

National Expert Workshop

**Further development of the draft guidelines for incorporating biodiversity-related
issues into environmental impact assessment legislation and/or process and
strategic environmental assessment
(UNEP/CBD/COP/6/VIIA)**

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Results

- Introduction
- Part 1: General references for further development of the guidelines
- Part 2: Guidelines combined with proposals for amendment or supplement
- List of participants

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INTRODUCTION

Article 14 of the Convention on Biological Diversity (CBD) requires each Contracting Party to introduce appropriate procedures requiring environmental impact assessment of any proposed activity that is likely to have significant adverse effects on biological diversity. Last year in April, in order to specify this requirement, the Conference of the Parties to the Convention on Biological Diversity at its sixth meeting (COP VI) put forward draft guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment (decision COP VI/7).

A draft framework has been developed to address the screening and scoping phases of environmental impact assessment. Further development of the framework will be required to address the incorporation of biodiversity into subsequent stages of the environmental impact assessment process.

COP VI urges parties, other governments and organizations to apply the guidelines as appropriate in the context of their implementation of paragraph 1 of Article 14 of the Convention and share their experience. The Executive Secretary was requested to compile and disseminate experiences of Parties in applying the guidelines and, in light of this information, to prepare proposals for further development and refinement of the guidelines and to provide a report of this work to the Subsidiary Body prior to the seventh meeting of the Conference of the Parties.

In order to support this process by providing qualified professional references, a workshop under participation of national experts was conducted in Germany. This workshop was carried out under the responsibility of the Federal Environmental Agency (UBA) and was organized by the Institute of Landscape and Environmental Planning of the Technical University Berlin. Apart from EIA-experts also natural scientists in the field of biodiversity-related research, belonging to either private consulting agencies, universities or federal agencies, participated in the workshop (see appendix for a list of participants).

The aim of the workshop was not only to discuss and outline national experiences regarding the consideration of biodiversity-related issues in EIA, but furthermore to transform them directly into recommendations for further development of the guidelines and to provide, as precise as possible, proposals for their formulation.

The references and recommendations acquired in the course of the workshop can be divided into two parts. The first part provides general references for further development of the guidelines, whereas the second part contains the guidelines combined with proposals for amendment or supplement resulting out of the general references and recommendations.

The references given reflect the common opinion of those experts participating in the workshop. Due to the tight timeframe of the workshop, however, it was not possible to deal with all questions/issues in the depth required. For this reason the references can only provide some impulse and cannot be considered concluding.

**PART 1: GENERAL REFERENCES REGARDING FURTHER DEVELOPMENT OF THE
“DRAFT GUIDELINES FOR INCORPORATING BIODIVERSITY-RELATED ISSUES INTO
ENVIRONMENTAL IMPACT ASSESSMENT LEGISLATION AND/OR PROCESS AND
STRATEGIC ENVIRONMENTAL ASSESSMENT (UNEP/CBD/COP/6/VIIA)”**

In the course of the workshop not only precise references regarding individual articles of the EIA-guidelines were discussed, but also general references and suggestions in terms of further development of these guidelines.

1. Great importance of EIA/SEA for achieving the objectives of the CBD needs to be emphasised!

Conservation of biological diversity can only be achieved, if biodiversity issues are taken into account in planning and political decision-making processes. For this purpose, ‘biological diversity’ has to be fed into decision-making processes as a relevant issue. Hence, environmental impact assessment of proposed activities likely to have significant adverse effects on biological diversity, as required pursuant to Article 14 of the CBD, is very important.

2. Provisions should focus on aspects relevant to biodiversity-related issues!

The guidelines of the CBD should not take over the function of general EIA-guidelines, but rather focus on aspects relevant to the conservation of biological diversity. General provisions in terms of procedures should be kept as short as possible whilst remaining on a conceptual level and should be limited to the components essential for conducting sound EIA/SEA. This is the only way to ensure that the guidelines remain compatible to already existing planning systems and EIA-procedures on national level.

Individual steps of the EIA-procedure should be concretised in the appendices, containing criteria and examples.

3. Maintain joint guidelines for both EIA and SEA. Clearly mark provisions that are specific to only one instrument!

Since separating between EIA and SEA is not clearly possible in either case and being handled differently by the Parties it should be adhered to joint guidelines applying to both EIA and SEA. This, however, requires that provisions referring only to one of the instruments are clearly marked as such.

4. Attention should be paid to the consistent use of terms and definitions!

So far terminology has not been used consistently. The current section (1.) containing definitions for the purpose of these guidelines is not coherent in itself.

Preferably, only a few terms should be used and attention should be paid to the consistent use of these terms. The most important terms should therefore be consistently defined at the beginning of the guidelines.

5. A basic understanding of the fundamental components of EIA/ SEA should be given!

A basic understanding in respect of the fundamental components of EIA/ SEA is a prerequisite for conceptual clarification of the terms used in this context.

A strict separation between data-collecting and impact analysis on the one hand and evaluation of the predicted environmental impacts on the other hand is essential. Aside, how the results of the evaluation becomes part of the decision-making process requires separat attention.

Generally, a strict separation of the impact analysis, support of the decision and decision-making is of great importance.

In order to achieve an inherent consistency of the guidelines it is essential to harmonise the terminology and contents in terms of individual steps/ stages of EIA/ SEA.

6. As a prerequisite for effective EIA/ SEA the necessity of providing national biodiversity strategies and action plan documents should be emphasised!

As an essential prerequisite for identification and evaluation of the impact on biological diversity, especially at the project-level, the implementation as well as national targets on biodiversity - contained in national biodiversity strategies - have to be detailed down to regional and local level – fitted to the information about the concrete natural landscape. For that additional local plans are needed. In order to be effective EIA and SEA require sufficiently detailed targets, which can be used as measurable standards or objectives against which the significance of environmental impacts on biological diversity can be evaluated.

If evaluative criteria are not defined in a national biodiversity strategy, alternative options must be found in order to be able to implement SEA and EIA. As a prerequisite for determining such targets, sufficient information and knowledge of the national and regional situation regarding biological diversity needs to be available. In addition, targets need refinement and specification at the local level. This should urgently be pointed out in the guidelines.

7. Within the scope of EIA socio-economic aspects related to biological diversity should not be intermixed with ecological aspects!

