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VOLUNTARY GUIDELINES ON BIODIVERSITY-INCLUSIVE IMPACT ASSESSMENT

Note by the Executive Secretary

1. At its sixth meeting the Conference of the Parties, in decision VI/7 A endorsed the draft guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment. In the same decision, the Executive Secretary was requested to compile and disseminate, through the clearing-house mechanism and other means of communication, current experiences in environmental impact assessment and strategic environmental assessment procedures that incorporate biodiversity-related issues, as well as experiences of Parties in applying the guidelines.

2. In light of this information, the Executive Secretary was requested to prepare, in collaboration with relevant organizations, in particular the International Association for Impact Assessment, proposals for further development and refinement of the guidelines, particularly to incorporate all stages of the environmental impact assessment and strategic environmental assessment processes taking into account the ecosystem approach (particularly principles 4, 7 and 8) and to provide a report of this work to the Subsidiary Body prior to the seventh meeting of the Conference of the Parties.

3. In his note prepared for the ninth meeting of SBSTTA (UNEP/CBD/SBSTTA/9/INF/18), the Executive Secretary reported on the ongoing work in preparing proposals for further development and refinement of the guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation or procedures and in strategic impact assessment.

4. Based on the guidance contained in decision VI/7 A and its inputs, submission of case-studies and recommendations from organizations and experts, in particular through various forums of the International Association for Impact Assessment (IAIA), the Executive Secretary prepared voluntary guidelines on biodiversity-inclusive environmental impact assessment (annex I below) and draft guidance on biodiversity-inclusive strategic environmental assessment (annex II below).

5. Since December 2004, earlier drafts of these documents have undergone several rounds of review and revision. On 11 July 2005, the Executive Secretary invited, through notification 2005-082, national

* UNEP/CBD/SBSTTA/11/1.

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focal points for the Convention, SBSTTA focal points and relevant organizations to submit comments on the last draft, by 30 September 2005. Submissions were received from four Parties as well as from a number of organizations and individual experts. These have been incorporated into the two sets of guidance contained in this note.

6. To facilitate discussions of these documents at the eighth meeting of the Conference of the Parties to the Convention on Biological Diversity to be held in Curitiba, Brazil, from 13 to 17 March 2006, this note is presented for information of the eleventh meeting of SBSTTA.

Annex I

VOLUNTARY GUIDELINES ON BIODIVERSITY-INCLUSIVE ENVIRONMENTAL IMPACT ASSESSMENT

1. The guidelines are structured in accordance with the internationally accepted sequence of procedural steps characterizing good-practice environmental impact assessment (EIA). 1/ They aim at a better integration of biodiversity-related considerations into the EIA process.

2. National EIA systems are regularly being evaluated and revised. These guidelines are intended to assist national authorities, regional authorities or international agencies as appropriate in better incorporating biodiversity-related considerations during such a revision, at which a significant enhancement of the EIA system can be made. This also implies that further elaboration of practical guidelines is needed to reflect the ecological, socio-economic, cultural and institutional conditions for which the EIA system is designed.

3. The guidelines focus on how to promote and facilitate a biodiversity-inclusive EIA process. They do not provide a technical manual on how to conduct a biodiversity-inclusive assessment study.

4. Screening and scoping are considered critical stages in the EIA process and consequently receive particular attention. Screening provides the trigger to start an EIA process. During scoping relevant impacts are identified resulting in the terms of reference for the actual impact study. The scoping stage is considered critical in the process as it defines the issues to be studied and it provides the reference information on which the review of the study results will be based. Scoping and review usually are linked to some form of public information, consultation or participation. During scoping promising alternatives can be identified that may significantly reduce or entirely prevent adverse impacts on biodiversity.

A. Stages in the process

5. Environmental impact assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, 2/ taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. Although legislation and practice vary around the world, the fundamental components of an EIA would necessarily involve the following stages:

(a) *Screening* to determine which projects or developments require a full or partial impact assessment study;

(b) *Scoping* to identify which potential impacts are relevant to assess (based on legislative requirements, international conventions, expert knowledge and public involvement), to identify alternative solutions that avoid, mitigate or compensate adverse impacts on biodiversity (including the option of not proceeding with the development, finding alternative designs or sites which avoid the impacts, incorporating safeguards in the design of the project, or providing compensation for adverse impacts), and finally to derive terms of reference for the impact assessment;

1/ See, for example, the International Association for Impact Assessment's principles of Environmental Impact Assessment best practice – www.iaia.org

2/ The terms project, activity and development are used interchangeably; there is no intended distinction between them.

(c) *Assessment and evaluation of impacts and development of alternatives*, to predict and identify the likely environmental impacts of a proposed project or development, including the detailed elaboration of alternatives;

(d) *Reporting*: the Environmental Impact Statement (EIS) or EIA report, including an Environmental Management Plan (EMP), and a non-technical summary for the general audience.

(e) *Review* of the Environmental Impact Statement, based on the terms of reference (scoping) and public (including authority) participation.

(f) *Decision-making* on whether to approve the project or not, and under what conditions; and

(g) *Monitoring, compliance, enforcement and environmental auditing*. Monitor whether the predicted impacts and proposed mitigation measures occur as defined in the EMP. Verify the compliance of proponent with the EMP, to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion.

B. Biodiversity issues at different stages of environmental impact assessment

1. Screening

6. Screening is used to determine which proposals should be subject to EIA, to exclude those unlikely to have harmful environmental impacts and to indicate the level of assessment required. Screening criteria have to include biodiversity measures, or else there is a risk that proposals with potentially significant impacts on biodiversity will be screened out. The outcome of the screening process is a *screening decision*.

7. Since legal requirements for EIA may not guarantee that biodiversity will be taken into account, consideration should be given to incorporating biodiversity criteria into existing, or the development of new, screening criteria. Important information for developing screening criteria can be found in National Biodiversity Strategy and Action Plans (NBSAPs) or equivalent documents. These strategies provide detailed information on conservation priorities and on types and conservation status of ecosystems. Furthermore they describe trends and threats at ecosystem as well as species level and provide an overview of planned conservation activities.

8. *Pertinent questions from a biodiversity perspective.* Taking into account the three objectives of the Convention, fundamental questions which need to be answered in an EIA study include:

(a) Would the intended activity affect the biophysical environment directly or indirectly in such a manner or cause such biological changes that it will increase risks of extinction of genotypes, cultivars, varieties, populations of species, or the chance of loss of habitats or ecosystems?

(b) Would the intended activity surpass the maximum sustainable yield, the carrying capacity of a habitat/ecosystem or the maximum allowable disturbance level of a resource, population, or ecosystem, taking into account the full spectrum of values of that resource, population or ecosystem?

(c) Would the intended activity result in changes to the access to, and/or rights over biological resources?

9. To facilitate the development of screening criteria, the questions above have been reformulated for the three levels of diversity, reproduced in table 1 below.

Table 1 Questions pertinent to screening on biodiversity impacts

Level of diversity	**Conservation of biodiversity**	**Sustainable use of biodiversity**
Ecosystem diversity 3/	Would the intended activity lead, either directly or indirectly, to serious damage or total loss of (an) ecosystem(s), or land-use type(s), thus leading to a loss of ecosystem services of scientific/ecological value, or of cultural value?	Does the intended activity affect the sustainable human exploitation of (an) ecosystem(s) or land-use type(s) in such manner that the exploitation becomes destructive or non-sustainable (i.e. the loss of ecosystem services of social and/or economic value)?
Species diversity 3/	Would the intended activity cause a direct or indirect loss of a population of a species?	Would the intended activity affect sustainable use of a population of a species?
Genetic diversity	Would the intended activity result in extinction of a population of a localized endemic species of scientific, ecological, or cultural value?	Does the intended activity cause a local loss of varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance?

10. Types of existing screening mechanisms include:

(a) *Positive lists* identifying projects requiring EIA (inclusion lists). A disadvantage of this approach is that the significance of impacts of projects varies substantially depending on the nature of the receiving environment, which is not taken into account. A few countries use (or have used) negative lists, identifying those projects not subject to EIA (exclusion lists). Both types of lists should be reassessed to evaluate their inclusion of biodiversity aspects;

(b) Lists identifying those *geographical areas* where important biodiversity is found, in which projects would require EIA. The advantage of this approach is that the emphasis is on the sensitivity of the receiving environment rather than on the type of project;

(c) *Expert judgement* (with or without a limited study, sometimes referred to as *initial environmental examination* or *preliminary environmental assessment*). Biodiversity expertise should be included in expert teams; and

(d) A *combination* of a list plus expert judgement to determine the need for an EIA.

11. A *screening decision* defines the appropriate *level of assessment*. The result of a screening decision can be that:

3/ The level at which "population" is to be defined depends on the screening criteria used by a country. For example, the conservation status of species can be assessed within the boundaries of a country (for legal protection), or can be assessed globally (IUCN Red Lists). Similarly, the scale at which ecosystems are defined depends on the definition of criteria in a country, and should take into account the principles of the ecosystem approach.

(a) The proposed project is 'fatally flawed' in that it would be inconsistent with international or national conventions, policies or laws. It is advisable not to pursue the proposed project. Should the proponent wish to proceed at his/her risk, an EIA would be required;

(b) An EIA is required (often referred to as category A projects);

(c) A limited environmental study is sufficient because only limited environmental impacts are expected; the screening decision is based on a set of criteria with quantitative benchmarks or threshold values (often referred to as category B projects);

(d) There is still uncertainty whether an EIA is required and an initial environmental examination has to be conducted to determine whether a project requires EIA or not; or

(e) The project does not require an EIA.

12. *Biodiversity-inclusive screening criteria* set out circumstances in which EIA is justified on the basis of biodiversity considerations. They may relate to:

(a) Categories of activities known to cause biodiversity impacts, including thresholds referring to size of the intervention area and/or magnitude, duration and frequency of the activity;

(b) The magnitude of biophysical change that is caused by the activity; or

(c) Maps indicating areas important for biodiversity, often with their legal status.

13. A suggested approach to the development of biodiversity-inclusive screening criteria, combining the above types of criteria, includes the following steps: (i) design a biodiversity screening map indicating areas in which EIA is required; (ii) define activities for which EIA is required; (iii) define threshold values to distinguish between full, limited/undecided or no EIA (see annex 2.1 for a generic set of screening criteria). The suggested approach takes account of biodiversity values (including valued ecosystem services) and activities that might impact drivers of change of biodiversity.

14. If possible, biodiversity-inclusive screening criteria should be integrated with the development (or revision) of a National Biodiversity Strategy and Action Plan. This process can generate valuable information such as a national spatial biodiversity assessment, including conservation priorities and targets, which can guide the further development of EIA screening criteria.

15. *Step 1*: According to the principles of the ecosystem approach, a *biodiversity screening map* is designed, indicating important ecosystem services (replacing the concept of sensitive areas – see annex 2.2). The map is based on expert judgement and has to be formally approved.

