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Strategic Environmental Assessment (SEA)
Guidelines for Thailand

Prepared for: **Thai National Sub-Committee on SEA Guidelines for the National Committee for Sustainable Development**

Prepared by: **ICEM - International Centre for Environmental Management**

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7th August, 2019

Strategic Environmental Assessment in Thailand

A strategic planning tool to support implementation of the United Nations Sustainable Development Goals, the Thailand 4.0 Strategy and National Economic and Social Development Plan

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ACRONYMS

ADB	Asian Development Bank
EFTEC	Economics for the Environment Consultancy
EIA	Environmental impact assessment
GIS	Geographical Information Systems
GMS	Greater Mekong Subregion
MCA	Multi-criteria analysis
MONRE	Ministry of Natural Resources and Environment
NEB	National Environment Board
NESDC	National Economic and Social Development Council
ONEP	Office of Natural Resources and Environment Policy and Planning
PIP	Public information and participation
SEA	Strategic Environmental Assessment
SEI	Stockholm Environment Institute
SIDA	Swedish International Development Cooperation Agency
SWOT	Strengths, Weaknesses, Opportunities and Threats

DEFINITIONS

Adaptation	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.
Alternative	A possible planning action or proposal, in place of another, that would meet the same purpose and need as the original planning action or proposal. In SEA, different alternatives are usually compared to evaluate their environmental and social risk, benefits and opportunities.
Baseline assessment	"Baseline" refers to past and existing conditions against which subsequent development can be referenced. "Baseline assessment" includes the range of pre-plan studies carried out to: (i) identify key environmental, social and economic factors, which may influence plan content and approach and even project design decisions (eg location and site lay-out); (ii) identify sensitive issues, areas or communities requiring mitigation or compensation; (iii) provide input data to impact prediction models; and (iv) provide baseline data against which the results of future monitoring programs can be compared. The main objective of the baseline assessment is to outline the past and existing conditions to understand changes that may occur as a result of proposed development.
Cumulative impact	An impact on the environment which results from the incremental impact of an action when added to other past, present or reasonably foreseeable future actions regardless of which agency or person undertakes the actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over an area or over a long period of time.
Environment	The air, water, and land in or on which people, animals, and plants live. Bio-physical factors that constitute the environment, include soil, water, air, sound, light, living organisms, ecological systems and other physical and biological forms.
Environmental impact assessment	A process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
Environmental Impacts	Positive or negative impacts on ecosystems, natural resources, biodiversity, cultivated land, water resources and climate change, including natural heritage.
Mitigation	The elimination, reduction or control of the adverse environmental and social effects of a policy, plan or program, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.
Plan	A detailed proposal by each sector and level of government for achieving an intended future course of action within a specific timeframe according to specific goal(s) or objective(s). In Thailand, the hierarchy of plans includes, for example, the National Economic and Social Development Plan prepared by NESDC, the Thailand Climate Change Master Plan, line agency plans such as the Power

Development Plan and Water Resource Management Strategic Plan, regional and area based plans and local government plans.

Policy

The vision and the overall direction of the work in each sector of Government and Ministry in order to guide the identification of strategic plans and programs related to the management, use, and protection of natural resources and the protection of the environment, for example, the Thailand 4.0 Policy to promote industrial development. In Thailand policy is often spelt out in strategies and master plans and includes for example, the national energy policy.

Program

A detailed set of related measures or activities with a particular long-term aim intended to implement a higher level plan and policy of government. For example, the Thailand Community Based Disaster Risk Management Program and the 30 Baht Health Care Program.

Project

A description or design of a specific development activity of any investment related to the implementation of plans or programmes. Normally, projects are subject to EIA not SEA.

Proponent

The entities organizing, proposing, or advocating a particular development policy, plan or project. A proponent could be the designer(s), developer(s) and/or investor(s), or other parties working on behalf of the plan or project. For example, government ministries, local authorities, government agencies, semi-government authorities, and public corporations proposing or preparing a development plan would be identified as proponents of the plan, and responsible for initiating and overseeing an SEA as part of the planning process. They are the "plan makers".

Scenarios

Different development options being considered in the planning process. In SEA, development scenarios are often compared and evaluated in terms of their environmental impacts and risks. This process can be used to assist decision makers to choose the most sustainable option.

Scoping

A process for setting the boundaries of an SEA. Scoping defines an SEA's substantive, temporal and spatial coverage. It can also identify the stakeholders to be involved in the assessment. Scoping is an early step in the SEA process, but it can continue throughout an SEA as more information and analysis comes to hand – ie to continue sharpening the focus of the assessment. Scoping needs to be an intensely consultative process.

Screening

The process for deciding whether a particular plan - or variation to a plan, other than those for which SEA is mandatory, would be likely to have significant environmental effects, and would thus warrant conducting a SEA. It is carried out as the first step in the process of conducting a SEA. It can also include preparation of the SEA TOR once a decision to proceed has been made.

SEA

An analytical and participatory process that aims to integrate environmental, economic and social considerations into strategic planning and decision-making to enhance its sustainability. SEAs are used for creating, improving, revising and implementing policies, plans and programs of government agencies. They are concerned with modifying the quality of development by integrating ecological, equity and environmental quality considerations along with economic objectives.

	SEAs seek to avoid or minimize negative impacts of plans on the social and natural environment. SEAs are broader in coverage than EIAs and include consideration of the effects of climate change and long term economic strategies in meeting sustainable development goals.
Social Impact	Positive or negative impacts on life, health, property, and daily living of people, including people's homes, cultural and historical heritage.
Stakeholder	Organisations or individuals who may be potentially affected or interested in the development planning or SEA process. This may include government agencies, academic and research institutes, non-government organizations, private sector and the public.
Strategy	-2050).A high level, long term policy and/or master plan designed to achieve a major overall aim of government. For example, the Thai 20 year National Strategic Plan for 2017-2036 and the National Climate Change Master Plan (2015
Sustainability analysis	Sustainability analysis or assessment includes any process that directs decision-making towards sustainability. SEAs are a form of sustainability analysis covering plans, programs and policies. It is best considered as an umbrella term encompassing a range of impact assessment practice. Its focus is broad, considers cumulative effects, is forward-looking, and incorporates intergenerational timescales. It is integrated across broad spatial scales and sectors; and comprehensive in coverage assessing the three pillars of sustainability - environmental, social and economic effects as well as indirect effects.
Sustainable development	The principle of meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend. It is development that meets the needs of the present without compromising the ability of future generations to meet their own needs
Trend analysis	The interpretation of changes in environmental and other social or economic issues over time. These changes can be considered with relation to past trends, the current situation, and the likely evolution of future trends. In SEA, trend analysis can be used to compare different planning scenarios

1.   INTRODUCTION

1.1 SEA definition

In these guidelines, Strategic Environmental Assessment is defined to mean:

An analytical and participatory process that aims to integrate environmental, economic and social considerations into strategic planning and decision-making to enhance its sustainability.

The definition covers SEAs of plans and programs and even situations where no plans exist but where development pressures and environmental and social concerns require strategic assessment to define management frameworks for sustainability. In these Guideline the term "plan" is used to represent all forms of strategies and plans, programs and any "policy" components which they contain. World-wide the distinction between policies, strategies, plans and program is not well defined or consistent. Often they are used interchangeably. For that reason, in this document "plan" is applied as an all embracing term.

1.2 SEA Development in Thailand

Thailand has practiced strategic environmental assessment (SEA) of plans and programmes for close to 20 years. In 2003, the Ministry of Natural Resources and Environment (MONRE) through the Office of Natural Resources and Environment Policy and Planning (ONEP) started to revise and improve the EIA system and recommended that SEA be used as a tool to enhance environmental management. In 2004, the National Environment Board (NEB) recommended preparing procedures for undertaking SEA in parallel with policy, plan and program formulation at regional and sector levels as a way of reducing conflict and encouraging sustainable development.

In 2005, in response to the interest shown in SEA by government agencies and civil society, an SEA Subcommittee was established under NEB. Its purpose was to oversee the development of SEA, and to sponsor several pilot studies. In 2009, ONEP launched Thailand's first SEA guideline. The 10th National Economic and Social Development Plan (2007 – 2011) made mention of the need for SEA, and the 12th Plan (2017 – 2021) anticipates legislation to make SEA legally binding.

The NEB resolution 3/2009 called for government agencies to apply SEA in their policy and plan process, which may have substantial impacts on the environment and society.

These initiatives have resulted in more than 30 pilot SEAs being conducted by proponent government agencies and civil society organizations. This extensive piloting has been a major learning experience and provides the basis for the current phase of SEA system development.

On the 20th August 2017, a SEA Subcommittee was established under the National Sustainable Development Committee to spearhead SEA system development in Thailand. To institutionalize SEA as part of the national policy and planning system, the Office of the National Economic and Social Development Council (NESDC) and MoNRE were designated the joint national focal point for SEA system development to act as secretariat to the SEA Subcommittee.

1.3 Purpose of the Guidelines

The Guidelines have been designed to capture internationally accepted principles and good practices for SEA, while being tailored to Thailand's current needs and level of experience. They aim to promote a common understanding of the concept and objectives of SEA, which in turn should encourage the development of better and more effective plans and programmes that integrate environmental and social considerations with those of economic development. In this way, the Guidelines will help Thailand to meet its development goals through sustainable pathways which embrace the United Nation's Sustainable Development Goals to 2030 and Thailand's 12th Socio-economic Development Plan (2018-2022).

The guidelines promote a common approach to SEA that should strengthen institutional capacity for integrating environmental and social concerns with development while preparing or revising plans at the national, regional or local level and across different sectors.

The Guidelines are targeted at proponents, notably government agencies responsible for decision-making and formulating plans, such as line ministries, authorities, or publicly-owned corporations. They will be useful for government agencies responsible for reviewing SEAs and for private sector organisations wishing to improve their sustainability performance.

The Guidelines may also be important for consultants involved in conducting SEA, and to others with an interest in research, teaching or training in this field.

1.4 Target Groups

There are four main target groups for these Guidelines:

(i) *The lead agencies responsible for undertaking SEA of proposed initiatives*. It is likely that these agencies will be Government Ministries, national line agencies, regional and local government authorities, or publicly-owned corporations proposing either new or redrafted plans. In these Guidelines, those agencies are referred to as "proponents".

(ii) Government agencies responsible for reviewing completed SEA reports.

(iii) Consultancy firms responsible for undertaking SEAs on behalf of proponents.

(iv) *NGOs, the private sector, academia and members of the public*, with an interest in the strategic assessment of proposals and sustainability of development.

1.5 Structure of the Guidelines

The SEA Guidelines prepared by the SEA Subcommittee build on earlier work and SEA experiences in Thailand to provide directions for the most appropriate SEA procedures and tools for Thai conditions. The objective is to have SEAs applied to plans and programs in Thailand in a systematic way so the sustainability of development is improved over time. The Guidelines consist of three parts, and three Annexes.

Part 1 introduces the purpose of SEA, by discussing the overall need for the tool, along with the objectives of the Guidelines. The relationship between SEA and the development of plans and programmes is discussed.

Part 2 presents the process steps that should be followed by proponents when they undertake SEAs. The key stages involved in SEA are introduced: screening, scoping, baseline assessment, impact or sustainability assessment (including consideration of alternatives), sustainable development pathway definition, and monitoring and evaluation. Reporting and stakeholder review needs to take place at each stage if feasible and at least during the baseline and impact assessment stages and for the sustainable development pathway stage. Normally, a final report is prepared which summarises the process, outcomes and lessons.

Part 3 outlines the administrative arrangements that are required within the Thai regulatory system to ensure that SEA takes place in a systematic fashion to the highest standards, and that all stakeholders are aware of the formal steps that need to occur during the SEA, and during review and implementation.

Annex 1 presents a summary introduction of the various tools that can be applied during the SEA. **Annex 2** outlines how public participation and communications should work within the SEA process. **Annex 3** lists past Thai SEAs.

2. PART 1: CHARACTERISTICS OF SEA

2.1 SEA scope and distinguishing features

These guidelines aim to support wider application of SEA in Thailand so it becomes a systematic part of the development planning and decision making process. In the guidelines the term "plan" is taken to include all forms of plans, programs and other strategic initiatives and decisions shaping the use of resources and ecological and social well-being in an area or sector.

SEA is a tool for assessing the environmental and social implications of plans and for ensuring those concerns are integrated into plan formulation and implementation. As applied internationally, SEA are linked to policy, legislation, plans, programmes and development-related strategies and decisions across a range of sectors (such as energy and transport), geographical areas (national, regional or local) or issues (such as, trade agreements, climate change or biodiversity). In some countries such as China and Vietnam and within the European Community, SEAs are mandatory for most types of plans – and specific projects cannot proceed unless a higher level SEA has been completed. In other countries such as Australia SEAs are applied at the discretion of ministers or proponent agencies. In Asia, SEAs are most commonly applied to development plans with a particular focus on the energy, transport, waste and water sectors and on area based plans such as special economic regions, river basins and provinces. Line Ministries and lead agencies generally initiate the SEA process as the plan "owners".

SEAs do not focus on individual projects. That is the role of environmental impact assessment (EIA), as prescribed through regulations under the *Enhancement and Conservation of the National Environmental Quality Act* and as illustrated in Figure 1. Project specific environmental assessment – even for major projects – is best left to the EIA and not the SEA process. Even so in Thailand, SEAs have been conducted into major projects with disappointing results. The distinctive features of SEA and EIA are listed in Table 1 to show that SEA is a proactive tool which is applied prior to detailed projects being formulated, while EIA is a reactive tool applied once a project is proposed.

