Biological diversity

1. Biological diversity or biodiversity refers to the variety of biological resources that the planet harbours and which are in the form of living organisms, whatever its size. It does not constitute simply the number of distinct ecosystems and plans and animals species that exist in a given period but also includes genetic differences that certain species contain. The number of animals and plants species represents in itself and for the simple fact of existing, a wealth. Moreover, this biological diversity should not be understood simply as a conceptual form but as a precious natural resource - vital for human existence and for trade.

2. All food crops grown today were derived from wild species and the existence of genetic variation in domestic crops that carry wildlife as a source from which research will continue to improve their yield and their resistance disease or to drastic changes in environmental conditions. Many industries are related to the existence of plants and animals that provide raw materials such as tannins, resins, dyes and oils or essences. Many drugs are made from wild species of fungi, bacteria and higher organisms from animal and plant world. Many crops are pollinated naturally. Some wild species can curb the infestation of parasites. The diversity of biological resources, if one considers only a single portion of listed species (even if it is only 5 percent of them) foreshadows the discovery of many useful products.

3. No less important are the intangible and cultural values of biological diversity. Wild plants and animals have recreational functions and are sources of aesthetic pleasure for many of us. They are deeply rooted in the traditions and heritage that we all share, they arouse the works of art and enrich the languages of expressions and even religious thought.

4. Biological diversity also allows wild species and natural ecosystems to withstand external factors. Genetic variability to which a species is subject is an essential function from which it can develop resistance against a disease or change in climate, and without which it would be doomed to extinction. The diversity of species provides stability to ecosystems while a pollutant in particular may destroy or drive species to a level of the food chain; others that are more resistant will remain and reproduce in order to preserve the organisms that depend[1] on them.

5. Consequently, the protection of biodiversity, is a form of natural resource management with the primary objective of maintaining biological resources of the planet upon which the needs and aspirations of future generations depend - a fundamental principle of sustainable development. The management practices of natural resources which seek only to maximize production in the short term, as well as those for the maximum long-term production, but specific resources, often give conflicting results. As a consequence we are witnessing a disturbing and irreversible extinction of biological diversity, for which the pressure of a growing population on biological resources and habitats is largely responsible.

BOAD Policy, procedures and guidelines

6. At least two principles are applied directly to biological diversity by the Bank in its member states:

   - The conservation of endangered species and sensitive habitats;
   - The protection and management of natural areas.

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[1] When a species can withstand a certain amount of pollutant, it often accumulates it in its tissues, and organisms that consume it accumulate it at their turn. The higher up the food chain, the more pollutant concentrations in the tissues, to the point of being lethal. Thus it happens that organisms that survive to pollutants exposure, rather than contributing to the preservation of organisms that depend on them, constitute a threat to their survival.

Other aspects of the issue of biodiversity can be raised by the BOAD, if necessary.

7. Also, BOAD will fund-t does not project likely to damage the environment in a way serious or irreversible, and would include no acceptable mitigation measures for the Bank. It will finance projects that will significantly alter natural areas considered by the conventions as world heritage sites or biosphere reserves or who, under national law, belong to national parks, protected fauna and flora wild.

Relevance to the Bank's investments

8. The following examples are related to development activities which may have consequences particularly harmful to biological diversity:

▪ Agriculture and livestock projects which involve land clearing, elimination of wetlands, inundation for irrigation storage reservoirs, displacement of wildlife fences and domestic livestock, the intensive use of pesticides, the substitution of traditional and varied crops of subsistence for monoculture cash crops;

▪ Fisheries projects which involve the conversion of large natural breeding or nursery areas for aquaculture or mariculture, overfishing, introduction of exotic species into natural aquatic ecosystems;

- Forestry projects which involve the construction of access roads, intensive operations, the establishment of forest products industries which induce other developments near the project site;

- Transportation projects that are intended for the construction of highways, bridges, rural roads, railways and canals to facilitate access to and spontaneous colonization of natural areas;

- Channelization of rivers;

- Dredge and fill activities of coastal and inland wetlands;

- Hydroelectric projects that involve diverting large water to flood or to transform aquatic or terrestrial natural surfaces causing damage or loss of habitats and consequently forcing movement of fauna into new areas that exceed their carrying capacity;

- Irrigation and water supply projects likely to exhaust resources drain wetland habitats or eliminate essential food sources;

- Industrial projects involving of air, water or soil pollution;
- Mining or mineral exploration projects causing the loss of many habitats;

- Projects of biological resources conversion to feed industries for fuel or feedstock.