16. Suggested categories of geographically defined areas, related to important ecosystem services, are:

(a) Areas with important regulating services in terms of maintaining biodiversity:

(i) *Protected areas*: depending on the legal provisions in a country these may be defined as areas in which no human intervention is allowed, or as areas where impact assessment at an appropriate level of detail is always required;

(ii) Areas containing *threatened ecosystems outside of formally protected areas*, where certain classes of activities (see step 2) would always require an impact assessment at an appropriate level of detail;

(iii) Areas identified as being important for the *maintenance of key ecological or evolutionary processes*, where certain classes of activities (see step 2) would always require an impact assessment at an appropriate level of detail;

(iv) Areas known to be *habitat for threatened species*, which would always require an impact assessment at an appropriate level of detail.

(b) Areas with *important regulating services for maintaining natural processes with regard to soil, water, or air*, where impact assessment at an appropriate level of detail is always required. Examples can be wetlands, highly erodable or mobile soils protected by vegetation (e.g. steep slopes, dunefields), forested areas, coastal or offshore buffer areas; etc.

(c) Areas with *important provisioning services*, where impact assessment at an appropriate level of detail is always required. Examples can be extractive reserves, lands and waters traditionally occupied or used by indigenous and local communities, fish breeding grounds; etc.

(d) Areas with *important cultural services*, where impact assessment at an appropriate level of detail is always required. Examples can be scenic landscapes, heritage sites, sacred sites; etc.

(e) Areas with *other relevant ecosystem services* (such as flood storage areas, groundwater recharge areas, catchment areas, areas with valued landscape quality, etc.); the need for impact assessment and/or the level of assessment is to be determined (depending on the screening system in place);

(f) All other areas: no impact assessment required from a biodiversity perspective (an EIA may still be required for other reasons).

17. *Step 2:* Define activities for which impact assessment may be required from a biodiversity perspective. The activities are characterized by the following direct drivers of change:

(a) Change of land-use or land cover, and underground extraction: above a defined area affected, EIA always required, regardless of the location of the activity - define thresholds for level of assessment in terms of surface (or underground) area affected;

(b) Fragmentation, usually related to linear infrastructure. Above a defined length, EIA always required, regardless of the location of the activity – define thresholds for level of assessment in terms of the length of the proposed infrastructural works;

(c) Emissions, effluents or other chemical, thermal, radiation or noise emissions - relate level of assessment to the ecosystem services map;

(d) Introduction or removal of species, changes to ecosystem composition, ecosystem structure, or key ecosystem processes responsible for the maintenance of ecosystems and ecosystem services (see annex 2.3 for an indicative listing) - relate level of assessment to ecosystem services map.

18. It should be noted that these criteria only relate to biodiversity and serve as an add-on in situations where biodiversity has not been fully covered by the existing screening criteria.

19. *Determining norms or threshold values for screening* is partly a technical and partly a political process the outcome of which may vary between countries and ecosystems. The technical process should at least provide a description of:

(a) *Categories of activities* that create direct drivers of change (extraction, harvest or removal of species, change in land-use or cover, fragmentation and isolation, external inputs such as emissions, effluents, or other chemical, radiation, thermal or noise emissions, introduction of alien, invasive or genetically modified organisms, or change in ecosystem composition, structure or key processes), taking into account characteristics such as: type or nature of activity, magnitude, extent/location, timing, duration, reversibility/irreversibility, irreplaceability, likelihood, and significance; possibility of interaction with other activities or impacts;

(b) *Where and when*: the area of influence of these direct drivers of change can be modelled or predicted; the timing and duration of influence can be similarly defined;

(c) A *map of valued ecosystem services* (including maintenance of biodiversity itself) on the basis of which decision makers can define levels of protection or conservation measures for each defined area. This map is the experts' input into the definition of categories on the biodiversity screening map referred to above under step 1.

2. Scoping

20. Scoping is used to define the focus of the impact assessment study and to identify key issues, which should be studied in more detail. It is used to derive terms of reference (sometimes referred to as guidelines) for the EIA study and to set out the proposed approach and methodology. Scoping also enables the competent authority (or EIA professionals in countries where scoping is voluntary) to:

(a) Guide study teams on significant issues and alternatives to be assessed, clarify how they should be examined (methods of prediction and analysis, depth of analysis), and according to which guidelines and criteria;

(b) Provide an opportunity for stakeholders to have their interests taken into account in the EIA;

(c) Ensure that the resulting Environmental Impact Statement is useful to the decision maker and is understandable to the public.

21. During the scoping phase, promising alternatives can be identified for in-depth consideration during the EIA study.

22. *Consideration of mitigation and/or enhancement measures*: The purpose of mitigation in EIA is to look for ways to achieve the project objectives while avoiding negative impacts or reducing them to acceptable levels. The purpose of enhancement is to look for ways of optimizing environmental benefits. Both mitigation and enhancement of impacts should strive to ensure that the public or individuals do not bear costs, which are greater than the benefits that accrue to them.

23. Remedial action can take several forms, i.e. *avoidance* (or prevention), *mitigation* (by considering changes to the scale, design, location, siting, process, sequencing, phasing, management and/or monitoring of the proposed activity, as well as restoration or rehabilitation of sites), and *compensation* (often associated with residual impacts after prevention and mitigation). A 'positive planning approach' should be used, where avoidance has priority and compensation is used as a last resort measure. One

should acknowledge that compensation will not always be possible: there are cases where it is appropriate to reject a development proposal on grounds of irreversible damage to, or irreplaceable loss of, biodiversity.

24. Practical evidence with respect to mitigation suggests that:

(a) Timely and ample attention to mitigation and compensation, as well as the interaction with society, will largely reduce the risk of negative publicity, public opposition and delays, including associated costs. Specialist input on biodiversity can take place prior to initiating the legally required EIA process, as a component of the project proposal. This approach improves and streamlines the formal EIA process by identifying and avoiding, preventing or mitigating biodiversity impacts at the earliest possible stage of planning;

(b) Mitigation requires a joint effort of the proponent, planners, engineers, ecologists and other specialists, to arrive at the best practicable environmental option;

(c) Potential mitigation or compensation measures have to be included in an impact study in order to assess their feasibility; consequently they are best identified during the scoping stage;

(d) In project planning, it has to be kept in mind that it may take time for effects to become apparent.

25. The following sequence of questions provides an example of the kind of information that should be requested in the terms of reference of an impact study if the project screening suggests that the proposed activity is likely to have adverse impacts on biodiversity. It should be noted that this list of steps represents an iterative process. Scoping and impact study are two formal rounds of iteration; during the study further iterative rounds may be needed, for example when alternatives to the proposed project design have to be defined and assessed.

(a) Describe the type of project, and define each project activity in terms of its nature, magnitude, location, timing, duration and frequency;

(b) Define possible alternatives, including “no net biodiversity loss” or “biodiversity restoration” alternatives (such alternatives may not be readily identifiable at the outset of impact study, and one would need to go through the impact study to determine such alternatives). Alternatives include location alternatives, scale alternatives, siting or layout alternatives, and/or technology alternatives;

(c) Describe expected biophysical changes (in soil, water, air, flora, fauna) resulting from proposed activities or induced by any socio-economic changes caused by the activity;

(d) Determine the spatial and temporal scale of influence of each biophysical change, identifying effects on connectivity between ecosystems, and potential cumulative effects;

(e) Describe ecosystems and land-use types lying within the range of influence of biophysical changes;

(f) Determine, for each of these ecosystems or land-use types, if biophysical changes are likely to have adverse impacts on biodiversity in terms of composition, structure (spatial and temporal), and key processes. Give indication of the level certainty of predictions, and take into account mitigation measures. Highlight any irreversible impacts and any irreplaceable loss;

(g) For the affected areas, collect available information on baseline conditions and any anticipated trends in biodiversity in the absence of the proposal;

(h) Identify, in consultation with stakeholders, the current and potential ecosystem services provided by the affected ecosystems or land-use types and determine the values these functions represent for society (see box 1). Give an indication of the main beneficiaries and those adversely affected from an ecosystem services perspective, focusing on vulnerable stakeholders;

(i) Determine which of these services will be significantly affected by the proposed project, giving confidence levels in predictions, and taking into account mitigation measures. Highlight any irreversible impacts and any irreplaceable loss;

(j) Define possible measures to avoid, minimize or compensate for significant damage to, or loss of, biodiversity and/or ecosystem services; define possibilities to enhance biodiversity. Make reference to any legal requirements;

(k) Evaluate the significance of residual impacts, i.e. in consultation with stakeholders define the importance of expected impacts for the alternatives considered. Relate the importance of expected impacts to a reference situation, which may be the existing situation, a historical situation, a probable future situation (e.g. the 'without project' or 'autonomous development' situation), or an external reference situation. When determining importance (weight), consider geographic importance of each residual impact (e.g. impact of local/regional/national/continental/global importance) and indicate its temporal dimension.

(l) Identify necessary surveys to gather information required to support decision making. Identify important gaps in knowledge;

(m) Provide details on required methodology and timescale.

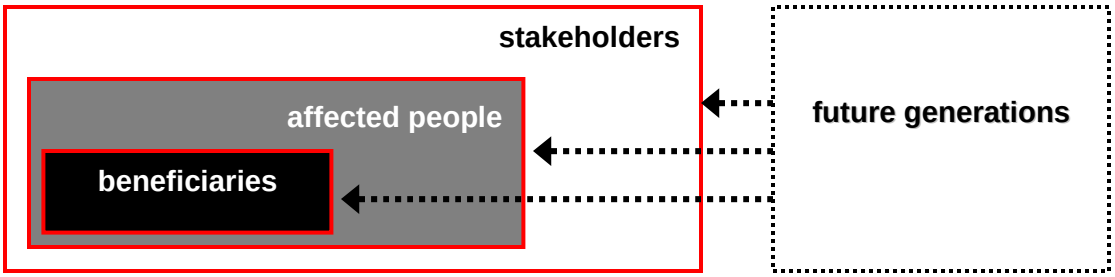
26. One should bear in mind that not implementing a project may in some cases also have adverse effects on biodiversity. In rare cases the adverse effects may be more significant than the impacts of a proposed activity (e.g. projects counteracting degradation processes).

Box 1: Stakeholders and participation

Impact assessment is concerned with (i) information, (ii) participation and (iii) transparency of decision-making. Public involvement consequently is a prerequisite for effective EIA and can take place at different levels: informing (one-way flow of information), consulting (two-way flow of information), or "real" participation (shared analysis and assessment). In all stages of EIA public participation is relevant. The legal requirements for and the level of participation differ among countries, but it is generally accepted that public consultation at the scoping and review stage are essential; participation during the assessment study is generally acknowledged to enhance the quality of the process.

With respect to biodiversity, relevant stakeholders in the process are:

- Beneficiaries of the project - target groups making use of, or putting a value to, known ecosystem services which are purposefully enhanced by the project;
- Affected people – i.e. those people that experience, as a result of the project, intended or unintended changes in ecosystem services that they value;
- General stakeholders – i.e. formal or informal institutions and groups representing either affected people or biodiversity itself.
- Future generations - 'absent stakeholders', i.e. those stakeholders of future generations, who may rely on biodiversity around which decisions are presently taken.