Figure 1: The level of focus of SEA and EIA
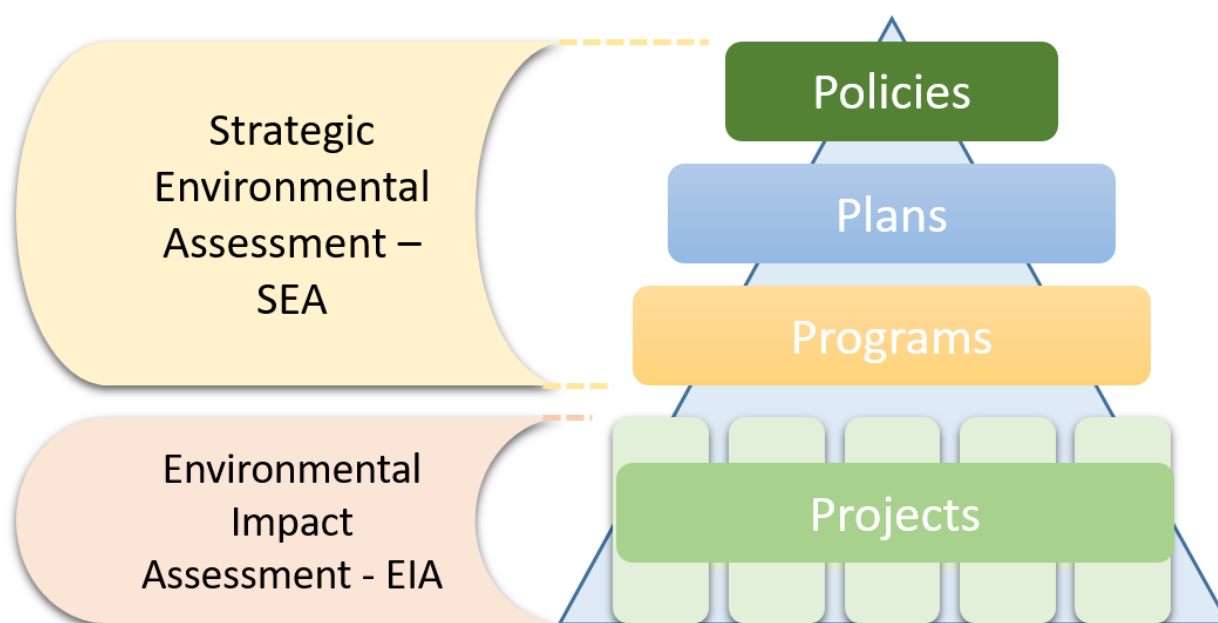
Table 1: The distinguishing features of SEA and EIA

SEA   SEA and EIA compared   EIA

SEA	EIA
• Takes place at earlies stages of decision-making cycle	• Takes place at end of decision-making cycle
• Multi-stage process applied flexibly to suit the planning situation	• Well-defined process, clear beginning and end
• Pro-active, out-in-front approach to development proposals	• Reacts to specific development proposal
• Broad level of analysis, e.g. focus on cross-sector links and issues	• Detailed, cause-effect analysis of the impact of project components
• Considers potentially wide range of development alternatives	• Considers limited range of feasible alternatives (how to carry out projects)
• Gives early warning of cumulative impacts (sectors or region wide)	• Limited opportunity to address cumulative impacts at project level
• Emphasis on meeting goals and safeguards for the environment	• Emphasis on mitigating and minimizing impacts
• Focus on 'do most good'	• Focus on do no/least harm

2.2 SEA process governing principles

The principles shaping and governing the SEA process have their foundation in promoting and achieving ecological sustainability and social equity and well-being. The principles require that SEAs

Promote ecological sustainable development (ESD): The most important principle and driver of SEA processes relates to the goal of transforming all development plans so they embrace ecological sustainability as a principle objective. ESD involves using, conserving and enhancing resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased. ESD requires the effective integration of economic, environmental, social and equity considerations in decision-making processes. At its heart is the need for ecosystems to maintain their essential functions and processes, and restore and retain their biodiversity in full measure over the long-term.

Promote transparency - Stakeholders must understand how the SEA process is being applied, how assessments are being undertaken and how follow up decisions are being made. Without this transparency, the process will not be trusted and the results will not be accepted.

Promote inclusiveness - SEA should seek to involve stakeholders who consider themselves or their interests to be affected by a plan. Individuals or groups need to respect the process as just and fair. This is challenging for SEAs which have such broad scope and potentially affect so many interests. SEA teams should seek to optimize – not maximise – participation and they should engage stakeholders in the decisions on how to achieve that in a fair and representative way.

Simply communicate information which is reliable and accessible. The SEA process must be based on unbiased, adequate, accessible and complete information about impacts, issues, concerns and processes. Information and analysis should be understandable to participants and communicated effectively in plain language.

Are independent: SEAs needs to be independent of the proponent and special interests. They should be independent of either real or apprehended conflicts of interest and bias.

Build consensus: The SEA process should encourage co-operation and reduce conflict. The open and collaborative SEA process should move stakeholders from conflict toward consensus and should facilitate the building of positive relationships among proponents and interested parties. This can be the most difficult aspect of SEAs, especially in situations where polarization of views and past negative experience within communities have led to intense levels of conflict over development options. New tools and team skills may need to be introduced to the SEA process which facilitate mediation and conflict resolution on key strategic issues.

Are flexible: No one SEA methodology will apply to all strategic actions. Proponents and SEA teams need to think in terms of an array of SEA tools from which the appropriate ones can be selected to meet the needs of the particular circumstances. An SEA should be shaped to address the needs of the target plan, planning process and related institutions and stakeholders.

Promote learning: SEAs should contribute original analysis and knowledge to the planning process so that the quality of informed decisions is improved and future plans and assessments can build on a much enhanced evidence base.

2.3 SEA benefits

Practice around the world indicates that SEA provides a number of benefits, including:

SEAs save time and money by:

- helping to avoid unplanned and unwanted environmental and social effects and irreversible ecological degradation and wasteful use of natural resources;
- helping to avoid costs that may be associated with controversial strategic decisions and be delayed due to opposition;
- allowing for significant public input; and,
- helping to focus and streamline project EIAs which are proposed within the umbrella of the target plan.

SEA improves governance by:

- increasing coherence in strategic planning.
- enabling early resolution of conflicts that may later slow implementation of strategic decisions.
- mobilising support of key stakeholders for implementation of optimised plans.
- supporting a shift in economic planning towards sustainable development.

2.4 Relationship between SEA and preparation of a development plan

The purpose of SEA is to positively influence the development of a plan and to improve its sustainability performance. Therefore, it is important to determine *when* it is best to carried out the assessment. To ensure that SEA has an influence on the shape and content of a plan, it is best undertaken prior to its formal endorsement.

In practice, SEAs can be undertaken at any point in the development planning cycle even if a new plan is not yet being prepared. In those cases the SEA is an assessment of an existing plan with the purpose of having it revised and/or influencing the shape and content of a future plan based on the experience of current implementation.

SEAs are an important strategic planning tool even in situations where no plan is in place – or at least where the plan may only be a modest list of projects, as in the case of many river basin plans in Thailand. In all situations the aim of the SEA is to reorient the quality of development so it contributes to ecological sustainability and social equity and well-being.

2.4.1 SEAs of future plans

The best situation for conducting a SEA is as an integral part of the development planning process. That means the SEA team is part of the plan preparation team and that economic measures are defined in response to and integrated with environmental and social considerations.

The long term goal is to have development planning teams with the capacity, knowledge and commitment to prepare their plans from the overriding perspective of sustainability. For that to happen planning and development legislation across all arms of government in Thailand would need to be modified to identify sustainability as the primary goal and to provide direction and standards on how it is to be achieved. In that future situation, SEAs would become more of an auditing process to ensure that plans meet national, sector and local sustainability commitments.

It is inevitable that each sector and level of government will need to move towards having sustainability as their core objective. Intensifying environmental, social and climate change imperatives will require it. Yet, that will take time. In the meantime, SEAs are needed in Thailand as a strategic planning tool to reorient plans and fill gaps in analysis. SEA teams often will need to "stand in the shoes" of the development planners in ensuring sustainability is a primary concern along with the consideration of alternatives and cumulative impacts.

In summary, SEAs can be conducted at any point in the development planning cycle – but the closer they are to the stage of preparing the new plan and to having a planning team and committee in place to work with the better.

2.4.2 SEAs of existing plans

SEA may need to be applied if a plan encounters implementation difficulties, public opposition or is having serious environmental and social impacts. Also, an SEA is appropriate if a plan is to be reviewed and revised as a normal part of the Thai development planning process. This type of SEA can be important as it may disclose missing perspectives and information which have come to light during implementation, and which will lead to improved sustainability performance. Most important, an SEA at this stage, can influence the next plan iteration in the normal development planning cycle.

2.4.3 SEA conducted when a plan is not in place

Another situation in which SEA can be conducted is when no development plan is in place or in process. At the time of preparing this guidance, for example, SEAs were being conducted for Thailand's river basins, some without development plans or with plans in the form of a list of desired projects. Other area based cases where SEAs have been carried out in Asia relate to important or vulnerable regions under development pressure such as coastal zones, industrial areas, forest complexes or for development of many projects on international rivers. SEAs have also been applied to help address concerns such as drought, climate change and long term rehabilitation and development challenges following disasters such as the Aceh tsunami or earthquake in Nepal. In those cased no prior plan was in place.

There are important benefits in using SEA as a strategic planning tool whether or not a development plan is in place or process. The assessment can lead to consensus on a sustainable development framework and on the need for its expression in a formal development plan which can then be prepared and reviewed on a cyclical basis.

3.   PART 2: PROCESS FOR UNDERTAKING SEA

3.1 The SEA Process at a Glance

There is no single way to conduct SEAs. The detailed steps in the SEA process and the tools they use should be defined and identified according to the specific needs of the planning situation and SEA team capacities. A river basin SEA will require a different approach to a national sector SEA, linked to energy sector planning for example. The SEA team needs to have the confidence and knowledge to discuss and shape the SEA process and tools to meet the circumstances. In situations where the development planning system is heavily oriented to economic outcomes, where the quality of plans is variable, where information is lacking, unreliable or inaccessible, and where most plans have not considered substantive, spatial or temporal alternatives or cumulative effects, SEA shape will need to be moulded around the content and objectives of the target plan or area. Flexibility and adaptive management are essential in effective SEAs.

Even so, there are basic stages or components in the SEA process which are best applied in all assessments. Those steps outlined in this chapter of the guidelines have been defined based on experience in Thailand. They need to be relatively simple, logical and easy for the team to apply and for stakeholders to understand. They need to allow for an efficient and disciplined delivery of strategic advice to the proponent in a timely manner.

The main stages of the SEA process are summarized in this section.   As illustrated in Figure 2, the stages in the SEA process are:

1. Screening
2. Scoping
3. Baseline assessment
4. Sustainability analysis (impact assessment)
5. The sustainable development pathway
6. Final reporting
7. Monitoring and evaluation

3.2 Stage 1: Screening

Screening responds to the question: "*is an SEA required*?"

- The screening decision is based on:

  (i)   the list of plans or situations for which SEAs are required, as prescribed by national law, regulation or Prime Minister's Order; and/or

  (ii)   initial review by a proponent or responsible agency of whether or not a plan is likely to have significant environmental and/or social impacts.

- If the plan is not listed for mandatory SEA and is unlikely to have significant environmental or social consequences, the proponent should indicate this in the plan proposal when submitting to the relevant authority for approval.

- If the plan is regulated to require SEA, or is found likely to have significant environmental and/or social consequences, the proponent must prepare an SEA TOR to engage an independent technical team to conduct the SEA and then proceed to Stage 2

Each agency and level of government should initiate an SEA in any situation in which they conclude a plan is likely to have unwanted environmental and social consequences. In making that judgement agencies should err on the side of caution. SEAs are a facilitating and enriching tool which improve the efficiency, effectiveness and sustainability performance of any plan. Agencies have much to gain by making them a systematic fixture in their development planning process.

3.3 Stage 2: Scoping

Scoping responds to the question: "what are the substantive, spatial and temporal boundaries to the SEA?"

A scoping process should establish the focus of an SEA, the scope of the analysis needed, and the relevant criteria for assessment. It provides an opportunity to focus the process on the important issues to maximise its usefulness to the authorities, decision-makers and public.

The scoping process should be open and iterative, involving key stakeholders, in order to:

- *review the context and confirm the spatial boundaries of the SEA* (that will require understanding of the plan objectives to assist in determining the spatial and temporal scale to be covered in the SEA);
- *identify key issues and areas of strategic concern* to the plan, as the focus and content of the SEA and group them into strategic themes or sectors;
- *Identify the SEA sustainable development objectives for each strategic theme* – drawing from existing Government policies and plans, international best practice and stakeholder input.
- *Identify indicators for the defined sustainable development objectives.* The indicators help in the baseline and impact assessment and provide an initial framework for monitoring of the plan as well as uptake of SEA recommendations. The indicators should help describe and interpret the strategic issues which are the focus for the SEA.
- Undertake stakeholder analysis and prepare a *SEA consultation and communications plan* – effective consultation and communications is the life blood of an SEA;
- *Prepare a scoping report* for stakeholder and public review and comment; and finalise in response to comments.
- *Begin to identify baseline and other data requirements* and initiate collection.

At the scoping stage, the main information gathering is through consultation with stakeholders in the plan. The first step should be consultation with the proponent agency's SEA core team or taskforce. External experts may be involved to help highlight strategic issues.

Consultation with stakeholders should include a scoping workshop with participatory working sessions. Other relevant methods can be used such as: in-depth interviews; questionnaires; drawing on expert opinion; multi-level focus group meetings; and public meetings.

Scoping is not a one off process. The SEA scope can be sharpened and adjusted as the SEA proceeds and more information and views come to hand to help in improving the strategic focus of the assessment.

Figure 2: Steps in the SEA Process

1. Screening
- Is an SEA required?
- Yes - because it is mandatory and/or the plan has significant potential impacts

2. Scoping
- What are the substantive, spatial and temporal boundaries to the SEA?
- Identifying the strategic themes and issues

- *Identify the SEA sustainable development objectives for each strategic theme*
- *Identify indicators for the defined sustainable development objectives*

3. Baseline assessment
- What are the past trends and current status of the strategic themes and issues of concern to the plan

4. Sustainability analysis
- What impacts will the plan and its alternatives have on sustainability?
- Identifying the alternatives
- Assessing the sustainability of alternatives

- *Alternatives are often grouped into "broader" development scenarios – the Business as Usual and "the plan" are two scenarios*
- *Each alternative is assessed against the SEA sustainability objectives*

5. Sustainability pathway
- What measures under each strategic theme and issue will best meet the sustainable development objectives?

- *Avoid risks (negative effects) of the plan*
- *Enhance benefits (positive effects) of the plan*
- *Mitigate (reduce) negative effects that can't be avoided*

6. Final reporting
- What priorities for action is the SEA recommending, and how will they be implemented and monitored?

7. Monitoring and evaluation
- How will the plan be monitored and evaluated to ensure it is on track in implementing the SD pathway

- *Apply the indicator framework defined for the sustainable development objectives*
- *Clearly designate responsibilities for improving sustainability performance*

3.3.1 Reviewing the proposed plan

The SEA may be conducted to review an existing plan as a way of improving the next plan in the development cycle. In that case, the existing plan and its implementation experience is the focus of the SEA. Alternatively, the SEA may have been initiated when the planning process is well advanced and a draft plan is available. In that case the SEA would focus on the draft plan objectives and content.

Either way, early in scoping, it is necessary to fully understand the nature and content of the existing or proposed plan. A summary of the existing or draft plan should be made available to stakeholders along with copies of the full plan when requested.

It is important for stakeholders to understand the plan content including its vision and objectives and how they are expressed through the detailed plan priorities, measures and projects. Stakeholders can begin to evaluate the plan against what has been identified through the SEA discussions as the strategic issues and themes of concern to the sector or area subject to the plan. Stakeholders and the SEA team need to begin appreciating if the objectives of the plan are in line with existing government environmental, social or other sector objectives. This will involve careful examination of the wider policy and legal framework of relevance to the plan content and implementation.

3.3.2 Setting sustainable development objectives

Once strategic themes and issues of concern to development in the sector or areas which are subject to the plan have been identified with stakeholders, the SEA team can define sustainable development (SD) objectives linked to each strategic theme. Those SD objectives should only relate to the themes and issues identified by stakeholders through the scoping process. They become the framework against which the strategic assessment is conducted.

The main source of sustainable development objectives will be from government policies and plans in the relevant sectors. Other sources can be international agreements to which Thailand is a signatory and from international best practice as reflected in reports from UN and other respected international technical agencies. Ultimately, the SD objectives will need to be shaped by the SEA team guided by discussion and input of stakeholders at workshops and in round table meetings.

3.3.3 The SEA Consultation and Communications Plan

Every SEA must prepare a Consultation and Communications Plan to guide stakeholder engagement in the process from the outset. Further guidance on effective consultation and communications in SEAs is provided in Annex 2. The first step is to conduct a stakeholder analysis which addresses issues such as:

- who are the main stakeholders of the proposed plan?
- what benefits are they likely to gain?
- what impacts are they likely to bear?
- what role do they play in various development scenarios?