10. The Bank finances projects that belong to all these categories, and in this case, may influence the management and protection of biological resources and promote biological diversity conservation in selecting projects, participating in the preparation and the process of their environmental and social assessment, the evaluation and implementation and by making recommendations with regard to sectoral and national development strategies of borrowing countries.

Guidelines for environmental and social impacts assessment

Determination of impacts

11. Any potential impact of a project on biological diversity will be, preferably among the important issues to be considered during the preliminary screening of project proposals. We can define the treatment to be accorded to these issues and recognize any other issue to consider during a reconnaissance of the area carried out in the context of a preparatory mission. The resulting information can be used, first, to integrate biological diversity issues in the planning and design of the project and, secondly, to establish the scope of the assessment of environmental and social impacts or another environmental/social study that may take place in conjunction with the preparation of the project.

A short checklist to quickly identify problems related to biological diversity is provided below:

(a) Identify the specific types of ecosystems that the proposed project will affect (eg. rainforest, salt marshes, Guinea savanna, Sudan savanna etc...) and whether these wildlands have a particular interest or if they

have been designated as natural sites of national and international importance.

(b) Define important biological aspects of ecosystems specifying, for example, the type of habitat that is home to endangered species or breeding or nesting areas of certain species.

(c) Determine the general nature of the project's impact on ecosystems such deforestation, flooding, drainage activities, changes in the hydrological regime, ease of access, road traffic and noise.

(d) Assess the significance of the likely negative impacts on:

- the entire ecosystem of the region and / or country (eg. the project will destroy approximately 10 percent of swamp forests still intact in the nation).

- cumulative effects and the evolution of the system (eg coastal wetlands recede into the country with an annual rate of 3 per 100 per year; the project and forecast of two installations of port facilities will result in the disappearance of 6 p . 100 of remaining land).

12. It is possible, in the case of a project that the impacts on biological diversity represent a relatively complex problem and if its nature allows to modify the design to eliminate the problematic element (by arranging the layout of a road, for example, to avoid a natural reserve). If otherwise, the problem should be included in the scope of the impacts assessment on the environment or other environmental study to be examined in more detail and taken into consideration when the impacts mitigation measures will be developed. The participation of an expert is essential in most cases.

13. Terms of reference models contained in this document should, in conjunction with investigative techniques that have been described, provide most of the information needed to assess the impacts of a project on biological resources. The following sources of documentation provide important information and allow obtaining a quick estimate of the composition of habitats and plant and animal species:

- publications dealing with natural areas with a particular interest or international importance;
- national inventories of fauna and flora;

- stocks inventory, inventory of art work timber, fish resources or species in general, providing census data and indicating the evolution of species and populations;

- regional or national programs engaged in monitoring the state or evolution of biological resources;

- regional or local research centres and NGOs

14. The contribution of some ecosystems to the region and the country is beyond the scope of a simple conservation of biological diversity. Sometimes this contribution to local, regional and national economies is measured, among others, in monetary terms, and shows the benefit-cost ratio of a project that has been modified or mitigation measures aimed at the conservation of specific biological resources. If these benefits are not measurable, they should be described quantitatively.

Determination of institutional tools likely to mitigate the impacts

15. The review of policies, regulations in force and governmental institutions that govern the management of biological resources should be carried out during the preparation of their inventory.

- Review legislation and sectoral policies that may affect the biological diversity, examine how biological diversity conservation is integrated into rural development programs, examine conflict or cooperation between organizations responsible for the operation and protection of natural resources - agriculture, fisheries, mineral resources, energy, water and recreational areas.

- Determine whether areas such as trade, transport and the military will have a significant impact on biological resources and if this is the case, make sure that their policies are compatible with the principle of conservation of biological diversity, or at least do not encourage unnecessary destruction of these resources.

- Identify policies that foresee dissuasive measures for protecting critical biological diversity resources to the maintenance of diversity, among which it takes tax deductions, credits, grants, donations or indirect incentives such as road construction or other business infrastructure forms in protected forests.

- Assess the effectiveness of organizations and procedures implementation of policies, legislation and regulations.

Mitigation Measures

16. The following actions are some of the technical aspects of mitigation plans for projects that affect biological diversity:

   ▪ establish areas of fauna management or other protected areas in the area under influence of the project;

   ▪ establish similar protection areas in another part of the country or region in order to compensate for the inevitable loss of habitat in the area affected by the project;

   ▪ design of buffer zones, corridors for fauna or other means to maximize the benefits that provide the management of fauna or mitigate the effects of the project on it;

   ▪ restore damaged habitats;

   ▪ create new habitats, such as wetlands, artificial reefs, nesting sites;

   ▪ protect rare and endangered species in places such as zoos, botanical gardens or gene banks.

