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Biodiversity in Impact Assessment

PURPOSE

These principles are intended to promote "biodiversity-inclusive" impact assessment (IA), including Environmental Impact Assessment (EIA) for projects, and strategic environmental assessment (SEA) for policies, plans and programs.

They should help practitioners to integrate biodiversity in IA, decision-makers to commission and review IAs, and other stakeholders to ensure their biodiversity interests are addressed in development planning.

Biodiversity is a cross-cutting theme relevant to all fields of IA. These principles should therefore be read in conjunction with the other principles of best practice provided by IAIA (www.iaia.org).

PROCESS

The principles build on work carried out by IAIA's Biodiversity and Ecology Section to support the work of the Convention on Biodiversity (CBD) and other biodiversity-related Conventions (the Conventions on Wetlands (Ramsar) and Migratory Species (CMS)) and to strengthen IA as a tool for the conservation and sustainable use of biodiversity. IAIA has memoranda of co-operation with Ramsar and the CBD.

IAIA is running a program of Capacity Building for Biodiversity and Impact Assessment (CBBIA) funded by the Dutch Government and guided by a Steering Committee with representation from the CBD and Ramsar. The principles will be developed further and tested through CBBIA.

The principles were drafted by members of IAIA's Biodiversity and Ecology Section. Comments are welcome at any time and should be forwarded to the current chair of the Section.

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BIODIVERSITY IN IMPACT ASSESSMENT

BIODIVERSITY MATTERS TO EVERYONE. ITS LOSS IMPOVERISHES THE ENVIRONMENT AND REDUCES ITS CAPACITY TO SUPPORT PEOPLE NOW AND IN THE FUTURE. IMPACT ASSESSMENT CAN HELP TO ENSURE DEVELOPMENT IS COMPATIBLE WITH THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY.

Biodiversity: The Basis of Our Existence

The first World Summit on Environment and Development in Rio de Janeiro (1992) emphasized the importance of biodiversity as the basis of our very existence, to be used wisely and sustainably and conserved for current and future generations. The main threats to global biodiversity are associated with human activities causing habitat loss or damage.

Impact assessment as a tool

The Convention on Biological Diversity (CBD), the Ramsar Convention, and the Convention on Migratory Species (CMS) recognize IA as an important decision-support tool to help plan and implement development with biodiversity "in mind."

The Conventions require Signatories ("Parties") to apply EIA and SEA to proposals with potential negative impacts on biodiversity to help meet their objectives, so that development proposals respect mechanisms for the **conservation** of biodiversity, result in **sustainable use** of biodiversity resources, and ensure **fair and equitable sharing** of the benefits arising from use of biodiversity.

IA provides opportunities to ensure that biodiversity values are recognized and taken into account in decision-making. Importantly, this involves a participatory approach with people who might be affected by a proposal.

Considerable progress has been made in the application of IA to further the aims of the CBD and related conventions, but there is still a long way to go.

Challenges that need to be addressed include:

- Raising of awareness of biodiversity and its values and importance.
- Building capacity to commission, carry out, and review assessments.
- Obtaining and communicating reliable, up-to-date information on biodiversity in an accessible form.
- Providing guidance to communities, governments and business.

The principles are set out in three sections:

1. "**What is biodiversity?**" explains what biodiversity is and why it is important.
2. "**Guiding principles**" apply to all stages and types of IA and explain how a desired outcome can be achieved for biodiversity.
3. "**Operating principles**" explain how biodiversity concerns are best addressed in the main stages of the IA process.

What is biodiversity?

The CBD defines biodiversity as "***the variability among living organisms from all sources including,* inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.***"* It is the variety of life on earth at all levels, from genes to worldwide populations of the same species; from communities of species sharing the same small area of habitat to worldwide ecosystems.

Levels of biodiversity. Countries that have signed the CBD ("Parties") must implement policies to protect biodiversity at different levels, in particular:

- *Ecosystems* containing rich biodiversity, large numbers of threatened or endemic species, that are important for migrating species; have social, economic, cultural or scientific significance, or support key processes.
- *Species* and communities of species that are threatened, related to domesticated or cultivated species, have medicinal, agricultural, or other economic, social, cultural or scientific significance, and indicator species.
- *Genotypes* with social, scientific or economic significance.

To provide an understanding of how biodiversity is likely to respond to a proposed activity, impacts at each level of diversity can be best assessed in terms of:

- *Composition*: what biological units are present and how abundant they are.
- *Structure* (or pattern): how biological units are organized in time and space.
- *Function*: the role different biological units play in maintaining natural processes and dynamics.

