

IMPROVING DECISION-MAKING FOR THE ENERGY TRANSITION

Guidance for using Strategic Environmental Assessment

CHAPTER 2

STAGES AND TASKS IN SEA



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CHAPTER 2

STAGES AND TASKS IN STRATEGIC ENVIRONMENTAL ASSESSMENT

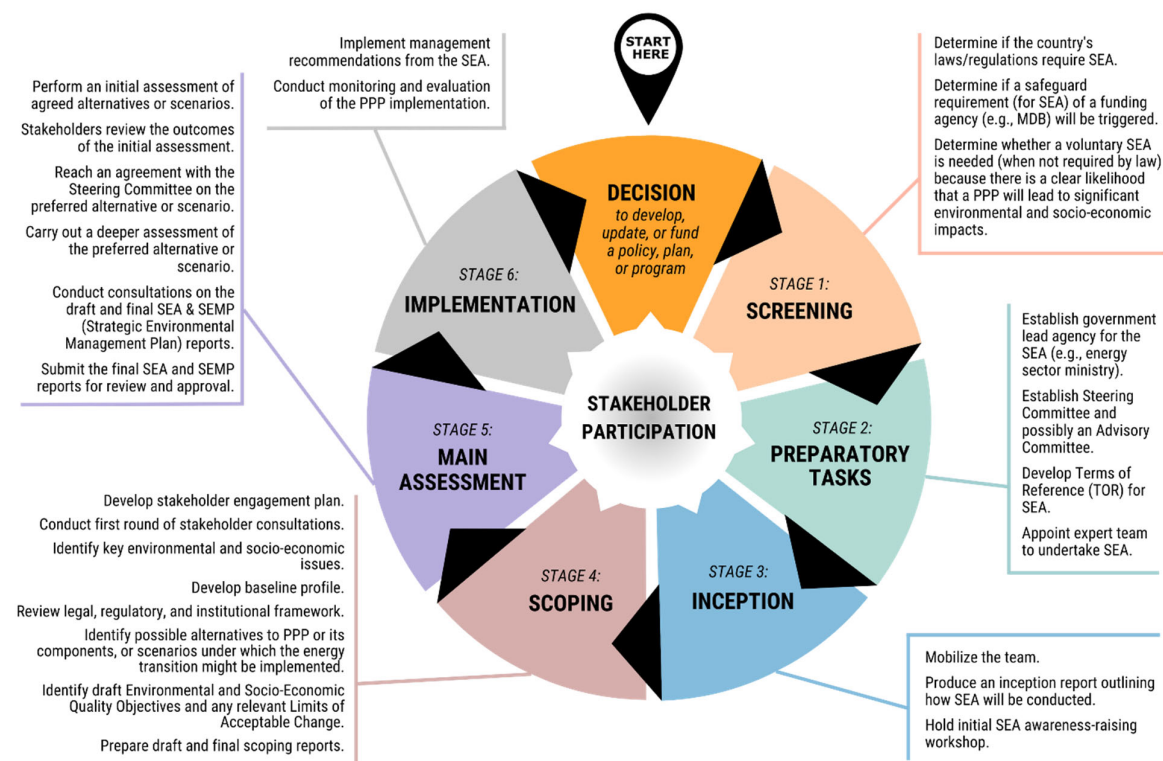
The stages and elements discussed in this chapter are considered generic to all full strategic environmental assessments (SEAs) (see Chapter 1, Section 1.7, and Table 1.2 for comparison of rapid and full SEA) and will be applicable to any SEA undertaken for a policy, plan, and program (PPP) concerned with the energy transition. They are not repeated in the chapters on renewable energy sub-sectors in Parts B and C. These stages and elements are based on internationally accepted principles for SEA good practice.¹

A fundamental principle of SEA is that there should be stakeholder participation throughout the process. This is discussed in Section 2.10.

2.1 THE SEA PROCESS AT A GLANCE

The main stages and elements of the SEA process will need to conform with requirements in national, legal, or regulatory requirements and may, therefore, differ from country to country. Typical stages are shown in Figure 2.1 and described in the following sections.

Figure 2.1: Typical stages in the SEA process



¹ OECD DAC (2006)

2.2 STAGE 1: SCREENING

Screening is the procedure to identify whether SEA is formally needed by law or regulation, is required by the safeguard policies of a lender/financing organization (e.g., a multilateral development bank), or is necessary because significant concerns have been raised that there is a clear likelihood that an energy PPP or regional energy development proposal will lead to significant environmental and socioeconomic consequences (Box 2.1).

Box 2.1: Key tasks of the Screening Stage

- The proponent screens its proposed PPP to determine if it is required by law or regulation to be subjected to an SEA. Depending on national legislative requirements, this may involve determining if the PPP is likely to have significant environmental and social risks or impacts. The proponent may convene an expert group to help with screening and/or seek advice from the competent authority.
- The environmental and social safeguard policies and frameworks of a funding organization (e.g., an MDB) may also trigger the need for an SEA or equivalent, whether or not one is formally required by a country's law or regulation.
- Where there is no legal mandate or requirement for SEA, it may be apparent and agreed that a proposed PPP or proposed major development activities in a geographical area would benefit from information and recommendations generated through an SEA undertaken on a voluntary basis.
- In any of the above circumstances, where it is determined that an SEA is required, the proponent should proceed to Stage 2.

Arguably, given the scale and speed of the energy transition, SEAs (and complementary processes such as spatial planning) are essential for renewable energy rollout and expansion. But SEA for the energy transition must be pragmatic and proportionate. In some countries, it may be more difficult to undertake because of limiting factors such as lack of governance structures, expertise, capacity, and budgetary resources.

A country's SEA law and/or regulations will indicate whether SEA is required for all types of PPP or for specific categories of PPP. Screening is used to determine whether a proposed PPP (or revision of an existing one) falls into one of these categories. In some countries, the proponent of a PPP (usually a line ministry or department) may be required to undertake some initial analysis to determine if there is potential for a PPP to result in significant environmental and social impacts, which might trigger a formal requirement for an SEA. Screening should be undertaken by the proponent of a PPP.

Where a country has no regulatory mandate for SEA, an SEA-type exercise may still be extremely beneficial, e.g., in terms of how best to meet obligations, targets, or goals under international or national obligations (Paris Agreement, Global Biodiversity Framework, Sustainable Development Goals, etc.), or for increasing lender or developer confidence. The energy transition is global, and potentially, countries without an existing legal requirement for SEA could be the ones where the benefits of SEA are greatest in terms of promoting sustainable development. There is a need for pragmatic and scalable approaches to SEA that can be implemented in countries without legislation for SEA or where it is still emerging.

Lenders' environmental and social safeguard policies and frameworks will also indicate whether an SEA (or equivalent, e.g., SESA) is required. Lenders will usually engage with the relevant government ministries about initiating the process and may provide funding for it.

Where national laws or regulations do not specifically prescribe which PPPs require an SEA, then the criteria listed in Box 2.2 can be used to determine whether an SEA would be beneficial. A screening

form is provided in Annex 3 based on these criteria. It can be used to document the result of the screening procedure and includes a record of the decision on whether an SEA should or should not be carried out.

Box 2.2: Screening criteria

1. Characteristics of the PPP itself:

- Degree to which the PPP sets a framework for projects and other activities, either with regard to the location, nature, size, and operating conditions or by allocating resources.
- Degree to which the PPP influences other policies, plans, and programs.
- Relevance of the PPP for the integration of environmental and socioeconomic considerations (and their relationship with economic concerns and drivers), with a view to promoting sustainable development.
- Environmental and social concerns relevant to the PPP.
- Relevance of the PPP for the implementation of national legislation on the natural or human environment (for example, PPPs linked to waste management or water protection) or social conditions.
- Extent to which the proposed PPP is likely to be politically or publicly acceptable or contentious.
- The PPP is unprecedented.

2. Characteristics of the impacts and of the areas likely to be affected:

- Probability, magnitude, duration, spatial extent (geographical area and size of the population likely to be affected), frequency, uncertainty, and reversibility of the impacts.
- There are inherent uncertainties, and the level of confidence in predicting the impacts of the proposed PPP is low.
- There are important information gaps, making it difficult to predict impacts.
- Cumulative nature of the impacts and whether they are likely to be significant (both additive and synergistic impacts).
- There are likely to be trans-boundary impacts (i.e., the PPP is likely to affect other administrative units, regions, or countries).
- Risks to the environment, social conditions, human health (e.g., due to accidents), safety, and/or the integrity of social or ecological systems are considered to be high.
- Social and/or ecological systems have low resilience and high vulnerability to disturbance or impact (e.g., poor communities, vulnerable groups, or sensitive ecosystems).
- Value and vulnerability of the areas likely to be affected due to:
 - Having unique, special, or highly valued natural elements (e.g., threatened biodiversity, critical, or sensitive habitats);
 - Protected areas (e.g., nature reserves, heritage sites, Ramsar sites) or areas of recognized local, district, national, or international importance for conservation and biodiversity importance;
 - Areas of unique, special, or highly valued cultural or spiritual elements;
 - Existing levels of environmental quality are close to defined limits of acceptable change (i.e., there is a definite risk that limits of acceptable change will be exceeded); or environmental quality standards have been exceeded;
 - Areas subject to intensive land-use and rapid change;
 - Vulnerable groups that could be affected.
- Impacts on areas or landscapes that have a recognized national or international protection status.
- The PPP is likely to result in major changes in actions, behaviors, or decisions by individuals, businesses, NGOs, or government that could lead to:
 - Induced development of infrastructure or other changes in urban or rural land use;
 - Loss or degradation of natural habitat or of areas important for nature conservation;
 - Adverse impacts to biodiversity or provision of ecosystem services;
 - Major changes in the pattern of settlement, land occupation, and/or demographics in an area;

- Major changes in the development or use of technology that could have negative implications for worker, community, and individual health and/or safety;
- Introduction of alien and potentially invasive organisms;
- Changes in society's consumption of energy and in particular fossil fuels, and therefore, in emissions of pollutants, carbon dioxide, and other greenhouse gases;
- Changes in the rate of society's consumption of and/or demand for natural resources, including water and materials;
- Impacts on energy security; or
- Transport, storage, and processing of hazardous and non-hazardous waste materials.

2.3 STAGE 2: PREPARATORY TASKS FOR THE PROPONENT

As soon as a decision is made to conduct an SEA, preparatory tasks can be initiated by the proponent – the government body or other agency developing the PPP. While in most cases this body will likely appoint a team of SEA experts to undertake an SEA, in some instances an SEA might be conducted by the government itself. Either way, it is important that the SEA is, and is seen to be, government-owned and government-led.

Box 2.3 lists a range of tasks that should be undertaken by the PPP proponent.

Box 2.3: Key tasks of the Preparatory Stage

- Determine whether other institutions (including donors) have carried out or intend to carry out an SEA relevant to the PPP in question and, in such circumstances, seek to engage in a **joint process**.
- Determine **who will undertake the SEA** – the proponent, or another government agency, or a team of consultant experts.
- Determine **who will fund the SEA** – the lead government agency or an MDB/development cooperation agency? In either case, the government should always lead the process.
- Establish an **in-house management group** – one or more individuals with responsibility for managing the SEA process. A person should be designated as a point of contact for the SEA.
- Establish a multi-stakeholder **Steering Committee** for the SEA. Its role will be to offer leadership and take key decisions on the SEA process and recommendations, provide a cross-institutional platform to increase understanding of and buy-in to the process, and provide high-level advice and guidance when needed throughout the process.
- Consider whether to establish a separate an **Advisory Committee** that would provide advice on technical matters.
- Prepare **TORs for the Steering Committee, Advisory Committee**, and any other representative bodies established for the SEA covering roles and responsibilities.
- Consult with the Steering Committee and Advisory Committee (if established) to **agree on the approach to the SEA** (to guide the TOR) and secure buy-in and ownership of the SEA, prepare an agreed “roadmap” as a starting document, and publicly announce that an SEA is to be undertaken.
- Develop **SEA Terms of Reference** (refer to Annex 2 for an example) based on the basic principles of SEA (see Section 1.4) and setting out the framework for the SEA.

- Appoint a team of experts (**consultant team**) where so decided to undertake the SEA. It is likely that, where national skills and expertise in SEA are limited or lacking, proponents will need to rely on external (expatriate) consultants to lead the work. But it will be important to include national consultants to ensure the team has access to critical local knowledge and also to build capacity.

Also:

- Confirm sources of funding (if not from the proponent's budget);
- Agree on the vision for the SEA and its goals;
- Identify the schedule for SEA start and completion;
- Identify opportunities for integrating the SEA process with the PPP development and decision-making process, and identify key decision points that can be assisted by SEA outputs.
- Undertake initial consultations with key government agencies and institutions likely to be involved in the SEA or implementing a SESMP to explain about the need for the SEA and the process involved in order to build understanding and support.
- Identify any need for training for relevant government personnel and others (e.g., NGOs) to explain SEA, its need, role, benefits, and modalities. Such training should be provided at an early stage during the Inception Stage or Scoping.

2.4 STAGE 3: INCEPTION

Once the SEA team is formally appointed, the expert members of the team should be mobilized and meet with the proponent for initial discussions on how the SEA will be conducted. Any **issues requiring clarification** should be raised. These could include aspects of the Terms of Reference. The inception stage will normally be short (e.g., 4-6 weeks) and will normally require the submission of an Inception Report setting out how the team will undertake the SEA, methods to be used, a timeframe for activities, etc.