Stakeholders may be government agencies, individuals, groups, organizations, institutes, or communities that may gain or lose from the proposed plan.

The stakeholder analysis should define the participation strategy and communication plan to be used throughout the SEA. Stakeholder meetings during earlier stages of the SEA can help improve (as needed) the draft consultation & communications plan.

Stakeholders need to be involved at each stage of the SEA – through specially convened workshops and round table meetings. The progressive reporting for stakeholder review and comment ensures that participants have an opportunity to shape and rectify facts, issues and viewpoints as the SEA moves forward (Figure 3).

Figure 3: SEAs as a staged process of documentation and consultation
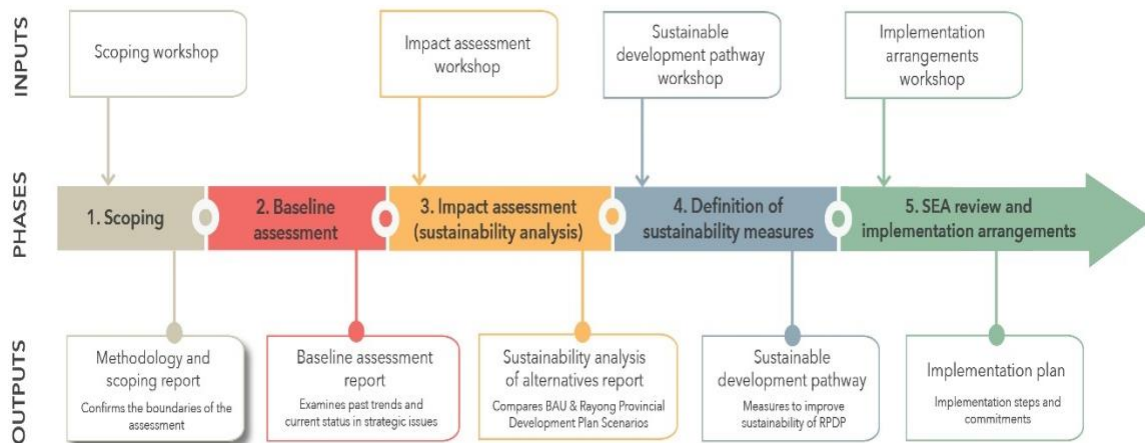
SEAs need to be strategic in which stakeholders to involve in different forms of consultation. Because of the broad nature of strategic assessments, it is not possible to involve all those with an interest in the plan in all consultative activities. SEAs need to engage "gate keepers" or 'public representatives' of interest groups rather than all their members.

The methods used to communicate with stakeholders need to be defined with the backbone being the distribution for stakeholder comment SEA reporting outputs at key stages in the process. Those reporting outputs may need to be supported by briefs, radio and TV spots, and even video materials.

If certain stakeholders have limited experience with strategic level planning, awareness raising activities can be included in the public engagement process – to raise awareness of the ways in which they can make their views known. It is important to identify and engage those stakeholders who may be the most exposed to environmental degradation and social change as a result of the plan or programme. In general, environmental and social pressures tend to affect the poor and vulnerable populations more seriously. Women, men and youth, indigenous peoples' groups should be included in this public-engagement process to draw on all relevant knowledge.

Stakeholders are comprised of many interest groups, with conflicting objectives, e.g. men and women with different rights and responsibilities, educated and uneducated people, young people and elder traditional people, different economic and cultural groups. The role of the public consultation in SEA should be to provide a mechanism for identifying and trying to resolve differing views in a constructive way.

Stakeholder groups identified as most affected by a given plan or programme may be politically and/or socially marginalized and may have little or no experience in providing input to decision-making. Public consultation processes will have to identify the best way to ensure that the socially marginalized groups (e.g. the poor, minority ethnic groups, itinerant/migrant groups) can participate effectively and can have their viewpoints given proper consideration. This may involve reaching out to stakeholders who do not have access to the internet, lack access to public libraries, speak a different language, are illiterate; have cultural differences, or other characteristics that need to be considered when planning for their engagement.

Authorities which, because of their environmental and social responsibilities, are likely to be concerned by the effects of implementing the plan must be consulted on the scope and level of detail of the information to be included in the SEA reporting.

Ultimately, the extent to which stakeholders can be involved – and the nature of that involvement will depend on the budget and duration set for the SEA. In SEAs it is not feasible or desirable to involve all individuals and groups which may be affected directly or indirectly by a plan. Too great an emphasis

on comprehensive participation can mean the SEA loses its strategic focus and becomes bogged down by parochial issues normally addressed through EIAs.

3.4 Stage 3: Baseline assessment

The baseline assessment responds to the question: "what are the past trends and current status of the strategic themes and issues of concern to the plan?"

SEAs need to be based on a thorough understanding of the economic, environment and social conditions and context for the plan. The recording of that context in an accurate and up to date way provides the foundation for the later phases of the SEA. It provides the basis against which the plan and its alternatives are assessed. Also, the baseline assessment is an important step in building the authority and credibility of the SEA in the eyes of stakeholders. The baseline assessment report and associated database and GIS products are important SEA outputs in their own right as an essential resource for development planning.

So a critical step for the SEA team is to identify and acquire baseline information, drawing from all relevant sources. This must involve more than a mere inventory, e.g. listing flora, fauna, landscape, urban environments, ethnological or cultural groups. Particular attention should be paid to ecological systems and services, their resilience and vulnerability, and their significance for human well-being. Existing environmental and social protection measures and /or objectives set out in international, regional, national and local plans or programme should be reviewed.

The guiding framework and focus for this information gathering are the strategic themes and issues of concern to development in the sector or areas which are subject to the plan and which were identified with stakeholders. SEAs need to be strategic in the information they gather. It is not a process of gathering and reporting on data for data's sake. The SEA team needs to follow a highly disciplined and finally tuned information gathering process focused on the strategic themes and issues. The categories of information which may be required is illustrated in Box 1.

An especially important method during the baseline assessment – and feeding into the next stage of impact assessment – is trend analysis which takes the strategic themes and issues identified by stakeholders and maps out the past trends for each and the drivers which shape those trends (Figure 4).

Figure 4: SEA stages and trend analysis
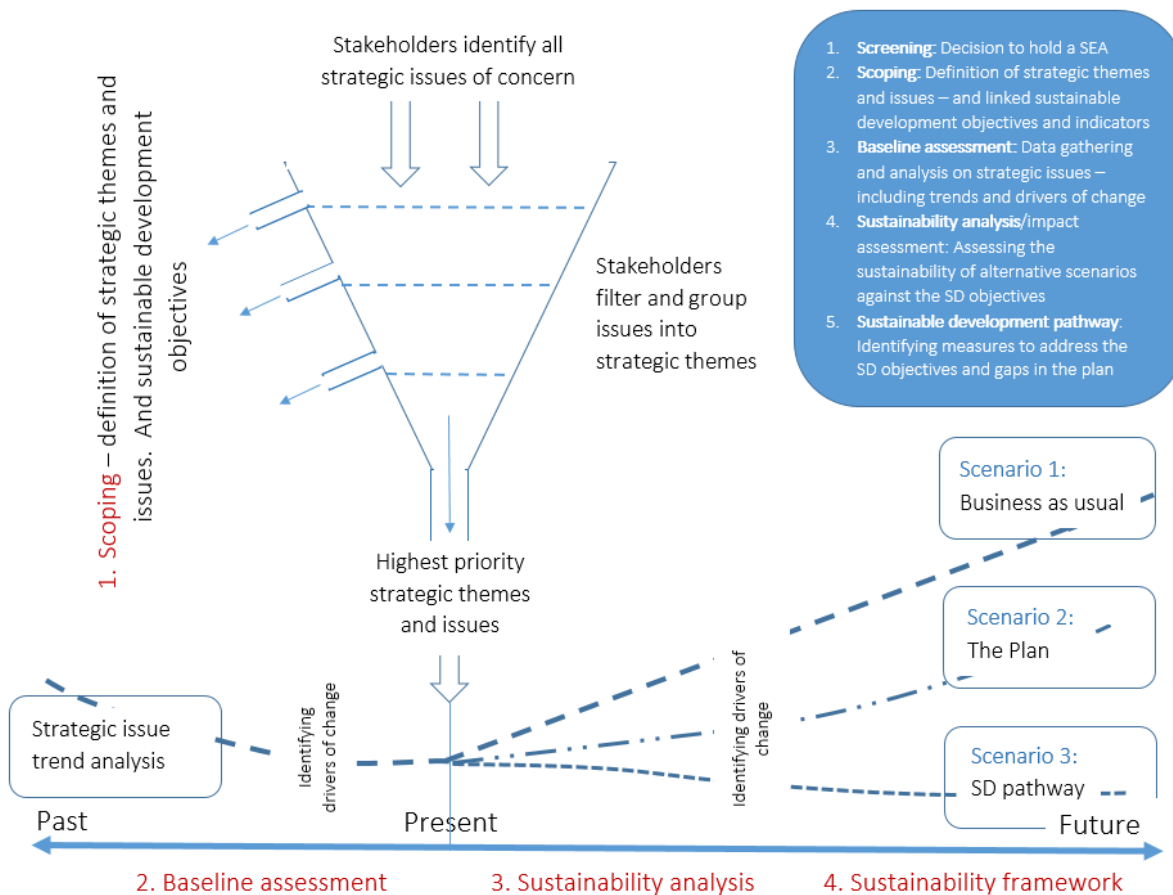
In summary the baseline assessment needs to:

- Identify key sources of data and information for the strategic themes and issues and in response to the linked indicators developed in the scoping stage;
- Initiate collection of baseline data and design and build the SEA data base (the database becomes an important resource for future development planning)
- Review and revise the SEA scope, and its strategic issues and indicators based on the baseline assessment.
- Define past trends in the strategic themes and issues – and identify the drivers which have shaped them, including the influence of other policies and plans
- Where resources and capacities are available, set up and initiate models to feed the impact assessment/sustainability analysis of alternatives/scenarios. Models might relate to, for example, hydrology, climate change, macro-economic analysis, alternative routings, biodiversity assessment or demographics.
- Conduct a baseline assessment workshop to present and review initial SEA baseline assessment findings.
- Prepare a baseline assessment report for stakeholder review and comment. This is an important step to ensure data is correct and stakeholders see evidence that their views have been heard.
- Start identifying potential alternatives to the plan or plan components.

- Design and conduct new research/field studies to fill critical information gaps (where required and budgeted)

Box 1: Categories of data which may be required for the SEA baseline assessment

Depending on the strategic themes and issues identified as the focus of the SEA the following data categories can guide information gathering.

Biophysical information

- Climate, including future climatic change scenarios (with special emphasis on micro-climates);
- Ecosystem services, especially wetlands (riverine areas, lakes, etc.) and forest areas, nature conservation and protected ecosystems, and biological corridors;
- Biodiversity (flora and fauna), rare and threatened/endangered species, endemic species and habitats), species of commercial importance, invasive species;
- River dynamics and siltation;
- Water resources and quality, and chemical characteristics.
- Use of natural resources;
- Air quality, with particular focus on the occurrence of pollutants; and
- Noise, topography, soils, geology, hydrology including risks of natural disasters.

Physical infrastructure and social facilities and services

- City/town and sector plans, especially zones and types of current and expected future development (e.g. municipal boundary changes/expansion), population dynamics, urban area development scenarios, property values and land use and availability;
- Water supply and use (city/towns, other settlements, agriculture, etc.) and likely future scenarios for demand and use;
- Dams (hydropower, storage);
- Transport, traffic, power lines, pipelines and other related infrastructure;
- Industrial infrastructure;
- Current and planned water and waste management and supply infrastructure (including assessment of state of infrastructure); and
- Current and planned schools, hospitals, clinics, recreation, religious, cultural and retail facilities.

Governance and decision-making

- Institutions, structures and decision-making systems regarding the PPP and projects and other developments/initiatives likely to arise during PPP implementation, and for those beyond (at regional, national or international level) – where developments may affect or influence the SEA area, e.g. regarding the allocation of permits and associated compliance monitoring for large projects.

Socio-economic conditions and human health

- Population dynamics.
- Un/employment, poverty, skills, livelihood and education profile of the SEA area.
- Sanitation issues within the SEA area
- Economic profile of the SEA area, including analysis of key economic drivers (e.g. tourism, hydropower, lifestyle investments, recreation) and associated multipliers and spin-offs.
- Human health profile of the SEA area, especially communicable (e.g. HIV and AIDS) and non-communicable diseases (e.g. diabetes, cancer prevalence).
- Archaeology and cultural heritage landscape.
- Recreational aspects.
- Social-economic aspects.
- Land use, transportation, infrastructure, agricultural development and tourism.

In situations where data is limited, of poor quality or not readily accessible, the baseline assessment stage of the SEA becomes a substantial contribution to development planning in its own right. In most cases, the baseline assessment is the most time consuming and resource intensive stage of an SEA. Often the strengths and weaknesses of the plan becomes clear at this stage, especially the extent to which it has considered the strategic themes and concerns of stakeholders. Often plans have moved forward despite serious gaps in information and analysis – gaps which need to be filled by the SEA to enable proper assessment of sustainability.

3.5 Stage 4: Sustainability analysis (impact assessment)

This sustainability analysis or impact assessment stage responds to the question: "What impacts will the target plan or program and its alternatives have on sustainability?"

This sustainability analysis or impact assessment stage has two main components – (i) the identification of alternatives to the plan and (ii) the assessment of the sustainability performance of those alternatives and the plan against the framework of SEA sustainable development objectives. The term "impact assessment" is usually associated with project specific EIAs. Even so it is a widely understood concept among government, private sector and civil society. That is why in this SEA guidance the term "sustainability analysis" and "impact assessment" are used interchangeably. Yet, care needs to be taken not to confuse the level of assessment with EIAs. The "impact" assessment which SEA's conduct concerns strategic relationships between sectors, areas and groups in society. Normally it should not consider in depth site specific impacts of the kind conducted in EIAs.

3.5.1 Identification of alternatives

In conducting an SEA, the team should appraise the likely significant environmental, social and economic effects of implementing a plan and any reasonable alternatives. Alternatives are different ways of achieving the plan goals and objectives – and can include adjustments to the plan framework of objectives as well as specific measures and actions it includes.

A key requirement of an SEA process is to work with the plan proponent in identifying alternatives to the plan or to its components. In the absence of a plan or planning team, the SEA team needs to work with stakeholders to define and assess alternatives. Considering alternatives during plan preparation is a necessary way to identify sustainable solutions – ie the best ways of meeting development needs without causing harm and closing off options for the future. Yet often, development plans have not considered alternatives and SEA team must "stand in the shoes" of planners in doing so.

In considering alternatives, the SEA has great potential to influence the plan shape and content. An evaluation of alternatives can be conducted before any irrevocable decisions are made. Such early consideration of alternatives can reduce the need for remedial measures at later stages in the development planning process - particularly when alternatives become increasingly constrained when moving 'downstream" in development, ultimately reaching the project level.