The significance of these responses depends critically on uses and values of biodiversity.

Why biodiversity is important

Biodiversity supports many lives and livelihoods. It does this by providing essential services.

Biodiversity is:

- A source of harvestable goods including food, medicines and building materials.
- Essential for regulation of natural processes and the earth's life support systems, e.g., carbon sequestration, soil formation, and purification of water.
- Essential for pollination of commercially valuable crops and biological control of pests and diseases.
- A source of spiritual and religious enrichment and well-being.

Perhaps most important of all, biodiversity is the basis for evolution and adaptation to changing environments, making it essential for survival of life.

Biodiversity values are often underestimated. They include:

- *Economic values*: biodiversity goods and products are sold for income or used as inputs to other economic activities, e.g., ecotourism. Replacement or substitution of the services provided by biodiversity (e.g., engineered flood defense to replace coastal protection by dunes or mangroves) often requires large financial investment.
- *Social values*: employment, health, quality of life, social security, appreciation.
- *Intrinsic values*: in many cultures and societies, all or some components of biodiversity have "intrinsic" value in their own right, irrespective of any material contribution to human well-being. Wherever this is the case, these values should be incorporated in socio-political decision making and should also be reflected in IA.

Guiding principles

Aim for Conservation and "No Net Loss" of Biodiversity. The biodiversity-related Conventions are based on the premise that further loss of biodiversity is unacceptable. Biodiversity must be conserved to ensure it survives, continuing to provide services, values and benefits for current and future generations. Take the following approach to help achieve *no net loss* of biodiversity:

1. Avoid irreversible losses of biodiversity.
2. Seek alternative solutions that minimize biodiversity losses.
3. Use mitigation to restore biodiversity resources.
4. Compensate for unavoidable loss by providing substitutes of at least similar biodiversity value.
5. Seek opportunities for enhancement.

This approach can be called "positive planning for biodiversity." It helps achieve no net loss by ensuring:

- Priorities and targets for biodiversity at international, national, regional and local level are respected, and a positive contribution to achieving them is made.
- Damage is avoided to unique, endemic, threatened or declining species, habitats and ecosystems; to species of high cultural value to society, and to ecosystems providing important services.

Take an Ecosystem Approach. The CBD advocates an "ecosystem approach" because people and biodiversity depend on healthily functioning ecosystems that have to be assessed in an integrated way, not constrained by artificial boundaries. The ecosystem approach is ***participatory*** and requires a ***long-term perspective*** based on a *biodiversity-based study area* and *adaptive management* to deal with the dynamic nature of ecosystems, uncertainty and the often unpredictable nature of ecosystem functions, behavior and responses. Biodiversity concerns are not limited to protected areas. Elements of natural systems remain in even the most urbanized cities and play an often important role in the quality of life in those cities.

Seek Sustainable Use of Biodiversity Resources. Use IA to identify, protect and promote sustainable use of biodiversity so that yields/harvests can be maintained over time. Recognize the benefits of biodiversity in providing essential life support systems and ecosystem services such as water yield, water purification, breakdown of wastes, flood control, storm and coastal protection, soil formation and conservation, sedimentation processes, nutrient cycling, carbon storage, and climatic regulation as well as the costs of replacing these services. In a developing country context, this principle is likely to be a key priority—i.e., for biodiversity to

be conserved and protected in this context, it is essential that it is linked to the issue of securing sustainable livelihoods for local people based on biodiversity resources.

Ensure Equitable Sharing. Ensure traditional rights and uses of biodiversity are recognized in IA and the benefits from commercial use of biodiversity are shared fairly. Consider the needs of future as well as current generations (inter-generational needs): seek alternatives that do not trade in biodiversity "capital" to meet short term needs, where this could jeopardize the ability of future generations to meet their needs.

Apply the Precautionary Principle. Apply the precautionary principle in any situation where important biodiversity may be threatened and there is insufficient knowledge to either quantify risks or implement effective mitigation. Application of the precautionary principle requires that development consent should be delayed while steps are taken to ensure that best available information can be obtained through consultation with local stakeholders/experts and/or new information on biodiversity can be obtained/consolidated.

Take a Participatory Approach. Consult widely to ensure that all stakeholders have been consulted and that important biodiversity values are taken into account. Valuation of biodiversity can only be done in negotiation with the different groups or individuals in society (stakeholders) who have an interest in biodiversity. Use traditional and indigenous knowledge wherever appropriate. Work carefully with indigenous communities to ensure that knowledge of biodiversity is not inappropriately exploited.

