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INLAND WATERS BIOLOGICAL DIVERSITY: WAYS AND MEANS TO IMPLEMENT THE PROGRAMME OF WORK

Note by the Executive Secretary

EXECUTIVE SUMMARY

At its fourth meeting, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) requested the Executive Secretary to prepare a report on ways and means to implement the programme of work on inland water biological diversity. Pursuant to that request, the present note reviews how a number of countries and international organizations have been carrying out activities contributing to the implementation of that programme of work; and how the Secretariat of the Convention has started implementing the programme of work essentially through collaborative activities and joint work plans. The note also highlights gaps and obstacles in the implementation of the programme of work.

SUGGESTED RECOMMENDATIONS

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

1. Notes the various ways and means to implement the programme of work on inland water biological diversity and obstacles in implementing some aspects of the work plan of the Subsidiary Body on Scientific, Technical and Technological Advice; and
2. Requests the Executive Secretary to systematically compile this information for dissemination through the clearing-house mechanism and report on it as part of the review of work plan on inland water biological diversity that the Subsidiary Body on Scientific, Technical and Technological Advice will carry out at its eighth meeting.

* UNEP/CBD/SBSTTA/5/1.

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I. INTRODUCTION

1. At its fourth meeting, held in Bratislava in May 1998, the Conference of the Parties to the Convention on Biological Diversity adopted decision IV/4, on status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use, including a programme on the biological diversity of inland water ecosystems and the associated matters of identification and monitoring, assessment methodology and taxonomy.

2. The programme of work adopted under decision IV/4 is set out in annex I to the decision and addresses the following areas:

(a) Assessment of the status and trends of the biological diversity of inland water ecosystems and identification of options for conservation and sustainable use (part A), including: general activities to be carried out by the Executive Secretary of CBD and SBSTTA (section 1); a work plan of SBSTTA (section 2); recommendations to Parties (section 3); financing (section 4);

(b) Provision of scientific advice and further guidance to assist in the national elaboration of Annex I of the Convention, on identification and monitoring, as pertaining to inland water ecosystems (part B);

(c) Review of methodologies for assessment of biological diversity, as pertaining to inland water ecosystems (part C);

(d) The urgency of needed action on taxonomy (part D).

3. Annex II to the same decision sets out a possible time-frame for the work programme pertaining to SBSTTA activities.

4. At its fourth meeting, held in June 1999, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) requested the Executive Secretary to prepare a report on ways and means to implement the programme of work on inland water biological diversity. Such a report, prepared at this early stage of the implementation of the programme of work, can serve a threefold purpose: (i) to assess and share information on how the programme of work is being implemented; (ii) to identify gaps and obstacles in implementing the programme; and (iii) to propose means to continue implementing the programme of work. This document is also intended to provide information to Parties in order to assist their implementation of the work programme, as described in its part A, section 3.

5. Following the structure of the programme of work, section II of the present note provides information on ways and means to implement the programme by focusing on ways and means to implement general activities. Section III considers ways and means to implement the work plan of SBSTTA, section IV identifies gaps and obstacles in implementing the SBSTTA work plan.

II. WAYS AND MEANS TO IMPLEMENT THE PROGRAMME OF WORK

A. Collaboration with other bodies for implementing general activities

6. In paragraph 1 of the work programme, the Conference of the Parties requests the Executive Secretary to continue and further develop collaboration with organisations, institutions, and conventions working with research, management and conservation of inland water biological diversity, including, inter alia, the Convention on Wetlands, FAO, ICLARM, Global Water Partnership,

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World Water Council, UNDP, UNEP, DIVERSITAS, Wetlands International, IUCN, World Bank, and the Bonn Convention.

7. In light of the above mentioned paragraph, in July 1998 and in August 1999, the Executive Secretary sent letters to relevant organizations and institutions drawing their attention to decision IV/4 and inviting them to submit case-studies and information relevant to the programme of work on inland water biological diversity. With the exception of the World Bank, case-studies were not submitted, although the information provided would indicate that several studies have been and are being carried out by the various organizations on specific targets. A summary of information on relevant activities of organizations working on inland water biodiversity is provided below. The complete information can be found at the Secretariat web site (<http://www.biodiv.org>). As a next step, specific areas will be identified for joint work plans between the Convention on Biological Diversity and these organizations/institutions.

