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CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY

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STRATEGIC PLAN, NATIONAL REPORTS AND IMPLEMENTATION OF THE CONVENTION

Additional information on potential main themes for the multi-year programme of work of the Conference of the Parties for 2006-2010

Note by the Executive Secretary

I. INTRODUCTION

1. In its recommendation VII/12, on topics for future work, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) noted a number of topics proposed as potential main themes for the eighth and subsequent meetings of the Conference of the Parties. In the same recommendation, SBSTTA invited Parties to provide to the Executive Secretary comments on these possibilities and/or additional suggestions, as appropriate, for inclusion in an information document to be made available to the Conference of the Parties at its sixth meeting; and invited the Conference of Parties, when considering its programme of work, to take into account these suggestions, as potential topics for in-depth discussion by the Conference of the Parties at its eighth and/or ninth meetings.

2. The Executive Secretary has prepared a note on the multi-year programme of work for the Conference of the Parties up to 2010 (UNEP/CBD/COP/6/5/Add.2). The present information document has been prepared, in collaboration with the organizations identified below under the various topics, to complement the information in that document. Section II lists additional proposals for topics received after the multi-year programme document had been finalized. Section III describes in some detail the potential topics for future in-depth consideration by the Conference of the Parties, highlighting: (i) the issues; (ii) ongoing initiatives and international and regional organizations addressing the identified issues; and (iii) possible actions to be undertaken in the framework of the Convention and related output.

3. Following the invitation of SBSTTA in recommendation VII/12, as of 4 March 2002, the Democratic Republic of Congo and the European Union provided to the Executive Secretary comments on topics listed in its recommendation VII/12 and additional suggestions on possible topics for future work of the Conference of the Parties.

* UNEP/CBD/COP/6/1 and Corr.1/Rev.1.

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4. The Executive Secretary has prepared document UNEP/CBD/COP/6/5/Add.2/Rev. 1 in which he organized the topics suggested into a multi-year programme of work for the Conference of the Parties up to 2010 and included a timetable for themes for in-depth review. Section II of the present note provides additional information on each of the topics proposed for in-depth consideration.

II. DESCRIPTION OF POTENTIAL TOPICS FOR IN-DEPTH CONSIDERATION BY THE CONFERENCE OF THE PARTIES

A. *Island biodiversity*

1. *Main issues*

5. Certain islands are important for science and conservation in that they harbour intact natural ecosystems that remain unmodified by human impacts. Many islands, however, bear the distinctive imprint of human modification, particularly through the deliberate introduction of animal pests and predators. Small islands, including, in particular, small island developing States (SIDS), are renowned for their species diversity and endemism. However, due to the small size, isolation and fragility of their ecosystems, their biological diversity is among the most threatened in the world. The main problems related to the conservation of biodiversity in small islands include the following:

- (a) Demographic and economic pressure;
- (b) Deforestation;
- (c) Introduction of non-indigenous species;
- (d) Climate change, including climate variability and sea level rise;
- (e) Natural disasters (volcanic eruptions, tsunamis, earthquakes and landslides, etc);
- (f) Limited surface water and groundwater resources;
- (g) Land and sea-based pollution;
- (h) Impact of tourism activities on the environment;
- (i) Role of local residents and the wider community;
- (j) Industrial activities.

6. Among the major constraints encountered by small islands, in particular, small island developing States, in implementing measures to conserve biodiversity are:

- (a) Inadequate coordination among international agencies;
- (b) Lack of inventories on biological diversity;
- (c) Shortage of capacity to assess and monitor changes in biodiversity;
- (d) Lack of integrated strategies for the management of terrestrial and marine biodiversity.

2. *Past and ongoing initiatives*

7. The United Nations Global Conference on the Sustainable Development of Small Island Developing States was convened in Barbados in 1994 to stimulate the attention and assistance of the international community on island environmental problems. The Barbados Programme of Action was adopted at the Conference by 111 Governments, with biodiversity resources being one of the priority areas of action. The Programme and its implementation were reviewed in 1999, at the twenty-second special session of the General Assembly, on small island developing States. A special unit within the United Nations Division of Sustainable Development serves as the secretariat of the meetings on small island developing States and coordinates with the Alliance of Small Island Developing States (AOSIS), also based in New York. The Global Environment Facility (GEF) is developing a strategy for action on capacity-building for the global environment, based on the Capacity Development Initiative carried out

jointly with UNDP. Within this strategy, there will be a special programme of critical capacity-building activities for least developed countries and small island developing States. Other partners for cooperation (project financing and implementation) include the United Nations Development Programme (UNDP), the World Bank and the development banks.