There is a number of potential constraints to effective public participation. These include:

- **Deficient identification** of relevant stakeholders may make public involvement ineffective;
- **Poverty**: involvement requires time spent away from income-producing tasks;
- **Rural settings**: increasing distance makes communication more difficult and expensive;
- **Illiteracy**: or lack of command of non-local languages, can inhibit representative involvement if print media are used;
- **Local values/culture**: behavioural norms or cultural practice can inhibit involvement of some groups, who may not feel free to disagree publicly with dominant groups;
- **Languages**: in some areas a number of different languages or dialects may be spoken, making communication difficult;
- **Legal systems**: may be in conflict with traditional systems, and cause confusion about rights and responsibilities for resources;
- **Interest groups**: may have conflicting or divergent views, and vested interests;
- **Confidentiality**: can be important for the proponent, who may be against early involvement and consideration of alternatives.

Also refer to decision VII/16-F containing the Akwé: Kon Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessment regarding Developments Proposed to Take Place on, or which are Likely to Impact on, Sacred Sites and on Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities.

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27. An analysis of current impact assessment practice 4/ has provided a number of practical recommendations when addressing biodiversity-related issues:

(a) Beyond the focus on protected species and protected areas, further attention needs to be given to (i) sustainable use of ecosystem services; (ii) ecosystem level diversity; (iii) non-protected biodiversity; and (iv) ecological processes and their spatial scale;

(b) The terms of reference should be unambiguous, specific and compatible with the ecosystem approach; too often the terms of reference are too general and impractical;

(c) In order to provide a sound basis for assessing the significance of impacts, baseline conditions must be defined and understood and quantified where possible. Baseline conditions are dynamic, implying that present and expected future developments if the proposed project is not implemented (autonomous development) need to be included;

(d) Field surveys, quantitative data, meaningful analyses, and a broad, long-term perspective enabling cause-effect chains to be tracked in time and space are important elements when assessing biodiversity impacts. Potential indirect and cumulative impacts should be better assessed;

4/ See document UNEP/CBD/SBSTTA/9/INF/18.

(e) Alternatives and/or mitigation measures must be identified and described in detail, including an analysis of their likely success and realistic potential to offset adverse project impacts;

(f) Guidance for scoping on biodiversity issues in EIA needs to be developed at country-level, but should, where appropriate, also consider regional aspects to prevent transboundary impacts;

(g) Guidance for determining levels of acceptable change to biodiversity needs to be developed at country level to facilitate decision-making;

(h) Guidance on assessing and evaluating impacts on ecosystem processes, rather than on composition or structure, need to be developed at country level. The conservation of ecosystem processes, which support composition and structure, requires a significantly larger proportion of the landscape than is required to represent biodiversity composition and structure;

(i) Capacity development is needed to effectively represent biodiversity issues in the scoping stage; this will result in better guidelines for the EIA study.

3. Assessment and evaluation of impacts, and development of alternatives

28. EIA should be an iterative process of assessing impacts, re-designing alternatives and comparison. The main tasks of impact analysis and assessment are:

(a) Refinement of the understanding of the nature of the potential impacts identified during screening and scoping and described in the terms of reference. This includes the identification of indirect and cumulative impacts, and of the likely cause–effect chains;

(b) Identification and description of relevant criteria for decision-making can be an essential element of this stage;

(c) Review and redesign of alternatives; consideration of mitigation and enhancement measures, as well as compensation of residual impacts; planning of impact management; evaluation of impacts; and comparison of the alternatives; and

(d) Reporting of study results in an Environmental Impact Statement (EIS) or EIA Report.

29. Assessing impacts usually involves a detailed analysis of their nature, magnitude, extent and duration, and a judgement of their significance, i.e., whether the impacts are acceptable to stakeholders and society as a whole, require mitigation and/or compensation, or are unacceptable.

30. Available biodiversity information is usually limited and descriptive, and cannot be used as a basis for numerical predictions. There is a need to develop biodiversity criteria for impact evaluation and measurable standards or objectives against which the significance of individual impacts can be evaluated. The priorities and targets set in the National Biodiversity Strategy and Action Plan process can provide guidance for developing these criteria. Tools will need to be developed to deal with uncertainty, including criteria on using risk assessment techniques, precautionary approach and adaptive management.

31. A number of practical lessons with respect to the study process have emerged including that the assessment should:

(a) Allow for enough survey time to take seasonal features into account, where confidence levels in predicting the significance of impacts are low without such survey;

(b) Focus on processes and services, which are critical to human well-being and the integrity of ecosystems. Explain the main risks and opportunities for biodiversity;

(c) Apply the ecosystem approach and actively seek information from relevant stakeholders and indigenous and local communities. Address any request from stakeholders for further information and/or investigation adequately. This does not necessarily imply that all requests need to be honoured; however, clear reasons should be provided where requests are not honoured;

(d) Consider the full range of factors affecting biodiversity. These include direct drivers of change associated with a proposal (e.g. land conversion, vegetation removal, emissions, disturbance, introduction of invasive alien species or genetically modified organisms, etc.) and, to the extent possible, indirect drivers of change, including demographic, economic, socio-political, cultural and technological processes or interventions;

(e) Evaluate impacts of alternatives with reference to the baseline situation. Compare against legal standards, thresholds, targets and/or objectives for biodiversity. Use NBSAPs and other relevant documents for information and objectives. The vision, objectives and targets for the conservation and sustainable use of biodiversity contained in local plans, policies and strategies, as well as levels of public concern about, dependence on, or interest in, biodiversity provide useful indicators of acceptable change;

(f) Take account of cumulative threats and impacts resulting either from repeated impacts of projects of the same or different nature over space and time, and/or from proposed plans, programmes or policies;

(g) Recognize that biodiversity is influenced by cultural, social, economic and biophysical factors. Cooperation between different specialists in the team is thus essential, as is the integration of findings, which have bearing on biodiversity;

(h) Provide insight into cause – effect chains. Also explain why certain chains do not need to be studied;

(i) If possible, quantify the changes in biodiversity composition, structure and key processes, as well as ecosystem services. Explain the expected consequences of the loss of biodiversity associated with the proposal, including the costs of replacing ecosystem services if they will be adversely affected by a proposal;

(j) Indicate the legal provisions that guide decision-making. List all types of potential impacts identified during screening and scoping and described in the terms of reference and identify applicable legal provisions. Ensure that potential impacts to which no legal provision applies are taken into account during decision-making.

4. Reporting: the Environmental Impact Statement (EIS)

32. The Environmental Impact Statement consist of a (i) technical report with annexes, (ii) an Environmental Management Plan, providing detailed information on how measures to avoid, mitigate or compensate expected impacts are to be implemented, managed and monitored, and (iii) a non-technical summary.

33. The Environmental Impact Statement is designed to assist:

(a) The proponent to plan, design and implement the proposal in a way that eliminates or minimizes the negative effect on the biophysical and socio-economic environments and maximizes the benefits to all parties in the most cost-effective manner;

(b) The Government or responsible authority to decide whether a proposal should be approved and the terms and conditions that should be applied; and

(c) The public to understand the proposal and its impacts on the community and environment, and provide an opportunity for comments on the proposed action for consideration by decision makers. Some adverse impacts may be wide ranging and have effects beyond the limits of particular habitats/ecosystems or national boundaries. Therefore, Environmental Management Plans and strategies contained in the Environmental Impact Statement should consider regional and transboundary impacts, taking into account the ecosystem approach. The inclusion of a non-technical summary of the EIA, understandable to the interested general audience, is strongly recommended.

5. Review of the Environmental Impact Statement

34. The purpose of the review of the Environmental Impact Statement is to ensure that the information for decision makers is sufficient, focused on the key issues, and is scientifically and technically accurate. In addition, the review should evaluate whether:

(a) The likely impacts would be acceptable from an environmental viewpoint;

(b) The design complies with relevant standards and policies, or standards of good practice where official standards do not exist;

(c) All of the relevant impacts, including indirect and cumulative impacts, of a proposed activity have been identified and adequately addressed in the EIA. To this end, biodiversity specialists should be called upon for the review and information on official standards and/or standards for good practice to be compiled and disseminated.

35. Public involvement, including the full and effective participation of indigenous and local communities, is important in various stages of the process and particularly at this stage. The concerns and comments of all stakeholders are adequately considered and included in the final report presented to decision makers. The process establishes local ownership of the proposal and promotes a better understanding of relevant issues and concerns.

36. Review should also guarantee that the information provided in the Environmental Impact Statement is sufficient for a decision maker to determine whether the project is compliant with or contradictory to the objectives of the Convention on Biological Diversity.

37. The effectiveness of the review process depends on the quality of the terms of reference defining the issues to be included in the study. Scoping and review are therefore complementary stages.

38. Reviewers should as far as possible be independent and different from the persons/organizations who prepare the Environmental Impact Statement.

6. Decision-making

39. Decision-making takes place throughout the process of EIA in an incremental way from the screening and scoping stages to decisions during data-collecting and analysis, and impact prediction, to making choices between alternatives and mitigation measures, and finally the decision to either refuse or authorize the project.

40. Biodiversity issues should play a part in decision-making throughout. The final decision is essentially a political choice about whether or not the proposal is to proceed, and under what conditions. If rejected, the project can be redesigned and resubmitted. It is desirable that the proponent and the decision-making body are two different entities.

41. It is important that there are clear criteria for taking biodiversity into account in decision-making, and to guide trade-offs between social, economic and environmental issues including biodiversity. These criteria draw on principles, objectives, targets and standards for biodiversity and ecosystem services contained in international and national, regional and local laws, policies, plans and strategies.

42. The precautionary approach should be applied in decision-making in cases of scientific uncertainty when there is a risk of significant harm to biodiversity. Higher risks and/or greater potential harm to biodiversity require greater reliability and certainty of information. The reverse implies that the precautionary approach should not be pursued to the extreme; in case of minimal risk, a greater level of uncertainty can be accepted. Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management have been by the Precautionary Principle Project. 5/

43. Instead of weighing conservation goals against development goals, the decision should seek to strike a balance between conservation and sustainable use for economically viable, and socially and ecologically sustainable solutions.

7. Monitoring, compliance, enforcement and environmental auditing

44. EIA does not stop with the production of a report and a decision on the proposed project. Activities that have to make sure the recommendations from EIS or EMP are implemented are commonly grouped under the heading of "EIA follow up". They may include activities related to monitoring, compliance, enforcement and environmental auditing. Roles and responsibilities with respect to these are variable and depend on regulatory frameworks in place.

45. Monitoring and auditing are used to compare the actual outcomes after project implementation has started with those anticipated before implementation. It also serves to verify that the proponent is compliant with the Environmental Management Plan (EMP). The EMP can be a separate document, but is considered part of the Environmental Impact Statement. An EMP usually is required to obtain a permission to implement the project. In a number of countries an EMP is not a legal requirement.

46. Management plans, programmes and systems, including clear management targets, responsibilities and appropriate monitoring should be established to ensure that mitigation is effectively implemented, unforeseen negative effects or trends are detected and addressed, and expected benefits (or positive developments) are achieved as the project proceeds. Sound baseline information and/or pre-

5/ The Precautionary Principle Project is a joint initiative of Fauna & Flora International, IUCN-The World Conservation Union, ResourceAfrica and TRAFFIC. The Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management are available in English, French and Spanish at: http://www.pprinciple.net/.

implementation monitoring is essential to provide a reliable benchmark against which changes caused by the project can be measured. Provision should be made for emergency response measures and/or contingency plans where unforeseen events or accidents could threaten biodiversity. The EMP should define responsibilities, budgets and any necessary training for monitoring and impact management, and describe how results will be reported and to whom.