The way to understand alternatives is as a hierarchy. The level at which alternatives should be considered depends on the characteristics of the proposed plan, and on the stage of its development. Specific alternatives can be identified for each plan component in the following *alternative measures hierarchy*:

- *Strategic alternatives* (high-level policy options that achieve a given objective)
- *Sectoral alternatives* (formulated to address sectoral feasibility and needs or to promote one sector versus another)
- *Spatial alternatives* (location options or the allocation of land to various forms of development))
- *Modal alternatives* (alternative technologies and methods for achieving the same objective)

- *Staging alternatives* (options for implementing the plan in stages so that some actions happen before others – or effects of one stage can be monitored and the plan adjusted to reduce unwanted outcomes)
- *Institutional arrangements* (alternatives such as decentralised structures for managing plan implementation or for sharing responsibilities more affectively between various levels of government or sector agencies. This might involve reforms to staffing and budget allocations)
- *Other policy priorities* (alternatives addressing other policy priorities for example, local livelihoods, poverty reduction, environmental flows, cultural values)
- *Avoidance and mitigation alternatives* (alternatives to avoid or reduce potential impacts)

In identifying alternatives it is best not to become too detailed at this stage in the SEA. Keep the definition of alternatives relatively simple so stakeholders can understand them and their origin. The definition of alternatives cannot appear to be an arbitrary process.

Box 2: Questions to guide development of alternatives in the hierarchy include:

1. **Meeting the need or reducing demand:** is the plan and its policies necessary or the best approach in meeting the needs?
   - Are each of the developments envisaged in the plan necessary to meeting the needs?
   - Can the need be met without implementing the plan fully or through a different mix of developments?
   - Can the negative effects of developments envisaged in the plan be avoided – if not are the trade-offs leading to irreversible harm?
   - Are there any realistic alternatives for reducing development demand, e.g. through regulatory, economic or administrative tools or other measures that promote behavioural changes?
2. **Mode or process of implementation:** what approaches to meeting the plan objectives cause least harm?
   - Are there technologies, methods or processes that can meet the need with less environmental damage or social impacts than conventional methods?
   - Has best-available technology been considered?
3. **Location and areas affected:** is the plan the most appropriate use of the affected geographic areas?
   - What alternative locations or uses of land could be considered?
4. **Timing of implementation**: what-to-do when?
   - When and in what sequence should the plan components be carried out?

SEA teams can become bogged down and overloaded at this stage with alternatives assessments. Every alternative will need to be assessed against the sustainable development objectives and that process can be demanding. So best a SEA team does not identify too many options.

Alternatives can be grouped as different overall development scenarios. The scenarios selected will depend on the nature of the plan under consideration. For example, a SEA into a river basin with many planned hydropower projects. In that case, it may be appropriate to shape alternative scenarios around different combinations of hydropower projects and their implications for other development sectors and river values. One might exclude all dams on the main-stem river while allowing for the proposed tributary dams. Another scenario might exclude main-stem dams and all dams on some key tributaries which have other important values which need to be retained. A third scenario might exclude all dams from the river system and instead emphasise the importance of watershed rehabilitation and the maintenance of fisheries, and sediment and nutrient transport to the delta. In

this case, the SEA team would benefit from having Integrated Watershed Management and hydrological modelling capacities.

Another example, is a SEA of a major road and development corridor such as the Greater Mekong Sub-regional economic corridors promoted by the Asian Development Bank. Four GMS corridors run through Thailand including the Southern economic corridor from Ho Chi Minh City through Cambodia, along Thailand's Eastern coast and up to Bangkok. Another runs from Kunming through Lao PDR to Bangkok. Alternative scenarios considered in road/economic corridor SEAs could be based on modelling of different road corridor routings, or differing mixes of road, rail, water and air transport facilities. Each alternative scenario would have a different environment, social and economic impact. In this case, the SEA team would need to have modelling capacities to explore the alternative routings, the various transport mode mixes and their greenhouse gas and biodiversity implications for example.

In the case of a recent SEA of the Rayong Province Master Plan, three alternative scenarios were considered with the main alternatives left to a sustainable development pathway scenario which addressed the SEA's sustainable development objectives:

(i) **A projection of baseline conditions** "without the plan" – this is termed the Business as Usual alternative or scenario.[1]

(ii) **Full implementation of the Plan** - the assumption that the plan (existing or proposed) will be fully implemented even if past experience would suggest that the full budget is never forthcoming

(iii) **A sustainable pathway** or framework which includes measures to enhance the plan and eliminates those which have unacceptable risk of negative effects

That choice of alternatives is useful in SEAs for socio-economic plans of local government areas or special development regions which lay out development strategies for all sectors.

A "business as usual" alternative represents how things would develop if existing policies continue and "the plan" is not implemented. A BAU scenario should be regarded as the benchmark or status quo reference against which the plan and other alternative strategies are compared. "The Plan" itself is assessed as a strategic option or alternative. If no plan is in place or in process, the SEA team must rely on working with stakeholders to identify development scenarios which group alternative measures. Each scenario (or alternatives grouping) is assessed against the sustainable development objectives framework – to determine its strengths and weaknesses in terms of sustainability performance.

In the assessment of impacts it is critical to keep foremost in mind the SEA function – that is to adjust the quality and nature of development so that it achieves ecological sustainability, equity and social well-being. That is why the definition of sustainable development objectives and indictors for each of the strategic themes and issues identified by stakeholders at the scoping phase is of fundamental importance to the Thai SEA system.[2]

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[1] It is best not to consider the business as usual scenario as "no action" scenario. In fact it is best not to use the term "no action" at all in SEAs. It is not an EIA of a project where "no development" or no action means that the proposed project will not proceed. At the strategic level the goal of an SEA is to facilitate the preparation and implementation of a development plan in ways which improve its sustainability performance. The concept of no action does not sit well with a proactive strategic planning process.

[2] Unlike the European situation, it is not appropriate to refer to alternatives as differing ways of meeting the plan objectives. That may be partially true, but most often in Thailand alternatives will involve adjustments and changes to the set of objectives originally identified in a plan to give it a more convincing and committed sustainability orientation. For example, an objective of a plan to double industrial output may not be acceptable

Inevitably some alternatives will be more sustainable than others, for example:

- **Watershed management**: do we set aside upper catchments as protected areas or allow extensive rubber plantation development.
- **Power development**: do we emphasise renewables or fossil fuels – what balance in the power mix do we wish to achieve?
- **Transport infrastructure**: do we emphasise roads or a balance including rail, air and/or water?
- **Agro-industry**: do we focus on expansion of rubber and durian plantations and/or promote community based agro-forestry?
- **Heal**th: do we focus on establishment of local health clinics and/or reinforce central hospitals?
- **Tourism**: do we go for mass tourism, and/or eco-tourism and community based tourism?

For some forms of land or resource use alternatives it is possible to use models to define and assess the effects of various scenarios. In some SEAs, for example into power development at national or special economic region level, models can drive the assessment process.

The sustainability analysis stage should be supported by a stakeholder workshop which facilitates participatory working sessions in which groups apply tools such as trend analysis, participatory mapping and multi-criteria analysis to assess the effects of the alterative development scenarios on the sustainable development objectives.

3.5.2 Assessing the sustainability of alternatives

Assessment against the SEA's sustainable development objectives: Alternatives assessment aims to compare the identified alternatives using a consistent set of sustainability objectives. This is normally done qualitatively, using expert judgment that takes account of stakeholder and local knowledge. GIS analysis, multi-criteria assessment, modelling approaches and trend analysis, amongst other techniques, are used as support tools that contribute to quantitative assessments of the alternatives.

Each alternative is assessed against the SEA sustainability objectives and the evidence base established during the baseline assessment. Positive as well as negative effects are considered, and uncertainties about the nature and significance of effects identified. This can be an **iterative** process, with the alternatives being adjusted to enhance positive effects and reduce negative ones.

Alternatives can be ranked according to scoring against the sustainability objectives with results shown in colour coded matrices or diagrams.

The assessment of the likely impacts of the plan and its alternatives may be positive or negative, direct, indirect or cumulative. Various methods (analytical tools) can be used, and these are summarized in Annex 1.

Assessment can be undertaken in several steps:

(i)   Confirmation of alternatives to the plan, or its components to be assessed;
(ii)   Assessment of a business as usual alternative scenario
(iii)   Assessment of the proposed plan,
(iv)   Assessment of other alternatives to the plan or its components.

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in terms of sustainability, given trade-offs which might be involved in expanding land under industry rather than agriculture, forests or other uses. The objective would need to be adjusted.

Another distinction between the European SEA system and the one set out in these Thai guidelines, is the European emphasis on identifying alternatives during the scoping phase. Generally, in Thailand that is not feasible because available analysis and baseline information is not sufficient to judge what alternatives may be appropriate in meeting the sustainability objectives. The formulation of alternatives is best left until the framework of sustainability objectives is in place and a comprehensive baseline assessment has been conducted.

(v)   Definition of a preferred alternative (considered in the next section – Stage 5: Sustainable Development Pathway). In some SEAs the team includes the definition of a preferred alternative and its assessment during the impact assessment stage. In other SEAs, the "preferred alternative" is constructed based on the assessment of the other scenarios. It is designed to implement the SD objectives and to address the strengths and weaknesses in terms of sustainability of the other alternatives.

The process steps (i) to (iv) best leads to the preparation of a SEA sustainability analysis (or impact assessment) report. The report is circulated to stakeholders for comment which leads to the shaping of a preferred alternative. In its final report, the SEA team should provide an explanation of how the findings of the assessment of alternatives and consultations were taken into account in the development of the preferred alternative (ie the sustainable development pathway).

The impact assessment process involves:

- continued analysis of available baseline data and new data from research/field studies
- continued stakeholder engagement
- identifying options to reduce or offset any significant adverse effects in cases where negative environmental or social effects are anticipated, or enhancement measures for optimizing positive impacts.

Assessment methods commonly applied at this stage include:

- Trend analysis
- Matrices
- Multi-criteria analysis
- Cost – benefit analysis
- Participatory/consultative techniques
- GIS overlay and analysis

These methods are also summarized in Annex 1.

The assessment of the alternatives should identify those components of the plan which may have significant effects on particular sustainable development objectives. The assessments may focus on the entire plan and its alternatives, a clusters of proposed developments (including projects), or even individual proposals which are likely to have significant environmental and social effects. The assessments should address:

- The character of the impacts (what causes these impacts or assumptions for the predictions);
- Probability and key uncertainties;
- Geographic scale - directly and indirectly affected geographic areas that will become of specific concern;
- Frequency, duration and reversibility; and
- Key concerns associated with the impacts.

If the alternative includes proposals for individual projects that will require EIA, the SEA should provide suggestions on the specific scope and focus of such EIAs (e.g. recommending specific issues that should be assessed). When assessing the alternatives against the SEA SD objectives, the full spectrum of potential effects should be taken into account, including, direct, indirect and cumulative effects. The comparative evaluation of alternatives needs to highlight potential irreversible effects or irreplaceable loss of natural capital, as well as risks to social and ecological systems.

Potential positive and negative environmental and social impacts need to be identified which may fall into different categories, including:

- *Direct impacts* associated with options within the plan that initiate and locate specific project activities;

- *Indirect impacts* that are associated more with policies that may have fiscal or legislative implications;
- *Cumulative impacts* and induced/synergistic impacts that involve large-scale schemes, such as infrastructure development;
- *Large-scale impacts* that that have regional and global effects. Impacts also may be permanent, temporary, or synergistic.
- *Trans-boundary impacts* – those that occur outside the immediate focal area of the plan or programme, e.g. in another district or region, or in another country.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a wide area or period of time. The impacts should be considered over time (e.g. short-, medium- and long-term) and varying spatial scales. The plan being assessed is likely to be implemented through actions and initiatives, often projects, each of which will give rise to a range of impacts. The impacts of an individual project may not be particularly significant or may be confined to a particular area and be capable of management or mitigation. But the impacts from multiple projects, whether of the same kind or different initiatives, can be substantial and spread across a very wide area.

It is also necessary to consider the impacts of other policies, plans, strategies and projects in the area covered or influenced by the target plan. They will also generate their own suites of impacts. When all of those are combined with the impacts of the plan being assessed, then the overall cumulative impacts can be very large indeed. Impacts are not a matter of simple cause-and effect. They are subject to cascading primary, secondary, tertiary and subsequent level impacts. This generates a complex web of interacting and cumulative linkages which need to be understood by policy makers and decision-takers. Developing a picture of such linkages is a complex process and takes time to brainstorm.

The concept of significance is at the core of impact assessment, impact evaluation and decision-making. Deciding whether a plan is likely to cause significant environmental and/or social effects is central to the practice of EIA. Similarly, in SEA, effects, impacts, trade-offs, and options or alternatives need to be assessed in terms of significance, in order to determine optimum choices and eliminate unacceptable ones. There is no single best method for determining significance. Various formal methods, using rating, ranking, weighting and/or scaling, future scenario building and back-casting methodologies can be used to determine significance in particular sectors, and/or to help determine significance (Box 3).

Box 3: Key elements that should be considered in determining significance include the characteristics of the actual effects and the area likely to be affected:

Impact Characteristics:
- The probability, duration, frequency and reversibility of the effects (e.g. ecosystem fragmentation);
- The cumulative nature of the effects;
- The trans-boundary nature of the effects;
- The risks to human health or the environment (e.g., due to accidents); and
- The magnitude and spatial extent of the effects (i.e., geographical area and size of the population likely to be affected).

Importance / recognition /value / vulnerability of the affected area:
- The value and vulnerability of the area likely to be affected due to:
- Special natural characteristics or cultural heritage;
- Exceeded environmental quality standards or limit values; or
- Intensive land use.
- The effects on areas or landscapes, which have a recognized community, district, national or international protection status or value.

Annex 2 provides examples of methods that can be used to investigate significance.

3.6   Stage 5: Sustainable development pathway

The main question to be addressed at the SD pathway stage in the SEA is: "what measures under each strategic theme and issue will best meet the sustainable development objectives?"

A preferred alternative or "sustainable development pathway" can be defined which performs best in addressing the sustainable development objectives. The intention is to construct a scenario or framework of sustainability measures which respond to (i) the strategic issues of concern identified for each theme during the scoping phase, (ii) the strengths, weaknesses and gaps in the proposed plan (iii) negative trends highlighted in the BAU scenario, and (iv) the sustainability imperatives implied in the SD objectives and their associated indicators..

A fourth stakeholder workshop is needed to support preparation of the sustainable development pathway. The SEA team should also review international good practice and the positive experiences within Thailand and elsewhere in identifying innovative measures.

The purpose of the sustainable development pathway is to find better (sustainable) alternatives and ways of doing things (i.e. of realising plan objectives). It needs to enhance environmental, economic and social benefits, avoid, minimise or remedy adverse impacts and ensure that any unavoidable impacts are kept within acceptable levels.

Special attention needs to be given to identifying the avoidance, enhancement and mitigation measures. Questions to be addressed are:

- how will the most important risks (negative effects) associated with the plan be _avoided_?
- how will the most important benefits (positive effects) associated with the plan be _enhanced_?
- how will the negative effects that can't be avoided be _mitigated – i.e. be reduced_?

The sustainable development pathway must be integrated with and adjust the plan content as necessary. The SD pathway should guide the plan in internalising its environmental and social costs and ensure it repairs or compensates for environmental and social damages (including through offset arrangements if needed). This may include the following:

- A complete set of mitigation actions for the proposed development area;
- Modification or improvement of certain activities or components of the proposed plan;
- Delay or cancellation of certain components of the proposed plan;
- Improvement or adjustment of the development objectives of the proposed plan;
- Proposal for new or revised regulations or a management system to enhance the efficiency and sustainability of the proposed plan.

The mitigation measures should be specific and include necessary practical details to ensure that they will be fully implemented. Appropriate timeframes, responsibilities and terms of reference of the parties concerned could be annexed to the final SEA report along with advice on the process for integrating the SEA SD pathway into the plan.

