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INDICATORS AND ENVIRONMENTAL IMPACT ASSESSMENT

Impact assessment: Further development of guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment

Note by the Executive Secretary

Executive summary

The present note has been prepared in response to decision V/18 of the Conference of the Parties to the Convention on Biological Diversity, in which the Conference of the Parties requested the Subsidiary Body on Scientific, Technical and Technological Advice to further develop guidelines for incorporating biodiversity considerations into procedures and processes of environmental impact assessment (EIA) and strategic environmental assessment (SEA) and to further elaborate the application of the precautionary approach and the ecosystem approach, taking into account needs for capacity-building.

Environmental impact assessment is a process of evaluating the likely environmental and socio-economic impacts of a proposed project or development. Strategic environmental assessment is the formalized, systematic and comprehensive process of identifying and evaluating the environmental consequences of proposed policies, plans or programmes.

Environmental impact assessment processes are in place and applied in over 100 countries, but biodiversity considerations are often inadequately addressed. There is growing recognition of this and actions to correct this problem. The way biodiversity is incorporated in EIA procedures varies. Important barriers to incorporation of biodiversity in EIA include low priority for biodiversity and lack of: capacity to carry out the assessments; awareness of biodiversity values; adequate data; and post-project monitoring.

* UNEP/CBD/SBSTTA/7/1.

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Strategic environmental assessments have high potential for addressing biodiversity in planning and decision-making, but there are challenges to their application.

Draft guidelines on the incorporation of biodiversity considerations into environmental impact assessment and strategic environmental assessment are proposed. A particular focus is given to the first two stages of the impact assessment, namely screening and scoping. Finally, it is suggested that through legislative authority, capacity building, public participation, the use of incentive measures, regional cooperation to develop criteria and indicators, awareness raising and exchange of information on best practices, biological diversity considerations can be incorporated into environmental impact assessment so that environmental issues are considered on a par with socio-economic and political factors relating to project development as well as national policies and programmes.

Suggested recommendations

The Subsidiary Body on Scientific, Technical and Technological Advice may wish to recommend that the Conference of the Parties

(a) *Adopt* the draft guidelines for incorporating biodiversity-related issues into environmental impact assessment (EIA) legislation and/or processes and in strategic environmental assessment contained in section III C of the present note as interim guidelines.

(b) *Urge* Parties, other Governments and organizations to apply them as appropriate in the context of their implementation of paragraph 1 of Article 14 of the Convention and share their experience, *inter alia*, through the clearing house mechanism and national reporting; and

(c) *Request* the Executive Secretary to compile and disseminate 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; in light of this information, to further develop and refine the guidelines, particularly to incorporate all stages of the EIA and strategic environmental assessment processes; and to provide a report of this work to SBSTTA prior to the seventh meeting of the Conference of the Parties.

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I. INTRODUCTION

1. At its fifth meeting, the Conference of the Parties considered the cross-cutting issue of environmental impact assessment and, through its decision V/18, paragraph 5, requested the Executive Secretary to compile and evaluate existing guidelines, procedures and provisions for environmental impact assessment together with information on existing guidelines on incorporating biological diversity considerations into environmental impact assessment and make this information available in order to facilitate sharing of information and exchange of experiences at the regional, national and local levels.

2. In paragraph 4 of the same decision, the Conference of the Parties requested the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) to further develop guidelines for incorporating biodiversity-related issues into legislation and/or processes on strategic environmental assessment, in collaboration with relevant stakeholders, and to further elaborate the application of the precautionary approach and the ecosystem approach, taking into account needs for capacity-building, with a view to completion by the sixth meeting of the Conference of the Parties.

3. In response to the request of the Conference of the Parties and to facilitate the work of SBSTTA, the present note has been prepared by the Executive Secretary, in consultation with the Biodiversity and Ecology Section of the International Association for Impact Assessment (IAIA) and includes comments from IUCN—The World Conservation Union and a number of experts contacted individually. Section II provides some lessons learned from existing guidelines, procedures and provisions for environmental impact assessment and strategic environmental assessment with respect to impacts on biological diversity. Section III presents a framework for integrating biodiversity into impact assessments, taking into account the guidance from the Convention on Biological Diversity and the Conference of the Parties and existing guidelines in the national instruments.

II. LESSONS LEARNED FROM ENVIRONMENTAL IMPACT ASSESSMENT AND STRATEGIC ENVIRONMENTAL ASSESSMENT PROCEDURES WITH RESPECT TO BIOLOGICAL DIVERSITY CONSIDERATIONS

A. Background and definitions

4. Paragraph 1 of Article 14 of the Convention identifies impact assessment as a key instrument for achieving the conservation, sustainable use and equitable sharing objectives of the Convention. Impact assessment also has a potential part to play in implementing a number of other Articles of the Convention. In paragraph 5 of decision IV/10 C, the Conference of the Parties recommended that appropriate issues related to environmental impact assessment be integrated into, and become an integral part of relevant sectoral and thematic issues under its programme of work. Furthermore, at its fifth meeting, the Conference of the Parties invited Parties, Governments and other organizations to act at the national level to address biodiversity concerns in the environmental impact assessment process. Parties have also been encouraged to assess not only the impacts 1/ of individual projects, but also their cumulative and global effects through strategic environmental assessment, incorporating biodiversity considerations at the environmental planning level and/or decision-making.

