr>
</tbody>
</table>

Table indicating relationships between key socio-economic parameters and planning measures

A very important group of data concerns infrastructure that provide services to people and production. Infrastructure is also an important source of environmental and social impacts.

The main data items comprise:

- Roads and highways, railways, waterways, airports.
- Energy supply: Hydropower projects, extraction of energy resources, energy production plants, and transmission networks and service areas;
- Water supply: Water extraction plants, water treatment plants, supply network or service areas. Amount of water supplied/consumed;
- Solid waste management system; location of disposal sites, treatment plants and service areas
- Wastewater system; location of wastewater treatment plants, discharge points and service areas.
- Irrigation systems; location of irrigation canals and service areas. Amount of water used.
- Communication system and network.
- Planned or ongoing infrastructure projects.
In its simple form the analysis of infrastructure should present the location of existing and planned infrastructure and indicate whether this meets the present demands. In a more advanced form the analysis should indicate whether the existing and planned infrastructure can meet future demands.

**Initial Integrated Assessment**

*Cross sector analysis and assessment of trends in development and environment.*

When the results of the baseline analysis are emerging, it is necessary to conduct an Initial Integrated Assessment. The objective of this assessment is to get a clearer picture of the main factors and forces driving the present trends in development and to assess what are our options to change the direction if needed.

As a first step we have to identify the main problems and potentials in terms of social, economic and environmental issues in each area. The next step is to outline the impacts or pressures causing these conditions. This will form the basis for an assessment of how these problems and potentials are addressed at present, and what will be the consequences if we do not try to change the situation.

To do this, we may use different tools and start from various angles. We may start with a brainstorming on the main issues based on the outcome of the analysis of the individual “sectors”, and make a rough prioritization. Hereafter, the pressures or impacts causing the issues as well as the further effects on other social, economic and environmental conditions should be identified and we should assess the various projects, plans or strategies involved in the issue or intended to influence it.

A simple, but effective help tool for integrated assessment is a so-called “problem tree” – a problem tree shows the chain of causes and effects from the root causes and up to the main problem or issue. A problem tree links causes and effects in various sectors and areas and is therefore very good for developing understanding of complex situations, and forms the basis for generating solutions that address the root causes to the problems. In order to make a problem tree operational, it is important to make it as specific as possible pointing out “where” and “what”, and finally the “tree” can be put on a map.

One way of putting a problem tree on a map is by showing where the root causes are generated and where the subsequent chain of causes and effects appear. Another way is to identify a key indicator of a certain problem or issue and produce a map that shows the distribution and degree of this indicator.

These kinds of maps draw our attention to the areas where the problems are most severe and thus may help us prioritize. However, it should be noted that in order to find solutions to the problems in a certain area it is necessary to look at the specific problem tree for that area and identify the root causes. For example, the solution to
a drought problem very much depends on the cause of the drought, which cannot be identified only by studying a drought risk map.
Making Strategies and Setting Objectives

Strategy-making for spatial planning builds on the analysis of problems and potentials, but is fundamentally a different type of process.

The starting point for developing a provincial strategy to go with the integrated spatial plan are the National Policies including the National Environment Strategy, the National Socio Economic Development Plan and any legal requirements that must be met by the plans.

So, the first activity is to identify the related issues in the National Policies and the legal requirements.

The National Policies and the legal requirements form the framework within which the provincial partners can prepare the strategy, which will be part of the integrated spatial plan.

If an overall provincial vision or strategy already exist this should also be part of the framework.

The draft series of baseline maps prepared during the Baseline Analysis (on paper, transparency or layers in a GIS format) will be the starting point for initial integrated assessment. Overlay these maps and see if there are overlaps indicating conflicting or competing interests.

Also identify areas where there are no overlaps. Example: are there any areas with potential for agriculture in unpopulated areas.

Check that the outcome of planning frame evaluation mentioned above has been considered and if possible satisfied. If not satisfied explain the reason for this.

Discuss and list major positive and negative impacts that the exploitation of the identified potentials may have.
Strategy-making is a different process from planning. Strategy-making involves data synthesis; looking at all factors simultaneously; seeing the wholeness – in other words a holistic approach using intuition, non-descriptive mind processes undisturbed by language. Planning, on the other hand is an analytical, rational and formalistic undertaking and trying to make strategies in the same way as planning would not be productive.

However, strategy-making should of course be built on analysis of problems and potentials, and after an outline of a strategy has emerged the more rationale analytically oriented work can return to formulate objectives, prioritize and assess various measures and interventions.