8. Additional notable initiatives include:

- (a) Other relevant environmental conventions;
- (b) Regional plans for the conservation of biodiversity within regional organizations (e.g. SPREP);
- (c) Global Review of Biodiversity in Small Island States, carried out by the World Conservation Monitoring Centre;
- (d) Protection of specific areas for biodiversity protection (e.g., the coastal and marine biodiversity project in Dominica).

3. *Possible actions and output in the framework of the Convention*

9. The Convention makes specific reference to small island developing States and recognizes their special conditions. Moreover, several decisions of the Convention on the protection of marine and coastal biological diversity (in particular, the Jakarta Mandate), as well as inland water biodiversity, make specific reference to small island States.

10. The Convention can respond to the needs of small islands by carrying out and developing:

- (a) Assessments of the status and trends of biodiversity and threats to biodiversity;
- (b) Assessment of the constraints and opportunities encountered in implementing the Convention;
- (c) Assessment of problems related to invasive alien species and climate change;
- (d) Rapid assessment methods and early warning systems;
- (e) Relevant provisions taking into account the specific needs of island biological diversity within the work programme of the Global Taxonomy Initiative; and
- (f) A programme of work including activities targeted to identified constraints in implementing the objectives of the Convention and more specifically develop:
 - (i) Methods and strategies to increase resilience for adaptation and mitigation to negative impacts;
 - (ii) Integrated strategies for effective management of terrestrial and marine (and other aquatic) ecosystems;
 - (iii) Integration and mainstreaming of biological diversity into sectoral and cross-sectoral programmes;
 - (iv) Tools and guidelines for the sustainable use of biological resources, by improving existing criteria and methods for identifying biodiversity indicators in small islands, for use in national planning efforts.

B. *Restoration and rehabilitation of degraded ecosystems and recovery of rare and threatened species*

1. *Main issues*

11. Given the current rate and extent of biodiversity loss and ecosystem/habitat degradation, there is an increasing need for restoration and rehabilitation of degraded ecosystems and for the recovery of threatened species. However, these can be extremely expensive and not always successful in fully restoring ecosystems. It is therefore necessary to evaluate critically costs and the scientific and technical

implications of proposed restoration/rehabilitation programmes and determine their value for conserving and recovering biodiversity. The potential problems identified under the topic include:

- (a) Lack of well-developed restoration/rehabilitation techniques;
- (b) High costs of restoration/rehabilitation of degraded ecosystems, including ecosystems invaded by alien species;
- (c) Lack of information on the effectiveness of restoration and rehabilitation activities in sustaining biodiversity;
- (d) Lack of incorporating monitoring and evaluation in restoration/rehabilitation programmes;
- (e) Insufficient local community participation in planning, developing and implementing restoration and rehabilitation programmes and need for better incorporation of traditional knowledge;
- (f) Lack of techniques to reproduce or propagate some rare and threatened species;
- (g) Lack of incentives to recover rare and threatened species.

2. *Past and ongoing initiatives*

12. International organizations, such as the Food and Agriculture Organization of the United Nations (FAO), the International Tropical Timber Organization (ITTO), the World Bank, UNDP and WWF have ongoing programmes on ecosystems rehabilitation and restoration. In 1998, the United Nations Commission on Sustainable Development took part in assessing, monitoring and rehabilitation of forest cover in environmentally critical areas.

13. The World Resources Institute (WRI) has been probing into issues relating to ecological restoration and invasive species. The Endangered Species Recovery Council (ESRC) was established to promote and engage in active restoration, research, planning, monitoring and habitat management for the betterment of endangered, threatened and sensitive biological resources. The ESRC has implemented various *in-situ* projects. IUCN is carrying out work on restoration, especially by its Forest Conservation Programme, and on recovery of rare threatened species through the Re-introduction Specialist Group (RSG) of its Species Survival Commission (SSC).

14. Research is also being carried out on rehabilitation of degraded coral reefs and restoration of ecosystems degraded by invasive alien species (e.g., in the United States).

3. *Possible actions and output in the framework of the Convention*

15. The Convention has provisions for the restoration and rehabilitation of degraded ecosystems and recovery of threatened species (Articles 8(f) and 9 (c)). In cooperation with relevant institutions and United Nations conventions, the Conference of the Parties can promote the implementation of Articles 8(f) and 9 (c) through:

- (a) Identifying degraded ecosystems and rare and threatened species;
- (b) Compiling information on relevant technologies and related costs for restoration and rehabilitation of degraded ecosystems and recovery of species;
- (c) Providing guidance on options and techniques for restoration and rehabilitation of major ecosystems (terrestrial, inland water and marine ecosystems);
- (d) Standardizing methodologies to determine degraded ecosystems and designate species-at-risk;
- (e) Empowering local and indigenous communities through training and educational programmes and ensuring their participation in the planning and implementation of programmes;
- (f) Assessing the effectiveness of measures taken;

- (g) Promoting research on reproduction and propagation of rare and threatened species, as needed; and
- (h) Integration of *ex-situ* and *in-situ* conservation of rare and threatened species.