Experience shows that PPP development rarely follows a smooth and predictable path. Sometimes, when the SEA is commissioned, the focus and content of the PPP can still be unclear, and some assumptions in this regard will be necessary to design the SEA. The assumptions may need to change later. In other cases, there may be a change in policy direction (e.g., following an election). Therefore, as indicated in Section 1.6, the SEA will need to be flexible and iterative (with constant dialogue with the proponent) so that it can be modified and adjusted to changing circumstances.

Experience from undertaking SEAs shows that most stakeholders and government officials in government agencies (particularly those that commission SEAs, receive the reports, and will have responsibility to implement recommendations) have little or no prior awareness or understanding of what SEA is. Neither do they understand how it can help the PPP process (preparation and implementation) and how it can be of benefit. So, it is important to organize, during or soon after the SEA inception stage, an **awareness-raising event** (usually a workshop) for stakeholders. This should provide a basic background to the nature, role, and benefits of SEA, explain why it is being conducted for the particular PPP in case, outline how the SEA will be conducted and how stakeholders can engage in the process, and indicate stakeholder roles and responsibilities. Such an initial workshop will help to generate understanding of the SEA process, build support and ownership, and encourage anticipation of the outcomes (reports and recommendations) and willingness to consider how best to consider and act on the recommendations. The workshop should be organized by the institution responsible for the SEA and should involve all stakeholders that have participated previously in the SEA process.

2.5 STAGE 4: SCOPING

During the scoping process, the SEA team should confirm the focus and content of the SEA, define the scope of the analyses needed, the stakeholders to be involved, the approach and methods to be

used, the data and information sources to be considered, and the relevant criteria for assessment. Scoping provides an opportunity to focus the scoping report on the important issues to maximize its usefulness to the authorities, decision-makers, and public. It does not preclude changes in the scope of the report if the need for them becomes apparent at a later stage.

The scoping process should be open and iterative, involving key stakeholders (see Section 2.10) to:

- **Review the context** of the SEA;
- **Explain to stakeholders** the role, modalities, and added value of SEA. One of the tasks of scoping is a review of the country's legal, regulatory, and governance framework (see Box 2.4). This should also analyze the formal and informal approaches to environmental and social assessment and management applied in the country (these may vary by sector). During any SEA training and during discussions with sector ministries, the SEA team should explain how such existing sectoral approaches (as far as they relate to the energy transition) are relevant to the SEA and what added value can be provided by SEA. In particular, the team should identify how SEA can help what the sectoral ministries and agencies are already doing, e.g., integrated water resources management (IWRM) in the water sector, feasibility studies in the infrastructure sector, master planning in the power sector, etc. This engagement with sectors should be undertaken upfront and feed into the design of the SEA process;
- **Identify alternatives** to the PPP to be assessed in the next stage. Scenarios can also be considered as alternatives, especially where multiple renewable energy options are being considered for the energy transition;
- **Identify key environmental and socioeconomic issues.** It is important to focus the assessment on the key issues that really matter and avoid trying to cover all possible (minor) concerns, as this will overload the SEA and lead to legitimate criticism that it is overcomplicated. It is important to re-emphasize that an SEA is not a large EIA and that the types of issues it should focus on should be more strategic and of a cumulative nature. Nevertheless, many of the issues likely to be identified and those likely to be raised by stakeholders will be based on peoples' experience from the implementation of past or existing renewable energy and other projects. Project-based impacts will give rise to cumulative impacts, and addressing the latter is a key principle of SEA;
- **Identify and confirm the focus and content** of the SEA;
- **Identify relevant environmental and social quality objectives (ESQOs), targets, indicators, and decision criteria** to use during the subsequent stages to select a preferred alternative – helped by stakeholder interviews, a review of the policy and legal framework, situation analysis, and the identified critical issues, and
- **Identify baseline and other data requirements** and initiate collection; and identify any critical information gaps.

A pragmatic view needs to be taken on how much can be achieved during an SEA, given the available time, resources, and existing knowledge about key issues (is sufficient and reliable baseline data available? Is there a need for research or supplementary field work and how will this be carried out?).

Box 2.4 summarizes the tasks to be undertaken during scoping.

Box 2. 4: Key tasks of the Scoping Stage

- **Clarify TOR** with the proponent, raise any concerns, suggest modifications based on professional experience, and agree on any adjustments required including as regards:
 - A realistic time scale for the SEA (start to completion);
 - The required documentation (reports to be prepared);
 - What stages of the PPP decision-making process should the various aspects of SEA be aligned with? (Need to map out the decision-making process to identify “windows” of opportunity);
 - How to integrate SEA findings, outcomes, and conclusions into decision-making at points when options and proposed activities are being developed and evaluated.
- Clarify **PPP objectives**.
- Meet with the **Steering Committee** to present the approach to be followed and seek its assistance to support the scoping work.
- Establish a dedicated **SEA website**.
- **Stakeholder analysis** – map those who have a direct interest in the PPP and may be affected by its implementation and what their main concerns about the environmental and/or social issues are likely to be (see Section 2.10).
- Prepare a **stakeholder engagement plan** (SEP) setting out (a) who should be involved in the SEA (including agencies that have various decision-making mandates within the spatial boundaries of the PPP and the SEA study area), (b) how and when they can/should engage in the process (identifying their roles and responsibilities and practical arrangements), and (c) presenting the results of preliminary stakeholder mapping (see Section 3.3.6). The latter may require consultations with the government where there are any sensitivities regarding stakeholder engagement. It may also include assessing stakeholders’ interests to be involved in the SEA process.
- Start **stakeholder consultations**, including **interviews** with key stakeholders (organizations and individuals), and **stakeholder workshops** to explain the SEA (reason and process), to identify baseline data and PPPs held by consultees, and for consultees to assist in scoping key issues and identifying SEA objectives. (*Note: stakeholder consultation should be undertaken throughout the duration of the SEA process (see Section 2.10).*)
- Develop and agree on the **assessment methods** to be used for the SEA (see Annex 6 for an overview of selected analytical and decision-making tools for the SEA).
- Determine if the SEA should be (a) **impacts-led**, (b) **objectives-led** (see Section 1.5), or both.
- Identify **key sources of data and information** to determine what data is required, what studies (and sources) are already available, and what the remaining gaps are.
- Initiate **collection of baseline data** and **new research/field studies** (where required), determine the **minimum information** needed to carry out SEA scoping effectively, and when this needs to be made available during PPP development (*note: in some circumstances, where critical information is lacking and requires special studies that may need considerable time to undertake (e.g., to gather seasonal data), and this may signal a need to consider deferring the SEA or extending the timeframe (see Section 2.5.4)).*)
- **Initial literature review** (published or unpublished reports by government or others, grey literature, donor documents, etc.) to identify relevant environmental and socioeconomic concerns, information, data, and trends.
- **Inventory and review of other PPPs** (to include PPPs related to the PPP being assessed (i.e., the target PPP), or that might have an influence on the target PPP, or that might be affected by implementing the target PPP) to document aims, objectives, and key themes of relevance to the target PPP (see Section 2.5.6 and Annex 5).
- Identify whether **other assessment processes** apply to the PPP and, if so, determine the best way to deal with any overlaps between the assessment systems.
- Analyze the **legal, regulatory, and governance framework** (laws, decrees, directives, regulations, etc.), and identify **synergies and conflicts** in their objectives (this may signal where policy revision may be required to achieve PPP and sustainable development objectives).
 - Include and analyze the formal and informal approaches to assessment applied in the country (these may vary by sector).
- Initiate a **review of institutions** that are likely to have a role in implementing the SESMP, covering mandates, roles, responsibilities, and capacity to undertake their functions.
- Identify **international conventions, treaties, and accords** to which the country is a signatory.

- Identify **key environmental and socioeconomic issues** that the PPP should take into consideration, the main ecosystem services that stakeholders depend upon and in what ways, and screen out issues that are less important at this stage.
- Decide what **technical studies or consultations** are required to assess the impacts and identify information gaps and analytical methods to be used.
- Based on key themes and issues, develop **draft environmental and social quality objectives** (ESQOs), targets, and indicators to provide a framework for assessment and monitoring of the PPP (see Section 2.6.3).
- Determine **Limits of Acceptable Change** (LAC) (see Section 2.5.2).
- Identify reasonable **alternatives or scenarios** (to the PPP or to possible PPP components). These should be realistic, practicable, and relevant, and should include the “status quo” or “do nothing” option (see Section 2.5.3). Establish goals, objectives, and decision criteria (e.g., for selecting the preferred alternative to the PPP or components of it) and who should be involved (other agencies, stakeholders, etc.).
- **Identify Relationship with other SEAs/EIAs** – Identify the relationship between the SEA being undertaken and other SEAs and project EIAs.
- Determine whether the **SEA report should be topic-based or task-based** (a suggested list of issues to be covered in an SEA report is provided in Annex 4).
- Preparation of a **draft scoping report** and circulation or disclosure for stakeholder or public comment.
- Convene a **scoping workshop** to obtain stakeholder feedback.
- Preparation of **final scoping report** updated in response to comments. Publicly disclose the report through the lead agency website or some other means.

2.5.1 Setting draft SEA environmental and social quality objectives (ESQOs)

As discussed in Chapter 1 (Section 1.5), an SEA can be impacts-led or objectives-led. A decision needs to be reached regarding which approach is appropriate, or both.² Where the SEA involves an objectives-led approach, Environmental and Social³ Quality Objectives (ESQOs) should be developed to help to focus the SEA and ensure important issues are not left out in the process, and to provide a framework for the assessment of the PPP and its alternatives or scenarios. In an objectives-led SEA, the assessment determines whether implementation of the PPP will enhance or impede the attainment of the agreed ESQOs.

ESQOs are specified targets and aims agreed upon during an SEA for environmental and social quality (e.g., prevention of loss of biodiversity, improved job opportunities, etc.) that should be met when implementing a policy, plan, or program. ESQOs should be developed as a response to key environmental and socioeconomic risks identified during scoping. They should be consistent with legal standards, objectives already set in existing policies, SDGs and climate change targets, and commitments the country has made under international conventions and treaties to which it is a signatory.

The following processes will help in the development of draft ESQOs.

- **Clarification of PPP objectives** to assist in deriving the spatial and temporal scale to be covered in the draft SEA ESQOs;
- **Compatibility analysis** to determine if the objectives of the PPP being assessed are in line with the proposed environmental, social, or other objectives, as well as with those in other government PPPs or commitments to international conventions, regional agreements, etc., or with the UN

² An objectives-led approach to SEA may be preferable when the focus is complex and at a very high level covering multiple PPPs, thus making it difficult to separate impacts likely to arise under different PPPs, or when an impacts-based approach is likely to be problematic (e.g., when there are inadequacies in the availability of baseline data (see Section 1.5)).

³ Social objectives may also include health, cultural, aesthetic, and other values, and may include economic objectives.

Sustainable Development Goals (SDGs). This may involve a careful examination of the policy and legal framework;

- Relations between the objectives of the proposed PPP and the relevant ESQOs may be easily presented through **simple matrices** that may provide the basic description of impacts. An example of a simple compatibility matrix is provided in Annex 7. Various conflicts, antagonisms, and synergies may be easily visualized using, for example, simple symbols or colors that indicate:
 - Absolute conflict/constraints (red);
 - Considerable conflict/constraints (orange);
 - Considerable positive impact or synergy (light green);
 - Full synergy – the proposed objectives resolve an existing environmental or sustainability problem (dark green);
 - Impact is uncertain (blue);
 - Impact is insignificant (no color);
- **Conflicts need to be resolved** or specific recommendations given on which areas may require resolution to ensure that the objectives are mutually supportive;
- **Stakeholder consultation** with relevant lead agencies and the public to determine how they will be affected and to ensure their concerns are included in setting ESQOs. It will also assist in the prioritization of boundaries, issues, or alternatives to consider, as well as outcomes. Stakeholder comments may lead to the development of other pertinent social and environmental objectives;
- Obtain **consensus from stakeholders**.

Some examples of ESQOs and indicators are shown in Table 2.1. More are provided in Annex 8.

Table 2.1: Some example SEA environmental and socioeconomic quality objectives and indicators

SEA topics / key issues	Possible environmental and social quality objectives	Possible Indicators (ways of quantifying the baseline, prediction, monitoring)
Biodiversity, fauna and flora	<ul style="list-style-type: none"> • Avoid damage to designated wildlife and ecological sites and protected species 	<ul style="list-style-type: none"> • Reported levels of damage to designated sites/species
Population and human health	<ul style="list-style-type: none"> • Create conditions to improve health and reduce health inequalities 	<ul style="list-style-type: none"> • Life expectancy • Hospital admissions
Water and soil	<ul style="list-style-type: none"> • Limit water pollution to levels that do not damage natural systems 	<ul style="list-style-type: none"> • Quality (biology and chemistry) of rivers, canals, and freshwater bodies and of soil
Air	<ul style="list-style-type: none"> • Limit air pollution to levels that do not damage natural systems 	<ul style="list-style-type: none"> • Number of days of air pollution / Levels of key air pollutants by sector and per capita
Climate factors	<ul style="list-style-type: none"> • Reduce greenhouse gas emissions 	<ul style="list-style-type: none"> • Carbon dioxide (CO₂) emissions
Cultural heritage and landscape	<ul style="list-style-type: none"> • Preserve historic buildings, archaeological sites, and other culturally important features 	<ul style="list-style-type: none"> • Percentage of historic buildings and archaeological sites 'at risk'

In the SESMP, indicators will need to be established to help monitor whether management recommendations for achieving the ESQOs are being met (see Box 2.14).