Strategy-making can be a somewhat fluid and intangible undertaking, and in order to structure and prepare for putting the strategy into action it is helpful to draw up a series of governing principles. Translating these principles into plans falls in the next phase of the planning process. An example of objectives and related principles is shown in Box 5.1

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Economic Development</td>
<td>- The province should strive towards developing a mining industry including processing industries, but only in areas that are not designated as protected areas.</td>
</tr>
<tr>
<td></td>
<td>- The province should strive towards self-sufficient production of agricultural products.</td>
</tr>
<tr>
<td></td>
<td>- All existing forests including flora and fauna should be protected against exploitation and destruction and may only be used for the maintenance of local people’s livelihoods;</td>
</tr>
<tr>
<td>Watershed protection and climate change adaptation</td>
<td>- All areas previously under shifting cultivation except for areas with potential for agriculture should be reforested;</td>
</tr>
</tbody>
</table>

Prioritization should be based on an agreed set of criteria. These criteria could be derived from National policies and sustainable development principles - see Chapter 1, and from the principles included in the draft strategy for the plan. Although very sophisticated scoring systems have been developed, it is recommended to keep it simple and easy.

Example:
1) Exclude problems/potentials that cannot be solved/reached by spatial planning or are beyond the capabilities of the planning partners;

2) Group all problems that have the same causes in one;

3) Rank problems according to their severity;

4) Favor problems/potentials related to National policies/sustainable development/principles in the strategy.

The formulation of a strategy-outline including objectives, principles and priority issues naturally involves integration and balancing to make the strategy coherent and functional.
Integration and Synthesis

Integration and Synthesis in spatial planning is a giant puzzle, where the pieces are changing in the process.

The main part of the work in this phase of the planning process comprises preparation of planning maps and development of strategic measures.

The previous two phases have produced:

1. Baseline data and baseline maps;
2. Overview and understanding of major problems and potentials;
3. Prioritized list of development potentials and planning issues;
4. Outline of the strategy including overall objectives and principles for the spatial plan;

These products are the framework for preparing planning maps and setting-up strategic measures and regulations.

The preparation of planning maps and strategic measures involve a number of technical sub-processes. In this process we should keep in mind that one of the main objectives is to make it simple and easy to understand and use. The most important sub-processes are:

- Setting criteria;
- Data transformation; map analysis; production of draft maps;
- Define draft measures, regulations and interventions;
- Integration; cross-checking; balancing competing or conflicting interests;
Production and publication of final maps, strategies and measures;

Criteria in this context means the factors that determine land use zones, protection zones, risk areas, potential areas for certain activities etc. First of all, criteria can be derived from laws and regulations; secondly, technical guidelines and administrative standards can provide input; thirdly, criteria have to be adjusted to fit the local situation and the availability of data. Selecting criteria also involves a consultative process to ensure that there is broad agreement on the choice of criteria.

Preparation of planning maps is most easily done by using GIS-software, but for the purpose of this training we will use paper maps and maps on transparency paper, which we can draw on and mark zones and features. The hand drawn maps will eventually be digitized and included in the GIS for the province.

Firstly, baseline data has to be transformed to suit the objective and principles behind the map and to fit with the criteria. A part of this is about making the map simple and easy to understand. This will make it much easier for people without technical background to understand and use the maps, and in this way it supports transparency and public participation.

Secondly, the data has to be processed manually as in our case or by using e.g. GIS-software. The basic data is the input and the data processing is determined by the criteria. The output could for example be a protection zone or potential area for reforestation. In many cases the full process of preparing a Planning Map consists of a series of such sub-processes, where the output of one sub-process is used as input to another sub-process. This often crosses over from map to map. For example, zones in a surface water protection map could form input to another map determining environmental sensitive areas for new landfills.

It goes without saying that this work requires very careful and systematic recording. The key point is to enable tracking of data, criteria and any aggregated or processed map theme, because inevitably at some stage new data will appear, or the criteria has to be changed and this may affect several planning maps. A good way of keeping track of the data is to prepare a matrix between all the baseline data and all the planning maps. Furthermore, for each map it is recommended to draw a diagram showing the input layers/data, the criteria and the output layers.

A typical planning map often contains some kind of zones or demarcation of areas where certain interventions or measures should be activated.

In some cases a zone can be directly derived from a law or regulation; for example the boundaries of a National Park are sometimes given by law. In other cases, we may have to use a set of criteria to define a certain zone.