C. Targets, baselines, indicators and mainstreaming

1. Main issues

16. It has long been recognized that biodiversity considerations have to be reflected at early stages of decision-making processes. It is therefore important to set targets, define baselines and develop indicators for continuing efforts to integrate or “mainstream” biodiversity conservation, its sustainable use and equitable sharing of benefits from the utilization of biological resources into national strategies and action plans.

17. In addition, the development and use of targets, baselines and indicators could be a focal area in capacity-building efforts whereby the entire information infrastructure and decision-support mechanisms are energized to deliver policy-relevant information. There are, however, certain barriers for effective implementation of these concepts, including the following:

- (a) Disagreements in defining and harmonizing baselines;
- (b) Lack of established data, information and institutional capacity for baseline determination and use of indicators;
- (c) Difficulty in setting and monitoring non-quantifiable targets;
- (d) Challenges for effectively coordinating mainstreaming efforts, i.e. setting realistic targets with relevant baselines, applying adequate indicators and integrating biodiversity considerations in all relevant sectors;
- (e) Difficulties in developing and implementing monitoring programmes using functional indicators to track progress in meeting the targets.

2. Past and ongoing initiatives

18. Various national biodiversity strategies and action plans (NBSAPs) have been produced for mainstreaming biodiversity issues into national planning and environmental assessment procedures for the achievement of the objectives of the Convention. Many national biodiversity strategies and action plans include targets and indicators; and some refer to baselines for biodiversity assessment.

19. In response to chapter 40 of Agenda 21, the Commission on Sustainable Development is leading an initiative to develop indicators of sustainable development, and is working closely with national Governments, United Nations organizations, intergovernmental organizations and non-governmental organizations. The work on criteria and indicators is ongoing in the field of forests with the participation of many members of the Collaborative Partnership on Forests. Various other organizations are working on indicators of biological diversity, including, *inter alia*, the Organisation for Economic Co-operation and Development (OECD) and WRI.

20. FAO, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Man and Biosphere programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO); the International Agenda for Botanical Gardens in Conservation; the IUCN Species Survival Commission; the International Plant Protection Convention; the Global Invasive Species Programme; the International Association of Botanic Gardens; and the WWF/UNESCO people and plants initiative have initiatives for developing targets in the context of Global Plant Conservation Strategy.

3. Possible actions and output in the framework of the Convention

21. The Conference of the Parties has ongoing work on indicators and is considering adopting a global plant conservation strategy, which includes targets for the conservation of plants. It is planned that

the Global Plant Conservation Strategy will serve as a pilot, and the Strategy would be expanded to other components of biological diversity in all the thematic areas addressed by the Convention.

22. Setting achievable targets, defining baselines and selecting effective indicators will facilitate the mainstreaming of biodiversity management at the national level, and this procedure will need to be incorporated into all ongoing and future programmes of work of the Convention. The Conference of the Parties can consider the following actions in its future work:

(a) Developing proposals for incorporation of targets in all work programmes under the Convention and for their assessment through agreed indicators;

(b) Approving principles and a set of standard questions for designing national-level indicators of the status and trends of biodiversity, and methods for baseline determination;

(c) Promoting the adoption of sets of indicators of biodiversity and indicators for assessing the effectiveness of measures taken;

(d) Producing operational guidelines for mainstreaming of biodiversity concerns into relevant sectoral and cross-sectoral plans, programmes and policies; and

(e) Providing technical assistance in the form of institutional strengthening, training and information sharing.

D. Biodiversity of urban and peri-urban areas

1. Main issues

23. Approximately 50% of the human population lives in cities, and the number is increasing. With the projected global increase of urbanization, land-cover conversions for urban use will also increase and can severely impact surrounding natural areas. However, the relevance of direct and indirect impacts of urban sprawl and industrial activities on biological diversity is not the only reason to investigate the relationship between human-made and natural environments. The cultural, leisure and environmental values associated with biodiversity in urban areas and the prospects of urban ecosystems for biodiversity regeneration have been often neglected and unexplored, and therefore need further consideration.

24. Issues associated with biodiversity in urban and peri-urban areas include the following:

(a) Lack of detailed understanding of the impacts of urbanization on biodiversity and the effects of urban and peri-urban (such as agriculture and mining) activities on biological diversity, including the possible shifting of the distribution/proportion of biodiversity and associated impact of this aspect on biodiversity functioning (goods and services);

(b) Lack of understanding of the value of urban biological diversity, and the impacts and role of living organisms on the built environment;

(c) Lack of information regarding biodiversity in heavily industrialized areas

(d) Problems of introduced species;

(e) Effectiveness of management of endangered and rare species in urban/peri-urban environment.