1/ Impacts can refer to: positive and negative impacts; temporary and permanent impacts; past, present and future impacts; cumulative impacts arising over time or in combination with other impacts; potential and actual impacts.

5. Environmental impact assessment is a process of evaluating the likely environmental and socio-economic impacts, both beneficial and adverse, of a proposed project or development. Though varied in legislation and practice around the world, the fundamental components of an environmental impact assessment involve the following stages (see figure 1 on page 8 below):

(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, and to derive terms of reference for the impact assessment;

(c) Impact assessment to predict and identify the likely environmental and socio-economic consequences of the project proposal;

(d) Identifying mitigation measures (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);

(e) Deciding whether to approve the project or not; and

(f) 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.

6. Individual countries may redefine the steps in the procedure to their needs and requirements as befits their institutional and legal setting. 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.

7. 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 they are fully included and appropriately addressed at the earliest possible stage of decision-making on a par with economic and social considerations. 2/ 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, 3/ but the 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.

2/ Based on Sadler and Verheem, 1996

3/ Saddler and Verheem, 1996; South Africa, 2000; Nierynck, 1997 ; Nooteboom, 1999.

B. Biodiversity considerations in guidelines, procedures and provisions for environmental impact assessment and strategic environmental assessment

1. Biodiversity considerations in environmental impact assessments

8. This section focuses on the extent to which biodiversity is currently addressed in guidelines or procedures for environmental impact assessment and strategic environmental assessment, based on the main findings from studies 4/ carried out in the past few years.

9. Environmental impact assessment processes are in place and applied in over 100 countries around the world but biological diversity considerations are often inadequately addressed in practice. Growing recognition of this has prompted many countries to revise existing legislation and provide additional guidance in light of the possible impacts of proposed projects on their biological resources. Many countries, with few exceptions such as Sri Lanka and Bhutan, 5/ incorporate the concept of biodiversity in the definition of the term "environment", which includes resources such as land, water, air, organic and inorganic matters, as well as living organisms that do constitute components of biological diversity.

10. Countries differ with respect to incorporation of biodiversity values in their environmental impact assessment procedures. Some make relatively rigid distinctions between physical impacts, social impacts, and impacts on biological diversity; and consider only the non-use values of biological diversity (limited, for example, to the impacts on endangered species), often resulting in separate biodiversity impact assessment studies. Others interpret biological diversity in the broad sense, considering both 'use' and 'non-use' values and incorporating them into integrated environmental impact assessment studies (e.g., South Africa, 6/ New Zealand). There is no single procedure for integration of biodiversity issues into environmental impact assessment. There is much guidance available, but none that has proved universally applicable.

Shortcomings in current environmental impact assessments with respect to the integration of biodiversity

11. It is generally accepted that environmental impact assessment in practice fails to address adequately all three levels of biodiversity recognized by the Convention on Biological Diversity (ecosystems, species and genes): 7/

(a) Most environmental impact assessment guidelines do not mention genetic resources despite the fact that most biosafety regulations and Article 15 of the Cartagena Protocol on Biosafety, which is yet to enter into force, call for risk (impact) assessments of living modified organisms (LMOs) prior to their release into nature for use in agriculture, aquaculture and forestry. However, these assessments often fail to address the wider social and environmental consequences of LMO releases. Impacts at the genetic level are difficult to assess. Nevertheless, significant negative impacts at the genetic level can occur, and include losses of valuable wildlife species. This oversight in environmental impact assessment guidelines may be due to the fact that impacts at the genetic level are difficult to

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4/ For example the results of workshops organized by GTZ reported in UNEP/CBD/COP/5/INF/34; Anneveldt and Pasman, 2001; Treweek and Zanewich, 2001., Bagri *et al.*,1998; Le Maitre and Gelderblom, 1998.

5/ Anneveldt and Pasman, 2001

6/ David Le Maitre, personal communication

7/ Mainly from Treweek and Zanewich, 2001, UNEP/CBD/COP/5/34 and Bagri *et al.*, 1998

assess. Yet negative impacts at the genetic level are important because they can lead to various losses of valuable components of biological diversity including valuable wildlife species (e.g. through hybridization, transgenic pollution, disease); endemic species (e.g. endemic races or cultivars replaced by introduced crops or removed for other forms of development); species with potential future value for medicine, new agricultural crops, new breeds of livestock; disease resistance; 'elite trees' through poorly regulated logging of forests with consequent loss of future production; local tree provenances; and microbial associations essential for viability or production (e.g. mycorrhizal associations or soil microbial associations); 8/