What is very important to be aware of for planners and users of planning maps; is that when we group criteria and simplify, we also loose something. We cannot see from the map exactly why a certain area is classified as “High” or “Medium” – to know that, we have to expose the whole set of criteria and see which criteria were significant in that particular area.
Development of strategic measures and regulations run in parallel with the map preparation. The measures should be targeted towards the defined objectives and principles. The measures may fall within the following categories:

- Prohibitions/restrictions on land use
- Administration of permissions to certain activities/projects
- Spatial priorities/recommendations for activities and investments
- Guidelines for good practices/management
- Encouragements/incentives
- Human Resource Development

Some measures are recommendations that should be followed; others are binding based on existing laws, regulations and standards and must be followed. Binding measures must have reference to the law, regulation or standard which they are based on.

In order to develop the strategic measures and ensure that environmental considerations are well integrated in the development strategies for the province, we need to carry out what is known as Strategic Environmental Assessment (SEA). To do that we will use a simple but effective tool: A Rapid SEA Matrix. as shown on page 54 in this Guideline. The SEA matrix is good for group work and should be developed district by district and for each of the identified development potentials. The idea is first to identify the requirements for each of the development potentials in the districts. This could be in terms of e.g. requirement for land, labor, natural resources, infrastructure and utilities. Then, each development potential including the whole package of requirements should be assessed in terms of potential positive and negative impacts followed by development of strategic measures necessary to prevent/minimize negative impacts and to optimize positive impacts.

Once the SEA Matrix has been completed on district level, the assessment should be lifted up on provincial level.

Another important and useful tool, which works well in combination with the SEA Matrix, is a Matrix of Development Interests (see page 53). This matrix will help identifying and mapping potential and actual conflicting or competing interests in-between the development potentials as well as between the development potentials and the actual usage of land and resources.

If for example the SEA of the development potentials has identified water quality and quantity in rivers and lakes as a main issue (requirements for water and impacts on water), then the first step would be to clearly define the objective for water quality and quantity. This could be in terms of a general statement such as:

“To ensure that there is sufficient supply of good quality water for a balanced and sustainable agricultural and industrial production and for good quality of life of the population.”
This should be followed by a set of targets such as provision of piped drinking water, Provision of irrigation systems, ambient water quality standards. It is important to define targets for those requirements related to water, which have been described in the SEA Matrix.

The next step is to develop measures directed at ensuring that the targets are met and that impacts are prevented or minimized. In this process, the draft targets and measures should be put on the maps and checked for inconsistencies and conflicts with other issues. This process should result in a series of planning maps and related targets and strategic measures. In this example, their could be a planning map showing the existing water quality, water quality targets and protection zones with certain restrictions in terms of e.g. discharge or wastewater. Another planning map could show the designated water uses in the rivers and lakes including zones designated for hydropower, drinking water resource, etc.

The planning maps should be accompanied by general measures and measures directed towards specific water bodies. Examples of general and specific measures towards water quality targets are listed below:

**General Measures**

- Any person who wishes to extract or use of water from rivers, streams, lakes, reservoirs or groundwater aquifers must apply for permission from the competent authority;

- Any person who wishes to discharge effluents or any kind to rivers, streams, lakes, reservoirs or groundwater aquifers must apply for permission from the competent authority;

- The competent authority shall ensure that permissions to extract or use water or to discharge effluents are given in strict accordance with the Integrated Spatial Plan;

- All concerned agencies and organizations in the province shall within their responsibility and available resources work towards the achievement of the desired water quality as determined in the Integrated Spatial Plan;

- All concerned agencies and organizations in the province shall make sure that activities and projects under their responsibility does not impede or delay the achievement of the desired water quality;

- All concerned agencies and organizations in the province shall prioritize projects and activities relevant to surface water quality in accordance with the priority of the water bodies set forth in the Integrated Spatial Plan.

- The overall priority for allocation of water is: 1. Domestic drinking water; 2. Agriculture; and 3 Industry.

**Specific Measures**

- Safe or maximum amounts of water to be extracted from particular water bodies;
GUIDELINE IN INTEGRATED SPATIAL PLANNING

- Maximum acceptable load to particular water bodies;
- Agency responsible for monitoring the condition of particular water bodies;
- Specification of what kind of activities and projects that are not allowed in a certain protection zone;
- Specification of what kind of activities and projects that should be carried out by the responsible agency/organization for specific water bodies;

More examples are shown in Box 4.1

Box 4.1

**General Measures:**

Proposals for reforestation projects shall be evaluated and prioritized based on the Reforestation Planning Map in the Integrated Spatial Plan.