3.7   Stage 6: Preparation of the final SEA report and report review

The final report responds to the questions: "what priorities for action is the SEA recommending, and how will they be implemented and monitored?"

The SEA process and its analysis and findings must be transparent and open to stakeholder scrutiny throughout. Reporting and stakeholder review in SEAs need to be linked to the main stages in the process. It cannot be left to the final step. By that stage there should be no surprises. By then, stakeholders should already be familiar with what the SEA has found and where it is headed in terms of recommendations. They should have had an opportunity to review and comment on reporting outputs at the scoping/baseline stages, the impact assessment stage – and then on the draft SD pathway.

The development planning process in Thailand is not at a stage where SEAs can just be an internal administrative process to ensure that existing sustainable development commitments and standards have been met. A Thai framework of SD principles and approaches applying across government and all levels of development planning is a work in progress. For that reason, in many respects and for some time to come, SEA teams in Thailand will find they need to "stand in the shoes" of the development planners. They will be required to establish SD frameworks, to fill critical gaps and to promote creative and innovative solutions. For all those reasons, SEAs need to be an open and stakeholder driven process.

The final SEA report draws together and summarises the completed reporting outputs from the earlier stages. It can reinforce and fine tune priorities for action and should lay out the institutional arrangements and roles required for effective implementation. It should remind decision makers of the consequences of failing to implement the SD pathway. Also, the final report needs to set out the monitoring and evaluation framework of indicators, steps and responsibilities to be applied during plan implementation to ensure the SEA sustainable development pathway is being followed.

As was the case for the earlier reporting outputs, the final report will need to be subject to stakeholder review and comment, then to be finalised and formally submitted to Government.

3.8   Stage 7: Monitoring and evaluation to ensure the plan/programme is on track in implementing the SD pathway

The questions addressed at the M&E stage of the SEA is: "*How will the plan be monitored and evaluated to ensure it is on track in implementing the SD pathway*?"

The SEA team should prepare a monitoring plan for the sustainable development pathway to monitor expected and unexpected impacts. Given the strategic nature of plans, there may be a degree of uncertainty associated with their eventual environmental and social implications. An effective monitoring plan would alert the parties concerned of the necessity to revise the plan and introduce follow-up measures, for better prevention and remediation of expected and unexpected impacts and for improving overall sustainability performance in plan implementation.

The monitoring plan should include an action plan that is built around the SEA SD objective and their indicators. The framework of sustainability indicators was developed during the SEA scoping stage. They can be adjusted and added to depending on need. The proponent is responsible for monitoring and evaluation of plan implementation by applying the SD indicator framework and the monitoring recommendations in the SEA report. It is important that the indicators have standard references against which the plan and its sustainable development measures can set appropriate targets. The monitoring plan should make use of the existing environmental monitoring network, and the plan should specify important details such as objectives, methods and techniques, area, timeframe, monitoring frequency, budget, and responsible parties. The drafting of the monitoring plan should also benefit from the opinions of outside experts.

The relevant agency must oversee the monitoring and evaluation process by the plan proponent.

4. PART 4: TECHNICAL AND ADMINISTRATIVE REVIEW OF SEAS

This final part of the guidelines outlines the technical and administrative arrangements to ensure that SEAs are of the highest quality and adhere to national standards and that SEAs takes place in a systematic fashion.

4.1 Proponent's Internal Technical Review of the SEA Reports

There are two main points at which SEA reports are formally reviewed: *Internal Technical Review* by the plan proponent, and *External Technical Review* by an external regulatory review agency.

The proponent's *Internal Technical Review* usually takes place according standard checklists. The following questions are a guide to those which need to be asked by the proponent of its own SEA process and product before submission to the relevant authority for formal Regulatory Review.

4.1.1 Review of Objectives and Context

- Are the goal and objectives of the proposed plan clear?
- Are environmental issues and problems including the need for environmental conservation at local, national, and international levels considered and incorporated into the goals and objectives of the SEA sustainable development pathway and plan?
- Are the SEA SD objectives clear and in line with the SD indicators and targets?
- Have linkages with other plans been identified and explained?
- Are conflicts among SEA SD objectives, between SEA SD objectives and the plan objectives, and between SEA SD objectives and other plans objectives identified, explained and resolved?

4.1.2 Review of Scoping

- Was the methodology used to conduct scoping described? Was the description clear?
- Did the scoping process identify strategic issues of concern in all three aspects of sustainability (economic, environmental and social)?
  - Did it list of all issues for the assessment?
  - Did it describe how key issues were identified?
  - Did it outline linkage of key issues to the sustainable development objectives?
  - Did it list of key issues that need further study?
- Were sustainable development objectives identified along with linked SD indicators
  - Were the sources of the SD objectives identified

4.1.3 Review of Consultation

- Was a careful stakeholder analysis carried out, and a consultation and communication plan prepared to be used throughout the SEA?
- Was the stakeholder consultation process conducted during each stage of the SEA relevant and adequate?
- Were key stakeholders brought together to share ideas about issues, SD objectives, and alternatives during the SEA?
- Were appropriate consultations conducted with stakeholders in appropriate ways and at appropriate times about the content, scope, alternatives and level of information to be included in the sustainable development pathway report?

4.1.4 Review of sustainability analysis

- Did the sustainability analysis stage of the SEA identify reasonable/adequate alternatives?
- Did it include consideration and description of alternative development and alternative assessment?
- Were the sustainability or impact assessments conducted using the SD objectives framework?

- Was there an assessment of the "business as usual" alternatives?
- Was there an assessment of the plan?
- Were other alternative scenarios assessed effectively?
- Was there discussion of technical, procedural difficulties/problems/obstacles, including assumptions and uncertainties?
- Were reasons for eliminating some issues from further consideration provided?

4.1.5 Review of sustainable development pathway

- Did the SD pathway
  - Address the strengths, weaknesses and gaps in the plan?
  - Address the negative trends identified in the baseline assessment and BAU scenario?
  - Define measures which responded to the strategic issues of concern identified by stakeholders?
 - Define measures which sought to address the SEA's SD objectives?

4.1.6 Review of the SEA Report

- Does the report have a non-technical summary, introduction, description of the plan/programme, environmental analysis (baseline description, alternatives development and assessment, mitigation measures, consultation), recommendations and monitoring plan, appendices?
- Does the non-technical summary explain the overall approach to the SEA, the main alternatives considered, the proposed mitigations & monitoring plan?
- Is the report clear and concise in its presentation? Does it use simple, clear language?
- Is it presented as an integrated whole (e.g. are the chapters harmonized)?
- Is it written in an impartial and open manner?
- Does the report define necessary technical terms or avoid technical jargon?
- Does the report identify the decision-maker?
- Does the report identify who carried out the SEA and their competencies?
- Does the report use maps, other illustrations, and summary tables where appropriate?
- Does the report describe the methodology used in the SEA (i.e. methodology for scoping, impact identification, prediction, evaluation, comparison of alternatives, stakeholder identification & analysis), including description of constraints, e.g. data gaps or lack of appropriate techniques?
- Does the report identify the stakeholders consulted and explain consultation methods used?
- Does the report focus on the important/relevant strategic issues?
- Does the report discuss the scope of the SEA (Is the scoping report attached?)
- Does the report comply with the TORs?
- Does the report identify all sources of information, including expert judgement and matters of opinion?
- Overall, is the information provided by the SEA process (and report) adequate for the point of view of those developing the plan/programme? What is missing?

4.2 Overall Structure of the Administrative System for SEA

The overall structure of the administrative system for SEA, including relevant institutions and mechanisms, is presented in Figure 5.

Figure 5: Administrative Mechanism for SEA
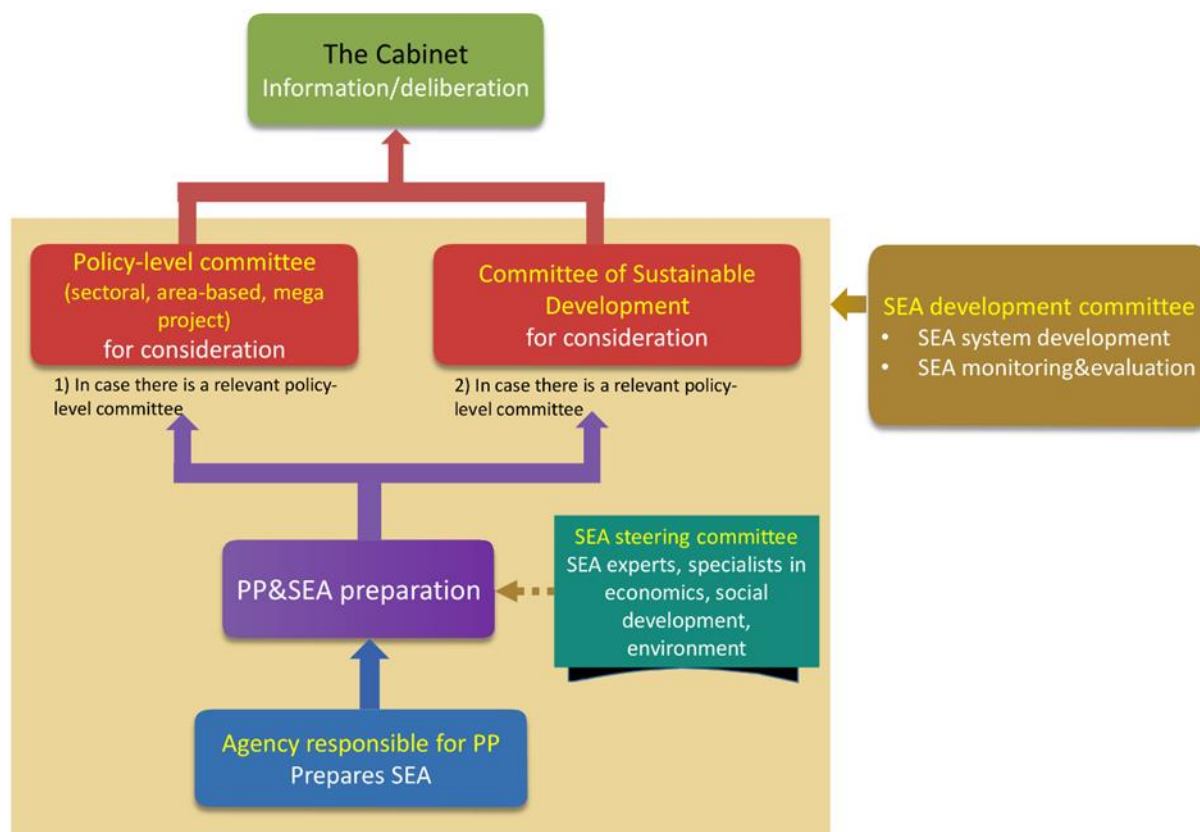
The SEA Subcommittee has proposed the organizations that will play an important role in the development of SEA systems in Thailand as:

(i)   The **Cabinet** sets the policy, steers the direction of SEA development and uses SEA as a national sustainable development planning and decision-making tool.

(ii)   The **SEA Subcommittee** outlines SEA policy and system in support of sustainable development and in line with the 20-year National Strategy, and provides recommendations and advice regarding SEA to government agencies.

(iii) **Sectoral and area-based policy-level committees** or the committee to which the Cabinet or the SEA Subcommittee designates to review the SEA report, makes use of SEA when deliberating, approving, or endorsing sectoral or area-based plans. Examples of such committees are the National Energy Policy Committee, the National Water Resources Committee, the Special Economic Development Zone Policy Committee, the National Forest Committee, the National Environment Board, and the National Land Policy Committee.

(iv) The **government agency responsible for the plan or programme (the proponent)**, or government agency designated by the Cabinet or the SEA Subcommittee, prepares the SEA report by conducting the study or contracting a consultant firm registered with the Consultant Database Centre (Ministry of Finance), monitors and evaluates the implementation of the plan, and the relevant SEA, and reports to the sectoral or area-based policy-level committee, or the committee tasked by the Cabinet or the SEA Subcommittee.

(v)   **Ad hoc SEA steering committee**, either set up on a case-by-case basis or incorporated into the plan steering committee, provides recommendation and advice on SEA preparation to ensure that it is in line with the SEA Guideline of the SEA Subcommittee.

(vi) **The Committee responsible for monitoring the implementation** of the plan monitors and evaluates the implementation of the SEA, prepares and submits a monitoring report with recommendations to the SEA Subcommittee and onwards to the Cabinet.

4.3   Screening considerations

The SEA Subcommittee established by the Prime Minister's Order 2/2017, spearheads SEA system development in Thailand. The Subcommittee has proposed that the Regulatory Review of SEAs should take into account the following matters:

- SEA screening considerations (what plans are subject to SEA)
- SEA mechanism and process
- SEA institutional support

4.3.1 SEA screening considerations

During the initial phase of SEA application according to these National Guidelines (2018-2021), SEA will be applied at the level of plan and programme as decided by government policy committees (Figure 5).

The objective of the Royal Thai Government is to have SEAs conducted systematically as part of strategic level decision making and development planning in Thailand. For the initial phase, the categories of plans and programs identified through a Prime Minister's Order as requiring SEAs will be limited. Following that trial period, the experience will be reviewed and adjustments can be made.

The screening process can include a trigger for SEAs of plans and programs which are identified in a Prime Minister's Order. It can also allow for SEAs to be initiated as part of any planning process at the discretion of the relevant government agency. It is important that all sectors and levels of government explore the use of SEA in their development planning. Government agencies of all kinds are encouraged to use their discretion in proposing that SEAs be conducted, even for those plans and programs which are not formally identified by the Prime Minister as mandatory.

SEA is not required for a defence or security related plan and program and any emergency plan or program to address an urgent problem in the interest of the public. Also, SEAs are not an appropriate tool for mega projects. If large projects are in the pipeline and strategic level assessments are needed, then SEAs can be used at higher and broader spatial or planning levels to adequately address the cross sector and cumulative assessment issues, as well as alternatives. SEA can make recommendations on the shape and content of specific ESIAs for projects falling within their spatial and substantive scope.

4.3.2   Agency responsible for preparing and reviewing SEA

The agency responsible for the sector or area-based plan[3] is responsible for preparing a SEA report, and for providing the necessary budget and personnel.

4.3.3 Qualifications of the SEA team

Consultants should register with the Consultant Database Centre, Ministry of Finance. The SEA team should consist of experts in economics, social development, the environment and other disciplines relevant to the plan. The qualifications of the SEA team should be stipulated in the TOR by the agency responsible for the plan or an agency designated by the Cabinet or the SEA Subcommittee.

Categories, qualifications, and criteria for registration with the Consultant Database Centre are stipulated by the Ministerial Decree on Criteria, Procedure and Conditions for Consultant Registration

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[3] In case that several agencies are involved in the plan/program, the Cabinet or the SEA Subcommittee will designate the lead agency for preparing and monitoring & evaluating the plan/program and the SEA.

2017. Subsequently, the Consultant Database Centre has added SEA as a field under the environment sector to facilitate the recruitment of SEA consultants.

4.4 SEA External Technical Review and Oversight by Regulatory Agency

The agency responsible for the sectoral or area-based plan, or the agency designated to prepare the SEA by the Cabinet or the SEA Subcommittee, appoints an Advisory Group to oversee SEA preparation for each plan (starting from scoping) on a case-by-case basis. This Group will be composed of experts/specialists in SEA, economics, social development, environment and other fields relevant to the plan, and will provide advice and oversee SEA preparation to meet quality standards and public acceptance.

