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OPEN-ENDED AD HOC WORKING GROUP OF
  LEGAL AND TECHNICAL EXPERTS ON
  LIABILITY AND REDRESS IN THE CONTEXT OF
  THE CARTAGENA PROTOCOL ON BIOSAFETY
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INFORMATION ON DEFINITION OF BIODIVERSITY LOSS AND WORK ON INDICATORS FOR ASSESSING PROGRESS TOWARDS THE 2010 BIODIVERSITY TARGET

Note by the Executive Secretary

I.   INTRODUCTION

1.   In its decision BS-I/8, the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety, in its decision BS-I/8, established an Open-ended Ad Hoc Working Group of Legal and Technical Experts on Liability and Redress to elaborate international rules and procedures in the field of liability and redress for damage resulting from transboundary movements of living modified organisms (LMOs). In order to undertake preparatory work for the first meeting of the Ad Hoc Group on Liability and Redress, a Technical Group of Experts on Liability and Redress was held in Montreal from 18 to 20 October 2004.

2.   The Technical Group of Experts on Liability and Redress identified several areas where additional information relating to liability and redress for damage resulting from the transboundary movement of living modified organisms is needed. One of these areas concerns the determination of damage to the conservation and sustainable use of biodiversity in respect of which reference was made to the definition of biodiversity loss in paragraph 2 of decision VII/30 of the Conference of Parties to the Convention on Biological Diversity as well as the ongoing work on the framework of indicators under that Convention (UNEP/CBD/BS/WG-L&R/1/2, para. 117 (b) (ii)).

3.   In decision VII/30 the Conference of the Parties to the Convention on Biological Diversity adopted a framework to facilitate the assessment of progress towards the target to achieve, by 2010, a significant reduction in the current rate of biodiversity loss, and communication of this assessment, to promote coherence among the programmes of work of the Convention and to provide a flexible framework within which national and regional targets may be set, and indicators identified. The present note provides information concerning the definition of biodiversity loss contained in that decision and

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*   UNEP/CBD/BS/AHWG-L&R/1/1.

summarizes the ongoing work relating to framework of indicators for assessing progress towards the 2010 target. It also provides some observers at ions on the relevance of this process under the Convention on Biological Diversity to the work of the Ad Hoc Group on Liability and Redress in the determination of damage to the conservation and sustainable use of biodiversity.

II.   DEFINITION OF LOSS OF BIODIVERSITY AND WORK ON INDICATORS FOR ASSESSING PROGRESS TOWARDS, AND COMMUNICATING, THE 2010 BIODIVERSITY TARGET

4.   Article 2 of the Convention on Biological Diversity defines biodiversity as the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, the ecological complexes and diversity within species, between species and of ecosystems. The combination of life forms and their interaction with each other and with the environment has made Earth a uniquely habitable place and provides a large number of goods and services that sustain our lives. Biodiversity is essential to our planet, human well-being and to the livelihood and cultural integrity of people.

5.   Sustaining that biodiversity, in the face of considerable threats from human activities, constitutes one of the greatest challenges of the modern era. In response to the challenges, in 2002, the Conference of the Parties, in its decision VI/26, adopted a Strategic Plan including the target, subsequently endorsed by the World Summit on Sustainable Development, of achieving by 2010 a significant reduction of the current rate of biodiversity loss. For the purposes of assessing progress towards this target, the Conference of the Parties in decision VII/30 defined "biodiversity loss" as:

> "The long-term or permanent qualitative or quantitative reduction in components of biodiversity and their potential to provide goods and services, to be measured at global, regional and national levels."

6.   This definition of "biodiversity loss" comprises several elements, that may be relevant, including:

  (a) A timeframe;

  (b) Permanency/reversibility;

  (c) Qualitative versus quantitative evidence;

  (d) Components of biodiversity;

  (e) Potential to provide goods and service; and

  (f) Geographical scale.