1. Convention on Wetlands

8. The Convention on Wetlands is carrying out several activities that strengthen cooperation and synergy with the Convention on Biological Diversity in the areas of common interest, since the adoption of the Joint Work Plan with the Convention on Biological Diversity in May 1998. At its seventh meeting, held in Costa Rica in May 1999, the Conference of the Parties to the Convention on Wetlands adopted a series of resolutions and recommendations that will benefit the programme of work on inland water biological diversity. The following are some examples.

(a) Recommendation 7.2, on small island developing states, island wetland ecosystems and the Ramsar Convention, calls on the Standing Committee of the Ramsar Convention to review the Barbados Programme of Action for the Sustainable Development of Small Island Developing States with a view to identify priority actions with respect to island wetland ecosystems;

(b) Resolution VII.18, on Guidelines for integrating wetland conservation and wise use into river basin management, is intended to assist Parties to integrate the ecosystem approach in river basin management systems, whereby issues relating to the maintenance of ecosystem integrity are given prominence in decision making associated with integrated management system of water resources. In this respect, the secretariats of the Ramsar Convention and the Convention on Biological Diversity are currently developing a project proposal on an Integrated River Basin Initiative;

(c) Resolution VII.20, on priorities for wetland inventory, recognized the poor state of wetland inventory globally and recommends a range of priority actions to rectify this situation. Ramsar's Scientific and Technical Review Panel (STRP) prepared a paper on early warning systems for detecting ecological change in wetlands, which provides Ramsar Parties with a basis for monitoring to detect impacts on water-dominated ecosystems and considers issues of indicators and criteria, which could be directly transferable to the SBSTTA programme of work on inland water ecosystems and to the cross-cutting issue on indicators of biological diversity;

(d) Resolution VII.11, on a strategic framework and guidelines for the future development of the list of wetlands of international importance, is relevant to the Convention on Biological Diversity as it provides detailed guidance on how to take a systematic approach to future site designations under the Convention in order that the vision of "an international network of

wetlands which are important for the conservation of global biological diversity and for sustaining human life through the ecological and hydrological functions they perform" can be achieved;

(e) Resolution VII.17, on restoration as an element of national planning for wetland conservation and wise use, provides criteria to assist Contracting Parties to consider the costs and benefits to be gained from the rehabilitation or restoration of these ecosystems.

9. The resolutions and recommendations from the seventh meeting of the Conference of the Parties to the Convention on Wetlands now form a comprehensive and integrated "toolkit" for the implementation of the Convention. Finally, in order to promote cooperation and synergy between the actions of the scientific and technical bodies of the two conventions, the current practice of inviting the chairs of these respective bodies to the meetings of the other should continue, in line with paragraph 12 of the programme of work.

2. DIVERSITAS

10. DIVERSITAS has many Special Target Areas of Research (STAR). The objective of the STAR on inland water biological diversity is to identify specific research areas that are new, or of sufficient ecological or economic importance, to justify the implementation of an international programme. The proposed research components are:

1. Inventorying and monitoring inland water biodiversity;
2. Origins, maintenance and change of inland water biodiversity; determinants of species diversity;
3. Biodiversity and ecosystem functioning in inland waters;
4. Sustainable use of inland water ecosystems;
5. Biodiversity of aquatic living resources as indicator of environmental health;
6. Cultural aspects on inland water biodiversity;
7. Education-training.

DIVERSITAS is also preparing inland water research in Western Pacific and Asia (DIWPA) in 2001 and 2002 with common comparative manuals, in relation to the International Biodiversity Observation Year (IBOY); pilot aquatic network sites (PLANETS); and an African freshwater inventory of biodiversity (AFRIBIO).

3. The Food and Agriculture Organization of the United Nations

11. FAO deals with numerous aspects of the sustainable use and conservation of biodiversity from inland aquatic ecosystems. The primary responsibility in these areas falls to the Land and Water Development Division concerning water as a resource, and for biodiversity issues to the Fisheries Department, which has established three broad strategic objectives:

- (a) Promotion of increased contribution of responsible fisheries and aquaculture to world food supplies and food security;
- (b) Promotion of efficient, sustainable and responsible fisheries sector management at the global, regional and national levels in the framework of the Code of Conduct for Responsible Fisheries; and
- (c) Global monitoring and strategic analysis of fisheries to provide a sound basis for projection of production potentials, resource trends and impacts of fisheries practices.