47. Monitoring focuses on those components of biodiversity most likely to change as a result of the project. The use of indicator organisms or ecosystems that are most sensitive to the predicted impacts is thus appropriate, to provide the earliest possible indication of undesirable change. Since monitoring often has to consider natural fluxes as well as human-induced effects, complementary indicators may be appropriate in monitoring. Indicators should be specific, measurable, achievable, relevant and timely. Where possible, the choice of indicators should be aligned with existing indicator processes.

48. The results of monitoring provide information for periodic review and alteration of Environmental Management Plans, and for optimizing environmental protection through good, adaptive management at all stages of the project. Biodiversity data generated by EIA should be made accessible and useable by others and should be linked to biodiversity assessment processes being designed and carried out at the national and global levels.

49. Provision is made for regular auditing in order to verify the proponent’s compliance with the EMP, and to assess the need for adaptation of the EMP (usually including the proponent’s license). An environmental audit is an independent examination and assessment of a project's (past) performance. It is part of the evaluation of the Environmental Management Plan and contributes to the enforcement of EIA approval decisions.

50. Implementation of activities described in the EMP and formally regulated in the proponent’s environmental license in practice depends on the enforcement of formal procedures. It is commonly found that a lack of enforcement leads to reduced compliance and inadequate implementation of EMPs. Competent authorities are responsible for enforcing pertinent impact assessment regulations, when formal regulations are in place.

Appendix 1

INDICATIVE SET OF SCREENING CRITERIA TO BE FURTHER ELABORATED AT NATIONAL LEVEL 6/

Category A: Environmental impact assessment mandatory for:

- Activities in protected areas (define type and level of protection);
- Activities in threatened ecosystems outside protected areas;
- Activities in ecological corridors identified as being important for ecological or evolutionary processes;
- Activities in areas known to provide important ecosystem services;
- Activities in areas known to be habitat for threatened species;
- Extractive activities or activities leading to a change of land-use occupying or directly influencing an area of at minimum a certain threshold size (land or water, above or underground - threshold to be defined);
- Creation of linear infrastructure that leads to fragmentation of habitats over a minimum length (threshold to be defined);
- Activities resulting in emissions, effluents, and/or other means of chemical, radiation, thermal or noise emissions in areas providing key ecosystem services (areas to be defined); 7/
- Activities leading to changes in ecosystem composition, ecosystem structure or key processes 8/ responsible for the maintenance of ecosystems and ecosystem services in areas providing key ecosystem services (areas to be defined).

Category B: The need for, or the level of environmental impact assessment is to be determined for:

- Activities resulting in emissions, effluents and/or other chemical, thermal, radiation or noise emissions in areas providing other relevant ecosystem services (areas to be defined);
- Activities leading to changes in ecosystem composition, ecosystem structure, or ecosystem functions responsible for the maintenance of ecosystems and ecosystem services in areas providing other relevant ecosystem services (areas to be defined);
- Extractive activities, activities leading to a change of land-use, and creation of linear infrastructure below the Category A threshold, in areas providing key and other relevant ecosystem services (areas to be defined).

6/ Note: These criteria only pertain to biodiversity and should therefore be applied as an add-on to existing screening criteria.

7/ For a non-exhaustive list of ecosystem services, see annex 2.2.

8/ For examples of these aspect of biodiversity, see annex 2.3.

Appendix 2

INDICATIVE LIST OF ECOSYSTEM SERVICES

Regulating services responsible for maintaining natural processes and dynamics

Biodiversity-related regulating services

- maintenance of genetic, species and ecosystem composition
- maintenance of ecosystem structure
- maintenance of key ecosystem processes for creating or maintaining biodiversity

Land-based regulating services

- decomposition of organic material
- natural desalinization of soils
- development / prevention of acid sulphate soils
- biological control mechanisms
- pollination of crops
- seasonal cleansing of soils
- soil water storage capacity
- coastal protection against floods
- coastal stabilization (against accretion / erosion)
- soil protection
- suitability for human settlement
- suitability for leisure and tourism activities
- suitability for nature conservation
- suitability for infrastructure

Water related regulating services

- water filtering
- dilution of pollutants
- discharge of pollutants
- flushing / cleansing
- bio-chemical/physical purification of water
- storage of pollutants
- flow regulation for flood control
- river base flow regulation
- water storage capacity
- ground water recharge capacity
- regulation of water balance
- sedimentation / retention capacity
- protection against water erosion
- protection against wave action
- prevention of saline groundwater intrusion
- prevention of saline surface-water intrusion
- transmission of diseases
- suitability for navigation

Water related regulating services (ctd.)

- suitability for leisure and tourism activities
- suitability for nature conservation

Air-related regulating services

- filtering of air
- carry off by air to other areas
- photo-chemical air processing (smog)
- wind breaks
- transmission of diseases
- carbon sequestration

Provisioning services: harvestable goods
Natural production:

- timber
- firewood
- grasses (construction and artisanal use)
- fodder & manure
- harvestable peat
- secondary (minor) products
- harvestable bush meat
- fish and shellfish
- drinking water supply
- supply of water for irrigation and industry
- water supply for hydroelectricity
- supply of surface water for other landscapes
- supply of groundwater for other landscapes
- genetic material

Nature-based human production

- crop productivity
- tree plantations productivity
- managed forest productivity
- rangeland/livestock productivity
- aquaculture productivity (freshwater)
- mariculture productivity (brackish/saltwater)

Cultural services providing a source of artistic, aesthetic, spiritual, religious, recreational or scientific enrichment, or nonmaterial benefits.

Supporting services necessary for the production of all other ecosystem services

- soil formation,
- nutrients cycling
- primary production.
- evolutionary processes

Composition	**Influenced by:**
Minimal viable population of: (a) legally protected varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance; (b) legally protected species; (c) migratory birds, migratory fish, species protected by CITES; (d) non-legally protected, but threatened species; species which are important in local livelihoods and cultures.	- selective removal of one or a few species by fisheries, forestry, hunting, collecting of plants (including living botanical and zoological resources); - fragmentation of their habitats leading to reproductive isolation; - introducing living modified organisms that may transfer transgenes to varieties / cultivars / breeds of cultivated plants and/or domesticated animals and their relatives; - disturbance or pollution; - habitat alteration or reduction; - introduction of (non-endemic) predators, competitors or parasites of protected species.
Structure	**Influenced by:**
Changes in spatial or temporal structure, at the scale of relevant areas, such as: (a) legally protected areas; (b) areas providing important ecosystem services, such as (i) maintaining high diversity (hot spots), large numbers of endemic or threatened species, required by migratory species; (ii) services of social, economic, cultural or scientific importance; (iii) or supporting services associated with key evolutionary or other biological processes.	Effects of human activities that work on a similar (or larger) scale as the area under consideration. For example, by emissions into the area, diversion of surface water that flows through the area, extraction of groundwater in a shared aquifer, disturbance by noise or lights, pollution through air, etc.
Food web structure and interactions: Species or groups of species perform certain roles in the food web (functional groups); changes in species composition may not necessarily lead to changes in the food web as long as roles are taken over by other species.	All influences mentioned with *composition* may lead to changes in the food web, but only when an entire role (or functional group) is affected. Specialized ecological knowledge is required.
Presence of keystone species: Keystone species often singularly represent a given functional type (or role) in the food web.	All influences mentioned with composition that work directly on keystone species. This is a relatively new, but rapidly developing field of ecological knowledge. Examples are: - sea otters and kelp forest - elephants and African savannah - starfish in intertidal zones - salmon in temperate rainforest - tiger shark in some marine ecosystems - beaver in some freshwater habitats - black-tailed prairie dogs and prairie

Key processes (selected examples only)	**Influenced by:**
Sedimentation patterns (sediment transport, sedimentation, and accretion) in intertidal systems (mangroves, mudflats, seagrass beds)	Reduced sediment supply by damming of rivers; interruption of littoral drift by seaward structures
Plant-animal dependency for pollination, seed dispersal, nutrient cycling in tropical rainforests	Selective removal of species by logging, collecting or hunting
Soil surface stability and soil processes in montane forests	Imprudent logging leads to increased erosion and loss of top soil
Nutrient cycling by invertebrates and fungi in deciduous forests	Soil and groundwater acidity by use of agrochemicals.
Plant available moisture in non-forested, steeply sloping mountains	Overgrazing and soil compaction lead to reduced available soil moisture
Grazing by herbivorous mammals in savannahs	Cattle ranching practises
Succession after fire, and dependence on fire for completion of life-cycles in savannahs	Exclusion of fire leads to loss of species diversity
Available nutrients and sunlight penetration in freshwater lakes	In-flow of fertilizers and activities leading to increased turbidity of water (dredging, emissions)
Hydrological regime in floodplains, flooded forests and tidal wetlands	Changes in river hydrology or tidal rhythm by hydraulic infrastructure or water diversions
Permanently waterlogged conditions in peat swamps and acid-sulphate soils	Drainage leads to destruction of vegetation (and peat formation process), oxidization of peat layers and subsequent soil subsidence; acid sulphate soils rapidly degrade when oxidized
Evaporation surplus in saline / alkaline lakes	Outfall of drainage water into these lakes changes the water balance
Tidal prism and salt/freshwater balance in estuaries	Infrastructure creating blockages to tidal influence; changes in river hydrology change the salt balance in estuaries.
Hydrological processes like vertical convection, currents and drifts, and the transverse circulation in coastal seas	Coastal infrastructure, dredging.
Population dynamics	Reduction in habitat leads to dramatic drop in population size, leading to extinction

Annex III

DRAFT GUIDANCE ON BIODIVERSITY-INCLUSIVE STRATEGIC ENVIRONMENTAL ASSESSMENT

1. Strategic environmental assessment (SEA) is now widely applied, and an increasing number of countries have integrated, or are in the process of integrating, SEA into their national procedures for environmental assessment. This guidance is intended to assist in better incorporating biodiversity during this process. The target audience of this document consequently are those involved in the process of establishing SEA systems. These typically are national authorities but can also include regional authorities or international agencies.

2. The generic nature of this guidance implies that further elaboration of its practical application is needed to reflect the ecological, social-economic, cultural and institutional conditions for which the SEA system is designed. The focus of the guidance is on how to guarantee a biodiversity-inclusive SEA process. The guidance does not intend to provide a technical manual for practitioners on how to carry out a biodiversity-inclusive assessment study.

3. This guidance is not structured according to a given procedure. The principal reason is that good practice SEA should ideally be fully integrated into a planning (or policy development) process. Since planning processes differ widely, there is, by definition, no typical sequence of procedural steps in SEA. Moreover, there is no general agreement on what a typical SEA procedure might be. It is intended to provide guidance on how to integrate biodiversity issues into the SEA, which in turn should be integrated into a planning process. Because the planning process may vary between countries, the SEA is not described as separate process but as an integral component of the applicable planning process.