7.   In decision VII/30, the Conference of the Parties adopted a framework to enhance the evaluation of achievements and progress in the implementation of the Strategic Plan and the 2010. The framework includes seven focal areas and a set of indicators (table 1) as well as goals and sub-targets to facilitate coherence among the programmes of work, and to provide a flexible framework for national targets.

8.   The annex to this note summarizes relevant information on the indicators for assessing progress towards, and communication, the 2010 biodiversity target. In reviewing the indicators, however, the following issues should be born in mind:

      (a)   Most indicators provide quantitative or qualitative information directly related to biodiversity loss. These are complemented by some pressure and response indicators and indicators to assess the enabling environment;

(b)   The indicators have been identified to assess progress made towards the 2010 target primarily at the global level. Although all indicators are fully scaleable, the ability to apply them to a finer geographic resolution (e.g. national level, site level) depends on the availability of suitable data sets;

(c)   Each indicator has been identified on the basis of its individual capacity to contribute information to assess and communicate progress towards the 2010 target, primarily at the global level. However, a particular strength of the set of indicators is the way in which they complement each other (see section II on "Relation of indicator to focal area" in the series of information documents on indicators for assessing progress toward the 2010 target prepared by the Executive Secretary for the tenth meeting of SBSTTA (UNEP/CBD/SBSTTA/10/INF/10 to INF/22)).

Table 1. Provisional indicators for assessing progress towards the 2010 Biodiversity Target

Under the seven focal areas (grey background) indicators for immediate testing are numbered. Possible indicators for development are shown in italics)

Status and trends of the components of biological diversity

1. Trends in extent of selected biomes, ecosystems and habitats

2. Trends in abundance and distribution of selected species

3. Coverage of protected areas

    Change in status of threatened species 1/

    Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance 1/

Sustainable use

    Area of forest, agricultural and aquaculture ecosystems under sustainable management 1

    Proportion of products derived from sustainable sources

    Ecological footprint and related concepts 2/

Threats to biodiversity

4. Nitrogen deposition

    Trends in invasive alien species 1/ 3/

Ecosystem integrity and ecosystem goods and services

5. Marine trophic index

6. Water quality in aquatic ecosystems

    Application of trophic index to freshwater and possibly other ecosystems

    Connectivity/fragmentation of ecosystems 1/

    Incidence of human-induced ecosystem failure

    Health and well-being of communities who depend directly on local ecosystem goods and services 3

    Biodiversity used in food and medicine

1/   Recommended for immediate testing by the tenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice in recommendation X/5.

2/   Recommended as a new indicator by the tenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (7-10 February 2005, Bangkok, Thailand), recommendation X/5.

3/   Reworded from the original formulation in decision VII/30 in accordance with recommendation X/5 of the Subsidiary Body on Scientific, Technical and Technological Advice adopted at its tenth meeting, held in Bangkok from 7 to 10 February 2005.

Status of traditional knowledge, innovations and practices

7. Status and trends of linguistic diversity and numbers of speakers of indigenous languages

    Further indicators to be identified

Status of access and benefit-sharing

Indicator to be identified

Status of resource transfers

8. Official development assistance provided in support of the Convention

    Indicator for technology transfer

III. OBSERVATIONS

9.   From the description of the indicators in section II and the annex hereto, and the general approach taken towards assessing biodiversity loss, it seems that some indicators (including those related to the status and trends of the components of biological diversity, such as trends in abundance and distribution of selected species) may be more relevant to the work on liability and redress than others (such as official development assistance and technology transfer). However, the overall application of indicators for assessing 2010 target to the determination of damage to biological diversity in the context of liability and redress is limited, reflecting the fact that the indicators have been identified to assess progress made towards the 2010 target, primarily at the global level, and may not be directly applicable for other purposes. Some of the differences in approach related to these distinct purposes are summarized below and in table 2.