Impacts on socio-economic aspects should only be analysed and taken into consideration within the scope of EIA to that extent as they are directly related to biological diversity. Otherwise EIA should focus on environmental aspects in a narrower sense, leaving the analysis and evaluation of impacts concerning other issues than those mentioned above to other forms of impact analysis (see modification proposal of 1 (a) of the guidelines).

It is advisable to deal separately with ecological, socio-economic and cultural issues otherwise decision-making becomes intransparent. This does not extend to the economic assessment of ecological services and impacts as a part of the EIA.

8. Not only the tasks and requirements related to EIA but also the persons, institutions or authorities involved should always be designated!

Numerous different institutions and persons are addressed within the section 'ways and means' as specified in the guidelines: the Legislature, the Executive (Federation/states/municipalities), the public and the stakeholders, the states of a particular region. This indicates the need for the elaboration of a common concept within the individual country regarding the implementation of the recommendations. The parties or persons involved in the EIA procedure or the decision-making process need to be addressed more precisely in order to meet the requirements.

In this context, it is important to distinguish at least as follows:

- the developer

- the authority responsible to decide whether a proposal should be approved (competent authority/ government)
- the authority responsible for the EIA/SEA (if not identical with the competent authority)
- the public
- the stakeholders.

9. The relation of EIA to SEA should be described more precisely!

So far the statements concerning the relation between EIA and SEA as given in the guidelines are not sufficient.

In comparison to EIA, SEA simply covers a different range of activities subject to assessment, namely proposed plans, programmes and where appropriate policies. This range of activities, however, is not to be understood in principle as 'wider'. At this point, it would be more important to mention the following aspects:

SEA provides an assessment of environmental impacts preliminary to project-level. At this level superior, regionally-relevant environmental aspects should be analyzed. EIA, in particular, focuses in detail on locally or site-relevant environmental impacts.

At the time of the preparation of plans and programmes often only little information is available about the detailed design of the proposed project and the further activities that are linked with the plan/ programme. Therefore statements on expected effects on the environment within SEA are often vague and can frequently only be made with soft prognosis techniques such as scenarios.

Further references regarding the handling of biodiversity-related issues within the scope of EIA/SEA

Not only the loss of genetic varieties, species or ecosystems, but also their gradual changes need to be rated as an adverse effect on biological diversity (see appendix 4 of the draft guidelines). The favourable conservation status for the habitat and species serves as a criterion for evaluating changes, as mentioned in Art. 6 of the European Habitat Directive.

Genetic biodiversity considers not only domestic varieties but also wild species.

Species diversity cannot, as a rule, be considered an appropriate criteria for EIA, instead it always needs to be interpreted in relation to the particular natural landscape unit and habitat type (respectively, in case of wider areas: landscape), taking into account the size of the area and the structural components present, especially in the case of limited site conditions not subject to human activities.

Within the scope of EIA species diversity should therefore only be interpreted as 'species diversity with regard to the particular natural landscape unit and habitat type as well as the particular local site potential'.

As a prerequisite for adequate handling of the aspect 'species diversity' within EIA and SEA national, regional and local measurable standards or objectives against which the significance of impacts on 'species diversity' can be evaluated need to be developed (as part of the national

biodiversity strategies). “Knowledge of the distribution and status of important biodiversity resources makes it possible to evaluate impacts on biodiversity in relation to local, national and international objectives”.

The formulation of reference lists having regard to natural landscape units should be encouraged. These lists should, in particular, contain for as many relevant species groups as possible the following contents:

- Designation of species, or the natural landscape unit, for the protection of which the Contracting Party has particular responsibility
- Species spectra (including further information regarding status, abundance) typical of the habitat types of a particular natural landscape unit should be determined
- Identification of those species within a cenosis classified to be particularly sensitive to environmental disturbances (particularly on the basis of Red Data Books, because of their sensitivity towards anthropogenic activities)
- Identification of cultivated species which function as key species, e.g. within the management of habitat types requiring the maintenance of human activities

Ecosystem diversity within the scope of EIA should relate to the scale of landscapes and should be defined as biodiversity referring to landscapes, including diversity of habitat types and biocenosis concerning the habitat potential.

Important aspects for the description of ecosystem diversity interpreted in the way previously mentioned, are functional relations, the diversity of habitats within the landscape and the ecosystem processes which are important for maintaining the favourable conservation status (e.g. succession and/or dynamic, disturbances).

Research on Biodiversity

Research on methodical requirements concerning the incorporation of biodiversity-related issues into EIA/SEA should be intensified.

PART 2: DRAFT FRAMEWORK COMBINED WITH PROPOSALS FOR AMENDMENT OR SUPPLEMENT

DECISIONS VII A ADOPTED BY THE CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY AT ITS SIXTH MEETING

The Hague, 7-19 April 2002
(Subject to Finalisation)

Annex

DRAFT GUIDELINES FOR INCORPORATING BIODIVERSITY-RELATED ISSUES INTO ENVIRONMENTAL IMPACT ASSESSMENT LEGISLATION AND/OR PROCESS AND IN STRATEGIC ENVIRONMENTAL ASSESSMENT

1. For the purpose of these guidelines, the following definitions are used for environmental impact assessment and strategic environmental assessment:

(a) *Environmental impact assessment (including health assessment)* is a process of evaluating the likely significant environmental impacts of a proposed project or development. Thus, it is one part of impact analyses regarding ecological, socio-economic and cultural impacts for the promotion of sustainable development by taking into account both beneficial and adverse as well as inter-related impacts.

Environmental assessments proceed on different levels under participation of authorities and the public: leading to strategic environmental assessments of policies, plans and programmes and where appropriate policies, and environmental impact assessments of public and private projects. 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 environmental impact assessment would necessarily involve the following stages steps:

1. Screening to determine~~Deciding~~ which projects or developments require a full or partial impact assessment study - if necessary by screening;
2. Scoping to identify which potential significant impacts on the environment are relevant to assess, and to derive terms of reference for the impact assessment;
3. Identifying and predicting ~~Impact assessment to predict and identify~~ the likely significant environmental impacts of a proposed project or development. This shall be done parallel to the consideration of taking into account inter-related consequences of the project proposal, and the socio-economic impacts and other;
4. Identifying~~ing~~ mitigation and consideration of measures to avoid, reduce or mitigate negative impacts (including 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);

5. Reporting to the proponent, competent authority and the public: the environmental impact statement (EIS) Deciding whether to approve the project or not; and

6. Review of the environmental impact statement

7. Evaluation of the predicted impacts

8. Deciding Decision-making, whether the project/development has to be approved or not with regard to the results of the EIA

6.9. Monitoring and evaluating the development activities, predicted impacts and proposed mitigation measures to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion;

(b) *Strategic environmental assessment* is the formalized, systematic and comprehensive process ~~of identifying and evaluating the environmental consequences of proposed policies, plans or programmes~~ to ensure that significant environmental impacts they are fully included and appropriately addressed at the earliest possible stage of decision-making on a par with economic and social considerations.^{1/} Strategic environmental assessment, 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. Strategic environmental assessment 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). The basic steps of strategic environmental assessment are similar to the steps in environmental impact assessment procedures,^{2/} but the spatial scope differs. Strategic environmental assessment does not replace or reduce the need for project-level environmental impact assessment, but it can help to streamline the incorporation of environmental concerns (including biodiversity) into the decision-making process, often making project-level environmental impact assessment a more effective process.