12. To promote new fisheries management approaches, FAO adopted the Code of Conduct for Responsible Fisheries in 1995 in order to provide a "necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment" (FAO, 1995). The Code of Conduct and the accompanying technical guidelines acknowledge the importance of biological diversity of inland fisheries. Technical guidelines have been created to help implement the Code for inland fisheries (FAO, 1997). These guidelines note the special character of inland fisheries, in that most impacts to the fisheries originate from outside the sector. A project is under way to establish linkages between the Code of Conduct and the provisions of the Convention on Biological Diversity in order to enhance Code of Conduct users' awareness of the Convention on Biological Diversity. FAO is working to improve the quality of fishery statistics for inland waters in light of the fact that actual production from inland fisheries may be 2-5 times the level officially reported by national Governments (FAO, 1999). In addition, FAO maintains a database on introductions of aquatic species that provides documentation on their range and impacts (Garibaldi and Bartley, 1999). This database may be useful for national reporting on alien species and their impacts on biological diversity, including that of inland water ecosystems. FAO is linking with other institutions such as ICLARM, the Water Resource Institute (WRI), the World Conservation Monitoring Centre (WCMC), the World Commission on Dams, regional bodies, such as the Mekong River Commission, and national Governments in order to share expertise to better conserve and sustainably use biodiversity from inland waters.

4. International Center for Living Aquatic Resources Management (ICLARM)

13. ICLARM is carrying out several activities relevant to inland water biological diversity. They include:

(a) The development of a biological database, called FishBase, in collaboration with FAO and other partners. The Fishbase contains key information (nomenclature, morphology, trophic ecology, population dynamics, physiology, pictures, maps, etc.) for 23,000 of the estimated 25,000 known species of finfish;

(b) The elaboration of the "Fishes for the Future" proposal, jointly with IUCN, Fauna and Flora International (FFI) and WCMC, to conserve and sustainably use the world's freshwater fishes;

(c) The establishment of the foundation of the International Network on Genetics in Aquaculture (INGA), consisting of 13 member countries and 11 advanced research institutions, as a mechanism for sharing information mainly on freshwater farmed fish, carps and tilapias;

(d) The organization of a conference, in collaboration with FAO, entitled "Towards Policies for Conservation and Sustainable Use of Aquatic Genetic Resources", the proceedings of which will be available at the fifth meeting of SBSTTA;

(e) The organization of a three-day scientific conference held under the auspices of the ACP-European Union Fisheries Research Initiative and the European Commission, on sustainable use of aquatic biodiversity: data, tools, and cooperation. The conference proceedings and a CD-ROM, containing texts of 35 presentations made at the conference, will be available at the fifth meeting of SBSTTA;

(f) The development of an "Aquatic Animal Diversity Information System" (AADIS), in collaboration with FAO and the World Fisheries Trust (WFT);

(g) The development of reviews of inland aquatic resource systems and the research of sustainability indicators for integrated farming systems, including the development and testing of software (RESTORE) for integrated resources management at farm level;

(h) A number of studies on: "Conservation and Use of a West African Tilapia Species (*Sarotherodon melanotheron*) to Generate New Knowledge and Improved Methods for Work with this and Other Species"; the "Genetic Diversity of the Silver Barb (*Barbodes gonionotus*) in Southeast Asia: a pattern to follow for determining the center(s) of genetic diversity of freshwater fish"; "Modelling the Management of Water Flows to Optimize Aquatic Resource Production in the Mekong Basin"; an assessment of the usefulness of ponds in integrated farm and forest border zone systems in the uplands of Quirino Province, Philippines; the migrations of small cyprinid fishes (*Barbus* spp.), important in the diets of rural or urban populations, in the Lake Chilwa basin, Malawi.

14. More information on ICLARM's activities on inland water biodiversity can be found in the Center's strategic plan 2000-2020, which includes a supplement on aquatic resources research in developing countries - data and evaluation by region and resource system.