17. The institutional aspects of mitigation plans may include:

   ▪ strengthening of current organisms that are responsible for the management of natural areas, parks and reserves and biological resources in general;

   ▪ establishment of , if necessary, new institutions, procedures and regulations;

   ▪ support to national perspectives on land to prevent biological diversity decreases due to cumulative or cross sectoral effects;

   ▪ strengthening of organizations and land instruments;

   ▪ support to scientific research in the field of biological diversity;

   ▪ environmental education;

   ▪ incentives for the preservation of the environment;

> > - compensation or concessions for the populations affected by the protection measures.

> Policy and operational procedures of BOAD on natural habitats provide more information.

18. Community involvement is an essential element in the protection of biological diversity, especially when it comes to restrictions on land use by the general population or land that has been recognized as being part of indigenous people's territory. The following questions belong to the aspects for which it is essential to maintain a dialogue with affected groups:
    - importance of biological diversity;
    - benefits to be derived from the protection of biological diversity;
    - costs and benefits of the project at the local level;
    - realistic management options;
    - local customs, traditions and cultural values.

19. Protective measures of biological diversity generally represent a small percentage of the total cost of a project. However, these measures do not generate direct revenues and their operating costs may fall on organizations that are not directly involved in the project. It will be, for example, difficult to get the enthusiasm and cooperation of local of parks and recreation administration that may feel subject to new management expenditure for operating a reserve established in the context of a hydropower project, and from which it will not derive any benefit. Implementing agencies and bodies be given the necessary resources in this regard.

20. There are a number of participatory methods of financing the protection of biological diversity or compensating affected groups by the costs they may incur:

   o charge entry fee to natural areas that visitors have access to;
   o tax tourism revenues in localities where natural areas attract tourists;
   o return a part of the profits from the exploitation of biological resources to local communities;
   o charge water use fees for water production in a reserve;
   o add a modest fee to electricity prices for energy sources fed by a reservoir belonging to a service of nature protection;
   o "rent" inundated areas to the producer of hydroelectric power;
   o establish links with other development projects;
   o include conditions for concession agreements related to the extraction of resources;
   o seek financial support from international organizations;
   o ensure that communities take ownership of protection program by the developing at the local level, specialized companies or NGOs related to conservation.

21. The means by which to support initiatives in biological diversity in sectoral and intersectoral level do not arise spontaneously. In general, we must undertake a research work which has its source in the context of the project that can show, for example, the need to:

   ▪ incorporate biodiversity issues in the documents of economic and sectoral planning;
   ▪ assist the government planning for the management of biological resources;

- include issues of biodiversity management in policy discussions between governments and international organizations;
- collaborate with national and international NGOs;
- incorporate aspects that affect biodiversity in training development institutes

22. Supervision is an essential aspect of protection of biological diversity to which BOAD places great importance in the projects it finances. Monitoring the implementation of measures related to biological diversity and the assessment of relevant work are two crucial elements. The long-term monitoring, which may continue after the project as such may be the only way to verify that such measures are sustained and to determine their actual contribution to the protection of biological diversity. The information gathered should be integrated into the national strategy and planning of future projects so as to improve the components related to biological diversity.

<u>Table: Objectives and examples of management systems for biodiversity conservation</u>

Onsite		Offsite	
Preservation of ecosystems	Species Management	living Collections	genebanks
←‑‑‑‑‑‑‑‑‑ Increased natural processes		Increased human intervention ‑‑‑‑‑→	
maintain: Reservoir of genetic resources	maintain: genetic interaction between the semi-domesticated species and their wild	maintain: reproduction of things that we can not keep in gene banks	maintain: source of genetic material necessary for breeding programs

	ancestors		
evolutionary potential	sustainable use of wild species	field research and development of new species	collection de matériel génétique d'espèces menacées problématiques
operation of various ecological processes	viable populations of species in danger	offsite cultivation or propagation	collections or species reference for research and for the purpose of filing a patent
set of most of the known or unknown species	species that play an indirect beneficial role (pollination or fight against parasites)	captivity of endangered breeding animals in the wild	access to germplasm in large geographic areas
representative samples of unique natural ecosystems	key species contributing to the maintenance of important ecosystems or having a regulatory function	immediate access to wild species (research, education and exhibition)	genetic material of endangered species
national Parks Natural Areas of Research marine reserves Development Plans of resources	Agro-cosystems Protected areas for wild fauna and flora In situ gene banks Parks and fauna Reserves	zoos botanical Gardens Collections on the ground Captivity breeding programs	seeds and pollen Banks
Source : United States Office of Technology Assessment, 1986			