The [name of agency] is responsible for preparing action plans according to the priorities and zoning directives in the Integrated Spatial Plan.

**Specific Measures:**

The target for reforestation is [...%] forest cover equivalent to [...ha] before the end of [...year]. Reforestation should be implemented in the high priority zone indicated in the Reforestation Planning Map in the Integrated Spatial Plan. All agencies and organizations shall ensure that the following activities/operations under their respective responsibilities are not carried out in the High Priority Zone as indicated in the Integrated Spatial Plan: Mining, construction of highways, land allocation for residential or industrial purposes, construction of industries or other large technical facilities.

Integration has already started in the strategy formulation phase and even during the baseline analysis, but in this final phase integration is more concrete and entails technical cross-checking and a participatory process of balancing competing or conflicting interests. It can be a long process where maps and measures have to be revised several times before a final solution is found.

With your strategy as point of departure, you should list all the different kinds of areas that should or may be developed, rehabilitated or protected. Mark these areas on a transparency or as a GIS layer.
Based on your previously prepared list of potential impacts, you should prepare a matrix of impacts and development. Use this matrix to find out which maps to overlay with the map showing the development areas.

In the same way assess the needs to be fulfilled in order to reach the development goals for the province, and put these on the map. Consider if this has any further impacts.

Are there any overlaps? If yes, what are the conflicts and possible solutions? Do you have to change your strategy?

Prepare a final integrated map indicating protected areas, areas that require rehabilitation and development areas. Add a brief description to the main areas and what measures and regulations should be implemented.

Prepare an integrated Strategic Planning Report explaining the different aspects of the planning process and the findings and decisions taken in the process. An outline of the report set-up can be found in appendix 5.
Implementation

This Chapter deals briefly with the preparation for implementation and application of the Spatial Plan — not with the actual implementation.

Provincial spatial planning as described in this Guideline is a framework plan and not an action plan and would therefore not require a full detailed implementation plan with objectives, targets, indicators, activities, time schedules, responsible implementers, budget and monitoring. However, some of these elements are still important for smooth implementation of a provincial spatial plan, and most of them form an integral part of the planning process as described in the previous chapters.

In brief, the following elements will support and help smooth implementation:

1. First of all the legal status of the Spatial Plan has to be determined. If it is a statutory plan, then it is directly required by law and carries certain legal consequences for implementation, which must be taken into account. However, even if the plan is non-statutory as such, it will still base the measures on laws and regulations.

2. Common understanding; this is also a prerequisite for proper integration and therefore fundamental for the whole planning process. Building a common understanding of the plan and the measures in the plan will reduce the risk of disagreements and mistakes during implementation.

3. Appropriate organization and management of the planning process; same as for “common understanding” a prerequisite for integration. Ensuring that all concerned agencies and organizations have taken part in the planning process will increase their commitment to the implementation of the plan.

4. Clear objectives and principles set the direction for description of measures in the plan, and also serve as a reference point in case of evaluation of new measures or projects—see Chapters 3 and 4.

5. Targets and indicators are normally less precise than required in an Action Plan due to the framework character of the Spatial Plan.
The Planning Maps and Strategic Measures form the core element in implementation as they show and prescribe where and what should be done. Therefore, it is essential that the planning maps are made as simple as possible without losing in precision and accuracy. The measures should determine responsible agencies.

The plan horizon of a spatial plan would normally be around 10 years with regular revisions every 3-4 years, but it should be possible to make amendments outside the regular intervals.

The spatial plan as described here does not relate to a specific budget, but the content of the Planning Maps and Measures should be based on financial and budgetary considerations.

Based on an Integrated Spatial Plan it will be fairly simple to develop an Action Plan describing the required or requested public and private investment projects. This will be of great value for the agencies concerned as well as for private investors.
### Extracts from VI NSEDP

**Sixth National Socio Economic Development Plan (2006-10)**

The Sixth National Socio Economic Plan describes visions and targets that are expected to have minor or major impact on the spatial planning in the provinces.

The following list covering different planning aspect should be used to guide the planning process. The list is a very short summary of visions and statements in the socio economic plan and includes solely statements that are expected to have a direct impact on the spatial planning activities.