5. The United Nations Environment Programme (UNEP)

15. The secretariat of UNEP submitted a short report on the proceedings and outcome of the Conference on African Water Resources Management Policy, held in Nairobi in May 1999. The Conference was organized by the World Bank and the Government of Kenya, in cooperation with UNEP, as part of the Global Water Partnership. It was recognized the need for adequate strategies to deal with the prevailing problems of water scarcity and equitable distribution, water pollution, watershed degradation, water weeds and hyacinth control as well as the environmental aspects of water management. The issue of managing transboundary water resources was also discussed, as well as the issues of economics and financing, regulation, statutory and customary water law, institutions, emerging and innovative arrangements for water resources management and sustainable utilization.

6. Wetlands International

16. A number of Wetlands International projects are specifically aimed at assessing biodiversity of inland waterbodies. These include :

(a) Assessment of freshwater biodiversity of Latin America and the Caribbean; fish biodiversity projects in Papua New Guinea, the Lower Mekong Basin and the Inner Delta of the Niger River in Mali; conservation of the Irrawady Dolphin in East Kalimantan, Indonesia; a flyway atlas for ducks, geese and swans in Asia and in the context of the Africa Eurasian Migratory Waterbird Agreement (AEWA); and cranes in the North East Asian flyway (in the context of the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996-2000);

(b) Projects are being developed in China, Uzbekistan and Malaysia that deal with management and conservation of inland wetland sites of different habitat types: from high-altitude marshes, rivers, lakes, to peat-swamp forests;

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(c) Broader activities relevant to inland water biodiversity include the setting up of regional and national wetland programmes, inventories, strategies, action plans and training, in e.g. South-East Asia, the South Pacific, Eastern Europe, the Mediterranean, Africa and the Americas;

(d) Also important to biodiversity are Wetlands International's information exchange and networking activities, including: newsletters produced at regional and national scales, in many different languages; twenty-one specialist groups and world-wide networks of experts, active on subjects ranging from flamingoes to wetland restoration; several inter-linked Internet websites maintained by Wetlands International specialist groups to disseminate information to a wide audience on different issues of wetlands biodiversity and ongoing projects;

(e) Regional guidelines for rapid assessment of inland water biological diversity for different types of wetlands were developed during the MedWet I project in the Mediterranean region, for which Wetlands International was the lead agency. Outputs from this European Union financed project include: an overview of the status of wetland inventories in the Mediterranean region; a methodological guide for wetland monitoring; and a five-volume set for Mediterranean wetland inventory, including:

- i) A reference manual;
- ii) Data recording;
- iii) A habitat description system
- iv) Photointerpretation and cartographic conventions, and
- v) A database manual.

Based on the experience of MedWet, it is being planned to develop a tool for national wetland inventories in the form of generic wetland database software, together with the establishment of a European Wetland Information Network;

(f) Among the watershed and river-basin projects that Wetlands International is or has been involved in, are: management of wetlands in Argentina and other south American countries; Tasek Bera and Lake Chini in Malaysia; Berbak and Danau Sentarum in Indonesia; Logtak Lake, India; the Lower Volga in Russia; and transboundary wetlands in Central Europe;

(g) Many management case-studies are documented in the proceedings of the conferences on wetlands and development, held in Kuala Lumpur in 1995 and in Dakar in 1998, and in other Wetlands International publications.

7. The World Bank

17. The World Bank has recently produced inland water biodiversity guidelines that have been published by the Inter-American Development Bank. Moreover, the Bank has been applying a new analytical tool, so called "Overlay", to integrate environmental externalities into the World Bank's economic and sector work. Similar to a graphic overlay, which attaches a new layer to an already existing surface, the "Overlay" concept can add an environmental dimension to sector studies. The "Overlay" concept is going to be applied to a "Viet Nam National Hydropower Study" to enable Vietnamese water-resource planning to proceed in full consideration of freshwater biodiversity functions and their broad economic values. This will be achieved by:

(a) Demonstrating the local and broader economic importance of freshwater biodiversity;

(b) Estimating the incremental (mitigation) costs of sustainable management of freshwater biodiversity in areas designated as suitable for different types of hydropower and other infrastructure-orientated developments;

(c) Understanding the distribution of Vietnamese fish and other freshwater organisms and habitats within and beyond the country;

(d) Providing recommendations for appropriate design and implementation of hydropower and other water-use programmes or projects that allow water to be used but not at the expense of the freshwater biodiversity;

(e) Holding a national workshop attended by senior government personnel to discuss, improve, and disseminate the overlay's ideas and findings.