(b) Environmental impact assessment analyses most commonly focus on the species level because, among other reasons, the concept of a 'species' as a unit of biodiversity is relatively easily understood. It should be noted, however, even for well-known "flagship" or "emblematic" species, the information needed to make reliable predictions in environmental impact assessment is not always available. In addition, environmental impact assessments often neglect certain taxa (particularly micro-organisms, soil invertebrates, and lichens, which are valuable indicators of air pollution). 9/ Lists of protected species and habitats, information about sensitive areas, Red Data Books or Red Lists of threatened and endangered species are widely available for flagging cases in which biodiversity might be an important issue. However, in general environmental impact assessments remain poor at providing meaningful analysis of the outcomes of development for species 10/ and a number of guidelines mention key communities and/or species and habitats, in one way or another, but not aspects to be studied during the environmental impact assessment process. 11/ Improving knowledge and information about species through work such as that of the Global Taxonomic Initiative and ensuring this information is readily available to practitioners of environmental impact assessments is one step Parties can take in overcoming these hurdles. Additionally, practitioners should be encouraged to use established and credible rapid assessment techniques;

(c) Ecosystem-level impacts are difficult to analyse on a project-by-project basis but may be the most significant consequence of development activities as impacts at the ecosystem level may result in important changes in the life-support system for humans as well as other species. Cumulative impacts of a number of smaller projects making relatively small impacts on an ecosystem over time and changes resulting from global issues such as climate change are complicating factors for addressing ecosystem impacts at the level of environmental impact assessments. Nonetheless, practitioners of environmental impact assessment can use resources such as the Global Land Cover Characterization 12/ to start to identify ecosystem impacts. . By taking an ecosystem approach it should be possible to ensure that the environmental impact assessment process does evaluate impacts on biodiversity at all relevant scales of analysis.

8/ Treweek and Zanewich, 2001

9/ Treweek and Zanewich, 2001

10 / reweek and Zanewich, 2001

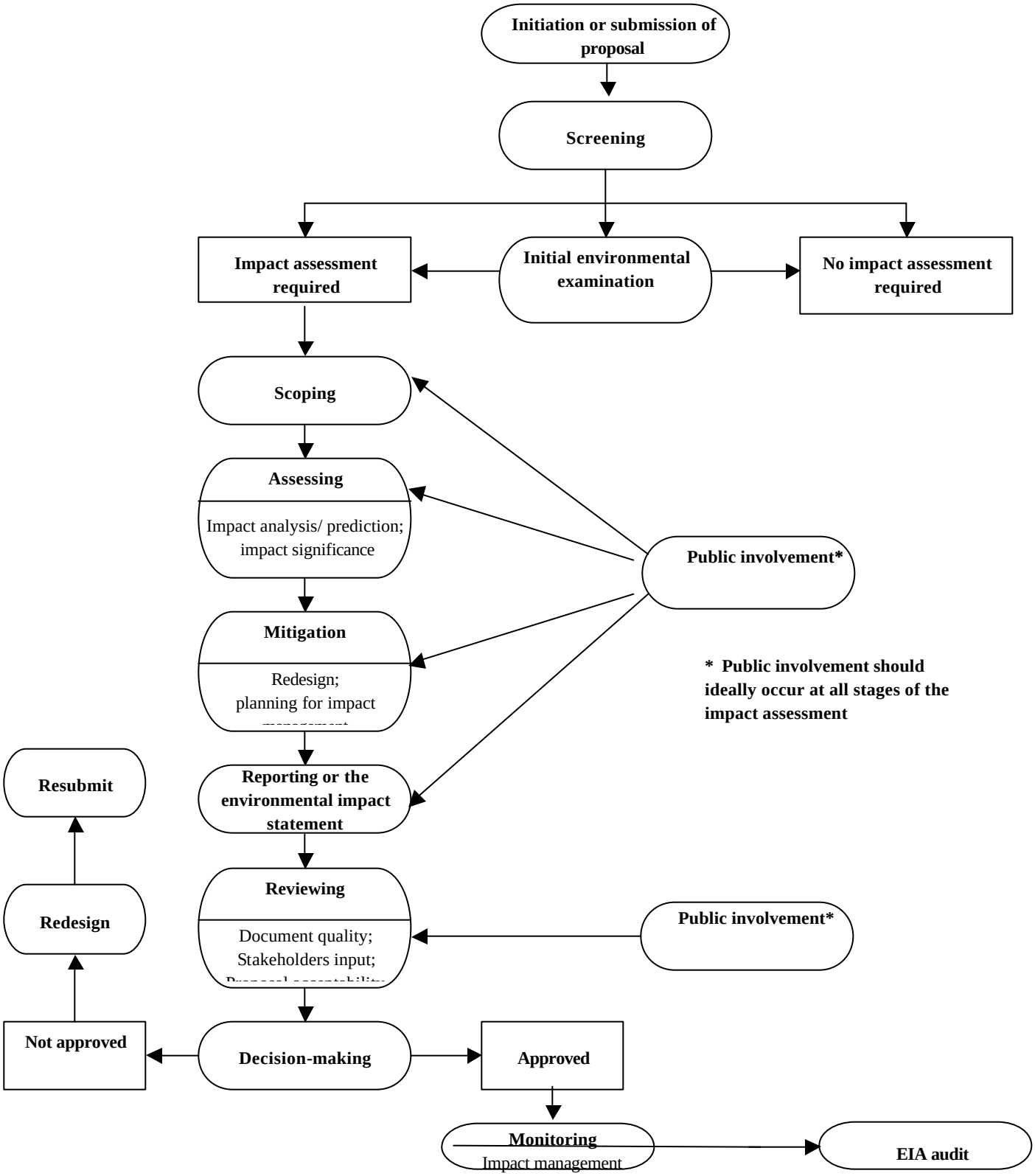
11/ Anneveldt and Pasman, 2001

12/ http://edcdaac.usgs.gov/glcc/background.html.