Upon completion, the proponent agency will submit the draft to the relevant policy-level committee, or the committee designated by the Cabinet or the SEA Subcommittee to technically review the SEA draft report.

Substantive/technical review of the SEA should employ a checklist approach. Relevant questions that should be asked of the SEA include:

Description of basic information

Does the report include the following?

- Description (as per the TOR) of the existing biological and physical conditions, cultural, social and economic issues.
- Description of changes in baseline conditions without the program/project (trend analysis)
- Description in detail about expected impacts within the scope of the TOR or beyond, if necessary.
- Identification of the sources of relevant data, data gaps, assumptions.

Impact assessment

Does the report include the following?

- Likely impacts identified, explained and evaluated.
- Impacts that most affect sustainability prioritized.
- Significant impacts identified:
    - Identification of positive and negative impacts.
    - Identification of the probability, duration (short, medium and long-term, permanent and temporary), frequency, and reversibility of the effects of the various options.
    - Identification of the magnitude and spatial extent of the effects (geographical area and size of population affected) of the various options.
    - Identification of the secondary, cumulative, and synergistic effects of the various options
    - Identification of the trans-boundary effects of the various options.
    - Identification of risks to human health and to the environment.
- In evaluating "significance", is the "importance" of environmental components considered, for example:
    - Institutional recognition. The attribute is acknowledged in the policy and legal framework, or has relevant accepted standards, regulations, and thresholds.
    - Public recognition. The public recognizes the feature as important.
    - Technical recognition. The feature is recognized as important based on scientific or technical knowledge.

Evaluation of alternatives & recommendations on preferred options

- Was each alternative evaluated against the sustainable development objectives?

- Were the environmental and sustainability effects (both adverse and beneficial) of each alternative compared to the other alternatives?
- Were the residual impacts (impacts remaining after mitigation) of each alternative evaluated and compared?
- Does the report outline how the alternatives were assessed and the reasons for selecting the preferred alternative(s)?
- Did the assessment & the procedure for comparison use credible tools/methodology?
- Did the evaluation/comparison of alternatives involve appropriate stakeholders?

Mitigation & Environmental Management and Monitoring

Does the report:

- Clearly identify measures to prevent, reduce, repair, and compensate/offset any significant adverse effects of implementing the plan?
- Clearly commit to measures to prevent, reduce, repair, and compensate/offset any significant adverse effects of implementing the plan?
- Identify and commit to measures to enhance positive effects of implementing the plan?
- Identify related issues for follow-up.

Consultation process during the scoping procedure, the SEA, & the SEA review)

- Was there effective co-operation between the SEA team and the proposed plan owners/developers? If not, how could this be improved in the future?
- Was SEA consultation an integral part of the plan -making process?
- Overall, was the consultation process adequate and effective? How could it be improved in the future?

Content of the report

Does the report:

- Describe how/when the relevant stakeholders were identified and how their interests were analyzed (i.e., during scoping, SEA preparation, and SEA review)?
- Describe how/when the relevant authorities (including environment and health authorities) lead agencies, and the public were consulted (i.e., during scoping, SEA preparation, and SEA review)?
- Describe how/when the draft plan and the draft SEA report were made available to relevant authorities, lead agencies, and the public and how/when they were allowed to express their opinions on the documents?
- Was the appropriate range of stakeholders consulted?
- Were relevant lead agencies and other authorities consulted in ways and at times that gave them an early and effective opportunity with appropriate timeframes to express their opinion on the draft plan and draft SEA report?
- Were relevant environmental and health agencies consulted in ways and at times that gave them an early and effective opportunity with appropriate timeframes to express their opinion on the draft plan and draft SEA report?
- Was the public (or more likely, the designated public representatives) likely to be affected by, or having an interest in the plan consulted in ways and at times that gave them an early and effective opportunity with appropriate timeframes to express their opinion on the draft plan and draft SEA report?
- Was there an effort to involve less powerful stakeholders in the consultation? If so, was it successful? How could this be improved in the future?
- Summarize & address all stakeholder views?
- Highlight how the consultation results were considered in decision-making?

After technical review, the reviewing body will submit a decision on the SEA to Cabinet.

In case that there is no responsible policy-level committee, and no committee was designated by the Cabinet or the SEA Subcommittee, the SEA draft should be submitted to the SEA Subcommittee for endorsement prior to submitting to the Cabinet for information or for consideration.

4.5 Monitoring and Evaluation

There are two types of monitoring and evaluation.

4.5.1 Plan and SEA evaluation

The responsible agency for the plan should establish a monitoring committee, which should include representatives from the agencies involved, experts in SEA, economics, social development, and the environment, or other fields relevant to the plan. The responsible agency should also prepare a budget and identify personnel to monitor and evaluate the implementation and report to the policy-level committee in charge.

4.5.2 SEA monitoring and evaluation for SEA system development.

The SEA Subcommittee is responsible for monitoring and evaluating the SEA processes and reports, as well as implementation, to gather information for further SEA system development, and to report to the Cabinet.

5. ANNEX 1: METHODS FOR APPLICATION IN SEAS[4]

This annex provides an overview of applicable methods (analytical tools) that can be applied for undertaking SEA in Thailand. This annex can be treated as a menu of options for tools and techniques that can be used during alternatives development and assessment (Stage 3 of the SEA process).

The following methods are described:

- Expert judgments
- Checklists
- SWOT
- Matrices
- Networks and flow diagrams
- Spatial analyses: Overlay maps and GIS
- Trends analysis/extrapolation
- Delphi technique
- Modelling
- Multi-criteria analysis
- Cost benefit

The key features of these tools can be summarized as follows:

Table 2: Application within the SEA process

Tools	Application within the SEA process				
	Identification of issues and impacts	Analysis context and baseline	Contributing to develop-ment of alter-natives	Assessment of impacts	Comparing key options for decision-making
Expert judgments	✓	✓	✓	✓	✓
Checklists	✓				
SWOT	✓	✓			✓
Matrices	✓		✓	✓	✓
Networks and flow diagrams	✓	✓		✓	
Spatial analyses: Overlay maps and GIS	✓	✓	✓	✓	✓
Trends analysis/extrapolation	✓	✓	✓	✓	✓
Delphi technique	✓	✓	✓	✓	✓
Modelling	✓	✓	✓	✓	
Multi-criteria analysis			✓	✓	✓

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[4] This Annex is based on work produced for the Vietnam Ministry of Natural Resources and Environment, *General Technical Guidance on SEA (2008*), and the Vietnam-Denmark Development Cooperation in Environment, *Guidelines for SEA of Socio-Economic Development Strategies, Master Plans and Plans (2008)*

Table 3: Expert Judgments

Tool	Expert Judgments
Linkages to other tools	Matrices Delphi technique Modelling Multi-criteria analyses
Purpose	Expert judgment is a process for obtaining data directly from experts in response to a technical problem.
Description	Expert judgments are part of any SEA process. This is inevitable because SEA is an analytical process which examines the relevant trends and risks through: • identification of key strategic issues relevant for the plan (and its position in the decision-making process); • determination of spatial and temporal scale of the relevant issues, • selection of appropriate indicators (or proxy-indicators) that simplify the evaluation and turn it into manageable assessment. Use of all analytical approaches and tools in the SEA is therefore always influenced by expert judgements. The SEA tools that most rely on the expert judgements include: • Matrices - experts need to use their own judgement determine the key impacts or synergies/conflicts addressed by the matrix; • Modelling - experts need to use their own judgement to identify the specific issues and interactions that needs to be modelled; determine key assumptions and boundaries of the modelling; select suitable model and verify it, calibrate it and fine-tune it to fit the local situation and data availability; and • Multi-criteria analyses - experts need to use their own judgement to determine the assessment criteria, their relative importance (weights) and performance (scoring) of each proposed option. This summary deals with one specific form of expert judgment when the recognized 'experts' in the relevant fields directly formulate explicit and quantitative views on the probability and magnitude of the expected impacts and explain uncertainties in these predictions. Well organised expert judgments does not mean 'guessing' since the participating experts need to usually clearly explain: • Assumptions on which the judgment is based (when would the risk/impact occur and what it is caused by); • Character of the predicted risk/impact (e.g. probability of the risk/impacts, its nature and scale; and duration and reversibility) • Directly and indirectly affected geographic areas, ecosystems or persons (e.g. particularly sensitive or important elements of the receiving environment, vulnerable social groups, non-renewable resources, endangered species, etc.); • Baseline situation (e.g. the past, present and future actions which should be considered when judging this risk/impact and the relative importance of the expected risk/impact when compared with the baseline situation); • Key concerns associated with the predicted risk/impact (e.g. how far is the predicted impact from any established thresholds or targets) and; • Magnitude of key uncertainties in this judgment. When these rules of good practice are expected, expert judgment can reflect a life-long experience and expertise of participating experts. Such judgments can be - especially in situations of significant data gaps - more precise than quantitative predictions based on incomplete data. Such expert judgments are best obtained through canvassing of opinions from a representative set of recognized experts in a given field and their iterative discussion.

Tool	Expert Judgments
	Expert judgments can be formulated through simple participatory tools such as: workshops, interviews or questionnaires with a problem-solving focus (these tools are described in the Annex 2 to this guidance) The most sophisticated means of collective expert judgement is the Delphi technique which is separately described in the annes)
	The Chinese Provisional Measures for Public Involvement in EIA[5] for instance allow for the use of expert judgements through consulting expert opinions in written or other forms (Article 20) or through organising evaluation meetings with relevant experts (Articles 21-23).
	Consulting expert opinions in written or other forms requires that the individual experts and organizations that accept such consulting arrangements provide clear opinions on consulting matters, and reply in writing. Any written opinion should be signed by individual experts and affixed with the employer's seal. Any different opinions in collective expert consulting shall be described by the consulting organization in consulting replies.
	Evaluation meetings with relevant experts require determination of the major topics for review according to the scope and extent of environmental impact and the assessment factors, notification of the related organizations and individuals of the time, venue and major topics of the meeting and elaboration of the meeting record. The meeting record summarizes the different opinions based on presented facts and can be prepared in the form of the meeting minutes or the meeting conclusions.
	The basic rules for the use of expert judgements formulated by the US Environmental Protection Agency[6] may be also of interest. These can be summarised as follows: - At least five individuals need to be used in any expert judgment process, unless there is a lack or unavailability of experts. - The individuals involved in expert judgment have appropriate level of knowledge and experience for the questions or issues addressed; - At least two-thirds of the experts involved in expert judgment are not directly employed by the proponent. - The public and relevant authorities are provided with a reasonable opportunity to comment on the scientific and technical validity of these expert judgements.
Usual application within SEA	The expert judgment can be used at any stage of the SEA process. It is usually used when: - the key issues of concern are being identified; - periodical result or final results are prepared -- to check the results achieved; - difficulties arise in the use of qualitative tools or when there are problems without solutions -- to collect opinions on the specific issue or to identify the solution.
Inputs and data demands	Basic information on the proposed development and affected environment, possibly complemented by a series of questions on the specific issue.
Outputs	Direct response from experts to a technical problem.
Advantages and disadvantages	☺ Expert judgment is a tool which provides quick and effective advice ☺ It can operate in situations of significant data gaps ☹ Quality of the outcome depends on the knowledge and competence of participating experts ☹ The judgment will be also affected by the comprehension of the background/briefing material. If the material is not complete or include deficit, it will affect the conclusions ☹ The outcome can be also influenced by the quality chairing of the entire process

[5] Document No. 2006 [28] issued by the State Administration of Environmental Protection on February 14, 2006

[6] http://www.epa.gov/rpdweb00/docs/wipp/card26.pdf

Table 4: Analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT analysis)

Tool	Analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT analysis)
Description	SWOT is used as part of diagnosis of the current situation. It highlights the key internal issues (strength and weaknesses) and the key external issues (opportunities and threats) that should be considered in the planning or in the assessment process. The following table shows logic of a SWOT analysis.

	Positive	Negative
Internal	Strengths	Weaknesses
External	Opportunities	Threats

SWOT was originally developed in business management but it is increasingly used in elaboration of SPPs. Regardless of its specific application, the SWOT analysis applies the following simple sequence of tasks.

Step 1. List internal factors (what is here and now): List all strengths that exist now. Then in turn, list all weaknesses that exist now. Be realistic but avoid modesty.

Step 2 – List external factors (what is relevant for the future developments): List all opportunities that exist in the future. Then in turn, list all threats that exist in the future.

Step 3 – Review the SWOT analysis: When the analysis has been completed, a SWOT profile can be generated and used as the basis of goal setting, strategy formulation, and implementation. The completed SWOT profile is usually arranged as follows:

Strengths	Weaknesses
1. 2. 3. …..	1. 2. 3. …..
Opportunities	Threats
1. 2. 3. …..	1. 2. 3. …..

These tasks can be performed by planning teams as well as assessment teams. However, SWOT analysis offers a useful tool in participatory discussions and is generally more effective if it engages stakeholders with different viewpoints.

Usual application within SEA	• Analysis context and baseline • Identification of constrains (risks) and opportunities (benefits)
Advantages	☺ SWOT reduces a large quantity into simple overview of key issues that could be considered in the planning. ☺ SWOT is a useful tool for obtaining various viewpoints on the current situation and can be very well used in participatory processes. ☺ Demand for data: Small – undertaking SWOT largely depends only on personal knowledge and insights of participants in the SWOT process. ☺ Cost and time requirements: Small - SWOT can be done as a quick exercise by single person or as a rapid appraisal process of current situation that involves a large number of stakeholders. ☺ Ability to deal with uncertainties: Medium to High. By examining future opportunities and threats SWOT highlights key future uncertainties.

Tool	Analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT analysis)
	☺ Transparency: High – SWOT is a very transparent technique.
Disadvantages	☹ SWOT has a tendency to oversimplify the situation.
	☹ Analysis of current internal situation through simple presentation of strengths and weaknesses does not explain why these strengths and weaknesses occur (their root causes) and whether there are any linkages between them.
	☹ Classification of external factors as opportunities or threats is somewhat arbitrary - the same point may feature both as a strength and as a weakness. For example, 'increased exports' may be presented as a strength and 'reliance on exports' as a weakness.
Examples of practical application or key sources of further information	Community Tool Box, a website from the United States, has an easy to follow description of how to do a SWOT analysis (http://ctb.ku.edu/tools/en/sub_section_main_1049.htm) An example of an interesting SWOT analysis that examined key trade, poverty and environmental issues and linkages in rural development programs of the European Commission DG Development can be found at: http://europa.eu.int/comm/development/body/theme/rurpol/outputs/diagnostic/html/5.htm

Table 5: Formal and informal checklists

Tool	Formal and informal checklists
Description	A checklist presents a catalogue of issues that might be considered when assessing particular types of plan or programme. Checklists may list: • Environmental, including health, concerns usually associated with certain plans and programmes • Relevant environmental, including health, objectives for various development activities • Indicators or specific guiding questions that can be asked when evaluating a plan or programme in certain fields
Usual application within SEA	• Analysis context and baseline • Identification of issues and impacts
Advantages	• Help remember all the information relevant to a task • Provide a simple way of identifying whether certain issues are relevant to a proposal and help to avoid overlooking potential issues
Disadvantages	• Do not offer a very analytical approach to analysis • Encourage neglect of any important effects that are not present in the checklist • May cloud judgement with irrelevant information • Do not specify the nature of cause-and-effect relationships – are prone to pigeon-holing impacts into certain categories whereas, in reality, an impact may be part of a complex system.