2.5.2 Limits of acceptable change

Scoping should determine relevant Limits of Acceptable Change (LAC) or thresholds to inform the evaluation of the potential significant environmental and social impacts of a PPP and/or to determine appropriate indicators to be recommended by the SESMP for monitoring (see Box 2.14). A key principle of SEA is that it sets the criteria for levels of environmental or social quality and identifies what change is considered acceptable. In some circumstances, it may be appropriate to select a LAC/threshold as an indicator.

LAC can be derived from various sources, such as existing international or national standards, legislation, guidelines, targets for environmental quality in management plans or programs, and State of the Environment (SoE) reports. If there are no appropriate LACs, they can be developed during the SEA through stakeholder engagement, inputs from specialists, and the findings of the situation assessment. LACs and thresholds may also be identified or clarified during the subsequent detailed assessment stage.

2.5.3 Identifying alternatives to a PPP or elements of a PPP and use of scenarios

A key principle of SEA is to consider alternatives to a PPP or elements of a PPP. This provides a means to identify and explore different ways (different options, choices, or courses of action) to deliver a PPP's objectives while addressing environmental and socioeconomic issues.⁴ The timely consideration of alternatives in SEA and the planning process provides an opportunity to identify and explore ways of accommodating the future development needs of an area or sector, taking into account the intrinsic environmental and socioeconomic conditions.⁵ Alternatives should be realistic, reasonable, viable, and implementable options that promote environmental and socioeconomic benefits while fulfilling a PPP's objectives.

Identifying alternatives is likely to be easier where the SEA is focused on a specific PPP (e.g., for hydropower, solar, or wind generation). However, where the SEA is focused at a higher and broader meta-level (e.g., for the wide range of energy options likely to be considered for the energy transition), considering PPP-specific alternatives is likely to be impossible. In such circumstances, it may be preferred to assess the impacts of implementing transition changes under different scenarios (see below).

SEA has the most influence during the early PPP development stage because a comparative evaluation of the need or demand for a new PPP or need to modify an existing PPP and an impact evaluation of a broad range 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 that process, ultimately reaching the project level.

A range of sources can trigger how to identify alternatives. These include:

- Analysis of strategic policy or action objectives, the policy context, environmental and social quality objectives, and existing and predicted environmental, social, or sustainability problems;
- Consideration of hierarchy alternatives (Box 3.5), and
- Suggestions raised by key stakeholders and by planners or contained in previous SEAs or other assessments.

The alternatives assessed in the SEA could represent different ways of delivering each target.

The early (initial) consideration and assessment of alternatives can reduce the need for remedial measures at later stages in the development-planning process, given that alternatives become increasingly constrained as planning moves from policy to plan to program level, ultimately arriving at the project level. This concept is usually referred to as the hierarchy of alternatives, illustrated in Box 2.5.

⁴ González *et al.* (2015)

⁵ González *et al.* (2015)

Alternatives are formulated bearing in mind the identified key environmental and socioeconomic issues and the likelihood of generating opportunities, benefits, and potential negative impacts that might arise. Generally, expert judgment, authority requirements, and key stakeholder inputs are combined to formulate and agree on reasonable alternatives.

The Steering Committee should confirm which alternatives should be initially assessed by the SEA and subsequently determine which is/are the preferred alternative(s) for deeper assessment.

Box 2.5: Hierarchy of alternatives

Need or demand: is it necessary? (often relevant to policy level)

- Are the developments envisaged in the PPP necessary?
- Can the need be met without implementing the PPP and without any new developments or infrastructure, etc.?
- Can the developments envisaged in the PPP be avoided?
- Are there any realistic opportunities for managing development demand, e.g., through regulatory, economic, or administrative tools or other measures that promote behavioral changes?

Mode or process: how should it be done? (often relevant to plan level)

- Are there technologies, methods, or processes that can meet the need with less environmental damage or social change than “obvious” or traditional methods?
- Has best-available technology been considered?

Location and timing: where should it go? (often relevant to program level)

- What alternative locations could be considered?
- Timing and implementation (when and what to do in detail? Usually considered by project-level EIA)
- When and in what sequence should development be carried out?
- What details matter and what requirements should be formulated to ensure effective implementation?

Scenarios

Another way to address alternatives is through the use of scenarios. These (existing or developed for the SEA) can be used to examine how implementation of energy transition options might unfold different under different potential futures. These scenarios could represent, for example, different rates for the energy transition and replacement by renewables (e.g., high, medium, low) or different time periods (e.g., near-term, medium-term, longer term). They could also include different economic growth regimes (e.g., high, medium, or low growth) or scenarios for climate change. Scenarios will be influenced by key drivers of change (see Box 2.7). They can also be considered as alternatives (see Annex 9 on scenario development).

Box 2.6 presents examples of scenarios used for a SEA undertaken for the energy transition in Indonesia.

Box 2.6: Scenarios for the energy transition in Indonesia

(Source: Ciera Group and PT Hatfield Indonesia, 2023)

In November 2022, the Government of Indonesia (GoI), the Asian Development Bank (ADB) and key development partners signed a Memorandum of Understanding (MOU) towards the retirement of coal fired power plants (CFPPs), a reduction of CO₂ emissions, and a transition to renewable power under ADB's Energy Transition Mechanism (ETM).

A StEA is being prepared to assess the environmental and social risks, impacts, and opportunities of the energy transition in Indonesia. To do this, three scenarios were developed:

Scenario 1: “Business as Usual” considers continued fossil fuel (coal) energy production, no early retirement of CFPPs, and increased use of natural gas. In this scenario, there is a slight and natural increase in renewable energy generation.

Scenario 2: “Moderate Energy Transition” demonstrates a slight retirement of CFPPs by 2060 where there is no new growth in fossil fuel usage and renewable energy responds to any new additional energy demand.

Scenario 3: “Rapid Energy Transition” represents a total retirement of CFPPs by 2060 where a full transition to renewable energy production meets or exceeds future energy demand.

Where scenarios are used/developed, these should be agreed by the Steering Committee.

When developing scenarios, it is important to take into account drivers of change (Box 2.7).

Box 2.7: Analyzing drivers of change

When analyzing the current and potential future environmental and socioeconomic conditions, it is important to reflect on how drivers of environmental and socioeconomic change (such as the energy transition, macro-economic factors, and climate change and globalisation) will affect ecosystem functions and services, as well as human well-being and economic development.

The sources of risk stemming from the environment and social activity as well as the risks to the environment and socioeconomic fabric should be examined. For example, degraded ecosystems caused by routing access roads and transmission lines through protected and sensitive areas may, in the long run, lead to a lack of clean water or reduced soil fertility which, in turn, will affect human health and livelihoods.

The links between socioeconomic factors (e.g., livelihoods, food security) and specific ecosystem functions that might be affected by renewable energy development should be addressed. For example:

- How finite are available resources in areas proposed for renewable energy development?
- How might such developments affect social power relations (e.g., where there is an influx of non-local construction workers) and influence livelihood opportunities for different gender groups?
- How will the siting and deployment of renewable energy projects affect issues of food security in prime agricultural land or impact biodiversity in natural or critical habitats?
- How might renewable energy development affect access to services, education, employment, and health?
- How is energy security to be addressed in moving from fossil fuel generation to renewable energy sources?

Consideration should be given to how PPP implementation as well as disasters may affect ecosystem functions and have an impact on health and livelihoods.

2.5.4 Identifying baseline information requirements and initiating collection

SEA needs to be based on a thorough understanding of the potentially affected environment and socioeconomic systems. So, a critical step for the SEA team is to identify and acquire critical 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 important ecological systems and services, their resilience and vulnerability, and significance for human well-being. Existing environmental and social protection measures and/or objectives set out in international, regional, national, and local PPPs should also be reviewed. Scoping will be very important in identifying what issues are important and to focus what data collection is required. Baseline data should cover the issues listed in Box 2.8.

Box 2.8: Required baseline information

Note: Not all of the listed information will be “required” in all cases; scoping key issues should be used to focus on what is relevant.

Biophysical

- Air quality, with particular focus on the occurrence of pollutants in the air;
- Climate, including future climatic change scenarios for the region and country, and vulnerability to climate change;
- Noise and vibration;
- Topography, soils, and geology;
- Risks of natural disasters, particularly earthquakes, landslides, and flooding;
- Surface water and groundwater resources, quality and quantity, and chemical characteristics;
- 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 (terrestrial, aquatic, marine);
- Land use and use of natural resources.

Socioeconomic conditions and human health

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

Physical infrastructure and social facilities and services

- Distribution of current and planned energy infrastructure (including planned renewable energy facilities, transmission lines, and grid analysis);
- Distribution of urban centers, types of current and expected future settlement development (e.g., municipal changes/expansion), population dynamics, land and property values, 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, roads, 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 relevant to energy management and energy transition implementation (e.g., regarding the allocation of permits and associated compliance monitoring for large projects) and for those institutions at a regional or international level that may influence energy transition implementation.

2.5.5 Analysis of baseline information and sensitivity mapping

The analysis of baseline information should include trend analysis to examine changes over time, with and without the proposed PPP. See Annex 11 for more details on trend analysis; it provides fictional examples of the assessment of impacts of past and future environmental and social trends as influenced by the actions proposed in a PPP for terrestrial biodiversity.

An SEA can be supported by a robust and data-led spatial planning exercise, involving identification of technical, environmental, and socio-economic constraints to implementing a PPP. A core component of such planning is sensitivity mapping, or what is also called the identification of “go or no-go zones” (see Box 2.9) to identify areas where renewable energy developments should be avoided due to their sensitivity for biodiversity and social receptors. Such mapping can be undertaken relatively rapidly with existing data (desk-based) or can be a more intensive process such as full scale Marine Spatial Planning.⁶ Sensitivity maps are a powerful tool for protecting nature and vulnerable communities whilst facilitating the transition to renewable energy to reduce global emissions.

Box 2.9: Sensitivity mapping

Source: Biodiversity A-Z (2019)

Sensitivity mapping provides a visual representation of risks and assets that may be exposed to them. Multiple environmental sensitivity mapping approaches exist, with methods and uses varying based on stakeholders' values, drivers of change, data availability, and the technical capacity of the users. Sensitivity mapping is often carried out using geographic information systems (GIS) technology. The amount and/or type of data used to produce a sensitivity map will affect and limit its potential uses. Nevertheless, environmental and social sensitivity mapping can have a wide variety of applications. These include but are not limited to:

- Helping decision-makers understand where protection of valuable environmental assets or social values is needed, which could aid the development of protected area networks or identifying low value lands for renewable energy development;
- Informing governmental and private sector spatial planning at the project level, targeting activities to the locations where they will have the lowest impact;
- Supporting all stages of impact management, including prevention, mitigation, preparedness, operations, relief, recovery, and integration of lessons learned, and
- Aiding situational awareness and response strategy development for responders and decision makers during an incident.

During scoping, sensitivity mapping of areas vulnerable to environmental and social pressures should be initiated by evaluating and interpreting the environmental and social baseline information, taking account of drivers of change (Box 2.7). This will help to identify the environmental and socioeconomic opportunities and risks/constraints in relation to the proposed PPP. The baseline information also provides a benchmark against which alternatives/scenarios can be evaluated.

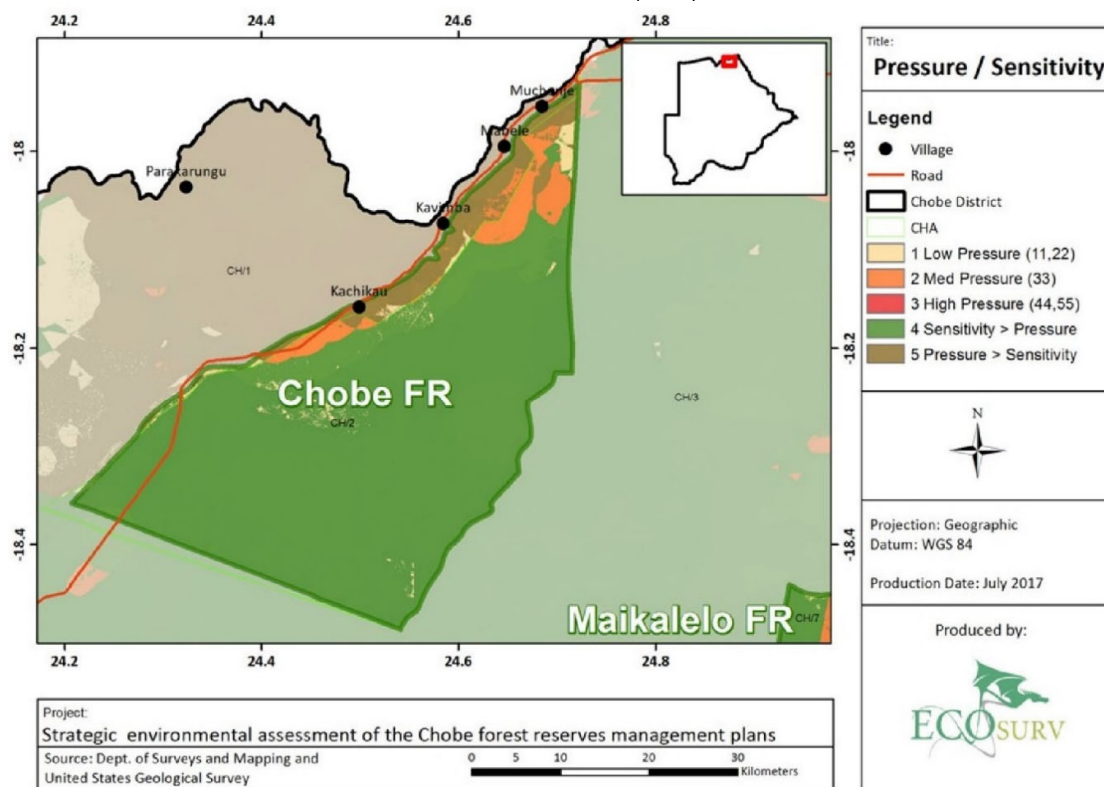
If placed in poorly chosen areas, renewable energy developments can end up have serious consequences for ecosystems or local communities. For example, offshore wind farms can cause considerable harm to fragile marine ecosystems, with seabirds being particularly sensitive. Whilst not replacing site-specific assessments of environmental impacts, sensitivity maps can dramatically reduce conflicts with nature by identifying areas where the negative impacts of offshore wind farms and grid infrastructure will be higher or lower.