8. IUCN - The World Conservation Union

18. IUCN has launched a freshwater initiative aimed at enhancing the capacities of IUCN members and partners to identify threats to freshwater resources and ecosystems and to design and implement measures required for their conservation and sustainable use. The initiative has three goals:

(a) Synthesize the existing knowledge and use it to raise the awareness of decision makers and water resource managers on issues associated with the conservation and sustainable use of freshwater resources;

(b) Develop management tools and build capacity for working with decision-makers and water-resource managers, encouraging them to adopt new practices of sustainable use of freshwater resources; and

(c) Work at levels ranging from small (sub-)catchments to international river basins to improve and facilitate cooperation among institutions in the interest of conservation and wise use of freshwater resources. Regional elements of the freshwater initiative, addressing all three of these goals, are being launched in Central America, Southern Africa, and South and South East Asia.

19. In addition, the IUCN Species Survival Commission (SSC) is contributing to the freshwater initiative by working, in particular, on the first goal. It is developing a series of regional networks with the aim of putting in place an information baseline on the status of freshwater biodiversity from which future trends can be monitored on a consistent basis. SSC has already gathered information which seems to indicate that inland water biodiversity is significantly more threatened than either terrestrial or marine biodiversity. At the global level, the initiative will synthesize information on integrated catchment management and pass the results on to important constituents and target audiences. The IUCN initiative seeks to work in close partnership with others, and to make information available to Parties to the Convention on Biological Diversity to assist them in the conservation and sustainable use of inland water biological diversity.

B. Elaboration of a Joint Work Plan with the Convention on Wetlands

20. In paragraph 2 of the work programme, the Conference of the Parties encouraged the Executive Secretary of the Convention on Biological Diversity and the Secretary-General of the Convention on Wetlands to elaborate a work plan that ensures cooperation, and avoid overlap between the two conventions, noting the memorandum of cooperation with the Convention on Wetlands and

decision III/21 of the Conference of the Parties, whereby the Convention on Wetlands would be a lead partner in inland water ecosystems.

21. The Joint Work Plan (JWP) was prepared by the Bureau of the Convention on Wetlands and the Secretariat of the Convention on Biological Diversity, distributed at the fourth meeting of the Conference of the Parties to the Convention on Biodiversity (UNEP/CBD/COP/4/Inf.8) and endorsed by the Conference of the Parties in decision IV/15. In late 1999, a new Joint Work Plan will be prepared for consideration by the Wetlands Convention Standing Committee and SBSTTA at its fifth meeting.

C. Collaboration with the Commission on Sustainable Development

22. In paragraph 3 of the work programme, the Conference of the Parties expresses its wish to continue the close collaboration with the Commission on Sustainable Development in its development of the strategic approach to freshwater management, to ensure that biological diversity issues are considered in this process.

23. To this end, the Secretariat is cooperating with the Subcommittee on Water Resources of the Administrative Committee on Coordination, which is the task manager for chapter 18 (Freshwater) of Agenda 21, and other relevant United Nations bodies, to follow up to the outcome of the sixth session of the Commission on Sustainable Development, held in April/May 1998, as requested in paragraph 8 (b) of decision IV/4. The aim of this work is, inter alia: to identify gaps or inconsistencies in the implementation of programmes of the ACC Subcommittee's constituent organizations; to consider ways of increasing efficiency in programme delivery and possibilities for joint programming; to explore the potential of cooperation arrangements and, where appropriate, take into account the experiences gained in existing programmes in the United Nations system; to assess the success of strategic approaches to the sustainable development, management, protection and use of freshwater resources in achieving the goals described in chapter 18 of Agenda 21; to develop a global picture of the state of freshwater resources and potential problems.

D. Development of a roster of experts

24. In paragraph 4 of the work programme, the Conference of the Parties requested the Executive Secretary to develop a roster of experts on the conservation and sustainable use of the biological diversity of inland waters and urged Governments to nominate experts to the roster, noting also that the Ramsar Bureau is establishing a similar list of experts.