Figure 1

FLOWCHART OF KEY STEPS IN THE ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE

(Modified from UNEP, 1996 cited by Anneveldt and Pasman, 2001 and Bagri *et al.*, 1998)



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12. For each stage in the environmental impact assessment process different types of information on biodiversity may be required, adding complexity to the full integration of biodiversity in environmental impact assessment. 13/ The following paragraphs provide a brief overview of what is generally covered in the environmental impact assessment processes which address biodiversity and some of the remaining gaps:

(a) *Screening*. Lists of protected species and habitats, red lists and information about sensitive areas are generally used to screen projects but these do not always include those species that are important in local livelihood and cultures. Furthermore, screening based on project size (the most common criteria) excludes small projects which may have insignificant impacts on biodiversity in isolation, but which constitute a significant collective threat to biodiversity. This is partly due to lack of ecosystem-level and cumulative effect indicators as triggers and evaluation criteria for environmental impact assessment and partly due to the common absence of biodiversity experts in environmental impact assessment teams;

(b) *Scoping*. Scoping for project-level environmental impact assessment often fails to ensure that regional or landscape-level impacts on biodiversity are considered. Ecosystem functions are often omitted and there is insufficient focus on peoples' values. Evaluation criteria are currently under-developed for biodiversity at the ecosystem-level and thus are often not taken into account during scoping. Lead-times are too short to collect biodiversity data where they do not already exist, so baseline ecosystem conditions may not be well defined or understood, and biodiversity issues may not be sufficiently clear-cut to be identified at the scoping phase. Also, linked or connected projects are not assessed in their entirety;

(c) *Impact analysis and significance*. Impacts on biodiversity cannot be predicted without reliable baseline information. Biodiversity baseline information is lacking in many countries, and environmental impact assessment budgets often do not enable the necessary data to be obtained to predict impacts. There is also a methodological deficiency: it is often not clear which data are relevant as indicators for measuring the impacts on biodiversity and how they can serve in the decision-making process. In most countries, many developments that might affect biodiversity are completely unregulated or do not undergo any form of environmental assessment prior to development consent being given. Impacts on biodiversity caused by unregulated development are difficult to estimate, but may be considerable. 14/ Little information is available for evaluating the significance of any identified impacts on biodiversity;

(d) *Mitigation*. On-site mitigation options are often limited and small implementing and executing agencies may lack the necessary expertise for biodiversity mitigation. Additionally, mitigation measures are often allocated insufficient funding making management of biodiversity in perpetuity impossible. When identifying mitigation options a basic rule of thumb for biodiversity is the desirability of achieving no-net-loss of an ecosystem's total area, functions, and quality. Thus when considering mitigation measures (including avoidance) priority should be given to mitigation of impacts related to high risk species or habitats (i.e., species where extinction is imminent, habitat where loss is irreversible, or losses which have expensive consequences). More lenient mitigation measures such as rehabilitation or restoration can be applied to impacts on stable, increasing, common or replaceable ecosystems, habitats or species;

(e) *Public participation*. Communication with key stakeholders at each level of the environmental impact assessment can help ensure that the range of values and uses of biodiversity are

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13/ Mainly from the information document provided by Germany for the fifth meeting of the Conference of the Parties (UNEP/CBD/COP/5/INF/34).