⁶ For more information, see: msspglobal2030.org

Figure 2.2 shows a map depicting pressure and sensitivity in the Chobe Forest Reserve, Botswana (see Annex 18 for further details of the sensitivity mapping process).

Figure 2.2: Map showing pressure and sensitivity in the Chobe Forest Reserve, Botswana

Source: ECOsurv (2018)



Such information allows the selection of locations for development that minimize harm to nature and communities. It can reduce uncertainty and save time and eventually costs for developers. Sensitivity maps can help to speed up existing planning processes, inform and corroborate EIAs for projects once locations are selected for development, and avoid conflicts between stakeholders, which can lead to significant delays.

The World Bank, via the Energy Sector Management Assistance Program (ESMAP), is currently developing guidance for environmental and social sensitivity mapping to support early spatial planning for offshore wind development in emerging market contexts. It is designed to be complementary to (or a precursor to) full-scale spatial planning processes like marine spatial planning, or SEA.

Existing guidance for sensitivity mapping includes Birdlife's AVISTEP (Avian Sensitivity Tool for Energy Planning)⁷ and the EU Wildlife Sensitivity Mapping Manual.⁸

Sensitivity mapping and analysis will also enable the SEA team to assess the adequacy and reliability of available information and data and identify whether additional information may be required. In some cases, it may be necessary to commission specialist studies on subjects/themes of particular importance to the PPP/SEA. Where vital information is lacking or inadequate, there may be a need to undertake or commission new research, e.g., where data is required on annual or seasonal trends or from other jurisdictions (such as adjacent countries in the case of an SEA of a PPP with cross-border implications).

⁷ Birdlife International (n.d.)

⁸ Allinson, T., Jobson, B., Crave, O. et al. (2020)

The sensitivity mapping and analysis should be informed by the scoping process and, in turn, help to inform it.

2.5.6 Consistency analysis of PPPs and legal instruments

As indicated in Box 2.4, one of the critical steps in scoping is to identify and analyze:

- all relevant PPPs that might be related to the PPP being assessed (the target PPP) or that might have influence on or be affected by the target PPP; and
- relevant laws, decrees, directives, and regulations.

Analysis should be undertaken of such PPPs and legal instruments to check their consistency with each other and with the target PPP. This should include identifying synergies, overlaps, and antagonisms (particularly in terms of their environmental and social objectives). Such analysis will help to:

- Identify where the target PPP and candidate ESQOs to be used in the SEA might conflict with other instruments or where there is potential to generate synergies, enhanced benefits, and win-win outcomes;
- Increase the efficiency of the new/revised target PPP; and
- Identify where policy reform or modification of legal instruments might be necessary to ensure alignment to foster progress towards sustainable development.

Analysis can be summarized in a tabular or comparative matrix format. Annex 5 provides an example of such a review conducted for the preliminary SEA of Bhutan's Road Sector Management Plan (2016).

2.5.7 Submission and review of scoping report

A *Scoping Report* should be prepared, incorporating, as an annex, the terms of reference as finally agreed on by the proponent. It should indicate how the scoping was conducted and cover the issues listed in Box 2.3.

The proponent should circulate the draft scoping report to key stakeholders (including the competent authority) for review and make it available for public comments. A workshop may be considered to discuss the scoping report and obtain feedback from participants. The scoping report should also be posted on the SEA website, if developed, to obtain additional feedback. Other forms of social media may also be used.

Annex 10, Section 1, *Scoping (Consolidated Checklist for the Quality Assurance, Review, and Performance Evaluation of a Comprehensive SEA)* can be used to review the scoping process and scoping report. The checklist should be included in the scoping report as an annex so that a check can be made by interested parties to determine that the scoping has been conducted thoroughly.

2.6 STAGE 5: THE MAIN ASSESSMENT

2.6.1 Introduction

This stage is the heart of the SEA process and involves an assessment of the likely risks and impacts of implementing the PPP and its alternatives, or of implementing energy transition options under different scenarios. The full spectrum of potential impacts, including those due to associated infrastructure, must be considered, including positive and negative, direct and indirect, cumulative, and transboundary environmental and socioeconomic impacts. Such impacts can result from individually minor but collectively significant actions taking place over a period when implementing the PPP of energy transition options (see Section 2.6.4. for discussion of cumulative impacts). In addition, the impacts should be considered over time and spatial scale (e.g., short-, medium-, and long-term). Permanent impacts at local, national, regional, or international scales should be identified. The comparative evaluation of alternatives should highlight potential irreversible impacts or irreplaceable loss of natural capital, as well as risks to social and ecological systems.

In subsequent chapters addressing particular types of renewable energy development (Chapters 5-11), the retirement of coal-fired power plants and closure of coal mines (Chapter 12), and associated infrastructure (Chapter 13), the guidance discusses the main environmental and socioeconomic issues and associated impacts that are relevant to strategic decisions.

Key tasks of the main assessment are summarized in Box 2.10. Various methods (analytical tools) can be used as described in Annexes 6 and 12.

Box 2.10: Key tasks of the main assessment stage

Assessment steps will need to be designed according to the context, nature of the PPP and other factors; but would usually involve:

- *Initial assessment of agreed alternatives* to the PPP or its components, or agreed scenarios. The proponent should then select a preferred alternative(s) or scenario (if these are being used as alternatives) and provide an explanation of how the findings of the initial assessment of alternatives and consultations were considered in its selection.
- *Deeper assessment of preferred alternative(s)* or scenarios.
- Preparation of *SEA report and SESMP* which sets out management recommendations (including monitoring requirements) and suggested mitigation measures to avoid significant adverse impacts and measures to enhance benefits.

The assessment should involve:

- Continued analysis of available baseline data, filling of data gaps and collection of critical new data from research/field studies;
- Continued stakeholder engagement;
- Identification of potential environment and socioeconomic risks and impacts (positive and negative, direct and indirect, cumulative, transboundary). This is best done to compare two situations: (a) *risk situation* when no safeguards are applied and no mitigation measures applied; and (b) *mitigated situation* when safeguard and mitigation measures are fully and effectively applied;
- Identification of whether the ESQOs will be likely to be enhanced or impeded by implementing the PPP under consideration;
- Identification of options for enhancing positive impacts and avoiding/minimizing/mitigating negative impacts;
- Preparation of the framework for the SESMP.

2.6.2 Two stages of assessment

The main assessment should be undertaken in two main stages:

- ***Initial (light) assessment*** of the alternatives to the target PPP, its components, or of agreed upon scenarios.
- ***Deeper assessment*** of preferred alternative(s) or scenario – more focused and detailed.

The ***initial assessment*** should also include a zero alternative (the “business-as-usual” alternative), which implies the continued use of fossil energy systems and existing (but not new) renewable energy facilities not already in the pipeline, and all of the impacts associated with these.

A simple scale (i.e., 1, 2, 3; low, moderate, high) for indicating likely negative and positive impacts of implementing the PPP or indicating the likelihood that implementation will either enhance or impede achieving ESQOs is likely to be appropriate for the initial assessment. Other more complex scales

(four, five, or more) could be selected if there is good knowledge of the ESQOs, but this will add time for discussion with the team.

In circumstances where the SEA focuses on the energy transition in general (with multiple options and multiple PPPs), the SEA will need to be tailored to that situation, and an objectives-led and scenario-based approach is likely to be the most appropriate. Table 2.2 shows ESQO scoring matrices (environmental and socioeconomic, respectively) for initial assessment of three scenarios undertaken for an energy transition SEA in Indonesia in 2023-2024.

Another such example where multiple PPPs were involved is an SEA conducted for the SW Region of Bangladesh for Conserving the Outstanding Universal Value of the Sundarbans, which addressed 89 separate PPPs across 28 sectors and key themes.⁹ In this case, the SEA involved:

- preliminary assessment of all 89 PPPs (using simple scoring: high, medium, low potential impacts);
- initial assessment of the impacts of implementing this suite of PPPs under three scenarios (taken as alternatives) – high, medium, and low growth; followed by
- deeper assessment of the high growth scenario (the government's primary economic development policy) on a key sector basis.

A report on this initial assessment should be circulated to stakeholders for comment, and then the selection of a preferred alternative(s) should be confirmed by the proponent, taking into account the views of the Steering Committee. The proponent should provide an explanation of how the findings of the initial assessment of alternatives and consultations were considered in deciding on the preferred alternative(s).

The **deeper assessment** of the preferred alternative(s) or scenario confirmed by the Steering Committee should be more focused and more detailed. This could involve:

- Focusing on particular renewable energy sectors or areas for development (e.g., regions of the country); and/or
- Using a more detailed scoring scale for positive or negative impacts/effects (i.e., 1 – 5; slight, moderate, very, significant, very significant).

⁹ CEGIS/Integra (2021)

Table 2.2: ESQO scoring matrix for initial assessment of energy transition scenarios, Indonesia

Source: Ciera Group and PT Hatfield Indonesia (2024)

A: Environmental

Theme	#	Objective	Risk Score by Scenario			Mitigated Score by Scenario		
			1	2	3	1	2	3
Environmental								
Climate change	1	Mitigate effects of climate change, through emission reduction.	-3	-2	-1	-2	0	3
	2	Increase resilience and adaptation of energy supply and infrastructure to climate change impacts	-2	-1	-1	-1	2	3
Habitats, biodiversity, and protected areas	3	Minimize loss of terrestrial and marine habitats, biodiversity and ecosystem services	-1	-2	-3	-1	-1	2
	4	Minimize deforestation	-1	-2	-2	-1	-1	0
	5	Reduce encroachment and degradation of protected and ecologically sensitive areas	-1	-1	-2	0	1	2
Air quality	6	Reduce air pollution	-3	-1	-1	-2	1	2
Noise and vibration	7	Minimize disturbance caused by noise and vibration	-1	-1	-2	0	0	-1
Surface water quality	8	Reduce water pollution (surface and groundwater)	-3	-1	-1	-2	0	1
Solid waste	9	Reduce waste disposed to landfills (e.g. by increasing repurposing, recycling, and reuse of assets)	-3	-2	-2	-2	0	1
	10	Improve safe handling, storage, and disposal of solid waste, including hazardous waste	-3	-2	-2	-2	0	1
Materials use	11	Minimize use of non-renewable and toxic materials used in developing new assets	-3	-2	-1	-2	0	1
Water use	12	Minimize use of local water resources and ensure efficient use/reuse of water	-3	-1	-1	-2	0	1
Land contamination and degradation	13	Maintain soil quality and reduce land contamination	-3	-2	-1	-2	0	0
	14	Minimize soil, riverbank and seabed erosion, and sedimentation of surface water	-1	-1	-2	0	1	0
Land-use change	15	Minimize loss and degradation of productive agricultural land, forests, grazing land, and fisheries	-2	-2	-3	-1	0	1
Visual impacts	16	Minimize extent of visual change to landscape and loss of aesthetic value	-1	-1	-3	-1	0	0
Cultural heritage	17	Preserve heritage sites (historic buildings, archaeological and cultural sites)	0	-1	-2	0	0	0
Health and safety	18	Ensure population health, and safety of communities and workers	-3	-2	-2	-1	0	1

B: Socioeconomic

Theme	#	Objective	Risk Score by Scenario			Mitigated Score by Scenario		
			1	2	3	1	2	3
Economic growth	19	Enhance economic development and diversification, and increase in economic growth (regionally & nationally)	1	1	-1	1	2	2
Employment and skills	20	Enhance opportunities for employment and skill development	1	1	-2	2	2	2
Local economy and livelihoods	21	Minimize loss of livelihoods including for vulnerable groups and adat communities	-1	-1	-3	0	2	1
	22	Enhance equitable opportunities for new/improved and diversified livelihoods	-1	-1	-3	1	2	2
Gender and vulnerable groups	23	Minimise gender inequality and minimise vulnerable groups being disadvantaged	-1	-1	-2	1	2	2
Food security	24	Improve food security	-2	-2	-3	-1	1	1
Physical and economic displacement	25	Minimize physical and economic displacement	-2	-2	-3	0	1	1
Public services and infrastructure	26	Maintain and improve local public facilities and services	0	0	-1	2	2	3
Human rights	27	Avoid infringement of human rights of workers, communities and vulnerable groups (including in supply chains)	-2	-1	-1	1	1	1
Migration	28	Minimise outmigration	0	0	-1	0	0	0
	29	Minimise influx and competition with local workers in RE facilities	0	-1	-2	0	1	1

Scenarios: 1 Business-as-usual. 2 Moderate rate of ET. 3 Rapid ET.