Table 6: Matrices

Tool	Matrices
Linkages to other tools	Expert judgments

Tool	Matrices
Purpose	Matrices enable identification or presentation of: • impacts of proposed development on various elements of the environment (matrices of impacts), or • synergies or conflicts between proposed development and the relevant environmental objectives (matrices of conflicts or synergies). Matrices visually summarize these effects in user-friendly way. As such can be used to quickly compare pros and cons of proposed development options.
Description	A simple matrix can help to identify various effects of a single intervention. More complex matrices can show cumulative effects of numerous projects on various environmental issues or objectives. Basic matrices can mark the existence of impacts or conflict/synergy using simple symbols (e.g. X, XX). More elaborate matrices use various characters, numerical scores, colours or even textual descriptions to outline the nature, scale, importance and duration or reversibility of each effect. Presented information should be easy to verify - matrices thus needs to be accompanied by a text explaining the nature of specific effects.
Usual application within SEA	Matrices belong along the most commonly used tools in SEAs in the European countries. They can be very easily used for: • Identification of effects • Presentation of effects • Comparison of alternatives
Inputs and data demands	Basic information on the proposed development - a simple list of proposed development objectives or development activities. Basic information on the local environment - a simple list of relevant environmental issues or relevant environmental objectives in the study area.
Outputs	Visual summary of impacts or conflicts/synergies
Advantages and disadvantages	☺ Matrices help to systematically identify impacts or conflicts/synergies ☺ They can easily present outcomes of qualitative or quantitative assessments ☹ They generally do not consider spatial issues and local territorial issues ☹ They force users to consider many potential interactions – this may divert attention to minor impacts.
Further reading	Further information on the various uses of matrices can be found at: http://en.wikipedia.org/wiki/Matrix_methods

Table 7: Spatial analyses: Overlay Mapping and Geographical Information Systems (GIS)

Tool	Spatial analyses: Overlay Mapping and Geographical Information Systems (GIS)
Linkages to other tools	-
Purpose	To illustrate the spatial distribution of relevant issues and impacts.
Description	Spatial analyses are undertaken through a preparation of maps with different information which is relevant to the SEA. When these maps are laid over each other, they can: • Provide a composite picture of the receiving environment (e.g. sensitive areas or resources, current pressures, etc.) and resulting development opportunities and constraints

Tool	Spatial analyses: Overlay Mapping and Geographical Information Systems (GIS)
	• Present impacts of previous developments and show linkages between different issues (e.g. correlation between air pollution concentrations and development of transport network, correlation between water pollution and sitting of industrial facilities, etc.)
	• Identify potential impacts of future activities
	• Outline cumulative impacts of different activities on one issue (e.g. impacts of agricultural developments, new housing and new industrial zones on water quality)
	• Indicate spatial concentrations of different environmental impacts (e.g. map showing specific areas that will be subject to excessive air pollution, water pollution and noise pollution).
	• Spatial analyses can be based on manual elaboration of transparent maps (overlay mapping) or elaboration and processing of electronic maps (Geographical Information Systems, GIS). While overlay mapping may be a simpler form of the analysis, it delivers only one series of maps and overlays. Elaboration of base maps for GIS is more demanding, however, once these maps have been prepared, GIS allows users to easily add further information or to flexibly amend existing maps within the GIS.
Usual application within SEA	• Analysis of context and baseline • Identification of issues and impacts, including cumulative and synergistic impacts • Development and comparison of alternatives
Inputs and data demands	• Base maps of appropriate scale (e.g. topography, land uses, etc.) • Maps indicating location of key development initiatives or spatial distribution of relevant environmental issues (e.g. air quality, water quality).
Outputs	• Maps showing spatial distribution of key issues or impacts. • These maps can be developed to visualise past, present and future situations.
Advantages and disadvantages	☺ Spatial analyses can consider topography and local territorial issues ☹ If the relevant maps are not readily available, spatial analyses can be expensive and time consuming.
Further reading	• British Geological Survey report (2004) on Strategic environmental assessment (SEA) and future aggregates extraction in the East Midlands Region presents a number of GIS usage methods and approaches: http://www.mineralsuk.com/britmin/CR_04_003N.pdf

Table 8: Trend analysis and extrapolation

Tool	Trend analysis and extrapolation
Description	Accurate trend analysis is one of the most important aspects of any strategic assessment. In the context of SEA, it can be defined as an interpretation of environmental pressures and changes in the state of the environment, including health, over time.
	Trend analysis uses data sets and helps to trace any trends or patterns. Trends can be linear, exponential or cyclical and they should, where possible, be analyzed over a correct temporal scale. The presentation of trends can be fairly simple, e.g. a line graph, or quite complex, e.g. using three-dimensional graphics or video simulation. There are numerous computer programs that facilitate trend analysis (e.g. the simplest ones being computer spreadsheet software, more advanced ones including RATS, GAUSS, JMP, etc.).
	Trend analysis facilitates presentation of the main linkages between environmental pressures and corresponding (sometime delayed) changes in the state of the environment. As such, it can also assist predictions of future impacts. Some trends can be safely extrapolated on the assumption that the trend is going to continue in the same dynamic. When doing so, it is important to realize that virtually every trend has a corresponding counter-trend. Oversimplified extrapolation that does not consider how the trend will evolve once it reaches a key breaking point (e.g. when carrying capacity of the surrounding environment has been reached or exceeded), or once the counter-trend becomes stronger, may be misleading.
	Trend extrapolation can thus play an important role in medium-to-short term forecasts when no major counter-trends or breaking points are expected. Long-term trends can be precisely determined only through modelling, if at all.
Usual application within SEA	• Analysis of context and baseline • Assessment of impacts
Advantages	• Can greatly assist in the quantification of cumulative impacts in cases where environmental data are available over long periods of time
Disadvantages	• There are often situations where it is not possible to obtain relevant or sufficient data on specific environmental pressures. • In cases where there are gaps in data, it becomes important to use appropriate statistical methods to ensure the proper interpretation of trends. Such analysis may be quite cumbersome.
Examples of practical application or key sources of further information	Different examples of trend analysis are presented in the Transport Analysis Guidance on *SEA for Transport Plans and Programmes* (2004) by UK Department for Transport, available at http://www.webtag.org.uk/webdocuments/2_Project_Manager/11_SEA/2.11.pdf

Table 9: Networks and Flow diagrams

Tool	Networks and Flow diagrams
Linkages to other tools	Modelling
Purpose	Networks and flow diagrams7 can be in SEA used to illustrate: • implications of the proposed decisions on the subsequent decisions and their knock-on effects on other developments (decision-trees); or

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7 sometimes also called system diagrams

Tool	Networks and Flow diagrams
	• a gradual progression from direct immediate effects to indirect or longer-term or delayed effects (effect networks).
Description	Steps for constructing a decision tree might comprise: • List the proposed developments; • Identify effects of these proposals on other decisions or developments; • Identify secondary knock-on effects of these decisions or developments – thus illustrating their wider indirect implications. Steps for constructing an effect network might comprise: • List the proposed developments; • Identify effects of these proposed developments on the directly affected elements of the environment; • Identify secondary knock-on effects on other elements of the environment, including health – thus illustrating pathways from direct effects to indirect effects; • When doing so, determine whether any cumulative effects on the same element of environment, including health, occur; • If appropriate consider a loop to show any feedback; • If appropriate use quantitative techniques as a simple form of modelling to evaluate the effects. This approach constitutes a simple form of modelling and allows the evaluation of effects (see more on modelling).
Usual application within SEA	• Identification of issues and effects • Assessment of effects • Development & comparison of alternatives
Inputs and data demands	• Basic information on the proposed developments. • Basic information on the local environment - a simple list of relevant elements of environment in the study area.
Outputs	Illustration of the cause-effect relationships
Advantages and disadvantages	☺ Flow diagrams help identifying indirect and delayed effects ☺ They clearly illustrate the interaction pathways – the mechanism of cause and effect is made explicit ☺ Flow diagrams provide a good basis for choosing which processes could be quantified or modelled in further detail ☹ Flow diagrams do not illustrate spatial or temporal scales of impacts ☹ They uses a holistic approach to impact assessment, so it may require a considerable effort to complete ☹ They can become too complex

Table 10: Delphi Technique

Tool	Delphi Technique
Linkages to other tools	Expert judgments
Purpose	Delphi Technique enables identification of prevailing judgment within a large group of experts who do not directly interact with each other.

Tool	Delphi Technique
Description	The Delphi technique represents the systematic and powerful tool for formulation of collective expert judgements. It is based on the following principles: • there is no face-to-face interaction; • each participant is given time for thought and an equal opportunity to contribute and, • in particular, disagreements are recorded used to examine different points of view and to increase understanding. The Delphi technique is based on the following key steps: • Clarify what information is needed, design the questions and determine the time line of the process. • Identify the appropriate number of experts to serve on the Delphi panel and explain the tasks. • Prepare and distribute the initial set of open-ended or closed-ended questions. • Collect and analyze the first responses and compile the responses. If open-ended questions were used extensively, analyze and present the first set of responses within an appropriate theoretical framework. • Send the same question out to the same panellists a second and third time. The process may be repeated with additional waves, if necessary. Include the responses with the question so that panellists can read the other opinions and adjust their own opinions. Respondents will read each other's ideas and answer the question again. As information is exchanged, people incorporate each others' perspectives and information into their thinking and arrive at a fairly accurate understanding of the critical issues to consider in their decision-making process. • Always prepare and distribute a final report to panellists. One of the motivations for participating in a Delphi panel, particularly for specialists, is to learn firsthand, before others, what the results of the Delphi study are. It process identification of prevailing judgment within a large group of experts who do not meet and who may not even know each other's identity in order to minimize personal influences.It thus enables participation of experts from geographically dispersed locations. The approach used in the Delphi technique also defines some useful principles and steps for the formulation of expert judgement through other less time-consuming techniques (e.g. workshops, conferences, etc).
Usual application within SEA	• Identification of effects • Assessment of effects • Comparison of alternatives
Inputs and data demands	• Basic information on the proposed development. • Basic information on the receiving environment.
Outputs	Prevailing professional judgment from a large group of experts.
Advantages and disadvantages	☺ Delphi technique can deal with quite technical or complex issues. ☺ It allows sharing of ideas and consensus in decision-making by a large number of stakeholders who do not know each other's identity and can be even geographically distanced ☺ It is convenient to participants, as they can contribute from their own office or home. ☹ It takes time for the organizers (can run for several months) ☹ Participant commitment may falter if the process takes too long or they have other commitments

Tool	Delphi Technique
	☹ Large amounts of data need to be carefully assessed and distributed, so the process can be expensive to manage
Further reading	Nehiley, J. M. (2001) How to Conduct a Delphi Study Dick, B. (2000), Delphi face to face, available at http://www.uq.net.au/action_research/arp/delphi.html

Table 11: Models

Tool	Models
Linkages to other tools	Networks and flow diagrams Spatial analyses
Purpose	Models facilitate simulation of environmental impacts.
Description	Modelling generally tends to be used in SEA only when other analytical tools would provide insufficient predictions. Models of relevance to SEA are mainly those developed to simulate specific environmental impacts. Environmental modeling typically includes the following basic steps: • define the very specific issues and interactions that need to be modeled; • define key assumptions and boundaries of the modelling; • identify the suitable model and fine-tune it to fit the local situation and data availability; • collect the basic data on the local environment (e.g. topography, wind speed & direction, flow regimes, etc.) • collect the input data for the past and current situations (e.g. emission levels) and run the model to enable its verification and calibration; • run the model for the different scenarios that are considered in the assessment (e.g. emissions from the different proposed project and from other actions which are considered during the assessment). Developing a new model is generally very costly. Established and accepted models can be used if they are carefully calibrated to ensure that the simulation fits the specific features of the study area. The most common models include: • <u>Air Quality Models</u> can simulate the cumulative impacts of a number of projects on the local air quality. They typically consider factors such as the wind direction and speed, air quality & humidity, details of the topography of an area and location of developments that emit air pollutants. • <u>Water Quality Models</u> can simulate dispersion of various pollutants under different flow or tidal conditions. They require data on flow regimes (and/or tidal conditions) and can typically predict changes in the dissolved oxygen, coliform bacteria, sediment or chemical concentrations. Other water quality models can simulate the behaviour of pollutants in a lake environment. These models normally consider various inputs of chemicals (e.g. discharge, inflow in rivers, and deposition from the atmosphere) and their removal factors (e.g. irreversible reaction in the water and sediment, outflow in the water, and sediment burial). They typically yield mass balance equations for the water columns and the bottom sediments, but they may also consider pollutant transfer through sediment-water exchanges (e.g. by diffusion and deposition). • <u>Soil Quality Models</u> can calculate soil degradation (e.g. erosion, degradation of the organic matter, etc.) or leaching and accumulation of chemicals (fertilisers, pesticides, heavy metals) applied to soil. They typically consider physical-chemical properties of the soil and chemical's behaviour of the applied chemicals in a soil environment.

Tool	Models
	• <u>Noise Models</u> can consider the cumulative noise levels from more than one source. They typically consider details of the topography of an area and locations of noise emitters.
Usual application within SEA	• Assessment of impacts • Development and compassion of alternatives
Inputs and data demands	Use of models typically requires the following inputs data: • specific impact that needs to be modeled; • key assumptions and boundaries of the assessment; • data on the local environment (e.g. topography, wind speed & direction, flow regimes, etc.); • input data on relevant emissions from the proposed project and from other actions which are considered during the assessment.
Outputs	Simulation that quantifies the expected impacts.
Advantages and disadvantages	☹ No model can realistically address every intricacy of the natural system. ☹ Model can be relatively easily manipulated through assumptions made in its design or adaptation ☹ The accuracy of a model totally relies on the quality of baseline data. ☹ Construction or calibration and running model is usually very demanding in terms of cost, expertise and time. ☺ Model, once constructed, can simulate effects over time and in space ☺ It can facilitate numerous simulations based on different assumptions and input data ☺ Modelling results can be effectively combined with GIS
Further reading	The Canadian Environmental Modelling Centre at Trent University develops, validates and disseminates mass balance models, which describe the fate of various chemicals in the environment. Their site www.trentu.ca/academic/aminss/envmodel/models/models.html offered (as of 2007) fifteen freeware models that can be freely used for basic modelling of air, water and soil quality. International Environmental Modelling and Software Society is a global not-for-profit association of persons and organizations dealing with environmental modelling. It operates a site http://www.iemss.org that offers a comprehensive information various aspects of environmental modelling, software and related topics.