1. Purpose and approach

- 2) The objective of these draft guidelines is to provide general advice on incorporation of biodiversity considerations into new or existing environmental impact assessment procedures, noting that existing procedures take biodiversity into consideration in different ways. Since in similar the basic steps of the procedure are similar for both instruments, the provisions laid down in the guidelines generally apply to both EIA and SEA. Requirements that are specific for one instrument are clearly marked as such. A draft framework has been developed to address the screening and scoping phases of environmental impact assessment. Further development of the framework will be required to address the incorporation of biodiversity into subsequent stages of the environmental impact assessment process, including impact assessment; (incl. impact analysis; and prediction), mitigation, evaluation and monitoring, and into strategic environmental assessment.
- 3) Individual countries may substantiate or even redefine the steps in the procedure to their needs and requirements by adapting them to national requirements as befits their institutional and legal setting. Thus, already existing procedures and approaches can be used and amended in order to improve the consideration of biodiversity aspects within the scope of environmental impact assessment and strategic environmental assessment. -The environmental impact assessment process, in order to be effective, should be fully incorporated into existing legal planning processes and not be seen as an “add-on” process. Hence, it is important to develop a co-ordinated action for the procedures of decision-making and environmental impact analysis.

^{1/} Based on Sadler and Verheem, 1996.

^{2/} Saddler and Verheem, 1996; South Africa, 2000; Nierynck, 1997 ; Nooteboom, 1999.

3a) For effective EIA/SEA an adequate participation of stakeholders and the public is an important measure at the various stages of the environmental impact assessment as well as in the decision-making process itself. Detailed arrangements for the participation of the institutions and persons concerned or interested have to be determined according to the specific stage of the procedure as well as the project/development in question.

- 4) As a prerequisite, the definition of the term “environment” in national legislation and procedures should fully incorporate the concept of biological diversity as defined by the Convention on Biological Diversity, such that plants, fungi, animals and micro-organisms are considered at the genetic, species/community and ecosystem/habitat levels, and also in terms of ecosystem structure and function. At the same time, attention should be paid that recording and evaluation processes relating to environmental and to socio-economic issues are kept separate, since EIA as a single component of the assessment process should refer primarily on the ecological belongings of biodiversity.
- 5) With regard to biodiversity considerations, the ecosystem approach, as described in decision V/6 of the Conference of the Parties and taking into account any further elaboration of the concept within the framework of the Convention, is an appropriate framework for the assessment of planned action and policies. In accordance with the approach, the proper temporal and spatial scales of the problems should be determined as well as the functions of biodiversity and their tangible and intangible values for humans that could be affected by the proposed project or policy, the type of adaptive mitigation measures and the need for the participation of stakeholders in decision-making. Consideration should, in particular, be given to the inter-actions between functions and values. The evaluation of the environmental impact as well as the evaluation of the socio-economic issues should be undertaken separated from each other. They should not be integrated before the decision-making stage.
- 6) Environmental impact assessment procedures should refer to other relevant national, regional and international legislation, regulations, guidelines and other policy documents ~~such as the national biodiversity strategy and action plan documents~~, the Convention on Biological Diversity and other biodiversity-related conventions and agreements including, in particular, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals and the related agreements, the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, the European Habitat Directive, the Convention on Environmental Impact Assessment in a Transboundary Context; the United Nations Convention on the Law of the Sea; the European Union directives on environmental impact assessment, and the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources.
- 7) The existence of a national biodiversity strategy and action plan is an important prerequisite for adequate incorporation of biodiversity-related issues into EIA/SEA. The targets and information laid down in the national biodiversity strategies and action plans, however, should be detailed down to regional and local level. Otherwise additional local plans are needed. Only then they can represent a suitable basis for the identification and evaluation of the impact on biological diversity, especially at the project-level, is given. Consideration should be given to improving the integration of the national biodiversity strategy and action plans and national development strategies using strategic environmental assessment as a tool for such integration to promote the establishment of clear conservation targets through the national biodiversity strategy and action plan process and the use of those targets for ~~the screening and scoping targets of~~ environmental impact assessment, and for developing mitigation measures as well as for monitoring and evaluating the development activities.

2. *Biodiversity issues at different stages of environmental impact assessment*

(a) *Screening*

- 8) Screening is used to determine which proposals should be subject to impact assessment, to exclude those unlikely to have harmful environmental impacts and to indicate the level of environmental appraisal

required. If screening criteria do not include biodiversity measures, there is a risk that proposals with potentially significant impacts on biodiversity will be screened out.

9) Since a legal requirement for environmental impact assessment on environmental grounds does not guarantee that biological diversity will be taken into account, consideration should be given to incorporating biodiversity criteria into existing or new screening criteria.

10) Types of existing screening mechanisms include:

(a) Positive lists identifying projects requiring environmental impact assessment. A few countries use (or have used) negative lists, identifying those projects not subject to environmental impact assessment. These lists should be reassessed to evaluate their inclusion of biodiversity aspects;

(b) Expert judgement ~~(with or without a limited study, sometimes referred to as “initial environmental examination” or “preliminary environmental assessment”); and~~

(c) A combination of a positive list and expert judgement; for a number of activities an environmental impact assessment is more appropriate, for others an expert judgement may be desirable to determine the need for an environmental impact assessment.

11) The result of screening can be that:

(a) An environmental impact assessment is required,

(b) (i) ~~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 norms or threshold values; [Since it can be assumed that only relevant impacts will be subject to environmental impact assessments, this point can be dropped.]~~

(ii) There is still uncertainty whether an environmental impact assessment is required and an initial environmental examination has to be conducted to determine whether a project requires environmental impact assessment or not, and

(c) The project does not require an environmental impact assessment.