10.   The mission of Strategic Plan of the Convention is to achieve a significant reduction in the current rate of biodiversity loss at global, regional and national levels. The primary focus of the assessment of biodiversity loss, using the indicators described above, is global. Accordingly, global datasets are required which may vary in **geographic resolution** and not necessarily allow extrapolation and the drawing of conclusions on biodiversity loss at a particular site. Suitable datasets exist only for a small number of biodiversity components or other parameters characterizing biodiversity loss. While the indicators are scaleable and the use of the same indicators is encouraged for (sub)national and regional assessments, and these might require the collection of more detailed information at a finer geographic resolution, this is entirely at the discretion of contracting Parties.

11.   The **temporal resolution** required to assess progress towards the 2010 target is relatively coarse because the 2010 target aims to reverse the long-term trend of biodiversity loss. As a minimum, it requires information about trends between 2002 (the year when the target was adopted) and 2010. However, many large-scale assessments do not provide enough data points to assess a change in trends within a period of eight years. The FAO Forest Resources Assessment, for example is being carried out at ten-year intervals. Because the confidence about each trend increases with the length of the time line, time-series data as far back as possible are used to assess long-term trends. The number of data points may be low.

12.   The increase in confidence with the length of the time series and the need to establish a **baseline trend** ("…significant reduction of the current rate of biodiversity loss…"), not a base*line per se*, justifies the use of time-series that start at different dates for different biodiversity components or other parameters characterizing biodiversity loss. For example, the FAO Forest Resources Assessment provides comparable global datasets on forest cover since 1990 while datasets on the percentage of live coral cover are available since 1977 for some regions.

13.   Biodiversity loss can be characterized by significant transformation of an ecosystem or population (e.g. incidence of ecosystem failure, extinction/extirpation of a species population) but is most

frequently a gradual process. **Thresholds** of biodiversity loss or other pressures on natural systems vary for each component of biodiversity and among ecosystems. Observations suggest that species populations and ecosystems tend to move from gradual change to catastrophic change with little warning. These "tipping points", which may lead to losses which are not **reversible**, cannot be forecast by even the most sophisticated science. It is therefore difficult to determine thresholds of biodiversity loss.

14.   The Strategic Plan of the Convention recognizes the intrinsic and utilitarian **values** of biodiversity, as well as the unexplored options for the future (option value) and identifies biodiversity as the living foundation for sustainable development. Accordingly the concept of "biodiversity loss", as it is applied in the context of the Strategic Plan, does not require assigning a monetary value to the biodiversity, or the calculation of the monetary amount of compensation or costs of reinstatement. However, for some indicators applied to assessing progress towards the 2010 target, the cost of the activities required to reduce the rate of biodiversity loss can be calculated. The indicator on trends in invasive alien species, for example, includes a parameter on the cost of invasive alien species, which may be calculated as the cost of prevention, mitigation of impacts or ecosystem rehabilitation.

15.   A key argument in the Strategic Plan is that the Convention was born out of the universal acknowledgement of the challenges facing biodiversity and that an effective implementation of the Convention should eventually lead to a reduction of the biodiversity loss. The Strategic Plan recognizes that threats to biodiversity need to be addressed in order to achieve the target of a significant reduction of the current rate of biodiversity loss by 2010. It does not, however, require establishing a direct **causal link** between biodiversity loss and activities causing the loss.

16.   The purpose and mission of the Strategic Plan imply that biodiversity loss is inherently undesirable - independently of whether that loss leads to social or economic costs and whether it constitutes **damage** in the legal sense. Indeed, biodiversity loss is frequently associated with positive economic development and the Convention reaffirms that States have sovereign rights over their own biological resources and that economic and social development and poverty eradication are the first and overriding priorities of developing countries.

17.   Finally, the definition of "**biodiversity loss**" as specified in decision VII/30 may provide useful elements in conceptualizing damage to the conservation and sustainable use of biodiversity in the context of liability and redress under the Protocol. It needs to be emphasized, however, that this definition is developed for the purpose of assessing progress towards the 2010 target and therefore those elements in paragraph 6 should be understood in that context.