<table>
<thead>
<tr>
<th>Poverty Reduction</th>
<th>Natural Resources and the Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision</strong></td>
<td><strong>Vision</strong></td>
</tr>
<tr>
<td>o Poverty eradication and the promotion of equity among different groups of Lao multi-ethnic population within a rapid and sustainable economic growth framework.</td>
<td>o Sustainable utilization of natural resources</td>
</tr>
<tr>
<td><strong>Targets</strong></td>
<td><strong>Targets</strong></td>
</tr>
<tr>
<td>o Accomplish the programme of Education for All</td>
<td>o Protect and conserve the environment to ensure the sustainable development of the country</td>
</tr>
<tr>
<td>o Provide clean water to 65 percent of the rural population</td>
<td>o Reduction of poverty and enhancing the quality of life and health of the Lao people</td>
</tr>
<tr>
<td>o Raise the ratio of green areas to 53-55 percent of all natural areas</td>
<td>** Targets**</td>
</tr>
<tr>
<td></td>
<td>o Balance the socio-economic development and environmental protection to ensure clean and nice environment</td>
</tr>
<tr>
<td></td>
<td>o Develop and manage land resources exploitation and natural resources (water and minerals) in better ways</td>
</tr>
</tbody>
</table>
Focus on solving the problems of environmental damage in the industrial areas and densely populated areas

- Aim to plant 25,000-30,000 ha of forest to increase the ratio of forest cover to 53% in 2010 and increase forest plantation in national parks, inter-provinces and national routes
- Plant trees to cover logged areas and bare hills, particular the areas along the Mekong, while at the same time preserving the natural view
- Develop areas for industrial trees, producing large volumes of goods such as rubber, fruit trees and special trees
- Put an end to slash-and-burn cultivation by 2010

- **Vision**
  - Ensure food security for all people
  - Maintain an average growth rate in agriculture output of 4-5 percent per annum
  - Stabilize shifting cultivation and eradicate opium poppy cultivation
  - Conserve the natural environment and protect threatened species and habitants
  - Maintain a healthy and productive forest cover as an integral part of the rural livelihood systems, and generate a sustainable stream of forest products
  - Improve rural livelihoods

- **Targets**
  - Increase the quantity of food stuffs and vegetable
  - Develop special industrial plantation area in order to reach a big quantity of production
  - Achieve a growth rate of livestock and poultry at 4-5 percent per annum
  - Increase the growing and plantation of aquatic products with high economic value, especially the Mekong River and its branches
  - Plant 25,000-30,000 ha forest to increase the ratio of forest cover to 53-55 percent in 2010

- **Vision**
  - Reduce the disparities between rural areas and urban centres
  - Enhance the transport and communications networks
  - Improve the living conditions of the rural people, especially those in mountainous and remote areas

- **Targets**
  - Reduce the disparities between rural areas and urban centres
  - By 2010, the ratio of poor families in total will reduce steeply and the rural living standards will be improved significantly compared to the situation in 2005
Health

- Vision
  - Improve the health status of citizens
  - Reduce urban-rural health differentials

- Targets
  - Access to fresh water to increase to 75 percent of the people overall
  - Access to fresh water in rural areas to increase to 65 percent of the people
  - Access to basic health care services to reach 100 percent
  - Coverage of toilet facilities meeting general standards to rise to 60 percent
  - In the 72 poor districts 100 percent of the population will have access to Primary Health Care
  - In the 72 poor districts 75 percent will have access to clean water and 55 percent to sanitation

Industry and Minerals

- Vision
  - Develop the industry and mineral sector as a key part of the industrialization and modernization process

- Targets
  - Mobilize the annual growth rate of industry at 13-14 percent, in which electricity production is to grow at 41 percent, manufacturing at 10 percent and mining at 11 percent
  - Provide electricity to 70 percent of households
  - Construct electricity transmission lines and install solar energy and other energy systems to villages
  - Make effort to produce two million pairs of leather shoes of different kinds by 2010
  - Continue to diversify industrial development to maintain the rapid growth of the entire industrial sector
  - Concentrate all resources on developing industrial groups with competitive advantages such as electricity, mining, agro-processing, forestry, aquatic products and seafood, wood products, garments, footwear, electronics and motor vehicle assembly
  - Build selected factories producing materials such as metals, machinery, basic chemicals and chemical fertilizers, in order to exploit the natural advantages and the plentiful labour of the Lao PDR
  - Establish and develop some industrial zones with high technology at potential places like Vientiane, Champasak, Savannakhet and Luang Prabang
  - Establish modern industrial centres of high competitive ability on large scale at the centre of three main economic areas as the engines of national industrial development

Infrastructure

- Vision
  - Provide the necessary infrastructure to sustain a modern nation state, where people in all parts of the country
could easily communicate and participate in development activities in the country and interacts with people and markets outside the country