12) How to use these guidelines for screening:

(a) Countries with a positive list identifying projects requiring environmental impact assessment should use, as appropriate, appendices I and II below for guidance on reconsidering their existing positive list with respect to biological diversity considerations. By assessing the possible impacts of categories of activities on biological diversity the existing list can be adjusted, if required;

(b) In countries where screening is based on expert judgement, experience has shown that professionals make screening decisions, often using “mini environmental impact assessment” to come to this decision. ~~Such intensive assessments within the screening process are not suitable. If there is imponderableness a full EIA or SEA should be made. These guidelines, its appendices and other guidelines help provide these professionals with the means to come to a motivated, transparent and consistent screening decision. Furthermore, the expert teams should include professionals with biodiversity expertise;~~

(c) In countries where screening is based on a combination of a positive list and expert judgement, country-specific thematic or sector guidelines, often including quantitative norms or thresholds,

facilitate the responsible people to make a well-founded and defensible decision. For biodiversity, thematic guidelines could be developed, 3/ sector guidelines need to be reviewed on biodiversity considerations.

The screening criteria

13) Screening criteria may relate to: (i) categories of activities, including thresholds referring to magnitude of the activity and/or size of the intervention area, duration and frequency or to (ii) a magnitude of biophysical change that is caused by the activity, or to (iii) maps indicating areas important for biodiversity with special legal status or of high biodiversity value and endemism, species patterns, breeding sites, or areas with species of high genetic value.

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

(a) Categories of activities that may affect biological diversity and the direct and indirect biophysical changes likely to result from these activities, taking into account characteristics like: type or nature of activity, magnitude, extent/location, timing, duration, reversibility/irreversibility, likelihood, and significance; possibility of interaction with other activities or impacts;

(b) Area of influence. Knowing the biophysical changes that result from an activity, the expected area of influence of these changes can be modelled or predicted, including the probability of off-site effects;

(c) Biodiversity maps indicating ecosystems and/or land-use types and their use and non-use values (showing the use and non-use values of biodiversity).

15) The process of developing a national biodiversity strategy and action plan can generate valuable information such as conservation priorities and targets which can guide further development of environmental impact assessment screening criteria. 4/ Appendix 2 below presents a generic list of criteria, intended to be a practical reference for further in-country development of criteria.

Pertinent questions for screening

16) Considering the objectives of the Convention on Biological Diversity, i.e., in particular, conservation, sustainable use and equitable sharing of benefits derived from biological diversity, fundamental questions need to be answered in an environment impact assessment study:

(a) Does the intended activity affect the physical environment in such a manner or cause such biological losses that it influences the chance of extinction of cultivars, varieties, populations of species, or the chance of loss of habitats or ecosystems?

(b) Does the intended activity surpass the maximal sustainable yield, the carrying capacity of a habitat/ecosystem or the maximum and minimum 5/ allowable disturbance level of a resource, population, or ecosystem?

(c) Does the intended activity result in changes to the access to and rights over biological resources?

17) To facilitate the development of criteria, the questions above have been reformulated for the three levels of diversity, reproduced in appendix 1 below.

3/ Some concrete targets in the draft global strategy for plant conservation (see item 17.3 below).

4/ Summarized in the IAIA information document by Treweek, 2001, box 2.

5/ For example, fire can be too frequent and too infrequent to sustain the integrity/health of a given ecosystem.

(b) Scoping

18) Scoping narrows the focus ~~of the broad issues found to be significant during the screening stage on issues identified to be significant~~. It is used to derive terms of reference (sometimes referred to as guidelines) for environmental impact ~~statement~~. Scoping also enables the competent authority (or environmental impact assessment professionals in countries where scoping is voluntary):

(a) To 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) To provide an opportunity for stakeholders to have their interests taken into account in the environmental impact assessment;

(c) To ensure that the resulting environmental impact statement is useful to the decision maker and is understandable to the public.

19) During the scoping phase promising alternatives can be identified for in-depth consideration during the environmental impact assessment study.

[Para 20 items a to l should be reduced to explicit aspects of biological diversity - if necessary restructured - and shifted into the appendices:]

20) The following sequence provides an example of iterative mechanism for scoping, impact assessment and consideration of mitigation measures, which should be carried out with the help of existing information and the available knowledge among stakeholders. This can be achieved particularly well by graded planning procedures on different rural scales:

(a) Describe the type of project, its nature, magnitude, location, timing, duration and frequency;

(b) Describe the expected biophysical changes in soil, water, climate, air, flora and fauna;

(c) Describe ~~biophysical changes impacts on biological diversity~~ that result directly or indirectly from social change processes as a result of the proposed project;

(d) Determine the spatial and temporal scale of influence of each biophysical change;

(e) Describe ecosystems and land-use types potentially influenced by the biophysical changes identified;

(f) Determine for each ecosystem or land-use type if the biophysical changes affect one of the following components of biological diversity: the composition (what is there), the temporal/spatial structure (how are biodiversity components organised in time and space), or key processes (how is biodiversity created and/or maintained);

~~(g) Identify in consultation with stakeholders the current and potential use functions, non use functions and other longer term less tangible benefits of biological diversity provided by the ecosystems or land-use types and determine the values these functions represent for society (see appendix 3 for an indicative list of functions); [shifted to (l)]~~

~~(gh)~~ Determine which of these functions will be significantly affected by the proposed project, taking into account mitigation measures;

(hi) For each alternative, define mitigation and/or compensation measures to avoid, minimize or compensate the expected impacts;

(ij) With the help of the biodiversity checklist on scoping (see appendix 4 below), determine which issues will provide information relevant to decision making and can realistically be studied;

(jk) Provide information on the severity of impacts, i.e. apply weights to the expected impacts for the alternatives considered. Weigh expected impacts to a reference situation (baseline), which may be the existing situation, a historical situation, or an external reference situation.

(kl) Identify necessary surveys to gather comprehensive information about the biological diversity in the affected area where appropriate.

(l) Identify in consultation with stakeholders the current and potential use functions, non use functions and other longer term less tangible benefits of biological diversity provided by the ecosystems or land-use types and determine the values these functions represent for society (see appendix 3 for an indicative list of functions).

21) The expected impacts of the proposed activity, including identified alternatives, should be compared with the selected reference situation and with the autonomous development (what will happen with biodiversity over time if the project is not implemented). There should be awareness that doing nothing may in some cases also have significant effects on biological diversity, sometimes even worse than the impacts of the proposed activity (e.g. projects counteracting degradation processes).