4. Situations in which SEA is applied and the scope of the assessments, are all varied. The SEA process therefore needs to be structured to reflect the specific situation. SEA is not a mere expansion of an EIA and it does not usually follow the same stages as an EIA. The approach and language used are therefore conceptual in nature.

5. The guidance is fully consistent with the Ecosystem Approach (decision V/6 and VII/11). It focuses on people-nature interactions and the role of stakeholders in identifying and valuing potential impacts on biodiversity. For the identification of stakeholders and the valuing of biodiversity, the concept of ecosystem services as elaborated by the Millennium Ecosystem Assessment (MA) provides a useful tool. It translates biodiversity into (present and future) values for society. It provides a mechanism to 'translate' the language of biodiversity specialists into language commonly understood by decision makers. The guidance is consistent with the MA conceptual framework and terminology.

6. The guidance intends to facilitate the ability to contribute to Goal 7 of the Millennium Development Goals, i.e. to '*ensure environmental sustainability*', and its target 9 to '*integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources'*.

A. Strategic environmental assessment applies a multitude of tools

7. Strategic environmental assessment has been defined as 'the formalized, systematic and comprehensive process of identifying and evaluating the environmental consequences of proposed policies, plans or programmes to ensure that they are fully included and appropriately addressed at the

earliest possible stage of decision-making on a par with economic and social considerations'. 9/ Since this original definition the field of SEA has rapidly developed and expanded, and the number of definitions of SEA has multiplied accordingly. SEA, by its nature, covers a wider range of activities or a wider area and often over a longer time span than the environmental impact assessment of projects. SEA might be applied to an entire sector (such as a national policy on energy, for example) or to a geographical area (for example, in the context of a regional development scheme). SEA does not replace or reduce the need for project-level EIA (although in some cases it can), but it can help to streamline and focus the incorporation of environmental concerns (including biodiversity) into the decision-making process, often making project-level EIA a more effective process. SEA is nowadays commonly understood as being proactive and sustainability-driven, whilst EIA is often described as being largely reactive.

1. Strategic environmental assessment vs. integrated assessment

8. SEA is a rapidly evolving field with numerous definitions and interpretation in theory, in regulations, and in practice. SEA is required by legislation in many countries and carried out informally in others. There are also approaches that use some or all of the principles of SEA without using the term SEA to describe them. However, practices in SEA and related approaches show an emerging continuous spectrum of interpretation and application. At one end of the continuum, the focus is mainly on the biophysical environment. It is characterized by the goal of mainstreaming and up-streaming environmental considerations into strategic decision-making at the earliest stages of planning processes to ensure they are fully included and appropriately addressed. The 2001 SEA Directive of the European Union and SEA Protocol to the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991) are examples of this approach. At the other end of the spectrum is an approach, which addresses the three pillars of sustainability and aims to assess environmental, social and economic concerns in an integrated manner. Depending on the needs of SEA users and the different legal requirements, SEA can be applied in different ways along this spectrum using a variety of methodologies.

9. Accordingly, SEA is referred to as 'a family of tools that identifies and addresses the environmental consequences and stakeholder concerns in the development of policies, plans, programmes and other high level initiatives.' 10/ In more specific terms, the Netherlands Commission for Environmental Impact Assessment 11/ describes SEA as a tool to:

(a) Structure the public and government debate in the preparation of policies, plans and programmes;

(b) Feed this debate through a robust assessment of the environmental consequences and their interrelationships with social and economic aspects;

(c) Ensure that the results of assessment and debate are taken into account during decision making and implementation.

9/ Based on Sadler and Verheem, 1996. Strategic Environmental Assessment. Status, Challenges and Future Directions, Ministry of Housing, Spatial Planning and the Environment, The Netherlands: 188 pp.

10/ OECD Development Assistance Committee Network on Environment and Development Cooperation – Task Team on Strategic Environmental Assessment.

11/ Netherlands Commission for Environmental Impact Assessment: Strategic Environmental Assessment - Views and Experiences (fact sheet at http://www.eia.nl/nceia/products/publications.htm).

10. This means that *stakeholder involvement, transparency* and *good quality information* are key principles. SEA is thus more than the preparation of a report; it is a tool to enhance good governance. SEA can be a formal procedure laid down by law (e.g. the SEA Directive of the European Union) or used flexibly/opportunistically.

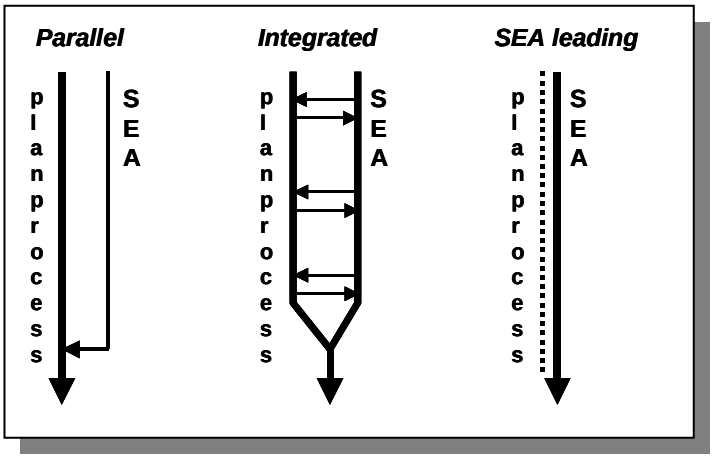
2. Parallel to or integrated within a planning process?

11. SEA is designed in accordance with the national context and the characteristics of the planning processes in which SEA is applied. Traditionally, SEA is often applied as a stand-alone process parallel to planning, intended to support the decision making at the end of the planning process. More recently, SEA has been further developed into its most effective form: integrated into the planning process, bringing stakeholders together during key stages of the planning process and feeding their debate with reliable environmental information (figure 1). In some cases, where planning procedures are weak or absent; SEA may structure or effectively represent the planning process.

12. Ideally, SEA is integrated throughout the development process of a specific legislation, policy, plan or programme, starting as early as possible. However, even when decisions have already been taken, SEA can play a meaningful role in monitoring implementation - for example, to decide on necessary mitigating actions or to feed into future reviews of decisions. SEA may even take on the form of a sectoral assessment used to set the agenda for future policies and plans.

13. There is no typical sequence of procedural steps to define an SEA process. By definition SEA is situation-specific.

Figure 1: Combinations of SEA and planning process



3. Steps in the SEA process

14. SEA aims at better strategies, ranging from legislation and country-wide development policies to sectoral and spatial plans. In spite of the wide variation in application and definitions, all good practice SEAs comply with a number of performance criteria and with common procedural principles. 12/ When a

12/ See IAIA Strategic Environmental Assessment Performance Criteria. IAIA Special Publications Series No. 1, January 2002.

decision on the need for an SEA has been taken, 'good practice SEA' can be characterized by the following phases: 13/

(a) Phase 1: Create transparency:

(i) Announce the start of the SEA and ensure that relevant stakeholders are aware that the process is starting;

(ii) Bring stakeholders together and facilitate development of a shared vision on (environmental) problems, objectives, and alternative actions to achieve these;

(iii) Examine, in cooperation with all relevant agencies, whether the objectives of the new policy or plan are in line with those in existing policies, including environmental objectives (consistency analysis).

(b) Phase 2: Technical assessment:

(i) Elaborate terms of reference for the technical assessment, based on the results of stakeholder consultation and consistency analysis;

(ii) Carry out the actual assessment, document its results and make these accessible. Organize an effective quality assurance system of both SEA information and process.

(c) Phase 3: Use information in decision-making:

(i) Bring stakeholders together to discuss results and make recommendations to decision-makers.

(ii) Make sure any final decision is motivated in writing in light of the assessment results.

(d) Phase 4: Post-decision monitoring and evaluation:

(i) Monitor the implementation of the adopted policy or plan, and discuss the need for follow-up action.

15. SEA is flexible, i.e. the scope and level of detail of the above steps can differ depending on time and resources available: from rapid (2-3 months) to comprehensive (1-2 years). The extent of documentation is also highly variable – in some SEAs, particularly where decision-makers are involved throughout, the process is of paramount importance, whilst in others reporting assumes greater importance.

B. Why give special attention to biodiversity in SEA and decision making?

16. Important reasons to pay attention to the effective incorporation of biodiversity in environmental assessment are summarized below:

(a) *Legal obligations.* A reason to pay particular attention to biodiversity in SEA is a legal national, regional or international obligation to do so. A number of legal obligations can be distinguished:

13/ OECD Development Assistance Committee Network on Environment and Development Cooperation – Task Team on Strategic Environmental Assessment.

(i) *Protected areas and protected species*: ecosystems, habitats and species can have a form of legal protection, ranging from strictly protected to restrictions on certain activities.

(ii) *Valued ecosystem services* can be subject to some form of legal regulation triggering the need for environment assessment. Examples are fisheries and forestry activities, coastal protection (by dunes or forested wetlands), water infiltration areas for public water supply, recreational areas, landscape parks, etc. (See box 1 on ecosystem services in their regulatory context).

(iii) Lands and waters traditionally occupied or used by indigenous and local communities represent a special case of ecosystem services.

(iv) International treaties, conventions and agreements such as the World Heritage Convention, Ramsar Convention, the UNESCO Man and Biosphere Programme or Regional Seas agreements. By becoming a Party to these agreements, countries agree to certain obligation to manage these areas according to internationally agreed principles.

Box 1: Ecosystem services in their regulatory context

SEA provides information on policies, plans and programmes for decision makers, including their consistency with the regulatory context.

It is important to realize that ecosystem services often have formal recognition by some form of legal protection. Legislation often has a geographical basis (e.g. protected areas) but this is not necessarily always the case (e.g. species protection is not always limited to demarcated areas). Of course, the legal context in any country or region is different and needs to be treated as such.

Some examples of ecosystem services linked to formal regulations:

Ecosystem service: preservation of biodiversity:

- Nationally protected areas/habitats, protected species;
- International status: Ramsar convention, UNESCO Man and Biosphere, World Heritage Sites
- Subject to national policies such as the U.K. Biodiversity Action Plans (BAP), or regional regulations such as the European Natura 2000 Network.
- Marine Environmental High Risk Areas (sensitive areas prone to oil pollution from shipping)·
- Sites identified and designated under international agreements, e.g. OSPAR Marine Protected Areas
- Sites hosting species listed under the Convention on the Conservation of Migratory Species of Wild Animals or the Convention on International Trade in Endangered Species of Wild Flora and Fauna
- Sites hosting species listed under the Bern Convention (Annex 1 and 2 of the Convention on the Conservation of European Wildlife and Natural Habitats, 1979)

Ecosystem service: provision of livelihood to people:

- Extractive reserves (forests, marine, agriculture)
- Areas of indigenous interest
- Touristic (underwater) parks (service: maintaining biodiversity to enhance tourism)

Ecosystem service: preservation of human cultural history / religious sites:

- Landscape parks
- Sacred sites, groves
- Archaeological parks

Other ecosystem services, in some countries formally recognized:

- Flood storage areas (service: flood protection or water storage)
- Water infiltration areas (service: public water supply)
- Areas sensitive to erosion (service: vegetation preventing erosion)
- Coastal defences (dunes, mangroves) (service: protecting coastal hinterlands)
- Urban or peri-urban parks (service: recreational facilities to urban inhabitants)
- Ecosystem functioning (soil biodiversity, pollination, pest control)

(b) *Facilitation of stakeholder identification*. The concept of biodiversity-derived ecosystem services provides a useful tool to identify potentially affected groups of people. Ecosystems are multifunctional and provide multiple services. By applying the ecosystem approach and focusing on ecosystem services in describing biodiversity, directly and indirectly affected stakeholders can be identified and, as appropriate, invited to participate in the SEA process.