- **Targets**
  - Increase access to remote areas by building firm roads
  - Construct bridges
  - Construct national roads to link provinces with Vientiane capital, and link national roads to neighboring countries
  - Construct provincial roads to link districts, particular to link the poorest areas
  - Provide water supply to 59 percent of total households
  - Construct and arrange for successful river transportation
  - Develop and construct a railway system
  - Increase the peoples access to electricity, telecommunication, education and health facilities
  - Develop sports infrastructure

- **Vision**
  - Develop the services sector in the coming years to go on diversifying and upgrading the quality of service activities to meet the demands of production, consumption and exports, contributing to economic growth, expansion of employment and improvement of the welfare of the people

- **Targets**
  - Make effort to achieve a growth rate of 7.3-7.8 percent per year for the service sector during the sixth plan period
  - In the year 2010 the sector will attract more than 1.7 million foreign tourist and 2.5 domestic tourist
  - Mobilize 15 percent of the population to train for sports, 8 percent of the households in 80 percent of the provinces and districts
  - Develop sports infrastructure, with 50 percent of districts having sports structure

- **Vision**
  - Achieve a balance between regions and among provinces within the regions, building upon the natural and human resources in each area

- **Targets**
  - The Northern Region
    - Attract a total number of 700,000 to 800,000 tourists with a growth rate of 5.5 percent per year
    - Increase the share of non-agricultural sectors and abolish opium production in all areas
  - The Central Region
    - The proportion of labour in the agricultural sector will be 40-50 percent in 2010
  - The Southern Region
- Plant high yielding rice on 190-195 ha
- Use the Champasak Plain for high yielding rice production for export
- Increase the number of cattle, buffaloes, pigs, sheep and goats
Assessment Tools
### MATRIX OF DEVELOPMENT INTERESTS

<table>
<thead>
<tr>
<th>Mining</th>
<th>Agriculture, paddy field</th>
<th>Agriculture, upland</th>
<th>Industry</th>
<th>Tourism</th>
<th>Residential</th>
<th>Production Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>Mineral resources located in areas suitable for paddy. Provision of water potential conflict. Pollution from mining impacts paddy</td>
<td>No conflicts</td>
<td>Industrial development may impact on paddy and need land which is suitable for paddy</td>
<td>No conflicts</td>
<td>Land needed for residential areas may encroach on land suitable for paddy</td>
<td></td>
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<tr>
<td>Agriculture, paddy fields</td>
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<tr>
<td>Agriculture, upland</td>
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<td>Industry</td>
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<td>Tourism</td>
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<td>Residential</td>
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<tr>
<td>Production forest</td>
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<tr>
<td>Biodiversity</td>
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</table>

*MATRIX for identifying potential/actual conflict of interests of competing interests*
**RAPID STRATEGIC ENVIRONMENTAL ASSESSMENT**

<table>
<thead>
<tr>
<th>District</th>
<th>Potentials</th>
<th>Requirements</th>
<th>Impacts positive/negative</th>
<th>Strategic Measures</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Describe briefly each development potential e.g.</td>
<td>List and describe the expected requirements in terms of e.g.</td>
<td>Identify the main positive and negative impacts of the Development Potential in terms of e.g.</td>
<td>Identify and describe briefly the strategic measures necessary to prevent/minimize negative impacts and to enhance positive impacts</td>
<td></td>
</tr>
<tr>
<td>1. Paper Industry</td>
<td>- Land for factory; - Skilled workforce; - Raw materials; - Water; - Energy; - waste/wastewater disposal; - Drainage; - Access; - sub-suppliers</td>
<td></td>
<td></td>
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<td></td>
<td>2. Eco-Tourism</td>
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<tr>
<td>3. Gold Mining</td>
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</tbody>
</table>
Watershed Classes

1. Areas with very high slopes and rugged landforms. Recharge area where forest required for protection.
2. Areas with steep slopes, usually at higher elevation. Production forest (economic forest) Area lower than class 1. If used for livestock require special protection.
3. Areas with moderate to steep slopes and less erosive landforms. Suitable for agriculture (integrated agriculture), livestock, community forest. Soil conservation required.
5. Gently sloping land and flat areas. Agricultural area suitable for rice, corn and other crop. Conservation of the area required.
Map Examples for Baseline Analysis
Map Examples for Strategy and Planning
Production of thematic maps