Table 2.   Summary of applications of concepts and approaches to A. liability and redress in the context of the Cartagena Protocol and B. the assessment of progress towards, and communicating, the 2010 biodiversity target

Issue	A. Assessing damage to biodiversity in the context of liability and redress	B. Assessing progress towards the 2010 target
Geographic scope	Site-based (focus on the area affected by release/movement of LMOs)	Primarily global; not site-based
Temporal resolution	Fine: Comparison of *ex ante* with *ex post* situation	Variable depending on each indicator but generally aiming to establish a long-term trend
Baseline	Just prior to release of LMOs	As long back as possible: depends on the availability of consistent data sets
Threshold	Qualitative threshold for damage to the conservation and sustainable use of biodiversity	Quantification of biodiversity loss. Changes often gradual. 'Artificial' thresholds used for some indicators (e.g. Red List categories)
Valuation	Valuation of damage (monetary: amount of	Based on both inherent value of biodiversity

	compensation or costs of reinstatement)	and biodiversity goods and services
Causation	Need to establish causal link between damage and activities causing the damage	No immediate requirement to establish causal link between biodiversity loss and activities causing biodiversity loss. Aims to reduce established key pressures on biodiversity
Damage	Several optional components for the definition of damage	Biodiversity loss considered independently of whether it constitutes damage

Annex

INDICATORS FOR ASSESSING PROGRESS TOWARDS THE 2010 BIODIVERSITY TARGET

A. *Focal area: Status and trends of the components of biological diversity*

1. *Trends in extent of selected biomes, ecosystems and habitats 4/*

1.   Based on currently available trend information, the following major ecosystem types are considered ready for immediate indicator implementation: (i) forests (including different forest types, notably mangroves); (ii) peatlands (as a component of inland waters or forests); (iii) coral reefs (as a component of marine and coastal ecosystems); (iv) croplands (as a component of agricultural systems); (v) grasslands/savannahs (as a component of dry and sub-humid lands); and (vi) polar/ice. For other ecosystem types globally consistent information is not available.

2.   In accordance with the definition in decision VII/30, biodiversity loss at ecosystem level applies if the species composition, structure and functioning of an ecosystem is altered to such an extent that it no longer provides the same goods and services, and if it can not regenerate naturally or through normal management interventions within one (or a few) vegetation periods or a normal rotation.

3.   For any ecosystem additional indicators provide further qualifications on biodiversity loss, in particular the following: (i) trends in abundance and distribution of selected species; (ii) change in status of threatened species; (iii) marine trophic index; (iv) numbers and cost of alien invasions; (v) connectivity/fragmentation of ecosystems; (vi) incidence of human-induced ecosystem failure; and (vii) health and well-being of people living in biodiversity-based-resource dependent communities.

2. *Trends in abundance and distribution of selected species 5/*

4.   Species population trend indices such as the Living Planet Index (LPI) and various Species Assemblage Trend Indices (STI) such as the European farmland bird index are valuable ways for monitoring and communicating biodiversity change at global, regional and (sub-) national scales or within biogeographic units. The LPI, STI and the Red List Index (RLI; see below) provide complementary information on the overall change in the ecosystem, the trends in specific biodiversity components (species groups) and trends in extinction risk, respectively.

3. *Coverage of protected areas 6/*

5.   A World List of Protected Areas is maintained by the World Conservation Monitoring Center of the United Nations Environment Programme (UNEP-WCMC) in collaboration with the World Commission on Protected Areas of the World Conservation Union (IUCN-WCPA), and provides information on changes over time in the number and area of protected areas. The number of protected areas has been increasing significantly over the past few decades and is now more than 100,000 sites. The total area has also increased continuously from less than 3 million km^2 in 1970 to more than 20 million km^2 in 2004. However, ecoregional and habitat representation remains uneven, and coastal and marine ecosystems are particularly under-represented.

4/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/10.

5/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/11.

6/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/12.

6.   Future work should seek to assess the extent to which protected areas cover important biodiversity, protected area maps should be overlaid with maps showing areas important for biodiversity (e.g. Important Bird Areas, Important Plant Areas, centres of origin and centres of genetic diversity of cultivated crops and domesticated animals).