14/ Treweek and Zanewich, 2001

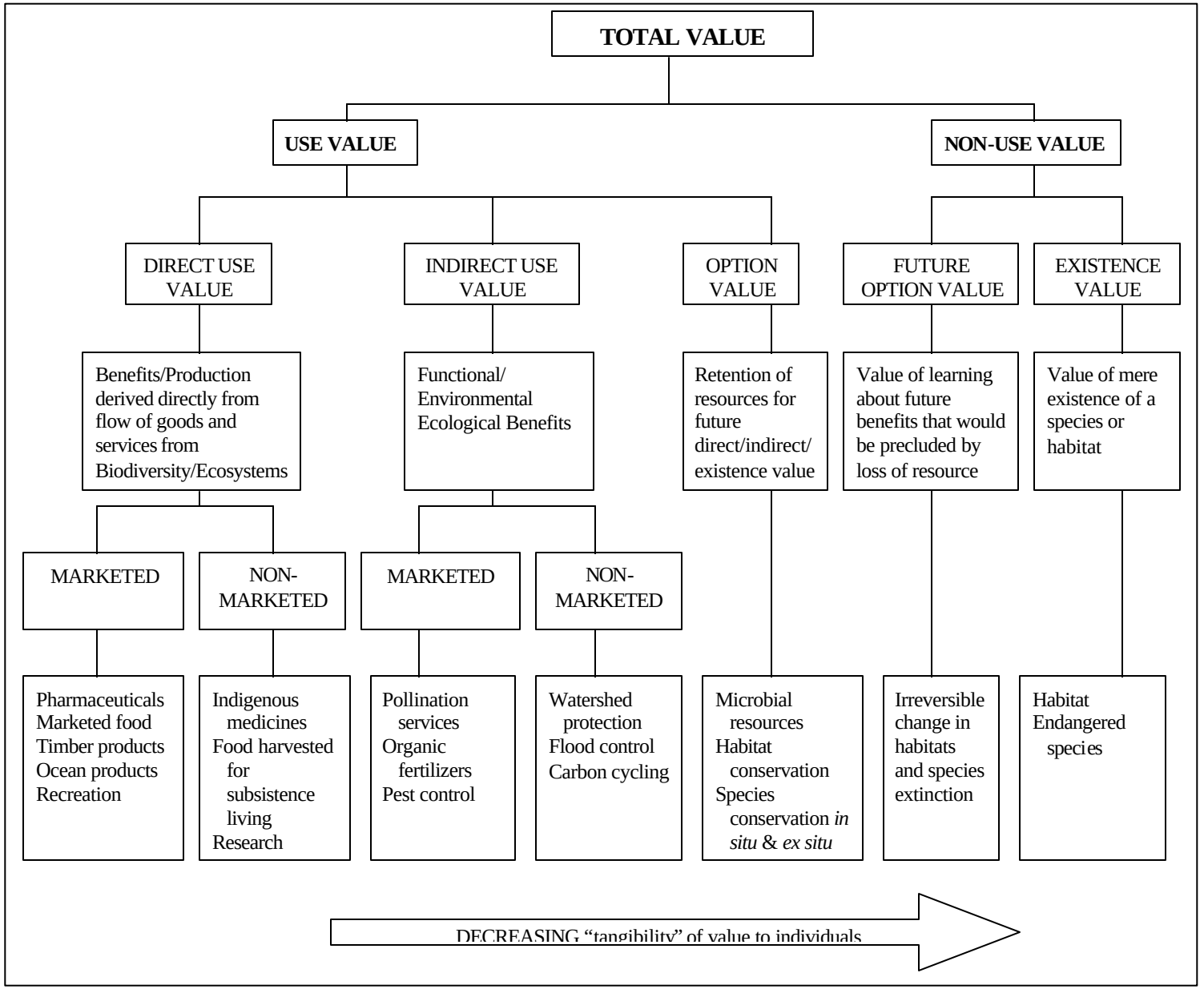
identified and addressed. At the screening, scooping, impact analysis and significance stages, local and indigenous communities, competent authorities, and scientific experts often hold valuable knowledge about the traditional and potential uses of biodiversity as well as the likely consequences of impacts from a project. At the mitigation stage, these communities may have insights about appropriate and effective mitigation strategies including alternatives and possible compensation measures. Unfortunately, public-participation processes, and in particular those involving local communities, are often poor and, when carried out, tend to be based on providing stakeholders with information about the project rather than creating a dialogue where information is exchanged in both directions. Biodiversity issues can only be introduced and made a subject of the assessment if there is a broad, common understanding of biodiversity values. In developing countries for instance where the livelihoods of rural people are often closely linked to biodiversity, new development projects (e.g., replacing a floodplain system by permanent irrigation and replacing traditional crops with high-yielding varieties) are not always to the advantage of either local people or biodiversity;

(f) *Review*. Existing methods for review do not necessarily take specific account of biodiversity. There is a widespread failure to follow up or monitor the effectiveness of environmental impact assessment in safeguarding biodiversity. For example, mitigation measures should be monitored to ensure, they are implemented effectively and to provide opportunities to modify them if they are not working. 15/

15/ See UNEP/CBD/COP/5/INF/34

Figure 2

USE AND NON-USE VALUE OF BIOLOGICAL DIVERSITY



Constraints in integrating biodiversity in environmental impact assessment procedures

13. In summary, the most important, often interlinked, barriers to incorporation of biodiversity with environmental impact assessment 16/ include lack of:

(a) Capacity to collect up-to-date information on biodiversity, evaluate biodiversity impacts, review the implications of proposals for biodiversity, follow-up developments post-implementation and inadequate or absence of legislation to back environmental impact assessment procedures;

(b) Awareness of needs for biodiversity conservation, the value of biodiversity, and the threats to its viability;

(c) Reliable, accessible and affordable up-to-date data on biodiversity distributions, status and threats. The general "taxonomic impediment" has been recognized;

(d) Follow-up or post project monitoring. For biodiversity considerations this is a particular problem, due to the inherent complexity of ecosystems and the acknowledged uncertainty of predictions;

(e) Concern for biodiversity/ biodiversity issues which are given low priority compared with other over-riding concerns, for example economic imperative. 17/

2. Biodiversity considerations in strategic environmental assessment

14. Strategic environmental assessment provides a structured process of analysing the economic, social and ecological impacts of programmes, plans and policies and of identifying alternative economic incentives for conserving and wisely or sustainably using ecosystems. By its nature, strategic environmental assessment can address the cumulative impacts of projects, the issue of induced impacts (where one project stimulates other development), synergistic impacts (where the impact of several projects exceeds the sum of the individual project impacts), and global impacts such as biodiversity loss and climate change.