22) At present, evaluation criteria for biological diversity, especially at ecosystem level, are under-developed and need serious attention when developing in-country mechanisms to incorporate biodiversity in environmental impact assessment.

(c) Impact analysis: ~~and assessment~~ Identification and Prediction

23) Environmental impact assessment Impact analysis should be an iterative process of assessing predicting impacts, redesigning alternatives and comparison. The main tasks of impact analysis and assessment are is:

(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 requires the following steps:

a) Description of the project and the alternatives as well as their general effects (environmental impact factors / driving forces),

b) Description of the current state of the environment with regard to biodiversity issues on a basis of appropriate criteria and indicators (including already existing environmental problems, sensitivity, vulnerability, existing loads),

c) Prediction of impacts. This includes the identification of indirect and cumulative impacts, and of the likely causes of the impacts (impact analysis and assessment). Identification and description of relevant criteria for decision-making can be an essential basis of element of this period;

d) Review and redesign of alternatives; consideration of mitigation measures; planning of impact management; evaluation of impacts; and comparison of the alternatives;

e) Recommendations regarding further actions (optionally information/details for monitoring, although not legally assigned).

(b) ~~Review and redesign of alternatives; consideration of mitigation measures; planning of impact management; evaluation of impacts; and comparison of the alternatives; and~~

(c) ~~Reporting of study results in a environmental impact statement. [Overlap with the reporting]~~

24) ~~[shifted to 29.]Assessing impacts usually involves a detailed analysis of their nature, magnitude, extent and effect, and a judgement of their significance, i.e., whether the impacts are acceptable to stakeholders, require mitigation, or are just unacceptable. Biodiversity information available is usually limited and descriptive and cannot be used as a basis for numerical predictions. There is a need to develop or compile biodiversity criteria for impact evaluation and to have measurable standards or objectives against which the significance of individual impacts can be evaluated. The priorities and targets set in the national biodiversity action plan and strategy 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.~~

(d) **Identification and Consideration of mitigation measures**

25) If the evaluation process concludes that the impacts are significant, the next stage in the process is to propose mitigation ideally drawn together into an “environmental management plan”. The purpose of mitigation in environmental impact assessment is to look for better ways to implement project activities so that negative impacts of the activities are avoided or reduced to acceptable levels and the environmental benefits are enhanced, and to make sure that the public or individuals do not bear ~~costs~~ detriments which are greater than the benefits which accrue to them. The effort to avoid or reduce impacts on biological diversity should be supported by appropriate incentive measures (in accordance with Article 11 of the CBD). Remedial action can take several forms, i.e. avoidance (or prevention), mitigation (including restoration and rehabilitation of sites), and compensation (often associated with residual impacts after prevention and mitigation).

(e) **Reporting the proponent, competent authority and the public: the environmental impact statement (EIS)**

26) The environmental impact statement contains the results of the impact analysis. It is designed to assist: (i) 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; (ii) the Government or responsible authority to decide whether a proposal should be approved and the terms and conditions that should be applied; and (iii) 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.

(f) **Review of the environmental impact statement**

27) The purpose of review of the environmental impact statement is to ensure that the information for decision makers is sufficient, focused on the key issues, scientifically and technically accurate, and if the likely impacts are acceptable from an environmental viewpoint and the design complies with relevant standards and policies, or standards of good practice where official standards do not exist. The review should also consider whether all of the relevant impacts of a proposed activity have been identified and adequately addressed in the environmental impact assessment. This requires, at any rate, an examination

[to what extent contents and methods laid down in the scoping phase were actually dealt with respectively applied.](#) To this end, biodiversity specialists should [parallel](#) be called upon for the review and information on official standards and/or standards for good practice to be compiled and disseminated.

- 28) Public involvement, including minority groups, is important in various [early](#) stages of the process and particularly at this stage. The concerns and comments of all stakeholders are 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.
- 29) 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. [As a prerequisite, Parties need to specify objectives according to Article 1 of the CBD to the regional and local level.](#)

(g) [new] Evaluation of the predicted impacts

[29\) \[prior 24. \]. Assessing impacts usually involves a detailed analysis of their nature, magnitude, extent and effect, and a judgement of their significance, i.e., whether the impacts are acceptable to stakeholders, require mitigation, or are just unacceptable. Biodiversity information available is usually limited and descriptive and cannot be used effectively as a basis for reliable predictions. There is a need to develop or compile biodiversity criteria for impact evaluation and to have measurable standards or objectives against which the significance of individual impacts can be evaluated. The priorities and targets set in the national biodiversity action plan and strategy 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 related to biological diversity.](#)

(gh) Decision-making

- 30) [The support of the decision-making process](#) takes place throughout the process of environmental impact assessment in a 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 between refusal or authorization of the project. Biodiversity issues should play a part in decision-making throughout. This final decision is essentially a political [or administrative](#) 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 essential](#) that the proponent and the decision-making body are two different entities. [Parties should define the role of the result of the environmental impact assessment and strategic environmental assessment in the decision-making process \(criteria or measures for the decision\); at least the result of the EIA or SEA should be taken into account during the decision-making.](#)
- 31) [In the light of uncertainty and inaccuracy in terms of effect prediction within the range of biological diversity](#) ~~the precautionary approach should always be applied in decision-making in cases of scientific uncertainty about risk of significant harm to biodiversity.~~ As scientific certainty improves, decisions can be modified accordingly.

(hi) Monitoring and environmental auditing

- 32) Monitoring and auditing are used to see what actually occurs after project implementation has started. Predicted impacts on biodiversity should be monitored, as should the effectiveness of mitigation measures proposed in the environmental impact assessment. Proper environmental management should ensure that anticipated impacts are maintained within predicted levels, and unanticipated impacts are managed before they become a problem and the expected benefits (or positive developments) are achieved as the project proceeds. The results of monitoring provide information for periodic review and alteration of environmental management plans, and for optimizing environmental protection through good practice at

all stages of the project. Biodiversity data generated by environmental impact assessment should be made accessible and useable by others and should be linked to biodiversity assessment processes being designed and carried out under the Convention on Biological Diversity. [Monitoring and auditing should be connected with monitoring pursuant to Art. 7 of the CBD.](#)

[32a. The responsibility for monitoring should be clearly defined. This also applies to the targets assigned for measuring the success of the mitigation measures.](#)

33) ~~An environmental audit is an independent examination and assessment of a project's (past) performance, is part of the evaluation of the environmental management plan and contributes to the enforcement of EIA approval decisions [Note: The difference between "audit", "monitoring" and "environmental management plan" is not perceptible]~~

3. *Incorporation of biodiversity considerations in strategic environmental assessments*

34) The guidelines proposed for the integration of biodiversity in environmental impact assessment are also applicable to strategic environmental assessment, taking into account that for the latter type of assessment, biological diversity concerns should be considered from the early stages of the drafting process, including when developing new legislative and regulatory frameworks (decision V/18, paras. 1(c) and 2 (a)), and at the decision-making and/or environmental planning levels (decision V/18, para. 2 (a)), and that strategic environmental assessments by their nature cover policies and programmes, a wider range of activities over a wider area.