2. Past and ongoing initiatives

25. The Scientific Committee on Problems of the Environment (SCOPE) has been looking into issues related to environmental change in peri-urban areas, which include identifying the driving forces for environmental change, seeking alternative approaches for maintaining biodiversity and working towards effective management solutions and best practices for land-use activities in peri-urban zones.

26. An issue paper of the Ecosystem Conservation Group (ECG) on biological diversity and the urban environment was prepared by UNESCO in cooperation with FAO in 2001, to address the following points:

(a) Conservation and sustainable use of biodiversity within the urban and peri-urban environment; and

(b) Mitigation of the negative impacts of urbanization on the surrounding and more distant biodiversity of urban and peri-urban areas.

27. Other relevant activities are being carried out in the context of the UNESCO Man and Biosphere programme, and with regard to urban forests and trees of the European Cooperation in the Field of Science and Technology (COST) and the International Union of European Forestry Research Organizations (IUFRO).

28. The mining industry has been addressing the impact of mining activities on biodiversity in peri-urban areas. Other work is being done, mainly at the national level, in the fields of urban agriculture, urban forestry, and environmental management and planning of peri-urban areas and biodiversity in urban habitat patches.

3. *Possible actions and output in the framework of the Convention*

29. The Conference of the Parties can contribute to the conservation and sustainable use of biodiversity in the urban and peri-urban areas by developing a programme of work that will include *inter alia*:

(a) Synthesizing existing information on the status and trends of biodiversity, and the role/importance of biodiversity, including exotic species, in urban and peri-urban areas, taking into account all potential values of biodiversity;

(b) Compiling information on management practices of local and indigenous communities;

(c) Assessing impact of urbanization and peri-urban activities on biodiversity;

(d) Developing guidance for the maintenance of biodiversity in urban and peri-urban areas, taking into account good practices and alternative approaches for maintaining biodiversity;

(e) Establishing guidelines and/or legal frameworks and policies for integrating biodiversity concerns into urban planning and management of peri-urban ecosystems;

(f) Developing strategies, using a participatory approach, for effective biodiversity management in urban and peri-urban ecosystems, including restoration and rehabilitation of degraded areas; and

(g) Fostering collaboration with relevant stakeholders, including the private sector (e.g., mining sector).

E. The importance of biodiversity to human health

1. Main issues

30. Today, as ever, human beings are dependent for their sustenance, health, well-being and enjoyment of life on fundamental biological systems and processes. Moreover, humanity derives all of its food and many medicines and industrial products from the wild and domesticated components of biological diversity. Thus the loss of biodiversity has direct negative implications on human health. However, there has been little attempt to cover the full, complex range of consequences for human health from species loss and ecosystem disruption. The potential health risks of living modified organisms, in particular genetically modified crops, are also poorly documented.

31. As a result, the human dimensions of biodiversity loss have not been fully addressed, policies to protect biodiversity have not generally taken into account human health considerations, and the public has not been given what may be the most compelling argument to preserve other species and ecosystems—that human health and life are dependent on them.

2. *Past and ongoing initiatives*

32. In December 1999, the Center for Health and the Global Environment at Harvard Medical School in the United States has launched a study on biodiversity and its importance to human health under the auspices of UNEP and the World Health Organization (WHO). The report will include state of the art information on ecosystem-based life support systems; the role of plants, animals, and microbes in biomedical research; ecosystem disturbance, biodiversity, and human infectious disease; and the role of biodiversity in the world food supply.

3. *Possible actions and output in the framework of the Convention*

33. Within the framework of the Convention, consideration could be given to the linkages between biodiversity and human health as a cross-cutting issue and develop, in cooperation with relevant organizations, including in particular UNEP and the World Health Organization (WHO), a programme of work including:

(a) The assessment of existing information on the goods and services of biodiversity for human health, including medicines, nutrition, biodiversity and human infectious diseases; the interlinkages between species loss or ecosystem disruption and human health;

(b) Addressing human dimensions of biodiversity loss in all thematic areas addressed under the Convention;

(c) Developing guidelines for integrating human health considerations in policies for biodiversity conservation and sustainable use;

(d) Developing guidelines on how the issue of biodiversity loss can be included as an important variable in the design of national and international health plans;

(e) Enhancing awareness that human health and life are dependent on other species and ecosystems;

(f) Promoting research on the interlinkages between biodiversity and human health, for example, in the framework of the programme of work on agricultural biodiversity, to investigate how land-use patterns, and alterations in the balances of predators and prey, and hosts and parasites (and the factors that alter these balances, directly from human over-exploitation and indirectly from such forces as human-caused climate change) can lead to the emergence and spread of human infectious diseases; or how biodiversity is important to soil formation and fertility, pollination, the dispersal of seeds and translocation of nutrients, and to holding various plant diseases and pests in check; and

(g) Dissemination of relevant information through training/educational programmes and the Convention clearing-house mechanism.