15. Strategic environmental assessment is becoming an accepted and widely used instrument for integrating environmental issues into the formulation of policies, plans and programmes. 18/ Current experience relates primarily to strategic environmental assessment at the planning and programme level, although it can also be applied at policy level. It is also becoming apparent that the application of strategic environmental assessment to policies uses different methodologies to those for plans and programmes.

16. The Convention on Biological Diversity recognizes the importance of integrating conservation and sustainable use objectives into sectoral planning and policy processes. This need emerges from a recognition that biodiversity loss at the genetic and species levels, as well as at the ecosystem level, is largely caused by human activities in sectors such as tourism, industry, agriculture, fisheries, forestry and mining.

17. Strategic environmental assessment provides a potentially adequate framework for incorporating biodiversity issues into planning and decision-making. This has been recognized by a

16/ Modified from Treweek and Zanewhich (2001).

17/ Treweek and Zanewich, 2001.

18/ South Africa, 2000; Nierynck, 1997.

number of countries. 19/ However, there are challenges in the application of strategic environmental assessment for biodiversity conservation and sustainable use, 20/ some of which are generic to strategic environmental assessment, such as developing links between strategic environmental assessment and development planning; coordination between various institutional structures; and provision of baseline information. 21/ Strategic environmental assessment has progressed through the legislative process slowly. The nature of policy, plan and programme processes makes it difficult to apply a structured process of analysis to determine their potential impacts and possible mitigation measures. Additionally, there has been some debate about the level of policies, plans or programmes to which strategic environmental assessment should be applied – whether to the whole range or only to those policies, plans or programmes that require consent and therefore go through an approval process.

18. However, the potential strengths of strategic environmental assessment in the consideration of biodiversity include: (i) allowing environmental issues to be considered earlier in decision-making; (ii) enabling the identification of conflicting objectives within policies; (iii) identifying responsibilities for environmental protection; (iv) setting the context for lower-level assessments (such as environmental impact assessment of projects); (v) considering non-project related impacts; (vi) enabling the meaningful consideration of alternatives; (vii) providing baseline information for lower-level assessments; and (viii) reducing the time and cost needed at the lower assessment level. This last point is particularly interesting when considering the linkages between impact assessment and assessment processes. Not only can strategic environmental assessments provide a baseline for environmental impact assessment data collection and monitoring, but they can also establish common collection and monitoring techniques so that information collected by one environmental impact assessment can be useful for other such assessments as well as feed into ongoing biodiversity assessment processes. As such, strategic environmental assessment provides one possible approach to overcome some of the limitations of project-based environmental impact assessment and also to implement the ecosystem approach for assessing impacts, both sectorally and regionally, on biodiversity.

III. ELEMENTS FOR THE FURTHER DEVELOPMENT OF DRAFT GUIDELINES FOR INCORPORATING BIODIVERSITY CONSIDERATIONS INTO ENVIRONMENTAL IMPACT ASSESSMENT AND STRATEGIC ENVIRONMENTAL ASSESSMENT PROCEDURES

A. Guidance from the Convention on Biological Diversity

19. Article 14 of the Convention on Biological Diversity 22/ requires each Party, as far as possible and as appropriate:

(a) To introduce appropriate procedures requiring environmental impzct assessment of proposed projects that are likely to have significant adverse effects on biological diversity with a view

19/ Examples include the European Union (EIA Directive 85/337/EEC as amended 97/11/EC with the proposal for an SEA Directive (COM 96/511 and COM 99/73)); New Zealand (e.g. Resource Management Act 1991 and Hazardous Substances and New Organisms Act 1991) , Canada (The 1999 Cabinet Directive on Environmental Assessment Policy, Plan and Program Proposals at http://www.ceaa.gc.ca/0011/0002/dir_e.htm), Benin (see Bouchard, 2000).

20/ See a synthesis in Bouchard, 2000.

21/ South Africa, 2000.

22/ In harmony with principle 17 of the Rio Declaration on Environment and Development, which states that: "Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority."

to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures (paragraph 1 (a));

(b) To introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account (paragraph 1 (b)); and

(c) To promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under its jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate (paragraph 1 (c)).

20. To meet the objectives of Article 14, it is necessary to consider also the provisions of other substantive articles of the Convention relevant to impact assessment, 23/ taking into account the sovereign rights of each State and the responsibility to ensure that activities within one State's jurisdiction do not cause damage to the environment of areas beyond national jurisdiction (Articles 3 and 4 of the Convention). These articles contains requirements that will enable Parties to develop methods, gather information, take legislative, administrative and policy measures, and develop the necessary framework that will facilitate the incorporation of biodiversity considerations into procedures for environmental impact assessments and strategic environmental assessment.