35) Strategic environmental assessment, while not a new process, is not practised as widely as environmental impact assessment. As experience accumulates in countries, it may then be necessary to draw more specific guidelines for the incorporation of biodiversity in the process.

4. *Ways and means*

(a) *Capacity-building*

36) Any activity aimed at the incorporation of biodiversity considerations into national environmental impact assessment systems should be accompanied by appropriate capacity development activities. Expertise in taxonomy, ^{6/} conservation biology, ecology, and traditional knowledge is required as well as local expertise in methodologies, techniques and procedures. Environmental impact assessments should involve ecologists with extensive knowledge on the relevant ecosystem(s) in the assessment team.

37) It is also recommended to develop training workshops on biodiversity and environmental impact/strategic environmental assessment for both assessment practitioners and biodiversity specialists [as well as decision-makers](#) to build a common understanding of the issues. School and university curricula should be reviewed to ensure that they incorporate material on biodiversity conservation, sustainable development and environmental impact/strategic environmental assessment.

38) Biodiversity-relevant data should be organized in regularly updated and accessible databases, making use of rosters of biodiversity experts.

(b) *Legislative authority*

39) If environmental impact assessment and strategic environmental assessment procedures are incorporated into legislation, and the requirements for project/policy developers to find the most environmentally

^{6/} See the Global Taxonomy Initiative and the programme of work (decision VI/8).

sound, efficient options that avoid, reduce or mitigate biodiversity and other adverse impacts are made explicit, this will prompt developers to, at a very early stage, use environmental impact assessment tools to improve the development process prior to the project consent stage or in some cases prior to screening procedures.

(c) Participation

- 40) Relevant stakeholders or their representatives, and in particular indigenous and local communities should be involved in the development of guidelines or recommendations for environmental impact assessments as well as throughout the assessment processes relevant to them, including decision-making. It should be ensured that, when a decision has been taken, the parties and stakeholders involved are informed of the content of the decision [by the competent authority].

Ideas should be developed for more active ways for relevant stakeholders to participate in decision-making processes based, inter alia, on environmental impact assessments/ strategic environmental assessments.

(d) Incentives

- 41) The possible link between impact assessment and incentive measures is pointed out in decision III/18 of the Conference of the Parties, on incentive measures. In paragraph 6 of that decision, the Conference of the Parties encouraged Parties to incorporate biological diversity considerations into impact assessments as a step in the design and implementation of incentive measures. The endorsement of the impact assessment process and its implementation within a legislative framework can act as an incentive, especially if applied at the policy level, to protect and, in certain cases even restore and rehabilitate biological diversity. ^{7/} Financial or other incentives can also be part of a negotiated approval package for a project.

(e) Cooperation

- 42) Regional collaboration is of particular importance, including for the development of criteria and indicators for the evaluation of impact and possibly criteria and indicators that can provide early warning of potential threats and adequately distinguish the effects of anthropogenic activities from natural processes, and the use of standardized methods of collection, assembly and exchange of information is needed to ensure regional compatibility and accessibility of data. Guidelines and sharing of information and experiences should be made available through, *inter alia*, the Convention's clearing-house mechanism.
- 43) As a follow-up to the implementation of decision IV/10 C of the Conference of the Parties, collaboration between the Convention on Biological Diversity and other biodiversity-related conventions, including in particular the Ramsar Convention and the Convention on Migratory Species, which have listed sites and binding agreements on certain species, and other relevant organizations and bodies will facilitate the development and implementation of any guidelines agreed upon for the integration of biodiversity-related issues in environmental impact assessment and strategic environmental assessment. Such a collaborative approach, also embodied in resolution VII.16 of the Conference of the Parties to the Ramsar Convention ("The Ramsar Convention and impact assessment: strategic, environmental and social"), could lead to the development of an umbrella set of guidelines on impact assessment for biodiversity-related conventions.
- 44) Web-based resources such as the clearing-house mechanism of the Convention on Biological Diversity may help to raise awareness about best available methods and useful sources of information and experience, and should be developed and used for the provision and exchange of information on environmental impact assessment.

^{7/} UNEP/CBD/COP/4/20 and UNEP/CBD/SBSTTA/4/10.

45) Communication between practitioners of environmental impact assessment and scientists working in the biodiversity domain is in urgent need of improvement and should be enhanced through workshops and case-study assessments. ^{8/}

Appendix 1

QUESTIONS PERTINENT TO SCREENING ON BIOLOGICAL DIVERSITY IMPACTS

<i>Level of diversity</i>	<i>Biological diversity perspective</i>	
	<i>Conservation of biological diversity (Non-use values)</i>	<i>Sustainable use of biodiversity (Use values)</i>
Genetic diversity ⁽¹⁾	(Ia) Does the intended activity cause a local loss <u>or relevant change/decline of genotypes of wild plants and animals as well as or of legally protected of varieties/cultivars/[races]/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of ecological, social, scientific and economic importance?</u> (Ib) <u>Is there any presumption that the intended activity might affect unique, locally adapted genotypes or essential parts of the gene pool of wild species?</u> ⁹	
Species diversity ⁽²⁾	(II) Does the intended activity cause a direct or indirect loss <u>or serious/relevant decline</u> of a population of a species?	(III) Does the intended activity affect the sustainable use of a population of a species?
Ecosystem diversity ⁽²⁾	(IV) Does the intended activity lead to serious damage or total loss of (an) ecosystem(s) or land-use type(s) <u>or their characteristic structures or processes</u> , thus leading to a loss of ecosystem diversity (i.e. the loss of indirect use values and non-use values)?	(V) Does the intended activity affect the sustainable exploitation of (an) ecosystem(s) or land-use type(s) by humans in such manner that the exploitation becomes destructive or non-sustainable (i.e. the loss of direct use values)?