F. Impact of globalization on the conservation and sustainable use of biodiversity, and ways to mitigate negative effects

1. Main issues

34. The proliferation of international bilateral and multilateral trade agreements in the last few decades has led to an increase in global movement of goods. While trade liberalization itself is not directly detrimental to the environment, certain aspects of increased transportation, particularly oceanic shipping traffic, have placed a strain on natural systems by facilitating the immigration of species to new habitats, introducing pollutants into aquatic ecosystems, and altering and destroying coastal habitats. However because of globalization, knowledge about environmental problems has also drawn attention on a worldwide level, and efforts to conserve global biodiversity have also increased. Issues that could be discussed under this topic include:

(a) Globalization as the root cause of an increase in invasions of alien species;

(b) Negative environmental impacts of increased shipping traffic on aquatic ecosystems;

- (c) Insufficient guidance for utilizing the positive impacts of globalization to mitigate negative effects;
- (d) Additional burden imposed on vulnerable ecosystems (such as deforestation, drainage of wetlands, and inclination towards species-poor monoculture) of increased export production in fast-growing developing countries;
- (e) Problems in the globalization of trade in agricultural goods (such as standardization of farming methods and crops) and impacts on species and genetic diversity;
- (f) Problems of increased global movement of hazardous products and technologies and implications on biodiversity loss;
- (g) Need for identifying synergies in existing environmental treaties and options for collaboration.

2. *Past and ongoing initiatives*

35. The Worldwatch Institute reported in their *Vanishing Borders; Protecting the Planet in the Age of Globalization (2000)* that globalization can work in favour of the global biodiversity if it is channelled to protect the Earth's natural systems. The report examines the impact of globalization on the environment and provides plan of action for protection.

36. In December 2001, at the fourth meeting of the Working Group on Agriculture and Environment, held under the auspices of Council for the Pan-European Biological and Landscape Diversity Strategy and UNEP, a detailed examination of the impact of globalization and agro-industry on the evolution of agricultural policies, practices and production systems was carried out.

3. *Possible actions and output in the framework of the Convention*

37. The Convention itself came into being to address concerns arising from rapid globalization, and most of its work programmes aim at mitigating negative impacts of unsustainable globalization pathways. However, the Convention could further respond to the global needs through:

- (a) Further assessing the positive and negative influence of globalization, including international trade and communication, on conservation and sustainable use of biodiversity, with emphasis on invasive alien species, vulnerable and fragile ecosystems, threatened species, and agrobiodiversity;
- (b) Developing options for promoting the positive effects and mitigating the negative impacts of globalization on biodiversity, in collaboration with relevant organizations; and
- (c) Integration of these considerations in all thematic areas addressed by the Convention.

G. *Polar ecosystems*

1. *Main issues*

38. The far northern and southern latitudes of the globe, while not host to as many species as warmer regions, nourish and protect an abundant web of living organisms. The polar ecosystems have their uniqueness as they demonstrate the ability of life to thrive in the most extreme conditions, by means of ingenious adaptations to climate, light and nutrition. Many species of plants and animals live in polar regions—from minute algae and lichen on bare rocks and ice to polar bears and penguins. In addition, the polar ecosystems provide food and shelter for many migrating bird species from other parts of the world for important parts of their life cycles. Although the polar regions are considered one of the last unspoilt and unexploited areas of the world, global warming, expanding natural resource exploration, extraction, and development are considered to be posing increasing threats to current forms of polar life. The following issues list some of the problem areas that could be further explored:

- (a) Lack of understanding of the characteristics of polar ecosystems and their role in the structure and formation of the larger-scale patterns of biodiversity on Earth;

- (b) Insufficient data and information concerning biodiversity status and trends in polar regions;
- (c) Global warming and its impacts on polar biodiversity;
- (d) Natural resource extractions in or near polar ecosystems and its effects on polar biodiversity;
- (e) Threats to the polar region marine life from overfishing and hunting;

2. Past and ongoing activities

39. The Arctic Council, whose members are Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden and the United States, as well as groups representing indigenous peoples, is studying the Arctic environment and developing parameters for habitat protection and conservation on an international scale. The Council manages a programme for the conservation of arctic flora and fauna (CAFF), and a number of related programmes.