Box 2: Stakeholders and participation

Impact assessment is concerned with (i) information, (ii) participation and (iii) transparency in decision making. Public involvement consequently is a prerequisite for effective impact assessment and can take place at different levels: informing (one-way flow of information), consulting (two-way flow of information), or "real" participation (shared analysis and assessment). In all stages of the process public participation is relevant. The legal requirements for and the level of participation differ among countries, but it is generally accepted that public consultation at the scoping and review stage are minimally required; participation during the assessment study is generally acknowledged to enhance the quality of the process.

With respect to biodiversity, three groupings of stakeholders can be distinguished. (N.B: note that the categories represent three levels, each higher level encompassing the earlier category):

- **Beneficiaries** of the project - target groups making use of or putting a value to known ecosystem services which are purposefully enhanced by the project;
- **Affected (groups of) people** – i.e. those people that experience, as a result of the project, intended or unintended changes in ecosystem services that they value;
- **General stakeholders:**
  - National or local government institutions having a formal government responsibility with respect to the management of defined areas (town & country planning departments, etc.) or the management of ecosystem services (fisheries, forestry, water supply, coastal defence, etc.);
  - Formal and informal institutions representing affected people (water boards, trade unions, consumer organizations, civil rights movements, ad hoc citizens committees, etc.);
  - Formal and informal institutions representing (the intrinsic value of) biodiversity itself (non-governmental nature conservation organizations, park management committees, scientific panels, etc.).
  - The general audience that wants to be informed on new developments in their direct or indirect environment (linked to transparency of democratic processes).
  - Stakeholders of future generations, who may rely on biodiversity around which we make decisions. Formal and informal organizations are increasingly aware of their responsibility to take into account the interests of these '*absent stakeholders'*.

In general it can be observed that the role of institutionalized stakeholders becomes more important at higher strategic levels of assessment; at lower level the actual beneficiaries and affected people will become more important.

There is a number of potential constraints to effective public participation. These include:

- Poverty: involvement means time spent away from income-producing tasks;
- Rural settings: increased distances make communication more difficult and expensive;
- Illiteracy: or lack of command of non-local languages, can inhibit representative involvement if print media are used;
- Local values/culture: behavioural norms or cultural practice can inhibit involvement of some groups, who may not feel free to disagree publicly with dominant groups (e.g. women versus men);
- Languages: in some areas a number of different languages or dialects may be spoken, making communication difficult;
- Legal systems: may be in conflict with traditional systems, and cause confusion about rights and responsibilities for resources;
- Interest groups: may have conflicting or divergent views, and vested interests;
- Confidentiality: can be important for the proponent, who may be against early involvement and consideration of alternatives.

(c) *Safeguarding livelihoods*. The identification of stakeholders through recognition of ecosystem services can lead to a better understanding of how the livelihoods of people who depend on biodiversity will be affected. In many countries, especially in developing countries, a large proportion of rural society is directly dependent on biodiversity. As these groups may also belong to the poorer and less educated strata of society, they may go unnoticed as they are not always capable to participate meaningfully in an SEA process (see box 2).

(d) *Sound economic decision making*. Ecosystem services such as erosion control, water retention and supply, and recreational potential can be valued in monetary terms, thus providing a figure on potential economic benefits and/or losses caused by the implementation of planned activities.

(e) *Cumulative effects on biodiversity* are best anticipated at a strategic level. By applying the principles of the ecosystem approach the cumulative effects of activities on those ecosystem services which support human well-being can be addressed. At the same time, it is appropriate to define levels of acceptable change or desired levels of environmental quality at the strategic (ecosystem or catchment) level.

(f) *Maintaining the genetic base of evolution for future opportunities*. The conservation of biodiversity for future generations is one important aspect of sustainability. It seeks to maintain options for the wealth of yet unknown potential uses of biodiversity. Moreover, maintaining the capacity of biodiversity to adapt to changing environments (e.g. climate change) and to continue providing viable living space for people is critical to human survival. Any long-term sustainability assessment has to make provisions for safeguarding that capacity.

(g) *Benefiting society*. By promoting/facilitating sustainable solutions to development needs SEA is benefiting society as a whole.

C. What biodiversity issues are relevant to SEA

1. Biodiversity in SEA – different perspectives

17. The spectrum of SEA ranging from those with a focus on the biophysical environment to broadly sustainability-oriented SEA focussed on the social, economic and biophysical environments, results in different perspectives on biodiversity in SEA. Although the Convention text is very clear on how biodiversity should be interpreted, day-to-day practice shows widely different interpretations. Some prominent differences are discussed below:

18. *Biodiversity conservation as nature conservation.* SEA traditionally focuses on the biophysical environment. Other instruments are used to represent the economic and social interests of stakeholders. Biodiversity therefore tends to be considered from a nature conservation perspective in which protection rather than sustainable or equitable use of biodiversity is highlighted. In this manner nature conservation becomes segregated from, and potentially conflicting with, economic and social development.

19. The problem with the sectoral approach in conventional impact assessment is that responsibility for biodiversity is divided between a number of sectoral organizations. For example the exploitation of fish or forest resources, agriculture, water quality and quantity management all have to do with (sustainable) use of biodiversity, but regulations and policies are defined by different entities that do not refer to their activities as sustainable use of biodiversity.

20. *Biodiversity for social and economic well-being*. In recent years, environmental assessment practices have been adopted in most developing countries. In these countries the biophysical

environment, including biodiversity, is not only looked at from a nature conservation perspective, but as the provider of livelihoods. Especially in rural areas the main objective of development is the social and economic improvement of the situation of poor communities. Both social/economic and biophysical environments are seen as complementary and consequently an integrated assessment approach has been developed in many of these countries. Biodiversity conservation and sustainable use are equally important issues in SEA; decision makers have to deal with the equitable sharing of benefits derived from biodiversity, including those derived from the utilization of genetic resources, in societies characterized by unequal distribution of wealth. Such integrated approaches reflect a broad perspective on biodiversity in accordance with the Convention and the Millennium Development Goals.

21. *Merging perspectives*. Both the integrated and sectorally divided approaches are converging as it is being realized that the environment, including its biodiversity components, provides goods and services that cannot be assigned to a sector (biodiversity provides multiple goods and services simultaneously) or a geographically defined area (goods and services are not limited to protected areas only). At the same time it is generally recognized that certain parts of the world are of such importance for the conservation of biodiversity, that these areas should be safeguarded for the future and require strict protective measures.

22. *Time and space*. From a biodiversity perspective spatial and temporal scales are of particular importance. In conventional SEA, the planning horizon is often linked to economic planning mechanisms with planning horizons of around 15 years. Assessing the impacts on biodiversity generally requires a longer time horizon. Biophysical processes such as soil formation, forest (re)growth, genetic erosion and evolutionary processes, effects of climatic changes and sea level rise, operate on far longer time scales and are rarely taken into account in conventional SEAs. A longer time horizon is required to address the fundamental processes regulating the world's biological diversity.

23. Similarly, flows of energy, water and nutrients link the world's ecosystems. Effects in an area under assessment may have much wider biodiversity repercussions. The most visible example is the linkage of ecosystems on a global scale by migratory species; on a continental or regional scale ecosystems are linked by hydrological processes through rivers systems and underground aquifers; on a local scale pollinators, on which important commercial species depend, may have specific habitat needs beyond the boundaries of an SEA. Biodiversity considerations may consequently require a geographical focus that exceeds the area for which an SEA is carried out.

24. *Opportunities and constraints* versus *cause-effect chains*. Biodiversity underpins ecosystem services on which human well-being relies. Biodiversity thus represents a range of opportunities for, and constraints to, sustainable development. Recognition of these opportunities and constraints as the point of departure for informing the development of policies, plans and programmes at a strategic level enables optimal outcomes for sustainable development. The question at SEA level is therefore "how does the environment affect or determine development opportunities and constraints?" This approach contrasts with the largely reactive approach adopted in project EIA, where the key question being asked is "what will the effect of this project be on the environment?"

25. Two broad approaches can be used in SEA: the reactive cause-effect chain approach where the intervention is known and the cause-effect chain are fairly clear (comparable to EIA), and the 'bottom up' opportunities and constraints of the natural environment approach where the environment effectively shapes the policy, programme or plan. The latter is most often used in land use planning/spatial planning where interventions are potentially wide-ranging and the objective is to tailor land uses to be most suited to the natural environment.

2. Biodiversity in this guidance

26. The way in which biodiversity is interpreted in this document has been described in detail in the accompanying information document. 14/ The most important features are summarized below:

(a) In SEA, biodiversity can best be defined in terms of the *ecosystem services* provided by biodiversity. These services represent ecological or scientific, social (including cultural) and economic values for society and can be linked to stakeholders. Stakeholders can represent biodiversity interests and can consequently be involved in an SEA process. Maintenance of biodiversity (or nature conservation) is an important ecosystem service for present and future generations but biodiversity provides many more ecosystem services (see annex 2.2 of the Voluntary guidelines on biodiversity-inclusive Environmental Impact Assessment).

(b) *Direct drivers of change* are human interventions (activities) resulting in biophysical and social effects with known impacts on biodiversity and associated ecosystem services (see box 3).

(c) *Indirect drivers of change* are societal changes, which may under certain conditions influence direct drivers of change, ultimately leading to impacts on ecosystem services (see box 4).

(d) *Aspects of biodiversity*: To determine potential impacts on ecosystem services, one needs to assess whether the ecosystems providing these services are significantly impacted by the policies, plans or programmes under study. Impacts can best be assessed in terms of changes in composition (what is there), changes in structure (how is it organized in time and space), or changes in key processes (what physical, biological or human processes govern creation and/or maintenance of ecosystems).

(e) Three levels of biodiversity are distinguished: genetic, species, and ecosystem diversity. In general, the ecosystem level is the most suitable level to address biodiversity in SEA. However, situations with a need to address lower levels exist.

14/ http://www.biodiv.org/doc/reviews/impact/information-guidelines.pdf.