Operating principles

1. Screening. Use biodiversity inclusive screening criteria to determine whether important biodiversity resources may be affected.

Biodiversity screening "triggers" for IA should include:

- Potential impacts on protected areas and areas supporting protected species.
- Impacts on other areas that are not protected but are important for biodiversity (see box at right).
- Activities posing a particular threat to biodiversity (in terms of their type, magnitude, location, duration, timing, reversibility).
- Areas that provide important biodiversity services including extractive reserves, indigenous people's territories, wetlands, fish breeding grounds, soils prone to erosion, relatively undisturbed or characteristic habitat, flood storage areas, groundwater recharge areas, etc.

Encourage development of a biodiversity screening map indicating important biodiversity values and ecosystem services. If possible, integrate this activity with the development of a National Biodiversity Strategy and Action Plan (NBSAP) and/or biodiversity planning at sub-national levels (e.g., regions, local authorities, towns) to identify conservation priorities and targets.

2. Scoping. Scoping leads to Terms of Reference for IA, defining the issues to be studied and the methods that will be used. Use scoping as an opportunity to raise awareness of biodiversity concerns and discuss alternatives to avoid or minimize negative impacts on biodiversity.

It is good practice to produce a scoping report for consultation. This should address the following issues (on the basis of existing information and any preliminary surveys or discussions):

1. The type of project, program, plan or policy, possible alternatives and a summary of activities likely to affect biodiversity
2. An analysis of opportunities and constraints for biodiversity (include "no net biodiversity loss" or "biodiversity restoration" alternatives)
3. Expected biophysical changes (in soil, water, air, flora, fauna) resulting from proposed activities or induced by any socio-economic changes
4. Spatial and temporal scale of influence, identifying effects on connectivity between ecosystems, and potential cumulative effects
5. Available information on baseline conditions and any anticipated trends in biodiversity in the absence of the proposal
6. Likely biodiversity impacts associated with the proposal in terms of composition, structure and function
7. Biodiversity services and values identified in consultation with stakeholders and anticipated changes in these (highlight any irreversible impacts)
8. Possible measures to avoid, minimize, or compensate for significant biodiversity damage or loss, making reference to any legal requirements
9. Information required to support decision making and summary of important gaps
10. Proposed IA methodology and timescale

For practical use, develop in-country (sectoral) guidance translating this generic scoping sequence into tools, such as guidelines and sample Terms of Reference.

Areas with "important biodiversity" are those that:

- Support endemic, rare, declining habitats/species/genotypes.
- Support genotypes and species whose presence is a prerequisite for the persistence of other species.
- Act as a buffer, linking habitat or ecological corridor, or play an important part in maintaining environmental quality.
- Have important seasonal uses or are critical for migration.
- Support habitats, species populations, ecosystems that are vulnerable, threatened throughout their range and slow to recover.
- Support particularly large or continuous areas of previously undisturbed habitat.
- Act as refugia for biodiversity during climate change, enabling persistence and continuation of evolutionary processes.
- Support biodiversity for which mitigation is difficult or its effectiveness unproven including habitats that take a long time to develop characteristic biodiversity.
- Are currently poor in biodiversity but have potential to develop high biodiversity with appropriate intervention.

3. Impact study and preparation of EIS. Address biodiversity at all appropriate levels and allow for enough survey time to take seasonal features into account. Focus on processes and services which are critical

to human well-being and the integrity of ecosystems. Explain the main risks and opportunities for biodiversity. Questions to ask:

At the gene level, to what extent will the proposal have significant effects on:

- Genetic diversity of species, particularly rare and declining species and those with identified as priorities in NBSAPs and/or sub-national biodiversity plans?
- Opportunities for species populations to interact, e.g., by increasing habitat fragmentation and isolation?
- Risk of extinction?
- Persistence of locally-adapted populations?

At the species level, to what extent will the proposal:

- Alter the species-richness or species-composition of habitats in the study area?
- Alter the species-composition of communities?
- Cause some species to be lost from the area?
- Affect species identified as priorities in NBSAPs and/or sub-national biodiversity plans?
- Increase the risk of invasion by alien species?

At the ecosystem level, to what extent will the proposal:

- Change the amount, quality or spatial organization of habitat?
- Affect plans to enhance habitat availability or quality?
- Damage ecosystem processes and services, particularly those on which local communities rely?

Finally:

- If habitats will be lost or altered, is alternative habitat available to support associated species populations?
- Are there opportunities to consolidate or connect habitats?