40. The Nature Conservancy, a not-for-profit organization in the United States, has a programme to identify biodiversity “hot spots” and conserve them, including some in the polar region. Over the last fifty years the British Antarctic Survey (BAS) has undertaken the majority of Britain’s research on and around the Antarctic continent including projects such as “Antarctic marine biodiversity: a historical perspective” and “Biodiversity and stability of climatically perturbed Antarctic terrestrial and freshwater food webs”. The Alfred Wegener Institute for Polar and Marine Research (AWI) coordinates polar research in Germany and has been investigating diversity and stability issues as one of their central topics.

3. Possible actions and output in the framework of the Convention

41. In collaboration with relevant institutions and other United Nations bodies, such as the United Nations Framework Convention on Climate Change (UNFCCC), the Convention can contribute to the better understanding and management of polar ecosystems through:

- (a) Assessing the status and trends of diversity in polar ecosystems;
- (b) Identification of components of biological diversity important for its conservation and sustainable use;
- (c) Increasing understanding of polar biodiversity functioning (good and services);
- (d) Integrating in the Convention work, being carried out in collaboration with other conventions and organizations, including in particular the UNFCCC and the Intergovernmental Panel on Climate Change (IPCC), on the interlinkages between climate change and biological diversity; and
- (e) Assessing impacts of natural resource extraction and development on polar biodiversity.

H. Role of biodiversity in natural disaster prevention and relief

1. Main issues

42. It has been widely observed that the frequency and severity of natural disasters is growing, and hitting developing countries hardest. The economic loss due to disasters during the 1990s were reported to be nine times those sustained during the 1960s. By far the most lethal of natural hazards are floods, which account for 40% of all disaster-related deaths. In developing countries, the continuous expansion of the agricultural frontier into more fragile ecosystems has increased the incidence of floods, mudflows and landslides. Climate is also a key factor and changes in climate are likely to impact the frequency and intensity of floods, drought and other extreme events, as well as their resulting adverse effects on nature and society.

43. In light of these trends, it is important to investigate the benefits of a healthy biodiversity acting as a buffer against adverse effects of natural disasters, and examine whether investments in environmental conservation could reduce the need for reactive and costly disaster relief interventions. Potential issues related to this topic include:

- (a) Need for better understanding of ecosystem (and biodiversity) goods and services with regard to natural disaster prevention and relief;
- (b) Problems of response-oriented conventional disaster prevention and relief system (as opposed to prevention-oriented practices based on applying the precautionary principle);
- (c) Challenges for promoting environmental conservation investments as a cost-effective alternative for disaster management;
- (d) Insufficient analysis of the fragility and resilience of ecosystems with regard to natural disasters;
- (e) Absence of detailed emergency response and planning procedures, especially in populated and protected areas;
- (f) Problems of addressing increased ecosystem vulnerability due to disasters;
- (g) Lack of capacities to limit impact of natural hazards in developing/least developed countries;
- (h) Need for greater co-ordination mechanisms for disaster management for minimizing impacts on biodiversity;
- (i) Problems arising from transboundary and cross-scale nature of natural disasters; and
- (j) Lack of measures for managing displaced populations and protected areas after natural disaster incidents.

2. *Past and ongoing initiatives*

44. The secretariat of the United Nations International Strategy for Disaster Reduction (ISDR) has been looking at the issue of natural disasters and sustainable development by understanding the links between development, environment and natural disasters. The World Bank is assisting several countries in developing systems of payments for environmental services, with the Latin America and Caribbean region taking the operational lead and the Environment Department providing technical support.

45. In addition to the above, the Millennium Ecosystem Assessment has certain components of its work linked to biodiversity and natural disaster issues, and the Mesoamerican Biological Corridor has some activities related to protected areas and natural disasters in Central America.

46. IUCN-The World Conservation Union, together with its Commission on Environmental, Economic and Social Policy (CEEP), and its partner the International Institute for Sustainable Development (IISD) are working to identify and promote tools to reduce vulnerability to climate change and climate-related natural disasters.