Table 12: Multi-criteria analysis

Tool	Multi-criteria analysis
Linkages to other tools	Expert judgements
Purpose	Multi-criteria analysis numerically evaluates all alternative options against several criteria, and combines these separate evaluations into one overall evaluation. It can be used to identify a single most preferred option, to rank options, or simply to distinguish acceptable and unacceptable options so that a limited number of options can be short-listed for a detailed appraisal.
Description	Multi-criteria analysis (MCA) helps to manage complexity in decision-making by converting the evaluation to a numerical score. All MCA approaches incorporate judgments that are expressed in weights of criteria and in performance evaluations of each option. Usual steps in a multi-criteria analysis are as follow:

Tool	Multi-criteria analysis
	1. Identify assessment criteria, so that they can measure key consequences of proposed alternative options. The proposed set of criteria should be carefully examined to ensure that: • The set of criteria is complete (no significant criteria is missing) • There are no redundant criteria (these may include insignificant criteria or criteria where all options perform equally) • Criteria are measurable (it must be possible to assess - at least qualitatively - how well each option performs in relation to the criterion) • Criteria are mutually independent (there is no double counting) *2. Analyze relative importance of criteria (weighting).* Most MCA techniques determine relative weights of each criteria in the decision -making. Methods of weighting vary from simple techniques (e.g. comparing criteria against each other to determine their relative weight) to complex methods (e.g. sociological surveys to determine importance of each criterion in the affected community). *3. Analyze performance (scoring).* Determine what constitutes the best and the worst performance in the given context. Then, score performance of each option with regard to each assessment criteria. Scoring can be basically done through three means: • Expert judgments that assign scores to show performance of each option when it comes to each assessment criteria (e.g. 0-100 point scale) • Compare options against each other. These methods vary – from simple mutual comparison of options (e.g. on criterion 1 the option A scores best, C second and B third) to more complex comparisons (e.g. programs based on fuzzy sets that turn linguistic evaluations into numerical scores) • Performance is determined on the basis of criterion-specific curve that defines gradual progression from the worst to the best performance *4. Multiply weights and scores for each of the options and derivation of their overall scores.* Each option's performance on a criterion is multiplied by the weight of the respective criterion – this done for all the criteria. The sum yields the overall relative score for the given option. The results for all options are compared and discussed. *5. Analyze sensitivity to changes in scores or weights.* Sensitivity shows how changes in the scores or weight affect the results of MCA. Such analysis may be essential if: • There are serious uncertainties about performance of some options against selected criteria, or • If decision-makers or stakeholders argue about the relative weights of criteria used in MCA.
Usual application within SEA	• Determination of relative importance of impacts • Assessment of impacts • Comparison of alternatives
Inputs and data demands	• Carefully identified assessment criteria reflecting the key environmental consequences of all proposed alternative options • Judgments on relative importance/weights of these criteria • Judgments on performance of each option with regard to all criteria
Outputs	Conversion of assessment into numerical scoring
Advantages and disadvantages	☺ MCA takes into account different criteria at the same time (i.e. they avoid decision-making process based on a single criterion); ☺ MCA may be used to bring together the view of the different stakeholders in the evaluation; ☺ MCA is transparent and explicit (the scores and weights are recorded and easy to audit);

Tool	Multi-criteria analysis
	☺ MCA may facilitate communication with decision maker and sometimes with the wider community.
	☹ MCA reduces rational debate about various pros and cons of proposed alternative options into discussion about abstract numbers (scores and weights)
	☹ MCA cannot facilitate consensus on very controversial decisions;
	☹ By presenting quantitative information (aggregated scores) MCA may create a false impression of accuracy. This sometimes hides the fact that all MCAs heavily depend on a value judgment;
	☹ MCA may be easily manipulated by those who perform it (i.e. simple sensitivity analyses that are normally performed within MCA show criteria that best influence outcomes - this knowledge can be used to manipulate the entire analysis).
Further reading	Multi-criteria Analysis Manual of the UK Government, available at http://www.odpm.gov.uk/index.asp?id=1142251
	The Journal of Multi-Criteria Decision Analysis (ISSN: 1099-1360). By subscription only. More information can be obtained from the editor val@mansci.strath.ac.uk or at http://www.interscience.wiley.com/jpages/1057-9214/
	Department of the Environment, Transport and the Regions, *Review of Technical Guidance on Environmental Appraisal:* A Report by EFTEC (Economics for the Environment Consultancy)
	http://www.defra.gov.uk/environment/economics/rtgea/1.htm

6. ANNEX 2: PUBLIC PARTICIPATION AND INFORMATION PROVISION IN THE SEA PROCESS

Stakeholder consultation and communications has a critical role to play at all stages of the SEA process. Stakeholders, namely individuals, groups, organizations, institutes or communities that are positively or negatively affected by the proposed plan/programme – as well as national, regional and local government agencies with roles in plan implementation and oversight should be involved in the SEA process. The objective is to promote learning among all stakeholders and to enhance understanding and cooperation by all parties. Most important, it is to bring stakeholders to an acceptance of the SEA – its objectivity and fairness, its scientific authority and rigour, and the reasonableness of its recommendations. Even if all stakeholder don't fully agree with the outcomes, they should be convinced that they have had a fair hearing, that their views have been considered openly, and that the result is an acceptable and beneficial for improved sustainability and ecological and social well-being.

6.1 Participation in the SEA and EIA Processes

At present, Thai society is familiar with the environmental impact assessment (EIA) and the EIA participation processes. It is therefore important that all parties understand that the participation process is not the same for SEA.

SEA has a much larger scope in terms of area and issue, but cover issues in less detail. As a consequence, SEA needs to engage a more diverse range of stakeholders, which requires a "representation" or indirect participation as opposed to direct participation as is the case with EIA. Moreover, at the strategic level, the issues tend to be more abstract, and are often multidimensional - social, economic, environmental. Participants need to understand that, compared with EIA, an SEA may not be able to consider local and site specific issues in depth. The nature of the analysis and recommendations are also broad and flexible in the form of remarks, observations, or highlighted issues for further study when more data are available or when certain issues become more evident.

For EIA, affected people are likely to be those living at or near the project site. The most important objective of public information and participation is to make all their concerns evident and to address them by way of mitigation measures, which should be specific and detailed.

It is important to emphasize that the essence of SEA is to develop and assess alternatives at the strategic, not project level, and to identify best-fit alternatives.

6.2 The SEA consultation and communications plan

Public information and participation should be planned. The SEA should identify the groups, communities, organizations, and institutes concerned with, or affected by the proposed plan. Analyzing stakeholders means listing those who have influence over the success or failure of the plan, and those who influence decisions regarding the plan.

6.2.1 Objectives of stakeholder analysis

- To obtain viewpoints from a diverse groups of stakeholders.
- To become familiar with the roles, authority and responsibilities of individuals, communities, organizations, and institutes who are affected by the plan, to make sure that all primary stakeholders are adequately and appropriately addressed in the participation and information disclosure process.
- To learn about key issues or concerns regarding the proposed plan, especially about sensitive matters concerning culture, religion or language.
- To have adequate information to design an appropriate participation and information disclosure exercise.

6.2.2 Stakeholder categories

Stakeholders can be classified into 2 categories:

Primary or direct stakeholders. This category includes individuals or groups that directly benefit as stipulated by the objective of the proposed plan, and those that may be positively or negatively affected e.g. residents in the proposed area of development.

Secondary or indirect stakeholders. This category includes individuals, groups, organizations, institutes and agencies involved with the plan. This may be the proponent agency responsible for the plan; other agencies with relevant mandates including the provincial authority; the local administrative organization of the proposed development area; or, concerned organizations that have professed interested in the issue (e.g. individuals, non-governmental organizations, educational institutes that have studied or researched issues concerning the plan). Informal groups or opinion leaders such as local politicians, community leaders, senior citizens, and religious leaders are also included.

6.3   Stakeholder Analysis Process

The process consists of 3 steps.

6.3.1 Identify stakeholders

There are several ways of identifying stakeholders. One method is to answer the following questions.

- What are the natural and man-made resources that may be affected by the proposed plan? Consider economic, social and environmental aspects.
- How are these resources used?
- Which organization has authority over the use of these resources?

Table 13 provides a summary set of example answers to the above questions.

Table 13: Stakeholder Identification Template

Type of stakeholder (agency/group/individual)	Likely benefit/impact from the plan/program	Issues of interest concerning the plan/program
Responsible agencies		
NGOs/public interest organizations		
Academics		
Businessmen		
Concerned citizens		

6.3.2 Stakeholder analysis

Once all stakeholders have been identified, the next step is to conduct a stakeholder analysis (interest and influence in the success of the plan) by group to distinguish primary from secondary stakeholders. It is important the PIP plan includes and gives high priority to primary stakeholders.

This requires knowledge about each stakeholder's position, responsibilities, organization and resources under control, relationship and influence over other groups, interest in the plan/programme, perspective and concerns about the impact of the plan/programme. In addition, it is important to assess each group's propensity to support or oppose the proposal. This information is useful for designing consultations to achieve a compromise or trade-off among the stakeholders.

Sample questions:

- What are the stakeholder's present and future interests and expectations regarding the use and management of resources that may be affected by the plan/programme?
- How were the resources used in the past? What benefit did the stakeholders get?

- What authority, rights, or responsibilities, formal or informal, did/does each stakeholder group have over the resources/environment? Has an organization or network on the issue been set up by the stakeholder? How?
- How did/does the use of the resources/the environment in the past and present result in positive or negative impacts to society and the environment?
- To what extent is the stakeholder willing to, and capable of, helping and cooperating in the management of the plan/programme?
- What are the issues likely to get consent and what are the likely benefits? How to develop this into collaboration and consensus?
- Can the stakeholder provide support in terms of manpower, knowledge, technique, capital toward the preparation of the plan/programme management? How?

Table 14 presents a template with hypothetical answers to these questions.

Table 14: Summary of Stakeholder Analysis

Stakeholder's interest	Stakeholder's influence over the success of the plan/program*			
	Not influential/ unknown	Somewhat influential	Influential	Very influential
Very interested	C	B	A	A
interested	C	B	A	A
Somewhat interested	D	D	B	B
Not interested /unknown	D	D	C	C

*Note: The level of importance of the stakeholder is represented by: A for most important; B for important; C for somewhat important; and D least important.

6.3.3 Designing the public information and participation (PIP) approach/format

The following principles should be taken account of during the design of a PIP approach:

- Give utmost importance to primary stakeholders (A: "most important") and secondary stakeholders (B: "important"). Primary stakeholders should be actively engaged from the initial stage.
- Inform and provide opportunities to other stakeholders (C: "somewhat important" and D: "least important") to participate as much as possible.
- Design appropriate PIP format in line with the plan/programme and different stakeholder groups.

Table 15 presents a template that would align stakeholders to issues of interest in the plan or programme, and to the PIP approach.

Table 15: Summary of Stakeholder Analysis and PIP Approach/Format

Stakeholder	Issues of interest in the plan/programs	Stakeholder analysis	PP approach/format

6.4 Public Information and Participation in the SEA Process

Another important decision is to identify the steps in the SEA process that should benefit from stakeholders' participation. Best practice is to have stakeholders participating at every step of the SEA

process. It is, however, important to realize that the objective of the participation is different at each step as shown in Table 16.

Table 16: Objective of Stakeholder Participation in the SEA Process

SEA steps	Objectives of stakeholders' participation
Screening	▪ to ensure that the stakeholders understand and accept the mandate of the proponent agency. ▪ to identify stakeholders of the SEA.
Scoping	▪ to ensure that the opinions and concerns of the stakeholders are considered, especially those concerning development objectives, development indicators, alternatives, impacts and impact assessment methodologies.
Baseline assessment	▪ to seek assistance in identifying sources for baseline data. ▪ to identify, collect local knowledge/wisdom and/or specific information.
Alternative development	▪ to seek assistance in identifying potential alternatives. ▪ to receive feedbacks on the development alternatives proposed by the proponent agency.
Impact assessment	▪ to obtain data and opinions concerning the operation and impact assessment. ▪ to ensure that all the opinions and concerns are addressed.
SEA sustainable development pathway	▪ to ensure that the SEA report addresses all key issues with clarity and in an appropriate manner, which should help the proposed plan earn the acceptance of the stakeholders and the society. ▪ to ensure that the decision to approve the draft plan and SEA is based on adequate and accurate data/information.
Monitoring and follow-up measure	▪ to participate in the monitoring of the plan implementation to see whether the impacts are as expected and are in line with standards and regulations, and to ensure that unforeseen impacts would be addressed in a timely fashion, and rectified.

If it is not practical to conduct public participation at every step, the following steps would be considered acceptable.

Scoping

In most countries, consultation with the agencies responsible for the environment and public health (including public safety and welfare) is mandatory at the time of scoping, to ensure that the SEA has an appropriate coverage and focus.

Impact assessment

This is a crucial step that requires the most thorough, precise, and detailed analysis. It is therefore necessary and obligatory to obtain feedback from the stakeholders.

Sustainable development pathway

This is the most important outcome of an SEA – the framework of recommended measures to be integrated into the plan. It is in this final stage that stakeholders have the greatest interest in participating in the SEA to contribute in shaping the plan and in promoting sustainable outcomes.

7.   ANNEX 3: SELECTED THAI SEA REPORTS

	Title/year	Prepared by
1	Area-based SEA: Environmental feasibility study for the development of land use plan in the Eastern Seaboard - Rayong, Chonburi and Chachoengsao Provinces (1998)	ONREP
2	Area-based SEA: Environmental feasibility study for the development of land use plan in the Eastern Seaboard – Prachinburi Province (2000)	ONREP
3	SEA for power sector integration in the Mekong, 6 countries including Thailand (2005)	Stockholm Environment Institute (SEI)
4	Area-based SEA for the special economic zone, Chiang Rai Province (2005)	ONREP
5	SEA waste management) 2007)	Health Systems Research Institute
6	SEA Yom River Basin management (2007)	Health Systems Research Institute
7	SEA for the development of electronic industry (2007)	Health Systems Research Institute
8	SEA for five southern coastal provinces (Surat Thani, Nakhon Sri Thammarat, Krabi, Phang-nga, Phuket (2008)	ONREP
9	SEA for Southern Seaboard 2008	Industrial Estate of Thailand
10	SEA for Mae Wong Dam Project, Nakhon Sawan Province, (2009)	Royal Irrigation Department
11	SEA for the North-South economic corridor strategy and action plan (2009)	Asian Development Bank (ADB)
12	SEA of the Hydropower on the Mekong Mainstream (2010)	Mekong River Commission
13	SEA for the Mekong-Loei-Chee- Moon (2010)	Royal Irrigation Department
14	SEA for potash development project (2010)	Department of Primary Industries and Mining
15	SEA for sustainable integrated steel industry development (2011)	Iron and Steel Institute of Thailand, Ministry of Industry
16	SEA for the Yom River Basin management policy (2011)	Royal Irrigation Department
17	SEA for shrimp farms development in the Southeast of Thailand)2011 (	Swedish International Development Cooperation Agency (SIDA)
18	SEA for Chantaburi Province Development Plan (2011)	Stockholm Environment Institute (SEI Asia)
19	SEA for Tha Chin River Basin for sustainable development of water resource (2011)	ONREP
20	SEA for Muang District and adjacent area, Rayong Province, phases 1, 2 (2012)	Air pollution unit/Bureau of Water Technology and Industrial Work Environment/Department of Industrial Works
21	SEA for Mekong-Chee-Moon Basin (2013)	Department of Water Resource
22	Initial SEA for mineral resource management (lead, zinc in Tongphapum District, Kanchanaburi Province (2013)	Department of Mineral Resource
23	SEA for the areas around the Suvarnaphum Airport (2013)	Airports Authority of Thailand (Public Company Ltd.)

	Title/year	Prepared by
24	SEA for the special economic zone strategy: Kanchanaburi case (2015)	thesis
25	SEA for the management of the Andaman coastal eco-system (2015)	ONREP
26	SEA for Southern Seaboard development (2015)	Office of Transport, Traffic Policy and Planning
27	SEA for the Prachinburi Basin Management Plan (2017)	NESDC

Source: NESDC, 2017

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