2.6.3 Tools for assessment

Apart from matrices, a wide variety of other tools that can be applied during an SEA. Common tools are listed in Table 2.3. Many of these are also commonly used in EIA/ESIA. The listed tools and others are described in Annexes 6 and 12 (with additional information in Annex 9 on scenario development). The most suitable method depends on the approach adopted (whether impacts-led, objective-led, or both) and the SEA team members' specialized competence in the analytical subject area, professional experience, and judgment.

Table 2.3: Common assessment tools available to SEA

Tools for predicting environmental and socioeconomic impacts	Tools for analysing and comparing options/alternatives
<ul style="list-style-type: none"> • Carrying capacity analysis • Checklists • Delphi technique • Ecological/environmental footprint analysis • Expert judgement* • Land use partitioning analysis • Mapping transmission channels • Matrices* • Modelling/forecasting* • Network analysis and linkage/flow diagrams* • Participatory assessment • Quality of life assessment • Indicators, multi-metric indices* • Scenario analysis* • Significance thresholds • Social and economic analysis/surveys • Spatial analysis*, e.g. GIS-based analysis (including overlays, capacity/habitat analysis) • SWOT (strengths, weaknesses, opportunities, threats) analysis • Trends analysis/extrapolation 	<ul style="list-style-type: none"> • Compatibility appraisal • Cost-benefit analysis • Least cost analysis • Impact matrices • Multi-criteria analysis • Opinion surveys • Policy impact matrix • Risk analysis/assessment • Modelling • Scenario analysis • Vulnerability analysis

* Tools often used to assess cumulative impacts

Notes: See Annexes 6 and 12 for descriptions of methods.

Some of these tools depend on expert judgement of the practitioners involved.

Both the initial and deeper assessment tasks should focus on the risks that implementing the PPP, its alternatives, or different options for the energy transition under different scenarios could result in significant environmental and/or socioeconomic impacts and enhance or impede achieving environmental and/or socioeconomic objectives.

The assessment should address:

- The character of the risks/impacts (what exactly causes the risks/impacts or assumptions for the predictions);
- The opportunities and the positive impacts or benefits that may arise from PPP implementation;
- Probability and key uncertainties (Box 2.11). Uncertainties must be properly acknowledged and included as a caveat to the SEA conclusions, recommendations, and subsequent decisions;
- 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 symbols are used to summarize the assessments and make the results of the assessments easy to present, such as in tables, they should be clearly described in a legend.

Box 2.11: Role of uncertainties in the SEA*Source: MONRE (2008)*

Each SEA process will be constrained by numerous uncertainties. These may be caused either by the lack of data (e.g., baseline trends in the affected environment, about scales, timing, or locations of proposed developments, etc.) or by the built-in limitations in analytical approaches and tools used in the SEA. It is important to ensure that all key uncertainties that inevitably occur in the SEA process are properly understood and acknowledged.

Where SEA is performed *ex ante*, it is clearly focusing on predictions ahead of implementation, a key source of uncertainty. This underscores the value of developing scenarios for a range of possible outcomes to take into account such uncertainties.

The initial and full SEA reports must therefore document any uncertainties or limitations in the SEA. SEA experts should not be afraid to acknowledge such limitations; on the contrary, a proper acknowledgement of uncertainties increases the quality and credibility of the entire SEA.

If the PPP 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).

2.6.4 Direct, indirect, cumulative, and transboundary impacts

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

- **Direct impacts:** the direct interaction with an environmental, social, or economic component of activities associated with options within the PPP or its alternatives that initiate and locate specific project activities;
- **Indirect impacts:** those which are not a direct result of activities undertaken when implementing the PPP (usually projects and developments), often produced away from or as a result of a complex impact pathway. Indirect impacts are also known as secondary or even third-level impacts;
- **Cumulative impacts** and induced/synergistic impacts, e.g., those arising from large-scale schemes such as infrastructure project development in combination with other multiple projects and activities in a given time and space that lead to snowballing and cumulative impacts on valued ecosystem components, as well as those from implementing other PPPs and major development initiatives. Cumulative impacts may also include consideration of impacts arising as a result of climate change;
- **Larger-scale impacts** 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 PPP, e.g., in another district or region, or in another country.

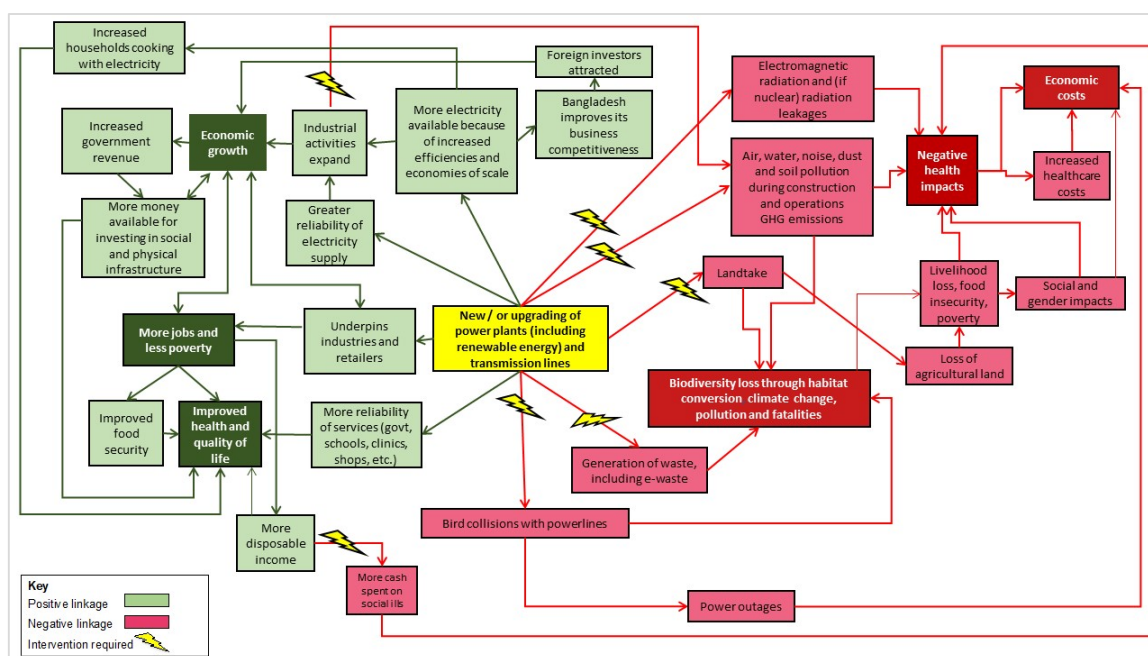
The target PPP is likely to be implemented through a variety of actions and initiatives (often projects), each of which will give rise to a range of impacts. The impacts of an individual project (e.g., a single wind farm or hydropower dam) may not be particularly significant or may be confined to a particular area and be capable of management or mitigation. But the impacts from multiple projects and actions, whether of the same kind (e.g., multiple hydropower dams in a watershed) or different initiatives (e.g., a combination of different renewable energy facilities), can be very considerable and spread across a very wide area. These are their *cumulative impacts*. But it is also necessary to consider the impacts of other PPPs, strategies, plans, and projects in the area covered or influenced by the PPP. They will also generate their own suites of impacts. When all of those impacts are combined with the impacts of

the PPP being assessed, then the overall cumulative impacts can be very large indeed, as depicted in Figure 1.2.

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 that need to be understood by policymakers and decision-takers. Developing a picture of such linkages is a complex process and takes considerable time to brainstorm. Figure 2.2 is an example of a linkage diagram that shows the pathways for cumulative impacts to arise that were identified during an SEA in Bangladesh.¹⁰ Figure 2.3 shows workshop participants constructing a linkage diagram during an SEA of development in Pohnpei State, Federated States of Micronesia. Figure 2.4 is an example of how cumulative impacts are the total impacts of multiple actions on a receptor.

Figure 2.2: Linkage diagram for power and energy: new or upgrading of powerplants and transmission lines in Bangladesh

Source: CEGIS/Integra (2021)



Main cumulative impacts

Positive: Economic growth, more jobs and less poverty, and improved health and quality of life

Negative: Economic costs, negative health impacts, loss of biodiversity through habitat conversion, climate change, pollution, and fatalities.

¹⁰ CEGIS/Integra (2021)

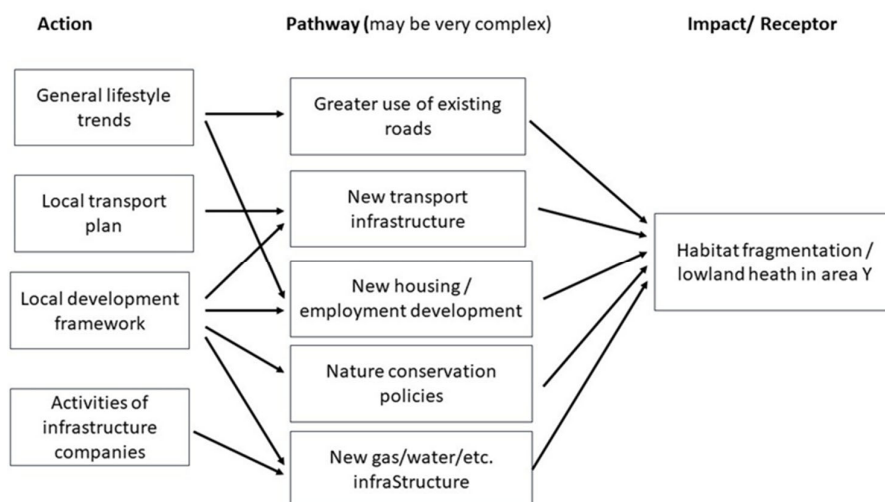
Figure 2.3: Constructing a linkage diagram for SEA of Pohnpei State, Federation of Micronesia, March 2019

Source: B. Dalal-Clayton (n.d.)



Figure 2.4: Example of how a cumulative impact can arise when implementing a PPP

Source: Therivel (2005)



2.6.5 Evaluating the significance of impacts

The concept of significance is at the core of impact assessment, impact evaluation, and decision-making. Deciding whether a PPP is likely to cause significant environmental and/or social impacts is central to the practice of EIA. Similarly, in SEA, impacts, trade-offs, and options or alternatives need to be assessed in terms of significance to determine optimum choices and eliminate unacceptable ones.

There is no single best method for determining the significance of impacts. Various formal methods include using ratings (see examples in Table 2.4 and Annex 13), 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 translate “facts into meaning.” The review of other PPPs and targets during scoping is key to providing information on significance.

Table 2.4: Example of scale for rating significance of impacts used in Kenya*Source: NEMA (2012)*

Significance	Criteria
High	<ul style="list-style-type: none"> Exceeds or threatens to exceed legal thresholds or standards. Exceeds or threatens to exceed functional thresholds or LAC for health and safety; may result in irreversible, irretrievable, or irreplaceable loss of ecosystem services. Norms or Limits of Acceptable Change (LAC) established by society.
Medium	<ul style="list-style-type: none"> Controversial LAC; no societal agreement on these limits.
Low	<ul style="list-style-type: none"> Preference thresholds for individuals, groups or organizations; not for broader communities or society.

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

Impact characteristics:

- The probability, duration, frequency, and reversibility of the impacts (e.g., ecosystem fragmentation);
- The geographical extent of the impact;
- The magnitude (scale) of the impact;
- The cumulative nature of the impacts;
- The transboundary nature of the impacts;
- The risks to human health or the environment (e.g., due to accidents); and
- The magnitude and spatial extent of the impacts (i.e., geographical area and size of the population likely to be affected).

Importance of the affected area due to:

- Its value and vulnerability;
- Special natural characteristics or cultural heritage;
- Exceeded environmental quality standards or limit values;
- Intensive land use;
- The impacts on areas or landscapes that have a recognized community, district, national, or international protection status or value.

Annex 14 provides a checklist of questions that can be applied when determining impacts and their significance.

2.6.6 Restoration

Implementing a PPP will usually involve a range of actions that will often take the form of individual projects or developments. Where mitigation measures proposed by an SEA (and subsequent project-level EIAs) are inadequate, ineffective, or not undertaken, actions and projects can result in environmental or social harm and degradation (e.g., unnecessary or excessive deforestation; loss of habitats, biodiversity, and ecosystem services; soil erosion; pollution; involuntary resettlement, etc.). The significance and seriousness of such degradation can be compounded where the impacts are cumulative and extensive. It will usually lead to demand and need for land and ecosystem restoration (see Box 2.12). This need will also arise at sites of projects that have come to the end of their useful life (e.g., coal mines or retirement of coal-fired power plants). This may involve situations where funds are not available for restoration if the company is no longer in business.