(1) ~~The potential loss of natural genetic diversity (genetic erosion) is extremely difficult to determine, and does not provide any practical clues for formal screening. The issue probably only comes up when dealing with highly threatened, legally protected species which are limited in numbers and/or have highly separated populations (rhinoceros, tigers, whales, etc.), or when complete ecosystems become separated and the risk of genetic erosion applies to many species (the reason to construct so called eoducts across major line infrastructure). These issues are dealt with at species or ecosystem level.~~

(2) ~~Species diversity:~~ The level at which “population” is to be defined fully depends on the screening criteria used by a country. For example, in the process of obtaining a special status, 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.

^{8/} See UNEP/CBD/COP/5/INF/34.

⁹ Applicable where appropriate

THE SCREENING CRITERIA

This is a suggested outline of a set of screening criteria, to be elaborated on country level. It only deals with biodiversity criteria and thus is an add-on to already existing screening criteria.

Category A: Environmental impact assessment mandatory:

In cases with a legal base for a mandatory EIA/SEA criteria for the proposals requiring such an EIA/SEA must be laid down. Inter alia, these criteria can themselves be based on formal legal provisions. When there is no legal base for a mandatory EIA/SEA, these criteria have to be laid down under category B.

Only Particularly in the case criteria can be based on formal legal backing, such as:

- National legislation, for example in case of impact on protected species and protected areas;
- International conventions such as CITES, the Convention on Biological Diversity, Ramsar Convention on Wetlands, etc.;
- Directives from supranational bodies, such as the European Union directive 92/43/EEC of 21 May 1992 on conservation of natural habitats and of wild fauna and flora and directive 79/409/EEC on the conservation of wild birds

Indicative list of activities for which an environmental impact assessment could be mandatory:

(a) **At the genetic level** (relates to screening question I in appendix 1 above):

- Directly or indirectly cause a local loss or serious/relevant decline of varieties of wild plants or animals as well as legally protected varieties/cultivars/[races]/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of ecological, social, scientific and economic importance e.g. by introducing living modified organisms that can transfer transgenes to legally protected varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives

(b) **At species level** (relates to screening question II and III in appendix 1 above):

- Directly affect legally protected species, for example by extractive, polluting or other disturbing activities;
- Indirectly affect legally protected species, for example by reducing its habitat, altering its habitat in such a manner that its survival is threatened, introducing predators, competitors or parasites of protected species, alien species or GMOs;
- Directly or indirectly affect all of the above for cases which are important in respect of e.g. stop-over areas for migratory birds, breeding grounds of migratory fish, commercial trade in species protected by CITES.
- Directly or indirectly affect non-legally protected, threatened species.

- (c) **At ecosystem level** (screening questions IV and V in appendix 1 above):
- Are located in legally protected areas ;
 - Are located in the vicinity of legally protected areas;
 - Have direct influence on legally protected areas, 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.

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

In cases where there is no legal basis to require an environmental impact assessment, but one can suspect that the proposed activity may have a significant impact on biological diversity, or that a limited study is needed to solve uncertainties or design limited mitigation measures. This category covers the frequently referred to but difficult to use concept of “sensitive areas” [and “hot spots”](#). As long as so-called sensitive areas [or hot spots](#) do not have any legal protected status it is difficult to use the concept in practice, so a more practical alternative is provided.

The following categories of criteria point towards possible impacts on biological diversity, and further attention is thus required:

(a) **Activities in, or in the vicinity of, or with influence on areas with legal status having a probable link to biological diversity but not legally protecting biological diversity** (*relates to all five screening questions in appendix 1 above*). For example: a Ramsar site has the official recognition of having internationally important wetland values, but this recognition does not automatically imply legal protection of biological diversity in these wetlands). Other examples include areas allocated to indigenous and local communities, extractive reserves, landscape preservation areas, sites covered by international treaties or conventions for preservation of natural and/or cultural heritage such as the UNESCO biosphere reserves and World Heritage Sites;

(b) **Impacts on biological diversity possible or likely, but the environmental impact assessment is not necessarily triggered by law:**

(i) **At the genetic level:**

- Replacing agricultural, forestry or fishery varieties or breeds by new varieties, including the introduction of living modified organisms (LMOs) (*screening questions I and II*).
- [Direct or indirect impacts on locally adapted genotypes of wild plant or animal species or essential parts of their gene pool.](#)

(ii) **At the species level:**

- All introductions of non-indigenous species (*questions II and III*);
- All activities which directly or indirectly affect sensitive or threatened species if or in case these species are not yet protected (good reference for threatened species is provided by the IUCN Red Lists); sensitive species may be endemic, umbrella species, species at the edge of their range, or with restricted distributions, rapidly declining species (*question II*). [This, however, also applies to representative or characteristic species subject to special protection responsibility.](#) Particular attention

should be given to species which are important in local livelihoods and cultures;

- All extractive activities related to the direct exploitation of species (fisheries, forestry, hunting, collecting of plants (including living botanical and zoological resources), etc.) (*question III*)
- All activities leading to reproductive isolation of populations of species (such as line infrastructure) (*question II*)

(iii) **At the ecosystem level:**

- All extractive activities related to the use of resources on which biological diversity depends (exploitation of surface and groundwater, open pit mining of soil components such as clay, sand, gravel, etc.) (*questions IV and V*);
- All activities involving the clearing or flooding of land (*questions IV and V*);
- All activities leading to pollution of the environment (*questions IV and V*);
- Activities leading to the displacement of people (*questions IV and V*);
- All activities leading to reproductive isolation of ecosystems (*question IV*);
- All activities that significantly affect ecosystem functions that represent values for society (see appendix 3 below for a list of functions provided by nature). Some of these functions depend on relatively neglected taxa;
- All activities in areas of known importance for biological diversity (*questions IV and V*), such as areas containing high diversity (hot spots), large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or which are representative, unique (e.g. where rare or sensitive species occur) or associated with key evolutionary or other biological processes.

Category C: no environmental impact assessment required

Activities which are not covered by one of the categories A or B, or are designated as category C after initial environmental examination.

The generic nature of these guidelines does not allow for the positive identification of types of activities or areas where environmental impact assessment from a biodiversity perspective is not needed. At country level, however, it will be possible to indicate geographical areas where biological diversity considerations do not play a role of importance and, conversely, areas where they do play an important role (biodiversity-sensitive areas).