4.   Change in status of threatened species 7/

7.   The IUCN Red List of Threatened Species classifies species according to the risk of extinction. The Red List Index llustrates the relative rate at which species in a particular group change in overall threat status (i.e. projected extinction risk), based on population and range size and trends as quantified by Red List categories. The Red List indices can be calculated for any representative set of species that has been fully assessed at least twice.

8.   Red List indices are available for birds and amphibians. Indices are in development for other groups, including mammals, reptiles, freshwater fish, sharks, rays and chimeras, freshwater molluscs.

5.   Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance 8/

9.   Little comprehensive information is available at this stage on trends in genetic diversity of domesticated animals, cultivated plants, and fish species *in situ.* Currently much of the information under this indicator relates to *ex situ* conservation efforts, while only qualitative indicators of *in situ* maintenance efforts are available. Sources of information include *inter alia* the DAD-IS (a clearing house mechanism for animal genetic resources communication and information tool for implementing the FAO Global Strategy for the Management of Farm Animal Genetic Resources), the FAO World Watch List for domestic animal diversity, the FAO World Information and Early Warning System for Plant Genetic Resources for Food and Agriculture.

B.   Focal area: Sustainable use

Area of forest, agricultural and aquaculture ecosystems under sustainable management 9/

10.   While only some agreed criteria are available to decide whether a forest, agricultural and aquaculture ecosystem is under sustainable management the indicator is currently applied to production certification systems, recognizing that many uncertified systems may also be managed in a sustainable way.

C.   Focal area: Threat to biodiversity

1.   Nitrogen deposition 10/

11.   Nitrogen in reactive forms is essential for life. Nitrogen fertilizers are used to produce sufficient food for a growing human population. Excessive levels of reactive nitrogen in the biosphere and atmosphere, however, constitute a major threat to biodiversity in terrestrial, aquatic and coastal ecosystems. Higher than natural levels of reactive nitrogen in natural terrestrial ecosystems, especially

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7/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/13.

8/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/14.

9/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/15.

10/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/16.

temperate grasslands, shrublands and forests leads directly to lower plant diversity, as slow-growing species are out-competed by a small number of faster-growing species.

2. Trends in invasive alien species [11]/

12. Invasive alien species are considered to be one of the main causes of biodiversity loss. The indicator concerns one of the major pressures on biodiversity. Data on the number and severity of alien invasions are available for some countries, but very sporadic for others. The economic cost of the impacts of invasive alien species, or the cost of control measures can be calculated in some cases. However, currently no agreed methodology for calculating the cost of invasive alien species is available.

D. Focal area: Ecosystem integrity and ecosystem goods and services

13. Ecosystem integrity reflects the capability of a system to support services of value to humans. [12]/ Indicators under the focal area on ecosystem integrity and ecosystem goods and services provide information on the quality and health of ecosystems and their productive capacity. This information complements the information on the area coverage of ecosystems addressed through the indicator on trends in extent of selected biomes, ecosystems and habitats.

14. While two indicators on the integrity of inland water and marine ecosystems are considered ready for testing and use, a range of additional indicators related to terrestrial ecosystems require further development.

1. Marine Trophic Index [13]/

15. The marine trophic index measures the change in mean trophic level of fisheries landings by region and globally. Trophic level is defined as the position of an organism in the food chain. The preferred fisheries catches consist of large, high value, high trophic level predatory fish, such as tuna, cod, and swordfishes. As a result, unsustainable fishing leads to depletion of these large predatory fish so that the relative numbers of low trophic level small fish and invertebrates increase.

2. Water quality in aquatic ecosystems [14]/

16. Water quality data represent one of the most comprehensive sources of indicator data for aquatic systems. They are multi-functional and indicate both major threats to the sustainability of freshwaters and unsustainable activities outside that ecosystem. Water quality should be monitored on the basis of three parameters for which data exist, are regularly updated and can be disaggregated or aggregated as required: (i) Biological oxygen demand; (ii) Nitrate concentrations; and (iii) Sediment loads in rivers/turbidity.