Box 2.12: Land and ecosystem reclamation and restoration

Land restoration, which may include renaturalization (also called rewilding in some countries), is the process of ecological restoration of a site to a natural landscape and habitat that is safe for humans, wildlife, and plant communities. Ecological destruction, to which land restoration serves as an antidote, is usually the consequence of pollution, deforestation, salination, or natural disasters. Land restoration is not the same as land reclamation, where existing ecosystems are altered or destroyed to give way for cultivation or construction. Land restoration can enhance the supply of valuable ecosystem services that benefit people.

Land restoration can include the process of cleaning up and rehabilitating a site that has sustained environmental degradation, such as those by natural causes (e.g., desertification) and those caused by human activity (strip mining), to restore that area back to its natural state as a wildlife home and balanced habitat.

Land restoration is also at the core of the UNCCD's mission, as actions that protect and revitalize land resources such as soil, water, and biodiversity are critical to achieving Land Degradation Neutrality (LDN) by 2030 and constitute a proactive way to build resilience to drought¹¹.

The Kunming-Montreal Global Biodiversity Framework was developed under the UN Convention on Biodiversity and was adopted in December 2022¹². It includes four global goals and 23 targets for 2030. Target 2 is to *“Ensure that by 2030 at least 30 percent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration in order to enhance biodiversity and ecosystem functions and services, ecological integrity, and connectivity.”*

The UN Decade on Ecosystem Restoration (2021-2030) aims to promote the UN's environmental goals; specifically, it aims to facilitate global cooperation for the restoration of degraded and destroyed ecosystems, along with fostering efforts to combat climate change, safeguard biodiversity, food security, and water supply. While much focus is on promoting restoration activity by national governments, the UN also wishes to promote such efforts from other actors, ranging from the private sector and NGOs to individuals.

Ecosystem restoration promotes the idea that developments should transition from a “do no harm” approach to a “do more good” approach. Thus, SEAs should not only identify how the energy transition and renewable energy PPPs can be framed to avoid, minimize, and mitigate harm to the environment, but also consider how such PPPs can promote opportunities to “do more good,” particularly downstream when individual projects are planned, sited, and implemented. This could look at measures such as the repurposing of retired coal fired power plants, the rehabilitation of coal mines, and reparations for outstanding environmental and social legacies.

Ecosystem restoration is also the last stage in the circular economy when projects come to their end of life, in that any residual impacts can be minimized and that the former development site can be repurposed or returned to other uses.

2.6.7 Assessing trade-offs

SEA is a process that should support the consideration of environmental and socioeconomic concerns in policy-making and planning. This includes indicating where such concerns (the main pillars of sustainable development) interact, either positively or negatively. This is often achieved by highlighting potential synergies or conflicts (antagonisms) between elements of the PPP or between the assessed PPP and other PPPs.

¹¹ United Nations Convention to Combat Desertification (n.d.)

¹² UNEP (n.d.)

Synergies provide potential to maximize positive environmental and socioeconomic benefits and impacts. Conflicts between PPPs (or elements of a PPP) have the potential to generate negative impacts, and an SEA should analyze these to identify where such impacts can be minimized, avoided, or mitigation measures put in place. Addressing conflicts will often require planners and decision-makers to make trade-offs. It is the role of SEA to highlight the areas of potential trade-off that would enable positive impacts to be enhanced and negative ones minimized, and to provide appropriate data and analysis. The provisions on trade-offs in existing agency guidelines should be followed.

Consideration of trade-offs is increasingly becoming a standard practice in SEA, and it is an effective measure to help reverse the current ecological deficit¹³, in terms of biodiversity and ecosystem services. SEA can be a catalyst for addressing complex development problems and alternatives under conditions of high uncertainty, where multi-stakeholder groups with diverse and sometimes conflicting objectives could be affected. In addressing sustainability, the goal is to seek “win-win” outcomes from development. In a situation where resources are limited and when two or more conflicting objectives are being pursued, the most common outcome is that society loses in one aspect (e.g., loss of biodiversity) at the expense of another (e.g., socioeconomic development). To promote sustainability, it is critical to consider a holistic balance of various forms of capital: financial, natural, human, social, and public (i.e., infrastructure which supports production). SEA can play a critical role in identifying where such balance is possible and where trade-offs may be required.

A trade-off usually refers to losing one quality or aspect of something in return for gaining another quality or aspect. For example, in the case of offshore wind development, fishing may be restricted in the vicinity of the turbines, resulting in a loss of income for fisherfolk. It could be argued that this is compensated through other gains (e.g., less CO₂ emissions, other types of employment, production of electricity, etc.). By setting out such potential trade-offs, an SEA can help decision-makers with regard to their choices regarding the spatial location for wind farm development.¹⁴ A trade-off implies a decision to be made with full comprehension of both the upside and downside of a particular choice.

Trade-off decisions are generally of two types:

- *Compensation and substitutions.* These can be straight forward where one option can be substituted for another, e.g., to eliminate a natural wetland and replace it with a constructed wetland of comparable ecological value elsewhere in the watershed – provided it provides the same values as a natural one – or an option can be provided to compensate for a particular risk or loss.
- *Net gain and loss calculations.* These are not always done explicitly or openly, and the measurement and comparisons are often difficult and sometimes objectionable, e.g., the jeopardized interests of a local community displaced by a new dam balanced against water supply security for a larger number of downstream rural communities.

Loss/gain accounting is quite a different prospect for biodiversity than for social values. In terms of biodiversity, loss/gain accounting is foremost about identifying the required amount of mitigation associated with an option, making sure the preventative stages of the mitigation hierarchy are optimized, and then reviewing the feasibility of achieving net gain via remediation measures. Trade-offs might be a consideration then for offsets (e.g., if net gain cannot be achieved like for like). In this sense, trade-offs MUST be acceptable to stakeholders or the option should not be pursued (the exception might be where it is legally mandated, but stakeholder acceptance is still a key factor).

While trade-offs may not always be acceptable, it is important that a justification is always provided and that the process is as transparent as possible. Significant adverse impacts could be justified if the alternative is worse.

Table 2.5 provides a basic working list of rules to guide trade-off deliberations. These rules can be used as a checklist when dealing with trade-offs within SEA.

¹³ An ‘ecological deficit’ occurs when the footprint of a population exceeds the biocapacity of the area available to that population. Conversely, an ‘ecological reserve’ exists when the biocapacity of a region exceeds its population's footprint.

¹⁴ Erik Zigterman, personal communication (2024)

Table 2.5: General trade-off rules*Source: NEMA (2012)*

Rule	Description
Maximum net gains	Seek to attain mutually reinforcing, cumulative, and lasting contributions that bring the most positive overall results in sustainability (including ecological, social, and economic aspects).
Burden of argument on trade-off proponent	Burden of proof rests on the proponent of the trade-off who has to prove that the trade-off is unavoidable and acceptable.
Avoidance of significant adverse impacts	No trade-off that causes significant adverse impacts on any sustainability areas (ecological, social, economic) can be justified unless the alternative is worse.
Protection of the future	No displacement of significant adverse impacts from the present to the future can be justified unless the alternative is of an even more significant adverse effect.
Open process	Proposed trade-offs must be addressed through open involvement of all stakeholders, particularly those who will be affected by the trade-offs.

A number of tools have been designed specifically for dealing with trade-offs, for example, cost-benefit analysis and consideration of opportunity costs, matrix-based appraisal methodologies, multi-criteria assessment scenario comparisons, and life cycle assessment.

2.7: REPORTING

A variety of reports (formal and informal) may be produced during an SEA process (Table 2.6). Some will require circulation to stakeholders (and in some cases to the public) with a request for comments. Some of these will require formal review.

Every effort should be made to make SEA reports accessible to stakeholders and the public, particularly to non-specialists (e.g., non-technical summaries) and in major local language(s). The use of social media is gaining increasing importance to effective disclosure of SEA reports.

2.7.1 The SEA report

The SEA results need to be reported (e.g., aspects of the technical analysis and the rationale for conclusions and recommendations). An SEA report can at times be very technical, but it must be presented in an understandable format, in the official language used in the country for government business (and in English where international financiers are involved in funding the implementation of the PPP).

Table 2.6: Reports produced during an SEA

Report	SEA stage when report required (Table 3.1)	Requires circulation to stakeholders for information and comment	Must be provided to the public for information and comment	May require formal review	Comment
Inception report	Stage 3				If required by TOR
Scoping report	Stage 4	√	√		Should incorporate stakeholder engagement and communications plan
Special studies and research reports¹⁵	Stage 3/4				May require to be completed before SEA can proceed to Stage 3. Should be submitted with the SEA report
Draft SEA report	Stage 5	√	√		
Draft SESMP (when required as stand-alone)	Stage 5	√	√		
Final SEA report	Stage 5	√	√	√	
Final SESMP (when required as stand alone)	Stage 5	√	√	√	
Record of stakeholder events	Stage 5		√		A record of numerous meeting/workshops (participants, comments) may better be presented as a stand-alone report, to reduce undue length of the SEA report
Monitoring reports on PPP implementation – may be subsumed in SESMP (where required) annual reports	Stage 6			√	On-going throughout PPP implementation

Note: In some countries there may be requirements to submit other reports/documentation.

An SEA is usually complex and can run to a considerable length. But is very helpful to minimize unnecessary text by using diagrams, graphics, and summary tables. In addition, a concise, non-technical summary is critical and should adequately summarize and explain the SEA findings to all stakeholders, including local communities. The non-technical executive summary should contain the title of the report and it should summarize:

- Proposed PPP, objectives and SEA methodology;
- Consultation process;
- Alternatives that were studied and the selected option(s) (preferred alternative(s));
- The affected area(s);
- Environmental and socioeconomic analysis;

¹⁵ The scoping process may identify the need for special reports or research where critical information or data is inadequate, unreliable, or not available. Supporting reports should be prepared on any such specialist studies, including on methods used, data acquired and analyzed, etc. They may be concerned with, but not limited to, specific subject matter areas such as health issues, biodiversity, ecosystems, land use, protected areas, archaeological and heritage sites, institutional arrangements, skills and capacities, or review of legal instruments.

- Expected impacts and benefits;
- Proposed mitigation and enhancement measures; and
- Proposed monitoring program.

Because the non-technical executive summary is likely to be the only part of the SEA report that is read by the public (and by other stakeholders), its quality is critically important for obtaining informed stakeholder comments on the Draft SEA Report. This executive summary should also be made available in the official language of the country and dominant local languages.¹⁶

Annex 4 lists issues that are usually required to be covered in an SEA report. Additional chapters and/or sections may be added as required.

The main SEA report should include an annex analyzing the main stakeholder perspectives and indicating how they have been addressed (these can be presented in an issue-response table). However, the inclusion of annexes detailing all stakeholder events, all participants, and all comments (many of which may cover essentially similar issues) will considerably lengthen an SEA report and may better be presented as a stand-alone Record of Stakeholder Events.

Key points from all special and supplementary reports should be reflected in the appropriate chapters of the main SEA report.

2.7.2 Strategic Environmental and Social Management Plan (SESMP)

It is becoming increasingly common to prepare a separate Strategic Environmental Management Plan (SESMP)¹⁷ to accompany the main SEA report. The SESMP is an effective reference document and management tool to frame and guide the implementation of recommendations and proposed management measures, including monitoring and follow-up procedures, to ensure the effectiveness of these measures once implemented.

Where a separate SESMP is prepared, it should amplify (but not replace) sections on mitigation and monitoring included in the SEA report. This should not be seen as a duplication of effort. Both the SEA report and SESMP will serve different functions and should be capable of being used without having to cross-reference each other. Box 2.13 sets out what kind of recommendations should be made in a SESMP. Further details on the role of a SESMP and its contents are provided in Annexes 15 and 16.

¹⁶ Digital Story Maps can be used for non-technical summaries (NTS) to aid visualization and understanding, particularly when consultations are conducted on the SEA process

¹⁷ In this guidance, the term Strategic Environmental and Social Management Plan (SESMP) is preferentially used to emphasize that it should address both environmental and social concerns. In some literature and countries, the term Strategic Environmental Management Plan (SEMP) is used.

Box 2.13: Measures to enhance opportunities and benefits, and mitigate risks and adverse impacts

There are no blueprints for this task. Recommendations should be made (and explained) on the issues listed below:

- Opportunities for optimizing development objectives or priorities pursued by the PPP;
- Opportunities for optimizing specific proposals/components within the PPP (e.g., alternative development methods and locations, scale, and sequencing/timing of proposed developments);
- Opportunities for changes to the legal and regulatory framework in regard to the PPP;
- Opportunities for optimizing implementation of the PPP, such as issues to be addressed in project-level assessments (e.g., preliminary advice on the scope of EIAs for specific projects or prescribing assessments for projects that are vulnerable to extreme climatic change conditions);
- Measures to avoid negative environmental and social impacts arising from PPP implementation, e.g., through changes in the proposed development objectives, priorities, or actions;
- Measures to enhance PPP benefits and,
- Changes in other relevant PPPs (often called “flanking measures”), where inconsistencies, overlaps, or antagonisms between PPPs have been identified.

Impacts due to climate change in the PPP area should also be considered, and, if possible, measures proposed to enhance resilience and mitigate such impacts.