Take an ecosystem approach and involve relevant stakeholders (including local communities). **Consider the full range of factors affecting biodiversity.** These include direct drivers of change associated with a proposal (e.g., land conversion and vegetation removal leading to loss of habitat—a key driver of biodiversity loss, emissions, disturbance, introduction of alien and genetically modified species, etc.); and indirect drivers of change which are harder to quantify, including demographic, economic, socio-political, cultural and technological processes or interventions.

Evaluate impacts of alternatives with reference to the baseline situation. Compare against thresholds and objectives for biodiversity. Use NBSAPs, sub-national biodiversity plans and other conservation reports for information and objectives. Take into account cumulative threats and impacts resulting either from repeated impacts of projects of the same or different nature over space and time, and/or from proposed plans, programs or policies.

Biodiversity is influenced by cultural, social, economic and biophysical factors. Cooperation between different specialists in the IA team is thus essential, as is the integration of findings which have bearing on biodiversity. Provide insight into cause-effect chains. If possible, quantify the changes in quality and amount of biodiversity. Explain the expected consequences of any biodiversity losses associated with the proposal, including the costs of replacing biodiversity services if they will be damaged by a proposal.

How do these relate to relevant biodiversity priorities and objectives or any legal obligations? Indicate the legal issues that create the boundary conditions for decision making.

4. Mitigation. Remedial action can take several forms, i.e., avoidance (or prevention), mitigation (including restoration and rehabilitation of sites), and compensation. Apply the "positive planning approach," where avoidance has priority and compensation is used as a last resort measure. Avoid "excuse"-type compensation. Look for opportunities to positively enhance biodiversity. Acknowledge that compensation will not always be possible; there will still be cases where it is appropriate to say "no" to development proposals on grounds of irreversible damage to biodiversity.

5. Review for decision-making. Peer review of environmental reports with regard to biodiversity should be undertaken by a specialist with appropriate expertise, where biodiversity impacts are significant. Depending on the level of confidentiality of public decision-making, consideration should be given to the involvement of affected groups and civil society.

6. Decision making. Avoid pitting conservation goals against development goals; balance conservation with sustainable use for economically viable, and socially and ecologically sustainable solutions. For important biodiversity issues, apply the precautionary principle where information is insufficient and the no net loss principle in relation to irreversible losses associated with the proposal.

7. Management, monitoring, evaluation and auditing. It is important to recognize that all prediction of biodiversity response to perturbation is uncertain, especially over long time frames. Management systems and programs, including clear management targets (or Limits of Acceptable Change (LC)) and appropriate monitoring, should be set in place to ensure that mitigation is effectively implemented, unforeseen negative effects are detected and addressed, and any negative trends are detected. Provision is made for regular auditing of impacts on biodiversity. Provision should be made for emergency response measures and/or contingency plans where upset or accident conditions could threaten biodiversity.

Key References

Convention on Biological Diversity. *Convention Text*. (http://www.biodiv.org/convention/articles.asp)

Convention on Biological Diversity: *Decision V/6 Ecosystem Approach* (http://www.biodiv.org/decisions/default.aspx?m=COP-05&id=7148&lg=0) and Decision VII/11 Ecosystem Approach (http://www.biodiv.org/decisions/default.aspx?m=COP-07&id=7748&lg=0)

CBD (2002). CoPDecision VI/7A: *Further development of guidelines for incorporating biodiversity-related issues into environmental-impact-assessment legislation or processes and in strategic impact assessment.* (http://www.biodiv.org/decisions/default.aspx?m=COP-06&id=7181&lg=0)

IAIA (2004) *Biodiversity & Impact Assessment Key Citations.* (http://www.iaia.org/Non_Members/Activity_Resources/key_resources.htm)

IUCN (2004) *Red List of Threatened Species.* (http://www.redlist.org/)

Millennium Ecosystem Assessment (2003). *Ecosystems and Human Well-being: A Framework for Assessment.* Island Press. (http://www.millenniumassessment.org/en/products.ehwb.aspx)

Ramsar Wetlands Convention (2002) Resolution VIII.9 *Guidelines for incorporating biodiversity-related issues into EIA legislation and/or processes and in SEA' adopted by the CBD, and their relevance to the Ramsar Convention*. (http://ramsar.org/res/key_res_viii_09_e.htm)

Ramsar Convention Secretariat (2004) *Ramsar handbooks for the wise use of wetlands, Volume 11 Impact Assessment.* (http://indaba.iucn.org/ramsarfilms/lib_handbooks_e11.pdf)

Precautionary Principle. (http://www.pprinciple.net/index.html)