B. Guidance from the Conference of the Parties

21. The Conference of the Parties has referred to paragraph 1 of Article 14 of the Convention on Biological Diversity in a number of decisions. It has invited Parties, Governments and other relevant organizations to implement this article in conjunction with other provisions of the Convention. In its decision V/18, the Conference of the Parties encourages Parties, other Governments and relevant organisations to address loss of biological diversity comprehensively in its interrelation with socio-economic, cultural and human-health aspects relevant to biological diversity; to assess not only impacts of individual projects, but also their cumulative and global effects through strategic environmental assessment so as to consider biological diversity concerns 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 to ensure the participation of interested and affected stakeholders in all stages of the assessment, and to ensure their information and education to enhance their awareness of the issues and the development of local expertise in environmental impact assessment.

22. Underscoring the importance of data and expertise required for environmental impact assessment, the Conference of the Parties, in its decision IV/10 C (Impact assessment and minimizing adverse effects), invited Parties, Governments, national and international organizations, and indigenous and local communities embodying traditional lifestyles, to make information available to the Executive Secretary for the purpose of exchanging information and sharing experiences on all aspects of environmental assessment relevant to biodiversity.

23. In its decision V/6 (Ecosystem approach), the Conference endorsed the description of the ecosystem approach and operational guidance and called Parties, other Governments and international organisations to apply it as the primary framework of any action to be taken including any activity or measure that may have an effect on biodiversity, consistent with the Convention definition of

23/ Modified from Athanas and Treweek, 2001

"ecosystem". 24/ In this view, this strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way provides an important framework for the integration of biodiversity in environmental impact assessment and strategic environmental assessment. It focuses on structure, processes, functions and interactions among components of biological diversity. The ecosystem approach comprises twelve principles and five points proposed as operational guidance.

24. In addition, the Conference of the Parties has invited Parties, Governments and other relevant organizations in a number of decisions to integrate environmental impact assessment into the Convention's work programmes on thematic areas and cross-cutting issues.

C. Draft guidelines for incorporating biodiversity considerations into environmental impact assessment and strategic environmental assessment procedures

1. Purpose and approach

25. 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. 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, mitigation, evaluation and monitoring, and into strategic environmental assessment.

26. 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, animals and micro-organisms are considered at the genetic, species/community and ecosystem/habitat levels, and also in terms of ecosystem structure and function.

27. 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.

28. 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 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 Convention on Environmental Impact Assessment in a Transboundary Context; the United Nations Convention on the Law of the Sea; the

24/ Under the Convention, "ecosystem" means "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit".

European Union directives on environmental impact assessment, and the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources.

2. Biodiversity issues at different stages of environmental impact assessment

(a) Screening

29. 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.

30. A legal requirement for environmental impact assessment on environmental grounds does not guarantee that biological diversity will be taken into account. Biodiversity criteria have to be explicitly incorporated into existing or new screening criteria.

31. 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 simply required, for others an expert judgement is needed to determine the need for an environmental impact assessment.

32. 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;

(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.

33. How to use these guidelines?

(a) Countries with a positive list identifying projects requiring environmental impact assessment should use annexes 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, professionals make screening decisions, often using "mini environmental impact assessment" to come to this decision.

These guidelines, its annexes and other guidelines such as the information document submitted by the International Association for Impact Assessment (IAIA) 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 defendable decision. For biodiversity, thematic guidelines could be developed, 25/ sector guidelines need to be reviewed on biodiversity considerations.

The screening criteria

34. 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, species patterns, breeding sites, or areas with species of high genetic value.

35. 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 (see figure 2 on page 11 above showing the use and non-use values of biodiversity).

36. 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. 26/ Annex II below presents a generic list of criteria, intended to be a practical reference for further in-country development of criteria.

Pertinent questions for screening

37. 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:

25/ Some concrete targets are proposed in the note by the Executive Secretary on a proposal for a global strategy for plant conservation (UNEP/CBD/SBSTTA/7/10).

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

(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 27/ 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?

38. To facilitate the development of criteria, the questions above have been reformulated for the three levels of diversity, reproduced in annex I below.

(b) Scoping

39. Scoping narrows the focus of the broad issues found to be significant during the screening stage. It is used to derive terms of reference (sometimes referred to as guidelines) for environmental impact assessment. 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.

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

41. 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:

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

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

(c) Describe biophysical changes that result from social change processes as a result of the proposed project;

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

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

(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 of biological diversity provided by the ecosystems or land-use types and determine the values these functions represent for society (see annex III for an indicative list of functions);

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

(i) For each alternative, define mitigation and/or compensation measures to avoid or counteract the expected impacts;

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

(k) 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.

42. 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).

43. 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

44. Environmental impact assessment should be an iterative process of assessing impacts, redesigning 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 causes of the impacts (impact analysis and assessment). Identification and description of relevant criteria for decision-making can be an essential element of this period;

(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.

45. 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.

(d) Consideration of mitigation measures

46. 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 which are greater than the benefits which accrue to them. 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, generally involving monetary payments for damage caused by the project).

(e) Reporting: the environmental impact statement (EIS)

47. The environmental impact statement 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. 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

48. 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. 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.

49. Public involvement, including minority groups (women, poor, indigenous, ethnic minorities), is important in various 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.

50. 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.

(g) Decision-making

51. Decision-making 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 choice about whether or not the proposal is to proceed, and under what conditions. If rejected, the project can be redesigned and resubmitted.