INDICATIVE LIST (NON-EXHAUSTIVE) OF EXAMPLES OF FUNCTIONS OF THE NATURAL ENVIRONMENT THAT ARE DIRECTLY (FLORA AND FAUNA) OR INDIRECTLY (SERVICES PROVIDED BY ECOSYSTEMS SUCH AS WATER SUPPLY) DERIVED FROM BIOLOGICAL DIVERSITY.

Since normally not all various functions can be fulfilled at the same time, frequently the necessity will have to be faced to weigh up the functions in the individual case. Thus, it must be ensured that impacts are considered and evaluated equally for all functions within the scope of EIA in order to allow for correct decision making.

Functions linked with significant adverse impacts on other functions or not depending on biological diversity (e.g. carrying functions, suitability for industry) should rather be taken off the list.

Production functions

Natural production

- Timber production
- Firewood production
- Production of harvestable grasses (construction & artisanal use)
- Naturally produced fodder & manure
- Harvestable peat
- Secondary (minor) products
- Harvestable bush meat (food)
- Fish and shellfish productivity
- Drinking water supply
- Supply of water for irrigation and industry
- Water supply for hydroelectricity
- Supply of surface water for other landscapes
- Supply of ground water for other landscapes

Nature-based human production

- Crop productivity
- Tree plantations productivity
- Managed forest productivity
- Rangeland/livestock productivity
- Aquaculture productivity (freshwater)
- Mariculture productivity (brackish/saltwater)

Carrying functions

- Suitability for constructions
- Suitability for indigenous settlement
- Suitability for rural settlement

- Suitability for urban settlement
- Suitability for industry
- Suitability for infrastructure
- Suitability for transport infrastructure
- Suitability for shipping / navigation
- Suitability for road transport
- Suitability for rail transport
- Suitability for air transport
- Suitability for power distribution
- Suitability for use of pipelines
- Suitability for leisure and tourism activities
- Suitability for nature conservation

Processing and regulation functions

Land-based processing and regulation functions

- Decomposition of organic material (land based)
- Natural desalinization of soils
- Development / prevention of acid sulphate soils
- Biological control mechanisms
- Seasonal cleansing of soils
- Soil water storage capacity
- Coastal protection against floods
- Coastal stabilization (against accretion / erosion)
- Soil protection

Water related processing and regulation functions

- Water filtering function
- Dilution of pollutants function
- Discharge of pollutants function
- Flushing / cleansing function
- Bio-chemical/physical purification of water
- Storage for pollutants function
- 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

Air-related processing and regulation functions

- Filtering of air
- Carry off by air to other areas
- Photo-chemical air processing (smog)
- Wind breaks
- Transmission of diseases
- Carbon sequestration

Biodiversity-related regulation functions

- Maintenance of genetic, species and ecosystem composition
- Maintenance of horizontal and vertical spatial structure, and of temporal structure
- Maintenance of key processes for structuring or maintaining biological diversity
- Maintenance of pollinator services

Signification functions

Cultural/religious/scientific/landscape functions

BIODIVERSITY CHECKLIST ON SCOPING FOR THE IDENTIFICATION OF THE IMPACTS OF PROPOSED PROJECTS ON COMPONENTS OF BIODIVERSITY (NOT EXHAUSTIVE).

COMPONENTS OF BIOLOGICAL DIVERSITY				
	<i>Composition</i>	<i>Structure (temporal)</i>	<i>Structure (spatial: horizontal and vertical)</i>	<i>Key processes</i>
Genetic diversity	<ul style="list-style-type: none"> ▪ Minimal viable population (avoid destruction by inbreeding / gene erosion) ▪ Local cultivars. ▪ Living modified organisms. 	<ul style="list-style-type: none"> ▪ Cycles with high and low genetic diversity within a population. 	<ul style="list-style-type: none"> ▪ Dispersal of natural genetic variability ▪ Dispersal of agricultural cultivars. 	<ul style="list-style-type: none"> ▪ Exchange of genetic material between populations (gene flow) ▪ Mutagenic influences ▪ Intraspecific competition
	<ul style="list-style-type: none"> ▪ <u>Number of species fitting to natural landscape units</u> ▪ Species composition, genera, families etc, rarity / abundance, endemism, <u>characteristic species/ -alien species</u> ▪ <u>Special protection responsibility</u> ▪ Population size and trends ▪ Known key species (essential role) ▪ Conservation status ▪ <u>Degree of endangering particularly sensitive species to anthropogenic impacts</u> 	<ul style="list-style-type: none"> ▪ Seasonal, lunar, tidal, diurnal rhythms (migration, breeding, flowering, leaf development, etc.) ▪ Reproductive rate, fertility, mortality, growth rate. ▪ Reproductive strategy. 	<ul style="list-style-type: none"> ▪ Minimal areas for species to survive. ▪ Essential areas (stepping stones) for migrating species. ▪ Niche requirements within ecosystem (substrate preference, layer within ecosystem) ▪ Relative or absolute isolation 	<ul style="list-style-type: none"> ▪ Regulation mechanisms such as predation, herbivory, parasitism,. ▪ Interactions between species. ▪ Ecological function of a species
<p>Species diversity should be interpreted with respect to the natural habitat type and site potential</p>				
<p>LEVELS OF BIOLOGICAL DIVERSITY</p>				

	<ul style="list-style-type: none"> ▪ Types and surface area of ecosystems ▪ Uniqueness / abundance ▪ Protection responsibility ▪ Succession stage, existing disturbances and trends (=autonomous development) ▪ Differentiation of the cenosis according to site potential 	<ul style="list-style-type: none"> ▪ Adaptations to / dependency <i>on</i> regular rhythms: seasonal ▪ Adaptations to / dependency of <i>on</i> irregular events: droughts, floods, frost, fire, wind ▪ Succession (rate) 	<ul style="list-style-type: none"> ▪ Spatial relations between landscape elements (local and remote) ▪ Spatial distribution (continuous or discontinuous / patchy); ▪ Minimal area for ecosystem to survive. ▪ Vertical structure (layered, horizons, stratified). 	<ul style="list-style-type: none"> ▪ Structuring process(es) of key importance for the maintenance of the ecosystem itself at a favourable conservation status or for other ecosystems (For example: ecosystem processes e.g. element cycling, energy flow, succession and natural disturbance).
Ecosystem diversity				

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