3. *Possible actions and output in the framework of the Convention*

47. The role of biodiversity in natural disaster prevention and relief can be considered in the context of the Convention in the framework of its work on biodiversity and climate change. The Conference of the Parties might therefore request SBSTTA and the Ad Hoc Technical Expert Group on Biodiversity and Climate Change to provide advice on how biodiversity conservation and sustainable use can contribute to reducing vulnerability to climate change and climate-related disasters. More specifically, SBSTTA and the Expert Group can consider the following tasks:

- (a) Assessing the functions of components of biodiversity in natural disaster prevention and relief;
- (b) Compiling case studies and good practices taking into account traditional knowledge on utilization of biodiversity in natural disaster prevention and relief, and developing guidelines for good practices;

- (c) Developing conservation strategies and policies to reduce vulnerability to natural disasters;
- (d) Assessing conventional disaster prevention and relief measures and identify ways to promote biodiversity conservation as an alternative approach;
- (e) Facilitating information exchange and flow, especially to benefit developing countries, and creating capacities to produce and use information;
- (f) Promoting biodiversity indicators as a tool for assessing environmental vulnerability and for early warning;
- (g) Evaluating ecosystem services in terms of disaster prevention and relief (adaptation, mitigation); and
- (h) Assessing transboundary/cross-scale aspects of natural disasters and recommending regional options for mitigation and adaptation.

I. Impact of armed conflicts on biodiversity and ways to mitigate negative effects

1. Main issues

48. From the defoliation of forests to the impacts of oil fires and biological agents, all major armed conflicts of the twentieth century have had a hidden casualty: the environment and its biodiversity. Warfare can affect many aspects of the environment. Land use, water supply, air quality, biological resources, and the functioning of ecosystem services are often severely disrupted. Moreover, military impact on natural capital is global, ongoing and persistent, disrupting ecosystems on enormous scales, over both distance and time. Yet environmental repercussions of armed conflicts have seldom been discussed in international environmental forums.

2. Past and ongoing initiatives

49. A number of initiatives have been undertaken to address the impacts of armed conflicts on biodiversity. They include *inter alia* the following:

- (a) IUCN surveyed the impact of war on biodiversity for the first international conference on addressing the environmental consequences of war held in June 1998, Washington D.C.;
- (b) In 1999, UNEP created a “Balkans Task Force” to investigate the environmental impacts of war, in which post-war strategy was discussed with various members of the European Union and non-governmental organizations;
- (c) A conference on the implications of war on the conservation of tropical forests was held at Yale School of Forestry and Environmental Studies in 2000, where topics such as biodiversity, war and tropical forests and legal mechanism of addressing wartime damage to tropical forests were discussed. Also in 2000, the Netherlands Committee for the IUCN and the Netherlands Foundation for International Nature Protection published a book *Biodiversity Conservation During Conflicts* with contributions from various stakeholders (such as the Democratic Republic of the Congo, Viet Nam, Uganda and Colombia) and international and Netherlands organizations; and
- (d) The Biodiversity Support Program’s Armed Conflict and the Environment project, which ran from 1998 to 2001 identified and raised awareness about the negative impacts of armed conflict on the environment, and developed concrete strategies for mitigating these impacts before, during and after conflicts.

3. Possible actions and output in the framework of the Convention

50. In collaboration with other interested bodies, the Convention on Biological Diversity could provide assistance in areas such as:

- (a) Compiling information on the impacts of armed conflicts on components of biodiversity, including socioeconomic impacts of biodiversity loss;
- (b) Developing options for mitigating the negative effects of armed conflicts on biodiversity;
- (c) Compiling information on methods for restoring and rehabilitating habitats and ecosystems degraded by armed conflicts or the consequences of armed conflicts (e.g., displacement of populations); and
- (d) Compiling information on strategies for mitigating negative impacts of armed conflicts on biodiversity.

J. Impacts of changes in ozone layer on biodiversity, and ways to mitigate the negative effects

1. Main issues

51. A number of global changes have serious impacts on biodiversity, one of which includes ozone layer depletion. The stratospheric ozone layer filters out ultraviolet radiation from the sun and protects all life on Earth from adverse effects. The thinning in the ozone layer leads to increased ultraviolet radiation at the Earth's surface, disrupting the ecological balance by harming the metabolism of cells and even damaging genetic material. This could consequently lead to endangering species and genetic materials (e.g. crop varieties and land races) already under threat and biological diversity in general. As such, the relationship between ozone depletion and impacts on biodiversity is direct, and therefore the protection of the ozone layer is a prerequisite for conservation and sustainable use of biodiversity. A few subjects that could be discussed in greater detail are listed below.

2. Past and ongoing initiatives

52. UNEP initiated an assessment of ozone depletion by convening a meeting of experts in 1977. On the recommendation of the participating experts, UNEP set up a Coordinating Committee of the Ozone Layer (CCOL) in cooperation with the World Meteorological Organization (WMO). Over the following ten years, this committee provided regular assessments of the state of the ozone layer and coordinated further research. In addition, the Environmental Effects Assessment Panel convened under the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer has been producing comprehensive assessment reports *on Environmental Effects of Ozone Depletion* covering issues such as the effects on aquatic and terrestrial ecosystems. The latest full assessment report is that of November 1998, and an updated interim summary report has been made available in August 2000.