Data from data collectors

Database

ArcGIS
Drafted Thematic maps
GUIDELINE IN INTEGRATED SPATIAL PLANNING

Check data on map

Correct map

Scan sketch map
GUIDELINE IN INTEGRATED SPATIAL PLANNING

Digitizing corrections
Corrected Thematic maps
Data Collection

1- Base Map

<table>
<thead>
<tr>
<th>Data</th>
<th>Authority/Agency</th>
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<tbody>
<tr>
<td>Administration boundary</td>
<td>NGD</td>
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<td>- National boundary</td>
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<tr>
<td>- Provincial boundary</td>
<td></td>
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<tr>
<td>- District boundary</td>
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</tr>
<tr>
<td>Provincial centers</td>
<td>NGD</td>
</tr>
<tr>
<td>District centers</td>
<td>NGD</td>
</tr>
<tr>
<td>Villages</td>
<td>NSC</td>
</tr>
<tr>
<td>Population in village</td>
<td>NSC</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>MPWT/PPWTO/NLMA</td>
</tr>
<tr>
<td>Population in urban areas</td>
<td>NSC</td>
</tr>
<tr>
<td>Rivers/Lakes/Ponds</td>
<td>NGD/MRC</td>
</tr>
<tr>
<td>Roads/National roads</td>
<td>MPWT/PPWTO</td>
</tr>
<tr>
<td>DEM/Hill shade</td>
<td>MRC</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>MPWT/PPWTO</td>
</tr>
<tr>
<td>Border crossing points</td>
<td>MPWT/PPWTO</td>
</tr>
<tr>
<td>Schools</td>
<td></td>
</tr>
<tr>
<td>Hospitals and Clinics</td>
<td></td>
</tr>
<tr>
<td>Temples</td>
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</tr>
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</table>

2- Agriculture & Forestry Map

<table>
<thead>
<tr>
<th>Data</th>
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</tr>
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<tbody>
<tr>
<td>Protected area</td>
<td>MAF/PAFO</td>
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<tr>
<td>- NBCA</td>
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<tr>
<td>- Protection forest</td>
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<tr>
<td>- Reforestation area</td>
<td></td>
</tr>
<tr>
<td>- Production forest</td>
<td></td>
</tr>
<tr>
<td>- District conservation area</td>
<td></td>
</tr>
<tr>
<td>- Provincial conservation area</td>
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</tr>
<tr>
<td>Land use</td>
<td>MAF/PAFO</td>
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<td>- Forest land</td>
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<tr>
<td>- Dry dipterocarp forest</td>
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<tr>
<td>- Unstocked forest</td>
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<tr>
<td>- Scrub/Grassland</td>
<td></td>
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<tr>
<td>- Urban/Built up area</td>
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<tr>
<td>- Rice paddy/ray</td>
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</table>
### 3- Industry & Mine Map

<table>
<thead>
<tr>
<th>Data</th>
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<tbody>
<tr>
<td>Factory/Plant locations, type and size</td>
<td>MPI/PPIO/MIB/PIBO</td>
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<td>Industrial zone</td>
<td>MPI/PPIO/MIB/PIBO</td>
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<tr>
<td>Hydropower projects</td>
<td>MEM/PEMO</td>
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<td>- In Operation</td>
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<td>- Under construction</td>
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<tr>
<td>- PDA project</td>
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<tr>
<td>- MOU project</td>
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<td>Hydropower reservoirs</td>
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<td>Electrical power plant</td>
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<td>Transmission lines</td>
<td>MEM/PEMO</td>
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<td>- 500kv Phase 1 - GMS</td>
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<td>- 500kv Phase 2 - GMS</td>
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<td>- 115kv Existing 2 Circuits</td>
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<td>Mining concession</td>
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<td>- Exploitation</td>
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<td>Mineral (Geology)</td>
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### 4- Tourism Map

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<tr>
<td>Historical/Archeological sites</td>
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<td>Cultural sites</td>
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<td>UNESCO conservation site</td>
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<tr>
<td>Museum</td>
<td>NTA/MIC/PICO</td>
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<tr>
<td>Eco-tourism areas</td>
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<tr>
<td>Waterfalls</td>
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<tr>
<td>Scenic views</td>
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<td>Zoo</td>
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<td>Hotel</td>
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<td>Restaurant</td>
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<td>Resort</td>
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### Data and Authority/Agency for Guideline in Integrated Spatial Planning

#### 5- Flood Risk Map

<table>
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<tr>
<td>Historical flood areas</td>
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<tr>
<td>Potential flood areas</td>
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<td>Wetland</td>
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#### 6- Potential Map