Opportunities should be identified for the PPP to enhance achievement of the Sustainable Development Goals (SDGs) and other sustainable development objectives. The aim is to develop “win-win” situations where multiple, mutually reinforcing gains can be achieved simultaneously through:

- Strengthening the economic base and enabling economic objectives to be achieved;
- Improving social conditions and providing equitable conditions for all, and
- Protecting and improving management of the environment.

Where such win-win outcomes are impossible, the trade-offs must be clearly documented to guide decision-makers.

There are likely to be situations where some negative environmental and/or socioeconomic impacts cannot be avoided. These will usually be addressed by project-level EIAs recommending mitigation measures – for which a **mitigation hierarchy** should be followed (see Figure 2.5). The SESMP can suggest (in a table) generic mitigation measures for particular types of projects. Caution should be exercised if analysis indicates a potential for major, irreversible, negative impacts on the environment or social conditions. This may often suggest selecting less risky alternatives. For less-threatening situations, standard mitigation measures can be used to minimize adverse impacts to “as low as reasonably practicable” (ALARP level).

Figure 2.5: The mitigation hierarchy



Practical arrangements for environmental and social monitoring should be recommended to ensure that:

- Information is recorded and assessed (against environmental and social quality objectives and indicators (see Box 2.14) identified by the SEA and those incorporated in the PPP) on the environmental and socioeconomic impacts (including cumulative and transboundary impacts) of the PPP and downstream development projects/initiatives that may be implemented. This is done to determine if the objectives and recommendations are being met;
- Any unforeseen adverse impacts are identified in order to be able to undertake appropriate remedial actions;
- A mechanism is included to signal when steps are required to enhance benefits or to remove or reduce risks and negative impacts. The proposed mechanism should take into account existing national legislation and provisions regarding EIA; and
- A timeline is presented for monitoring and follow-up actions. Where possible, it may also be useful to present a summary of the costs of SEA implementation.

A **stakeholder consultation procedure** should be elaborated for the mechanism to monitor and evaluate the environmental and social dimensions of PPP implementation.

Procedures and measures should be recommended to ensure **compliance with relevant safeguards** (national and international where applicable) during implementation of the PPP and downstream projects/initiatives. National regulations should take precedence in the case of a nationally-driven SEA. Where such national safeguards do not exist, then reference can be made to incorporate the requirements of other international standards (e.g., IFC, WHO, multilateral development banks).

Guidance and recommendations for EIAs of individual projects that may arise during PPP implementation.

Thus, the SESMP should act as an overarching framework and roadmap for addressing the cumulative impacts of projects, development initiatives, and activities planned to be implemented under the PPP. Commitments in this regard should be incorporated in the PPP as an integral part, but they may be in less detail than in the SESMP, and the PPP will cover much more ground.

The SESMP should set out the roles and responsibilities of different jurisdictions, authorities, and actors in implementing the SESMP. As far as possible, recommendations should identify responsible parties.

Further information on the role of a SESMP is provided in Annex 15.

Box 2.14: Indicators

The SESMP should propose indicators to be used in monitoring to determine whether ESQOs and SEA recommendations are being met. Indicators are useful to communicate complex information in a simple way for decision-making and management. In SEA, they help to:

- Describe current levels and trends in environmental and socioeconomic quality;
- Gauge impacts;
- Evaluate progress towards achieving ESQOs and sustainability objectives;
- Relate key strategic issues to the SEA study;
- Enable adaptive and corrective management during PPP implementation;
- Establish criteria for an ongoing monitoring framework.

Some aspects of achieving goals and objectives are better evaluated in a qualitative manner; in that situation, a written description of the envisaged objectives can be compared with what was practically achieved.

It can be useful to link indicators to *Limits of acceptable change (LAC)*. These are extremes in environmental or social quality beyond which society would find further change unacceptable. LAC relates to a level of environmental quality (usually biophysical) or social quality that is either desired or would be tolerated by society (often a qualitative value).

In developing the recommendations set out in the SESMP, the team should prepare an initial or provisional set of such recommendations and discuss these with the key government or other agencies likely to have a key role in their implementation. This is vital to ensure that those agencies understand the rationale for the recommendations and their potential role in their implementation, are able to interrogate them with the team, can identify where these are realistic and practical or not (for whatever reason), suggest alternatives (where necessary), and agree to them. This process is important to secure buy-in to the SESMP recommendations and will enhance the likelihood that they will be accepted and acted on effectively.

To aid this process, it is highly recommended to identify and appoint a **Task Group** of contact point representatives from key agencies at an early stage in the SESA process so that its members are cognizant of the process and are ready to engage in discussions on key recommendations. In countries where the establishment of such a Task Group may take time due to bureaucratic requirements, such early establishment is particularly recommended.

2.8 REVIEW OF FINAL REPORTS

2.8.1 Quality assurance / technical review of SEA/SESMP

Designing an SEA to include the tasks and practices outlined in the various stages of the process (see Figure 2.1) will provide a basic level of process quality. However, a specific measure of quality control assurance will be needed, e.g., to ensure the credibility of the assessment in the eyes of stakeholders. These measures will depend on the nature, context, needs, and timeframe of the specific PPP. For further guidance, see Annex 10.

The SEA process described in this guidance sets out the following options for quality control checks.

Administrative review

Administrative review of draft SEA reports and SESMPs should be undertaken by the PPP proponent (Section 2 (Report Presentation) of Annex 10 (Consolidated Checklist for the Quality Assurance, Review, and Performance Evaluation of a Comprehensive SEA) can assist with this step).

Scrutiny workshop

A scrutiny workshop may be organised by the proponent with the competent authority to jointly examine the first draft of the SEA report and its recommendations and agree any revisions and amendments.

Lead agency and stakeholder review

The PPP proponent should send the draft SEA report and draft SESMP at the same time to relevant sector lead agencies (e.g., Ministries of Energy, Transportation, Health, and Agriculture). Lead agencies and other stakeholders should be allowed sufficient time (generally 30 working days) to review the documents and submit comments.

One of more stakeholder workshops should be organized to discuss the reports. A national workshop should be organized (Figure 2.5). In countries that have disparate and remote regions (e.g., geographically dispersed island nations), a number of regional workshops will be advisable to enable

stakeholders to participate. The use of remote consultation techniques (e.g., Microsoft Teams, Zoom, Google Meet, WhatsApp) may be useful where face-to-face meetings are not possible.

Figure 2.5: National workshop to discuss draft report of SEA of SW Bangladesh and the Sundarbans, February 2021

Source: B Dalal-Clayton (2021)



Public review

Where possible, the PPP proponent should ensure that at least two notices regarding the draft SEA report (and draft SESMP) are published, each one week apart, in newspapers, on the SESA website, or via social media with a nationwide circulation, and announced in other local media. The public generally should be allowed 30 working days (from the date of the first advertisement) to submit comments.

The invitation for public comments (notice) should state (a) the nature of the PPP, (b) where the PPP and SEA documents can be found (e.g., on the dedicated SEA website, at particular government offices), and (c) how, by when, and to whom comments should be submitted.

Formal technical review

The PPP proponent may be required by some national SEA regulations to submit a specified number of copies (possibly in specified format) of the draft SEA report and draft SESMP, and possibly additional documents (e.g., an Environmental Statement summarizing information in the SEA report) to the competent authority for formal review. The PPP proponent may be required to cover various related costs, such as:

- Verification surveys;
- Formal review by the competent authority;
- Coordination of the stakeholder engagement review process (e.g., coordination of a Technical Advisory Committee) and the public review process;
- Compliance checks by the competent authority or others of the PPP implementation; and
- Any other required steps or functions as may be determined by the competent authority.

A formal technical review by the competent authority of the final SEA report and final SESMP may also be required in some jurisdictions (see sections 3-8 of Annex 10).

The competent authority may seek support for such review by the following:

- Commissioning **independent external experts** to conduct a technical review;
- Establishing a **Technical Advisory Committee** (TAC) to undertake the review; or
- Establishing an **Independent Expert Commission** (applicable for transnational shared resources).

[Note: where an SEA is likely to have transnational impacts, it will be necessary to advise the authorities of the concerned country at the outset, agree on how to address such impacts (perhaps with experts

from both countries taking part in the SEA), and agree how to jointly review the SEA report. As indicated above, the nomination of experts to the Independent Expert Commission to represent the country on transboundary issues will be necessary. The respective notification protocols and procedures would apply].

Before submitting the final SEA report (and final SESMP where required) to the competent authority, the PPP proponent shall ensure quality-assurance of the SEA using the same checklists as the internal and external reviewers will use (see Annex 10). The PPP proponent should endorse the final SEA report (and final SESMP where required).

2.8.2 Key questions and criteria for reviewing the SEA report

Note: Reviewing the SEA process (rather than the report), outcomes, or performance is considered in Section 3.7, “Monitoring and Evaluation.”

The most important outcome of an SEA, and thus measure of success (see also Chapter 1, Section 1.12 on SEA effectiveness), are the positive changes that are made to the PPP. Key questions related to the comprehensive review of an SEA Report include:

- The changes made to the PPP as a result of the main assessment stage of the SEA (Stage 4);
- The quality of information presented in the SEA report;
- The level of stakeholder participation and response to stakeholder comments;
- The definition of the environmental and social quality objectives (ESQOs);
- The adequacy and quality of the assessment and mitigation of environmental and social impacts; and
- The planned implementation framework, timing, follow-up activities, and constraints.

Box 2.15 presents criteria that can be used for internal, informal, or formal review of SEA reports by the proponent, the competent authority, expert committees, or others to check whether an SEA has been conducted properly and whether all required information is included in the SEA Report.

Box 2.15: Review criteria for SEA reports

Source: Adapted from MONRE (2008)

Addressing key issues

- The purpose and objectives of the PPP and SEA are made clear.
- Links with other related PPPs are identified and explained.
- Environmental and social issues that are relevant to the PPP are determined.
- The assessment focuses on significant issues.
- Reasons are given for eliminating issues from further consideration.
- The framework of SEA objectives is appropriate to the PPP and identified environmental and social issues.
- Mechanisms have been provided to allow stakeholder inputs into SEA recommendations and decisions.

Alternatives and scenarios

- Realistic alternatives of the PPP are considered, and the reasons for choosing them are documented.
- Alternatives include ‘do minimum’ and/or ‘business as usual’ options wherever relevant.
- The environmental and socioeconomic impacts (both adverse and beneficial) of each alternative are identified and compared.
- Inconsistencies between the alternatives and other relevant PPPs are identified and explained.
- Assumptions behind the development of alternatives are provided, and reasons are given for selection or elimination of alternatives.
- A range of realistic scenarios were developed and assessed.

Baseline information

- Relevant aspects of the current state of the environment and socioeconomic conditions and their likely evolution without the PPP are described.
- Environmental and socioeconomic characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the PPP area where it is likely to be affected by the PPP.
- Relevant data gaps are identified, as are the means to address them.

Prediction and evaluation of likely significant environmental and social impacts

- Both positive and negative impacts are considered, and the duration of impacts (short, medium, or long-term) is addressed.
- Likely secondary, cumulative, and synergistic impacts (positive and negative) are identified where practicable.
- Inter-relationships between impacts are considered where practicable.
- The prediction and evaluation of impacts make use of relevant accepted standards, regulations, and thresholds.
- A ranking of significance is provided.

Uncertainties

- Methods used to carry out the SEA are described.
- Deficiencies in background information or methods are explained.

Mitigation and enhancement

- Measures envisaged to prevent, reduce, and offset any significant adverse impacts of implementing the PPP are indicated, or to enhance any positive impacts.
- Issues to be taken into account in project consents are identified.

SEA Report

- Is clear and concise in its layout and presentation.
- Uses simple, clear language and avoids or explains technical terms.
- Uses maps and other illustrations where appropriate.
- Explains the methodology used.
- Explains who was consulted, what methods of consultation were used, and how the consultees' views have been taken into account.
- Identifies sources of information, including expert judgment and matters of opinion.
- Contains a non-technical summary covering the overall approach to the SEA, the objectives of the PPP, the main options considered, and any changes to the plan resulting from the SEA. The summary is provided in local languages as required and complies with any accessibility requirements.
- Technical, procedural, and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.
- Clearly identifies how recommendations have been incorporated in the PPP.

Management of the SEA process

- The SEA is carried out as an integral part of the PPP-making process.
- Relevant authorities and the public concerned are consulted in ways and at times that give them an early and effective opportunity within appropriate time frames to express their opinions on the draft PPP, SEA Report, and SESMP.

A system to review, chapter-by-chapter, the content of an SEA Report is presented in Sections 2 to 8 of Annex 10:

Section 2 of the checklist reviews the *Report Presentation* (i.e., is it complete, adequate, clear, etc.). It can support the administrative review of the draft SEA report, ensuring that the draft SEA is of sufficient quality to be sent out to stakeholders for review. Sections 3 to 8 of the checklist focus on the review of various chapters of an SEA:

- Section 3: PPP description;
- Section 4: Policy, institutional and legal framework, and links;
- Section 5: Description of the environmental and social baseline;
- Section 6: Assessment of impacts, determination of impact significance, and evaluation of alternatives;
- Section 7: Mitigation and environmental management and monitoring plan;

- Section 8: Consultation process.