Box 3: Direct drivers of change *are human interventions (activities) resulting in biophysical and social/economic effects with known impacts on biodiversity and associated ecosystem services.*

Biophysical changes known to act as a potential driver of change comprise:

- Land conversion: the existing habitat is completely removed and replaced by some other form of land use or cover. This is the most important cause of loss of ecosystem services.
- Fragmentation by linear infrastructure: roads, railways, canals, dikes, powerlines, etc. affects ecosystem structure by cutting habitats into smaller parts, leading to isolation of populations. A similar effect is created by isolation through surrounding land conversion. Fragmentation is a serious reason for concern in areas where natural habitat are already fragmented.
- Extraction of living organisms is usually selective since only few species are of value, and leads to changes in species composition of ecosystems, potentially upsetting the entire system. Forestry and fisheries are common examples.
- Extraction of minerals, ores and water can significantly disturb the area where such extractions take place, often with significant downstream and/or cumulative effects.
- Wastes (emissions, effluents, solid waste), or other chemical, thermal, radiation or noise inputs: human activities can result in liquid, solid or gaseous wastes affecting air, water or land quality. Point sources (chimneys, drains, underground injections) as well as diffuse emission (agriculture, traffic) have a wide area of impact as the pollutants are carried away by wind, water or percolation. The range of potential impacts on biodiversity is very broad.
- Disturbance of ecosystem composition, structure or key processes: annex 2.3 of the EIA guidelines contains an overview of how human activities can affect these aspect of biodiversity.

Some social changes can also be considered to be direct drivers of change as they are known to lead to one of the above-mentioned biophysical changes (non-exhaustive):

- Population changes due to permanent (settlement / resettlement), temporary (temporary workers), seasonal in-migration (tourism) or opportunistic in-migration (job-seekers) usually lead to land occupancy (= land conversion), pollution and disturbance, harvest of living organisms, and introduction of non-native species (especially in relatively undisturbed areas).
- Conversion or diversification of economic activities: especially in economic sectors related to land and water, diversification will lead to intensified land use and water use, including the use of pesticides and fertilizers, increased extraction of water, introduction of new crop varieties (and the consequent loss of traditional varieties). Change from subsistence farming to cash crops is an example. Changes to traditional rights or access to biodiversity goods and services falls within this category. Uncertainty or inconsistencies regarding ownership and tenure facilitate unsustainable land use and conversion.
- Conversion or diversification of land-use: for example, the enhancement of extensive cattle raising includes conversion of natural grassland to managed pastures, application of fertilizers, genetic change of livestock, increased grazing density. Changes to the status, use or management of protected areas is another example.
- Enhanced transport infrastructure and services, and/or enhanced (rural) accessibility; opening up of rural areas will create an influx of people into formerly inaccessible areas.
- Marginalization and exclusion of (groups of) rural people: landless rural poor are forced to put marginal lands into economic use for short term benefit. Such areas may include erosion sensitive soils, where the protective service provided by natural vegetation is destroyed by unsustainable farming practices. Deforestation and land degradation are a result of such practices, created by non-equitable sharing of benefits derived from natural resources.

3. Biodiversity 'triggers' for SEA

27. To be able to make a judgement if a policy, plan or programme has potential biodiversity impacts, two elements are of overriding importance: (i) affected area and ecosystem services linked to this area, and (ii) types of planned activities that can act as driver of change in ecosystem services.

28. When any one or a combination of the conditions below apply to a policy, plan or programme, special attention to biodiversity is required in the SEA of this policy, plan or programme.

(a) *Important ecosystem services*. When an area affected by a policy, plan or programme is known to provide one or more important ecosystem services, these services and their stakeholders should be taken into account in an SEA. Geographical delineation of an area provides the most important biodiversity information as it is possible to identify the ecosystems and land-use practices in the area, and identify ecosystem services provided by these ecosystems or land-use types. For each ecosystem service, stakeholder(s) can be identified who preferably are invited to participate in the SEA process. Area-related policies and legislation can be taken into account (see box 1).

(b) *Interventions acting as direct drivers of change*. If a proposed intervention is know to produce or contribute to one or more drivers of change with known impact on ecosystem services (see Box 3), special attention needs to be given to biodiversity. If the intervention area of the policy, plan or programme has not yet been geographically defined (e.g. in the case of a sector policy), the SEA can only define biodiversity impacts in conditional terms: impacts are expected to occur in case the policy, plan or programme will affect certain types of ecosystems providing important ecosystem services. If the intervention area is known it is possible to link drivers of change to ecosystem services and its stakeholders.

(c) *Interventions acting as indirect drivers of change*. When a policy, plan or programme leads to activities acting as indirect driver of change (e.g. for a trade policy, a poverty reduction strategy, or a tax measure), it becomes more complex to identify potential impacts on ecosystem services (see box 4). In broad terms, biodiversity attention is needed in SEA when the policy, plan or programme is expected to significantly affect the way in which a society:

(i) consumes products derived from living organisms, or products that depend on ecosystem services for their production;

(ii) occupies areas of land and water; or

(iii) exploits its natural resources and ecosystem services.

Box 4: Indirect drivers of change are societal changes, which may under certain conditions influence direct drivers of change, ultimately leading to impacts on ecosystem services

The performance of ecosystem services is influenced by drivers of change. In the Millennium Ecosystem Assessment (MA) conceptual framework, a "driver" is any factor that changes an aspect of an ecosystem. A direct driver unequivocally influences ecosystem processes and can therefore be identified and measured to differing degrees of accuracy. In the case of activities that have no obvious biophysical consequences it becomes more complex to define impacts on ecosystem services. The MA conceptual framework provides a structured way of addressing such situations.

Activities without direct biophysical consequences exert their influence through indirect driver of change. These operate more diffusely, often by altering one or more direct drivers, and its influence is established by understanding its effect on a direct driver.

Indirect driver of change can be:

- *Demographic*: e.g. population size and rate of change over time (birth and death rates), age and gender structure, household distribution by size and composition, migration pattern, level of educational attainment;
- *Economic* (macro): e.g. global economic growth and its distribution by country;
- *Socio-political*: e.g. democratization and participation in decision making, decentralization, conflict resolution mechanisms, privatization;
- *Scientific and technological processes*: e.g. rates of investment in R&D, rate of adoption of new technologies, changes in productivity and extractive capabilities, access to and dissemination of information;
- *Cultural and religious values*: values, beliefs and norms influences behaviour with regard to the environment

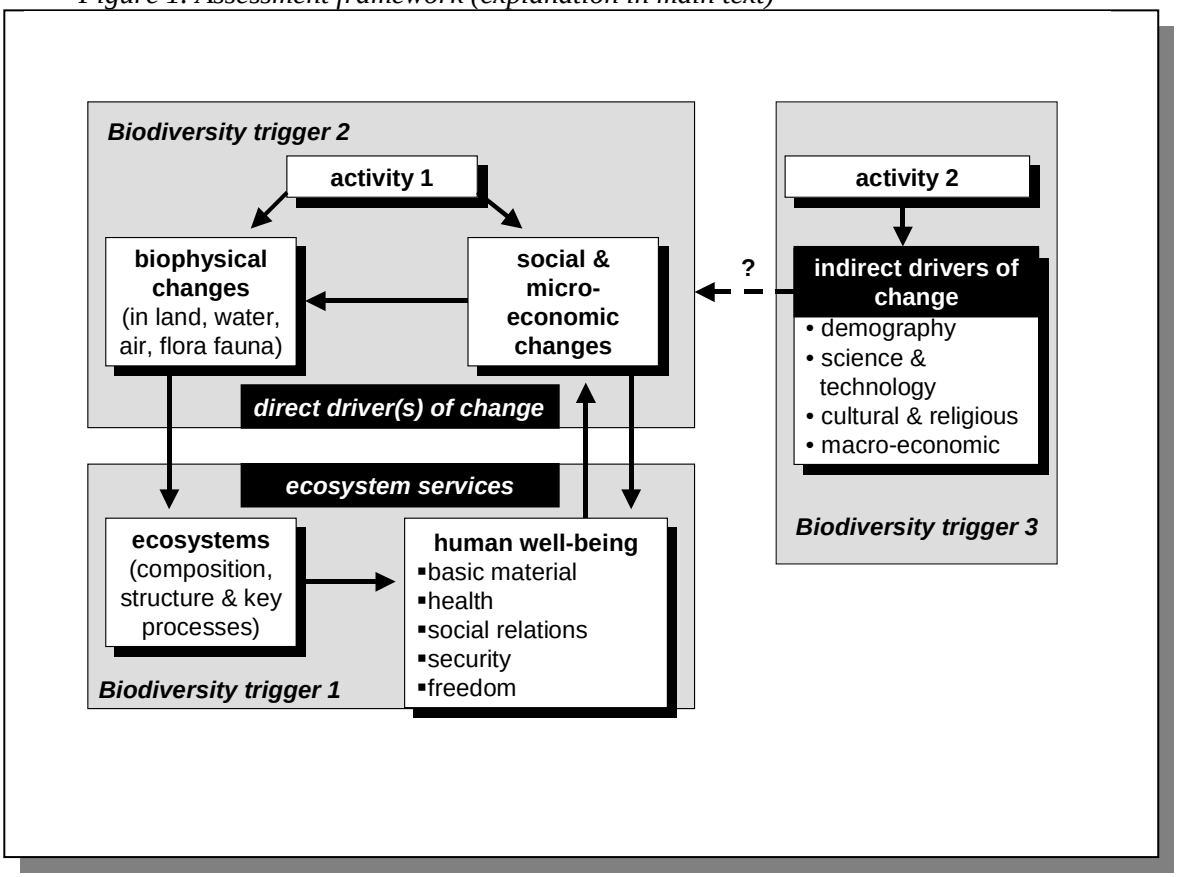
Actors can have influence on some drivers (endogenous driver), but others may be beyond the control of a particular actor or decision-maker (exogenous drivers).

D. How to address biodiversity in SEA

1. The assessment framework

29. Figure 1 depicts the conceptual framework used in these guidelines. It integrates the MA conceptual framework with a more detailed integrated impact assessment framework, describing pathways of activities to impacts. It positions the biodiversity triggers, i.e. (1) affected ecosystem services, and activities producing direct (2) or indirect (3) drivers of change in ecosystem services.

Figure 1. Assessment framework (explanation in main text)



30. Activities resulting from a policy, plan or programme lead to biophysical changes and/or social/economic changes (activity 1 in figure 1). Social/economic changes influence human well-being directly, but some of these changes may in turn also lead to biophysical changes (for example in-migration of people leads to occupation of land). Within their spatial and temporal range of influence, biophysical changes may influence the composition or structure of ecosystems, or influence key processes maintaining these ecosystems. Activities resulting in this type of biophysical changes are referred to as direct drivers of change. The ecosystem services provided by impacted ecosystems may be affected, thus affecting groups in society who depend on these services for their well-being. People may respond to changes in the value of ecosystem services and act accordingly, thus leading to new social/economic changes. Good participatory scoping and application of the best available scientific and local knowledge results in the identification of most relevant impacts and associated cause-effect chains that need further study in the SEA.

31. Identifying impacts on ecosystem services resulting from indirect drivers of change (activity 2 in figure 1) is a more challenging task. As the figure shows, the links between indirect and direct drivers of change have not yet been fully established. The scenario development under the MA provides further elaboration of the linkages between indirect and direct drivers of change in biodiversity.