53. The Ozone Secretariat, which is the secretariat for the Vienna Convention for the Protection of the Ozone Layer (1985) and for the Montreal Protocol, has published data on the state of the ozone layer and guidelines on how to protect the ozone layer, reduce and eventually eliminate the emissions of man-made ozone depleting substances, and cooperate in scientific research to improve understanding of the atmospheric processes.

54. The Scientific Committee on Problems of the Environment (SCOPE) has looked into the matter through a book titled *Effects of Increased Ultraviolet Radiation on Global Ecosystems* in 1993.

55. The biodiversity and climate change programme of the UNEP World Conservation Monitoring Centre have been tying biodiversity information into global and regional climate models, including effects of ozone depletion and increased ultraviolet radiation, to better understand the impacts of global change and further develop response strategies. A few of their pipeline projects include effects on waterbirds, forests and coral bleaching.

56. Further scientific research regarding the effects of ultraviolet radiation on biodiversity is being conducted in many academic institutions, addressing, for example, the role of UV-B radiation in aquatic and terrestrial ecosystems, or the effects of ultraviolet radiation on marine macroalgae and sea grasses.

3. *Possible actions and output in the framework of the Convention*

57. As one of its main cross-cutting issues, the Convention is addressing the impacts of climate change on biodiversity. In continuation of this endeavour, the Convention can also examine ozone depletion and its negative effects on biodiversity. Furthermore, bearing in mind ongoing work under the Montreal Protocol, the Conference of the Parties to the Convention on Biological Diversity can contribute by calling for:

(a) An assessment of the impacts of ozone layer depletion on biodiversity, in particular on plant biodiversity, crop performance, marine productivity and fisheries, through existing information;

(b) The development of options for mitigating the negative effects of the depletion of the ozone layer on biodiversity, and for adaptation measures; and

(c) A study of the interlinkages between biodiversity, ozone depletion and climate change to complement the work of the Ad Hoc Technical Expert Group on Biodiversity and Climate Change, and enhance opportunities for synergy between the three instruments (Convention on Biological Diversity, United Nations Convention on Climate Change, and the Montreal Protocol).

K. Importance of biosecurity in preserving biodiversity through the control of invasive alien species

1. Main issues

58. Around the world, plants, animals and microorganisms are on the move due to increasing international transport and trade. Many of them find new homes and cause problems for indigenous species and people. In spite of the serious implications associated with their impacts, people remain under-informed regarding the scope and gravity of the invasive species problem, and little effective strategy has been developed to enable appropriate solutions. In this context, exercising biosecurity could pave the way to preventing harmful invaders from securing a foothold and facilitate their control or eradication.

59. There is currently:

(a) Insufficient understanding of legal and institutional dimensions of biosecurity;

(b) Problem of overlooking internal (domestic) biosecurity;

(c) Lack of detailed evaluation of the effectiveness of biosecurity programmes;

(d) Need for early warning and emergency response systems;

(e) Poor knowledge base for biosecurity development and implementation; and

(f) Insufficient capacity building initiatives and public information.

2. Past and ongoing initiatives

60. International and regional efforts to promote biosecurity strategies aim to prevent the opportunity for potentially invasive species to enter new non-native areas, and to limit the spread and impact of species once they become established in a new area. The Global Invasive Species Programme (GISP), including the IUCN Strategy on Invasive Species, is the most important global ongoing initiative on invasive alien species. It has produced a toolkit and strategy along with numerous publications. The regional invasive species strategy of the South Pacific Regional Environment Programme (SPREP) is another important initiative.

61. A few countries, such as New Zealand, are extensively involved in developing biosecurity strategies and programmes at the national level. A comprehensive public consultation paper has recently (September 2001) been prepared by the Biosecurity Council of the New Zealand Government detailing strategic directions and objectives, biosecurity principles and policies, biosecurity systems and procedures, and biosecurity operations.

3. *Possible actions and output in the framework of the Convention*

62. There is ongoing work on invasive alien species under the Convention. At its sixth meeting the Conference of the Parties will consider how to implement Article 8(h) of the Convention and adopting guiding principles for the prevention of the introduction of invasive alien species, their control and eradication. In focusing on biosecurity, the Conference of the Parties may wish to:

- (a) Compile information on pathways and vectors of invasive alien species to be included in designing and improving biosecurity programmes;
- (b) Develop guidelines for risk analysis (risk assessment and management systems) to facilitate decision-making process;
- (c) Continue synthesizing case-studies in light of the guiding principles for the control and prevention of invasive alien species, and mitigation of their impacts, and case-studies on restoration of invaded ecosystems;
- (d) Promote the implementation of biosecurity; and
- (e) Disseminate information and strengthening capacities.