When reviewing a *SESMP*, it will be necessary to check that the plan covers all the issues listed in Annex 16, and that it is presented in a clear and easy-to-use manner.

2.9 STAGE 6: IMPLEMENTATION OF THE SESMP

2.9.1 Institutional arrangements

If the recommendations and management framework proposed in the *SESMP* are to be meaningfully and effectively implemented, it is important that the ***SESMP is endorsed and adopted*** by the Steering Committee and the Lead Agency (which should include inter-ministerial representatives) since a number of sector ministries will be likely to have a role and responsibilities for components of the *SESMP* and taking recommended actions.

Such endorsement will be more readily achieved if a Task Group of contact point representatives from key sector agencies has already been successfully engaged in the SEA process from an early stage (as recommended in Section 2.7.2) and has been closely involved in reviewing and agreeing the proposals set out in the *SESMP*.

Effective implementation of the *SESMP* will be more likely if an ***inter-ministerial oversight body*** is appointed. This could be the existing SEA Steering Committee or another appropriate body.

It will also be important to establish a ***SESMP Coordinating Unit*** (or similar dedicated body) to be responsible for day-to-day management and coordination of *SESMP* implementation. This would report to the oversight body. This unit would need to be staffed by several technical and administrative personnel. Outline functions for such a unit are listed in Box 2.16.

Box 2.16: Recommended functions of a SESMP Coordinating Unit (SCU)

- Establish and maintain procedural arrangements to ensure that the *SESMP* monitoring system runs effectively and that data collected from year to year are replicable, comparable, and auditable. This should include:
 - Regular liaison with focal persons in all *SESMP* implementing agencies to ensure that their monitoring responsibilities are established and undertaken (as required);
 - Collating all monitoring data gathered by different organizations/departments (as specified in the *SESMP*). The SCU might use published data from other sources as well.
- Maintain/organize continuous dialogue and interaction (including through consultations and workshops as needed), as required, with all implementing agencies;
- Evaluate and interpret submitted monitoring data along with the submitting agency and request necessary clarification/corrections, if required;
- Submit interpretative summary reports along with advice or recommendations;
- Prepare periodic overview reports (suggested every three years) on progress in implementing the recommendations of the SEA and *SESMP*. These should be approved by the oversight body;
- Develop and maintain an interactive *SESMP* website where all relevant reports and documents are made available (the existing SEA website could be a starting platform);
- Liaise with the mass media if required;
- Identify the need for awareness-raising programs on the *SESMP*, targeted at implementing agencies, stakeholders, and the public and private sector. These should cover the needs and role of the *SESMP* (e.g., how it operates), key environmental and socioeconomic issues that are being addressed, and how stakeholders can engage and provide inputs;
- Coordinate budget allocation for *SESMP* actions and associated monitoring functions;
- Be a point of contact and liaison for all communications to participants in the *SESMP* process, and

- Be responsible for arranging (and acting as Secretariat for) SCU bi-monthly meetings with all respective focal points of ministries and organizations.

2.9.2 Monitoring

Monitoring is an important function of SESMP implementation to determine whether the recommended actions and management measures have been undertaken and have been successful. Among such measures should be a program to monitor the indicators selected to track whether ESQOs have been achieved. Such monitoring is critical to determine where management measures are having success and, where not (e.g., where environmental or social trends are negative), to enable corrective measures to be identified and recommended.

Information tracking systems can be used to monitor and check progress. Monitoring of cumulative impacts may be appropriate for PPPs that will initiate regional-scale change in critical natural assets. Methods and indicators for this purpose need to be developed on a case-by-case basis.

2.9.3 Evaluation of the SESMP results and influence of the PPP

At some point during or after implementation of the PPP, a formal evaluation of the SESMP's management and monitoring results should take place as part of the revision or renewal of the PPP. This will be necessary to determine whether the outcomes of the PPP have been achieved, fully or in part.

Key questions to help evaluate the performance of the PPP and the influence of the SEA include:

- The accuracy of the assumptions made during the SEA;
- The influence of the SEA on the PPP process;
- The implementation processes of the PPP;
- Progress towards achieving the Sustainable Development Goals and accountability;
- The environmental and socioeconomic outcomes of PPP activities;
- The impacts on institutional, legal, governance, and capacity-building issues that highly influence the PPP implementation process, and
- Any required corrective actions, adjustments, or next steps.

The proponent should undertake such an evaluation in consultation with the competent authority. Consultants may also be engaged to provide an independent evaluation.

Role of evaluation

Evaluation should examine whether an intervention has achieved intended outputs and outcomes. The challenge is to define clearly how to measure these achievements in an objective and robust manner. The approach can be kept relatively straightforward if it focuses on elements that can be measured more objectively than others (instead of on elements where it is difficult to determine a cause-effect relationship). Evaluating the influence of an SEA will involve examining plausible cause-effect relationships and making an informed judgment about the extent to which the SEA influenced PPP design, implementation, and outcomes (see also Chapter 1, Section 1.12).

It may not be necessary to obtain absolute scientific proof, but it is necessary to engage in a reflective process to evaluate and improve on previous decisions. The aim is to learn how to continuously improve the integration of sustainability into decision-making and how to improve the use and efficiency of SEA as a tool to support sustainable development. In this context, SEA evaluation can also help to:

- Improve learning on the linkages between PPP formulation, assessment, and practical outcomes;
- Achieve PPP goals by identifying ex-post adaptation requirements for those implementation mechanisms/actions that failed to deliver intended outcomes; and

- Support the accountability of decision-makers and involved stakeholders by making the results of decisions transparent.

Evaluation should lead to concrete results, for example:

- Positive recommendations on future actions;
- Ex-post adaptation of implementation measures or even the PPP decision(s) itself (e.g., in the case where serious deviations from previous assumptions endanger the achievement of specific goals); and
- Specific measures to develop capacity, tailored to help overcome implementation gaps.

The most important outcome of a good quality SEA is that it significantly influenced the achievement of positive development results and will have enhanced the effectiveness of the PPP.

A systematic approach to monitoring and evaluation can be supported by checklist(s). Sections 9-11 of Annex 10 focus on evaluation, Section 9 reviews decision making, Section 10 provides IAIA's SEA process review checklist, and Section 11 is the SEA performance monitoring evaluation checklist.

2.10 STAKEHOLDER ENGAGEMENT IN SEA

Stakeholder involvement in SEA is a key principle of full SEA¹⁸ (see Sections 1.4 and 1.10). The International Association for Impact Assessment has issued international best practice principles for participation in impact assessment¹⁹ which should be followed in SEA.

As indicated in Figure 2.1, stakeholders should be engaged throughout the entire SEA process, even, in some circumstances, during screening when there can be some limited or specific stakeholder engagement (e.g., with statutory environmental agencies).

A key step in the scoping stage is to identify/map the key stakeholders (see Section 2.10.3) and develop a plan/strategy for how and when they can contribute to the SEA. Stakeholder consultations should be organized in two main rounds:

- **First round (during scoping):** to explain why the SEA is being conducted, indicate how and when stakeholders can engage in the process, and gather stakeholder perspectives on the PPP and the key environmental and socioeconomic issues likely to be associated with its implementation. This will help the team to focus the SEA on the critical issues.
- **Second round (after the main assessment stage):** to present the findings of the SEA and its recommendations and seek stakeholder feedback on these.

In addition, throughout the SEA process, specific engagement with stakeholders may be warranted, such as focus group meetings or workshops on particular issues (e.g., to verify proposed ESQOs, alternatives, and scenarios, and to address particular concerns such as the use of natural resources or challenges for Indigenous Peoples). Furthermore, the draft SEA and SESMP reports should be made available for public comment, and stakeholder involvement may also be required to monitor implementation of the SESMP. Stakeholder engagement is discussed further in the following sub-sections.

2.10.1 Minimum requirements for participation

At an absolute minimum, the PPP proponent must meet with the main stakeholders to inform them about the PPP and SEA being undertaken and to solicit their views about it. The ideal elements of stakeholder participation in an SEA are listed in Box 1.3. Understanding the decision-making authority of different stakeholders and how they interact with each other and the environment and socioeconomic

¹⁸ Note: A rapid SEA will rely mainly on expert inputs.

¹⁹ André, P., Enserink, B., Connor, D., & Croal, P. (2006) and Morrison-Saunders, A., & Arts, J. (2023)

conditions is essential for good analysis and process management. Relevant regional and/or country representatives should also be included when transboundary impacts are anticipated.

PPPs concerned with the energy transition are likely to affect all inhabitants in a country. But it is almost impossible to give all inhabitants the opportunity to be engaged in the process. Therefore, the option that CSOs represent the voice of the people is a reasonable and acceptable approach. In any case, during the early stages of scoping, there should be discussions between the proponent and the SEA team about how consultation will be undertaken, who should be consulted (identification of SEA stakeholders), what preparations will be needed before, during, and after consultation, and how the results of consultation should be disclosed.

2.10.2 Stakeholder analysis, engagement plan and communication plan

Stakeholder engagement during scoping

During scoping (see Section 2.5), stakeholder mapping should be undertaken to identify stakeholders, determine their potential interest and influence, and as a basis for preparing a draft stakeholder engagement plan and a communication plan. Box 2.17 indicates the broad categories of stakeholders that should be included in the mapping.

Box 2.17: Main categories of stakeholders

Broadly, stakeholders should include:

- The Ministry of Energy, or equivalent, other relevant government ministries/agencies, and others involved in decision-making relevant to the PPP being assessed at all levels (from national to local), particularly the ministries for environment, water, and land. For PPPs concerned with the energy transition, where multiple sectors will be involved, the engagement of multiple authorities will be necessary.
- All those organizations and individuals with a legitimate interest in the PPP and who may be affected by PPP outcomes;
- Civil society (who may be represented by CSOs and NGOs);
- Vulnerable groups, Indigenous Peoples, and other interests that may not have specific representation;
- The private sector;
- Multilateral development banks, bilateral donors, and aid agencies that may fund the SEA or support the implementation of the PPP.

The methods adopted to engage stakeholders will need to be determined according to their purpose.

A variety of meeting methods should be considered to ensure that all stakeholders are reached and involved, including “town hall” meetings, workshops, focus groups, key informant interviews (one-on-one or small groups), surveys, social media, etc.

Generally, SEAs draw the attention of ‘public representatives’ rather than individuals. If the public has limited experience with being engaged at the strategic level, it is critical to include an *education component* in the public engagement process to inform stakeholders what SEA is about, its objectives, and to raise awareness of the ways in which they can make their views known and contribute.

It is important to identify and engage those stakeholders who may be the most exposed to environmental degradation and adverse socioeconomic change as a result of the PPP. In general, environmental and socioeconomic pressures tend to affect the poor and vulnerable populations more significantly. Women, men and youth, and Indigenous Peoples' groups should be included in this public engagement process to draw on all relevant knowledge and ensure their meaningful inclusion. Culturally sensitive consultation norms should be taken into account (e.g., language, representation, world views, etc.). It will also be important to explain energy transition in the context of the SEA, as this may not have been conveyed to a great extent at the onset of the SEA process.

As mentioned above, the SEA process relies on effective and sustained public engagement. PPP decisions are embedded in the political domain and involve political dynamics, including the engagement of the stakeholders who are likely to be most affected or who are most vulnerable. One challenge is to ensure that public engagement is meaningful, transparent, and continuous, and not just a case of providing stakeholders with detailed, comprehensive information. The engagement process must provide an *opportunity to influence decisions* over the life of the SEA process.

Stakeholders are comprised of many interest groups, often with conflicting objectives (e.g., gender differences) with different rights and responsibilities, educated and uneducated people, young people and elders, Indigenous groups, and different economic and cultural groups. The role of the public consultation in SEA should be to provide a mechanism for identifying and trying to *solve differing views in a constructive and meaningful way*.

Stakeholder groups identified as most affected by a given PPP 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, other vulnerable 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 have other characteristics that need to be considered when planning for their engagement. In some cases, special means of engagement may be required, e.g., women of the SEA team meeting with a women's group or use of an Indigenous-led facilitator when meeting with Indigenous groups.

Authorities that, because of their environmental and socioeconomic responsibilities, are likely to be concerned by the impacts of implementing the PPP, must be consulted on the scope and level of detail of the information to be included in the SEA Report.

Depending on the nature of the political institutions and their internal functions, the SEA stakeholder engagement process should be integrated, to the extent possible, with the public engagement process for the development and implementation of the PPP itself. This will help to emphasize both the positive contributions and potentially harmful impacts of the PPP. More problematic issues should involve more extensive consultation.

Stakeholder engagement during assessment and implementation phases

Stakeholders have a clear role to review the outcomes of the draft SEA report and recommendations in the draft SESMP, identify gaps and errors, and challenge assumptions and conclusions. This should be the focus of the second main round of stakeholder consultations. However, it may not need to be as extensive as the first round. But should, at least, include multi-stakeholder workshops at the national level and in the main regions.

Once the PPP is approved and is being implemented, stakeholders will have key roles to play in monitoring whether the environmental and social quality objectives agreed to and used in the SEA are being met and whether mitigation plans are being fully and effectively carried out. The SESMP will recommend a monitoring and auditing program for this purpose. It should also set out the roles and responsibilities of governmental bodies and other stakeholders to implement the SESMP as well as the opportunities for civil society groups to engage in this process (e.g., data gathering, informal reporting of changes, etc.).