2. Identifying potential biodiversity impacts through biodiversity triggers

32. **Trigger 1**: The area influenced by the policy, plan or programme provides important ecosystem services:

(a) *Focus*: Area-oriented policies, plans or programmes without precisely defined activities. Biodiversity can be described in terms of ecosystem services providing goods and services for the development and/or well-being of people and society. The maintenance of biodiversity (for future generations or because biodiversity is considered to have an intrinsic value) is often emphasized as a special ecosystem service, described in terms of conservation status of ecosystem, habitats and species, possibly supported by legal protection mechanisms;

(b) *This trigger is often associated with* the 'bottom up' opportunities and constraints of the natural environment approach, as may be used in land use planning/spatial planning where interventions are potentially wide-ranging and the objective is to develop suitable land uses in line with the natural conditions;

(c) Summary of procedure:

(i) Identify ecosystems and land-use types in the area to which the policy, plan or programme applies (human land-use can be considered as an attempt by humankind to maximize one or few specific ecosystem services, for example productivity in agriculture, often at the cost of other services). Identify and map ecosystem services provided by these ecosystems or land-use types.

(ii) Identify which groups in society have a stake in each ecosystem service; invite such stakeholders to participate in the SEA process. Identification and valuation of ecosystem services is an iterative process initiated by experts (ecologists, natural resources specialists) but with stakeholders playing an equally important role. The frequency of reliance on ecosystem goods or services should not necessarily be used as an indication or measure of their value because ecosystem services on which local communities rely even on an occasional basis can be critical to the resilience and survival of these communities during surprise or extreme natural conditions.

(iii) For absent stakeholders (future generations), identify important protected and non-protected biodiversity which is representative of species, habitats and/or key ecological and evolutionary processes (for example by applying systematic conservation planning or similar approaches).

(iv) Ecosystem services identified by experts but without actual stakeholders may represent an unexploited opportunity for social, economic or ecological development. Similarly, ecosystem services with conflicting stakeholders may indicate overexploitation of this service representing a problem that needs to be addressed.

33. **Trigger 2**: The policy, plan or programme is concerned with interventions producing direct drivers of change.

(a) *Focus*: As explained earlier, interventions resulting from a policy, plan or programme can directly, or through socio-economic changes, lead to biophysical changes that affect ecosystems and services provided by these ecosystems. Impacts on ecosystem services can only be defined as potential impacts, since the location of the intervention or the area where its influence is noticed may not be known;

(b) *This trigger is often associated with* policies, plans or programmes without defined geographical area of intervention, such as sectoral policies, or policies, plans or programmes producing social/economic drivers of change which cannot be geographically demarcated;

(c) Summary of procedure:

(i) Identify drivers of change, i.e. activities leading to biophysical changes known to affect biodiversity (see box 3).

(ii) Within the administrative boundaries (province, state, country) to which the policy, plan or programme applies, identify ecosystems sensitive to the expected biophysical changes. Within these administrative boundaries sensitive ecosystem can be identified. The SEA needs to develop a mechanism to avoid, mitigate or compensate potential negative impacts to these ecosystems including the identification of less damaging alternatives.

34. **Triggers 1 and 2 combined**: The policy, plan or programme concerns activities producing direct drivers of change in an area with important ecosystem services:

(a) *Focus*: Knowledge of the nature of interventions and the area of influence allows relatively detailed assessment of potential impacts by defining changes in composition or structure of ecosystems, or changes in key processes maintaining ecosystems and associated ecosystem services;

(b) *This combination of triggers is often associated with* SEAs carried out for programmes (resembling complex, large-scale EIAs). Examples are detailed spatial plans, programme level location and routing alternatives or technology alternatives;

(c) *Summary of procedure*: The procedure is a combination of the procedures for trigger 1 and 2, but the combination allows for greater detail in defining expected impacts:

(i) Identify direct drivers of change and define their spatial and temporal range of influence.

(ii) Identify ecosystems lying within this range of influence (in some cases species or genetic level information may be needed).

(iii) Describe effects of identified drivers of change on identified ecosystems in terms of changes in composition or structure of biodiversity, or changes in key processes responsible for the creation or maintenance of biodiversity.

(iv) If a driver of change significantly affects either composition, or structure, or a key process, there is a very high probability that ecosystems services provided by the ecosystem will be significantly affected.

(v) Identify stakeholders of these ecosystem services and invite them to participate in the process. Take into account the absent (future) stakeholders.

35. **Trigger 3**: The policy, plan or programme is concerned with interventions affecting indirect drivers of change. An example of such a trigger would be trade liberalization in the agricultural sector and the effects this might have on biodiversity. A study carried out within the framework of the Convention on Biological Diversity synthesized existing approaches and assessment frameworks. 15/

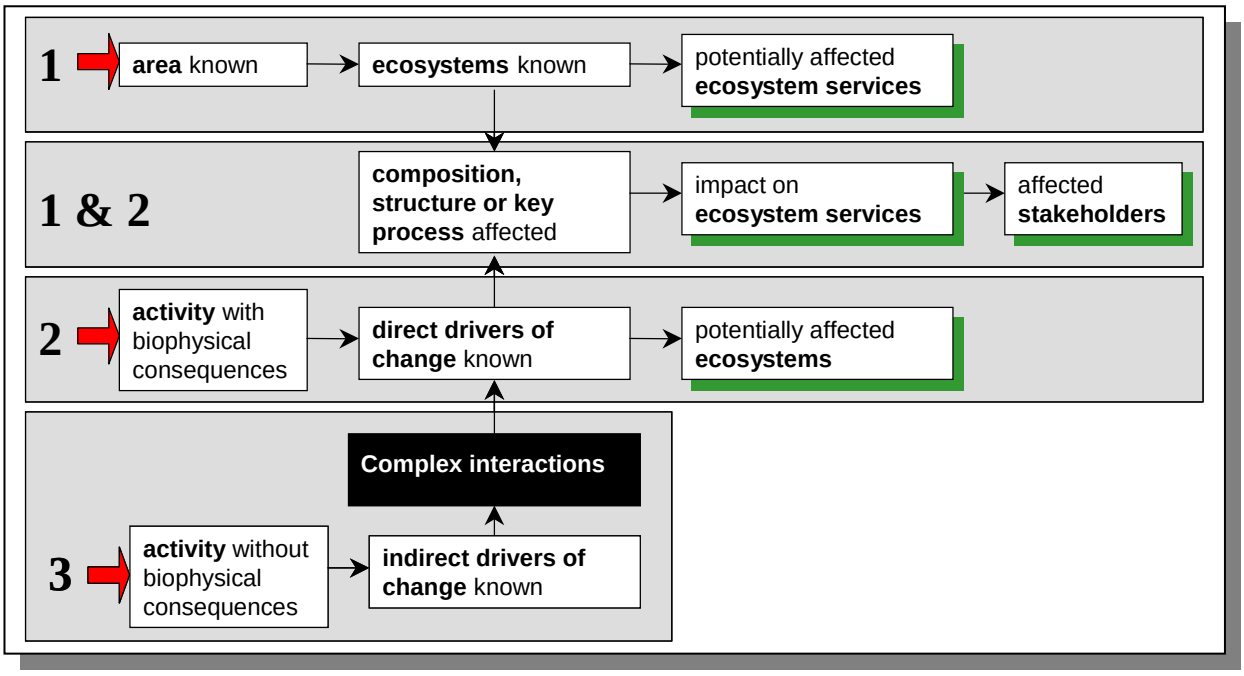
15/ See UNEP/CBD/COP/7/INF/15.

36. Baseline conditions, trends and characteristics of the production and socio-economic systems determine whether indirect consequences will affect biodiversity. This SEA works with a combination of economic modelling studies, empirical evidence from literature, case-study analysis and causal chain analysis. Biodiversity impact is described in very broad terms, mainly as changes in surface area and species richness. Groupings of countries with comparable characteristics are studied in further detail by selecting one country per grouping in which an in-depth case-study is carried out. The difficulty in the identification of biodiversity-related impacts lies in the definition of impact mechanism.

37. More research and case material is needed to elaborate this biodiversity trigger. The MA methodology is potentially valuable to identify linkages between indirect and direct drivers of change. The scenarios working group of the MA considered the possible evolution of ecosystem services during the twenty-first century by developing four global scenarios exploring plausible future changes in drivers, ecosystems, ecosystem services, and human well-being. The reports on global and sub-global assessments may also provide suitable material.

38. Figure 2 provides a summary overview of the way in which potential biodiversity impacts of a policy, plan or programme can be identified. It starts with the identification of potential biodiversity triggers in the policy, plan or programme to be analysed, including: (i) an area with valued ecosystem services; (ii) activities affecting direct drivers of change; (iii) activities affecting indirect drivers of change; or a combination of (i) and (ii) where activities with known drivers of change influence a known area with valued ecosystem services. If one of these triggers is present in the policy, plan or programme, the flow chart shows the type of information that can and should be obtained in the SEA process. The link between indirect and direct drivers of change is characterized by complex interactions, many of which are presently subject to intense research efforts worldwide.

Figure 2. Summary overview of procedure to define biodiversity impacts starting with one or a combination of biodiversity triggers.



39. Annex 3.1 provides a summary overview of the conditions under which a Strategic Environmental should place particular attention to biodiversity issues and how they should be addressed.

Appendix

SUMMARY OVERVIEW OF WHEN AND HOW TO ADDRESS BIODIVERSITY IN SEA

Biodiversity triggers in policy, plan or programme	**When is biodiversity attention needed**	**How to address biodiversity issues**
Trigger 1 Area known to provide important ecosystem services	*Does the policy, plan or programme influence:* Important ecosystem services, both protected (formal) or non-protected (stakeholder values) Areas with legal and/or international status; Important biodiversity to be maintained for future generations	*Area focus* Systematic conservation planning for non-protected biodiversity. Ecosystem services mapping. Link ecosystem services to stakeholders. Invite stakeholders for consultation.
Trigger 2 Policy, plan or programme affecting direct drivers of change (i.e. biophysical and non-biophysical interventions with biophysical consequences known to affect ecosystem services)	*Does the policy, plan or programme lead to:* Biophysical changes known to significantly affect ecosystem services (e.g. land conversion, fragmentation, emissions, introductions, extraction, etc.) Non-biophysical changes with known biophysical consequences (e.g. relocation / migration of people, migrant labour, change in land-use practices, enhanced accessibility, marginalization).	*Focus on direct drivers of change and potentially affected ecosystem* Identify drivers of change, i.e. biophysical changes known to affect biodiversity. Within administrative boundaries to which the policy, plan or programme applies, identify ecosystems sensitive to expected biophysical changes.
Combined triggers 1 & 2 Interventions with known direct drivers of change affecting area with known ecosystem services	Combination of triggers 1 and 2 above	*Knowledge of intervention and area of influence allows prediction of impacts on composition or structure of biodiversity or on key processes maintaining biodiversity* Focus on direct drivers of change, i.e. biophysical changes known to affect biodiversity. Define spatial and temporal influence. Identify ecosystems within range of influence. Define impacts of drivers of change on composition, structure, or key processes. Describe affected ecosystems services and link services to stakeholders. Invite stakeholders into SEA process. Take into account the absent (future) stakeholders.
Trigger 3 Policy, plan or programme affecting indirect drivers of change, but without direct biophysical consequences	*Are indirect drivers of change affecting the way in which a society*: produces or consumes goods, occupies land and water, or exploits ecosystem services?	*More research and case material needed* MA methodology potentially valuable to identify linkages between indirect and direct drivers of change.