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<td>- Rice and vegetable</td>
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<td>- Livestock</td>
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<td>- Reforestation</td>
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<td>Potential for industry</td>
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<tr>
<td>- Hydropower</td>
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<td>- Industrial zone</td>
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</tr>
<tr>
<td>Potential for tourism</td>
<td>NTA</td>
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<tr>
<td>- Cultural sites</td>
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<tr>
<td>- Eco-tourism areas</td>
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<tr>
<td>- View sights</td>
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<td>- Golf course</td>
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<td>- Resort</td>
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<td>Potential for economy</td>
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<td>- Market</td>
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<td>- Infrastructure</td>
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<td>Potential for protection</td>
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<td>- Flood protection</td>
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<tr>
<td>- Forest/biodiversity protection</td>
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#### 7- Planning Map

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<td>Provincial and/or District Administration</td>
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<td>- Urban and village area</td>
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<td>- Road network</td>
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<td>- Market</td>
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<td>- Landfill</td>
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<tr>
<td>Industry</td>
<td>MEM/PEMO/MIB/PIBO</td>
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<tr>
<td>- Wastewater treatment</td>
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<td>- Mining concession</td>
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<td>- Hydropower</td>
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<td>- Industrial development area</td>
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<table>
<thead>
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<th>NTA</th>
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<td>- Cultural sites</td>
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<tr>
<td>- Eco-tourism areas</td>
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<tr>
<td>- Scenic views</td>
<td></td>
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<tr>
<td>- Golf courses</td>
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<td>- Resorts</td>
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<table>
<thead>
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<td>- Forest/biodiversity protection</td>
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<td>- Fish conservation zone</td>
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<tr>
<td>- Groundwater protection</td>
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<td>- Cultural heritage protection</td>
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</tbody>
</table>
Outline of ISP Report

Outline for Integrated Strategic Spatial Plan

Foreword

Message from Head of District/Governor
Message from Vice President of WREA

Acknowledgements

Executive Summary

TABLE OF CONTENTS

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Chapter I: Introduction

Methodology: Description of the planning process, major milestones and basis for the analyses.

Chapter II: Background and Government Policies

Description of the content of policies decrees and plans relevant for the planning process. The required materials could be Vision for the Province, National and Provincial socio-economic plans, National, Sector and Provincial policies, Environmental strategies, Development projects, laws and ministerial decrees. If known climate adaption management issues should also be covered.

Chapter III: Baseline analysis

A. Size, geography, elevation, principal production, population, number of villages, ethnic population.
B. Description of the existing degree of utilization and exploitation of the district.
C. Description of watersheds.
D. Description of the potentials in the different sectors (mining, tourism etc.)
E. Description of the technical problems/restrictions with the present and potential use and development in each sector
F. Statistics
Chapter IV: Strategies for the province or district
   A. Description of relevant issues related to targets and strategies in the socio-economic plan.
   B. Description of relevant issues related to targets and strategies in the national laws and policies
   C. Description of relevant issues in provincial or district regulations
   D. Description of nature and environment strategies.
      a. Potentials and constraints
      b. Challenges and opportunities
   E. Description of business and production strategies.
      a. Potentials and constraints
      b. Challenges and opportunities
   F. Description of people and living strategies.
      a. Potential and constraints
      b. Challenges and opportunities
   G. Description of protection priorities

All or some of the following subjects to be covered by the description: Protected Areas, Land, Water, Biodiversity, Mining, Industry, Agriculture, Tourism, Population, Productions, Investments, Poverty, Education, Health, Hydropower (Dams and reservoirs), Forestry, Production forest, Industrial tree plantations (concession areas)

Chapter V: Integrated spatial strategic plan
   A. Description of development interests (results from the matrix of development interests).
   B. Description of the strategic environmental assessment (results from the rapid strategic environmental assessment).
   C. Description of the short term and long term integrated spatial strategic plan
   D. Description of responsibilities.
   E. Description of the integration into the socio-economic plan.

Chapter VI: Implementation of the integrated strategic spatial plan
   A. Description of activities to implement the plan.
   B. Description of partners, interest groups and affected people.
   C. Description of a short and long term time schedule
   D. Description of information activities
   E. Description of monitoring activities related to the plan

Chapter VII: List of contributors

Chapter VIII: Glossary of terms

Chapter IX: Bibliography

Annexes: Thematic planning maps
Industry, re-forestation, biodiversity conservation, utilization and protection of water resources, mining, tourism, agriculture etc