3. Connectivity/Fragmentation of ecosystems [15]/

17. Information on connectivity/fragmentation is available on a number of biomes, including in particular on forests and major river systems. In the case of forested habitats, interpretation of the patterns

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[11]/ A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/17.

[12]/ See for example http://www.ozestuaries.org/indicators/Def_ecosystem_integrity.html for more detailed definitions.

[13]/ A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/18.

[14]/ A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/19.

[15]/ A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/20.

of forest cover change requires consideration of the distribution of forest types as well as the characteristics of forest species present and their ability to cope with fragmentation or deforestation. To quantify the spatial patterns of forest cover change, different spatial indices (or metrics) have been developed in the recent years. The main aspects that these attempt to capture are a loss of total habitat area, an increase of patch abundance and density, a decrease of patch size, a reduction in core area, and an increase in patch edges.

E.   Focal area: Status of traditional knowledge, innovations and practices

18.   In accordance with article 8(j) of the Convention, Parties should, *inter alia,* respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities, embodying traditional lifestyles relevant for the conservation and sustainable use of biodiversity. This provision and related guidance provided by the Conference of the Parties recognize the role of indigenous and local communities in managing and maintaining biodiversity.

19.   The close association between language and cultural knowledge and practices, including traditional ecological knowledge and associated biodiversity management practices, is widely recognized. 16/ While additional indicators need to be developed the Conference of the Parties decided to use trends in indigenous languages and speakers as a proxy for trends in traditional knowledge, innovations and practices. The development of additional indicators on the status of traditional knowledge, innovations and practices has been assigned to the Ad hoc Open-ended Working Group on Article 8(j) and Related Provisions.

1.   Status and trends of linguistic diversity and numbers of speakers of indigenous languages 17/

20.   The indicator uses the loss of languages as a proxy to the loss of traditional knowledge, innovations and practices. While no accurate data about trends in language loss have been calculated as yet, current information on numbers of languages and numbers of speakers is likely to allow deriving such trends information.

D.   Focal area: Status of access and benefit-sharing

21.   The fair and equitable sharing of benefits arising out of the utilization of genetic resources is one of the objectives of the Convention (article 1). The development of indicators on the status of access and benefit-sharing has been assigned to the Ad hoc Open-ended Working Group on Access and Benefit-Sharing.

E.   Focal area: Status of resource transfers

22.   The need for financial, technical and technological resources for the implementation of the Convention is reflected in a number of provisions. Paragraph 2 of article 20 of the Convention, *inter alia,* requests developed country Parties to provide new and additional financial resources to enable developing country Parties to meet the incremental costs of implementing the provisions and obligations of the

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16/   See for example document UNEP/CBD/WG8J/1/INF/4 http://www.biodiv.org/doc/meetings/tk/wg8j-01/information/wg8j-01-inf-04-en.pdf; Posey, D.A. 1999. Cultural and spiritual values of biodiversity. UNEP Nairobi, 731p.

17/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/21.

Convention. Article 21 establishes a financial mechanism for the Convention. In accordance with paragraph 2 of article 16, access to and transfer of technology relevant to the attainment of the objectives of the Convention to developing countries should be provided and/or facilitated under fair and favourable terms.

23.   The Conference of the Parties adopted an indicator on official development assistance provided in support of the Convention, which can draw on official statistics provided by relevant bodies, such as the Statistics Committee of the Development Co-operation Directorate of the Organization for Economic Co-operation and Development (OECD-DAC), and an indicator on technology transfer, which needs to be developed.

Official development assistance provided in support of the Convention 18/

24.   An adequate access to resources is essential for the effective implementation of the Convention on Biological Diversity. Bilateral and multilateral assistance provided to developing countries is an important component of the financial resources available for the implementation of the Convention.

18/   A detailed description of the indicator is contained in document UNEP/CBD/SBSTTA/10/INF/22.