52. The precautionary approach should be applied in decision-making in case of uncertainty in knowledge of the impacts and their significance. Decision-making should be designed to adjust to the unknown/unexpected, rather than to act on the basis of a belief in certainties.

(h) Monitoring and environmental auditing

53. 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 optimising 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.

54. An environmental audit is an independent examination and assessment of a project's (past) performance and is part of the evaluation of the environmental management plan.

3. Incorporation of biodiversity considerations in strategic environmental assessments

55. 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.

56. 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

57. 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, 28/ conservation biology, ecology, and traditional knowledge is required as well as local expertise in methodologies, techniques and procedures. Ideally environmental impact assessments should involve ecologists with extensive knowledge on the relevant ecosystem(s) in the assessment team.

58. It is also recommended to develop training workshops on biodiversity and environmental impact/strategic environmental assessment for both assessment practitioners and biodiversity specialists 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.

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

(b) Legislative authority

60. 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 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

61. 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.

(d) Incentives

62. 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. 29/

(e) Cooperation

63. 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.

28/ See the Global Taxonomy Initiative and the proposed programme of work (decision V/9 of the Conference of the Parties and SBSTTA recommendation VI/6)

29/ UNEP/CBD/COP/4/20 and UNEP/CBD/SBSTTA/4/10.

64. As a follow-up to the implementation of decision IV/10 C of the Conference of the Parties, collaboration between this Convention 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.

65. 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.

66. 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, case-study assessments. 30/

30/ See UNEP/CBD/COP/5/INF/34

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Annex I

QUESTIONS PERTINENT TO SCREENING ON BIOLOGICAL DIVERSITY IMPACTS

	Biological diversity perspective	
Level of diversity	*Conservation of biological diversity (Non-use values)*	*Sustainable use of biodiversity (Use values)*
Genetic diversity [1]	(I) 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?	
Species diversity [2]	(II) Does the intended activity cause a direct or indirect loss 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), 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 eco-ducts 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.

Annex II

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:

Only 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, 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

Environmental impact assessment is mandatory for activities that:

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

- Directly or indirectly cause a local loss of legally protected varieties/cultivars/breeds of cultivated plants and / or domesticated animals and their relatives, genes or genomes of 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 annex I 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;
- All of the above for species that are legally protected in other countries (e.g. stop-over areas for migratory birds, breeding grounds of migratory fish, commercial trade in species protected by CITES).

(c) **At ecosystem level** (screening questions IV and V in annex I above):

- Are located in legally protected nature reserves;
- Are located in the vicinity of legally protected nature reserves;
- Have direct influence on legally protected nature reserves, 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". As long as so-called sensitive areas 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 annex I 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 local and indigenous 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 likely, but the environmental impact assessment is not necessarily triggered by law:**

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

- Replacing of agricultural varieties or breeds by new varieties, including the introduction of living modified organisms (LMOs) (*screening questions I and II*).

(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*). 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 use values for society (see annex III 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).

Annex III

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 (NOT EXHAUSTIVE).

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 & 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 desalinisation of soils
- Development / prevention of acid sulphate soils
- Biological control mechanisms
- Seasonal cleansing of soils
- Soil water storage capacity
- Coastal protection against floods
- Coastal stabilisation (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
- 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

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

Signification functions

- Cultural/religious/scientific/landscape functions

Annex IV

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

		COMPONENTS OF BIOLOGICAL DIVERSITY			
		Composition	***Structure (temporal)***	***Structure (spatial: horizontal and vertical)***	***Key processes***
LEVELS OF BIOLOGICAL DIVERSITY	**Genetic diversity**	▪ Minimal viable population (avoid destruction by inbreeding / gene erosion) ▪ Local cultivars. ▪ Living modified organisms.	▪ Cycles with high and low genetic diversity within a population.	▪ Dispersal of natural genetic variability ▪ Dispersal of agricultural cultivars.	▪ Exchange of genetic material between populations (gene flow) ▪ Mutagenic influences ▪ Intraspecific competition
	Species diversity	▪ Species composition, genera, families etc, rarity / abundance, endemism / exotics ▪ Population size and trends ▪ Known key species (essential role) ▪ Conservation status	▪ Seasonal, lunar, tidal, diurnal rhythms (migration, breeding, flowering, leaf development, etc.) ▪ Reproductive rate, fertility, mortality, growth rate. ▪ Reproductive strategy.	▪ 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	▪ Regulation mechanisms such as predation, herbivory, parasitism,. ▪ Interactions between species. ▪ Ecological function of a species
	Ecosystem diversity	▪ Types and surface area of ecosystems ▪ Uniqueness / abundance ▪ Succession stage, existing disturbances and trends (=autonomous development)	▪ Adaptations to / dependency ***on*** regular rhythms: seasonal ▪ Adaptations to / dependency of ***on*** irregular events: droughts, floods, frost, fire, wind ▪ Succession (rate)	▪ Spatial relations between landscape elements (local and remote) ▪ Spatial distribution (continuous or discontinuous / patchy); ▪ Minimal area for ecosystem to survive. ▪ Vertical structure (layere d, horizonts, stratified).	▪ Structuring process(es) of key importance for the maintenance of the ecosystem itself or for other ecosystems.