25. To date, the Convention on Biological Diversity roster on inland water biological diversity includes 223 experts nominated by 44 countries. The roster is made available on the Internet through the clearing-house mechanism (CHM) of the Convention at <http://www.biodiv.org>. It should be noted that, in February 1998, the Ramsar Convention launched its Wetland Expert Database of nearly 300 experts in different fields of wetland management from around the world. The two Conventions' rosters of experts have been linked through the joint website entry page (<http://www.biodiv.org/rioconv/websites.html>). Furthermore, Ramsar is now establishing national focal points to assist with the work of the Scientific and Technical Review Panel by providing inputs in all areas, as well as helping to mobilize other experts within their

countries. In the same way, Parties to the Convention on Wetlands have also been asked to nominate one governmental and one non-governmental national focal point for matters concerning communication, education and public awareness.

E. Role of the clearing-house mechanism

26.Paragraph 5 of the work programme affirms that the clearing-house mechanism of the Convention on Biological Diversity should be used to promote and facilitate the exchange of information and the transfer of technology relevant to the conservation and sustainable use of inland water biological diversity. To this end, besides the roster of experts, the clearing-house mechanism also houses case-studies and information provided by Parties and organizations on inland water biodiversity. Moreover, the clearing-house mechanism has been reviewed, in particular in national reports, to enhance its efficiency.

F. Early cooperation with small island States and States suffering from ecological disasters

27.In paragraphs 6 and 7 of the work programme, the Conference of the Parties requests the Executive Secretary and SBSTTA to pay special attention to early cooperation with small island States in the development of rapid-assessment methodologies, and States with inland water ecosystems suffering from ecological disasters, in assessing such disasters and mitigating activities and in developing rapid assessment methodologies within these States.

28.In this regard, as a first step toward cooperation, the Executive Secretary sent a letter in September 1999 to all national focal points to the Convention on Biological Diversity, requesting them to indicate whether their inland waters suffer from ecological disasters and possibly provide case-studies and information in order to initiate cooperation in developing rapid-assessment methodologies. To date, no reply has been received by the Secretariat.

29.Furthermore, the Secretariat carried out a search of organizations working on the biological diversity of small island States and States suffering from ecological disasters to avoid duplication but take advantage of possible synergies to respond to the request of the Conference of the Parties in paragraphs 6 and 7 of the work programme. The results of the search can be found in annex I below.

III. WAYS AND MEANS TO IMPLEMENT THE WORK PLAN OF SBSTTA

30.This part of the present note refers to paragraph 8 of part A, section 2 of the work programme, and presents information on possible ways and means to implement the work plan of SBSTTA. Paragraph 8 states that the work plan of SBSTTA should be developed in cooperation with relevant organizations, Governments and Parties and build upon the ongoing efforts in inland water ecosystem conservation. The work plan should include elements identified by the Conference of the Parties in paragraphs 8(a), (b), (c) and (d) of the programme of work.

31.For this purpose, in July 1998 and in September 1999, the Executive Secretary sent letters to all national focal points of the Convention, inviting them to submit case-studies and other information relevant to paragraphs 8 (a), (b) and (c) of the work programme. Following the time-table presented in annex II to decision IV/4, the Executive Secretary will prepare

proposals for the elements identified in paragraph 8 (d), namely on development of methods and techniques for the valuation of goods and services of inland water ecosystems, incentive and policy reforms and understanding of ecosystem function, in the year 2002. Therefore, this task is not analysed in the present document.

32.To date, case-studies and information have been submitted by Argentina, Australia, Belgium, Bulgaria, China, Egypt, Germany, Mexico, the Netherlands, Portugal, Saudi Arabia, and the United Kingdom.

A. Ways and means for implementing paragraph 8 (a) of the work programme

33.As stated in paragraph 8(a) of the work programme, the work plan for SBSTTA should make use of existing information and draw upon relevant organizations and experts to develop an improved picture of inland water biological diversity, its uses and its threats, around the world. The output should identify areas where the lack of information severely limits the quality of assessments.

34.A synthesis of relevant information on how countries are assessing the status and trends of inland water biological diversity, its uses and threats, taken from case-studies and information submitted to the Executive Secretary by those countries mentioned in paragraph 32 above, is provided in the following paragraphs.

35.Australia-wide assessment of river health (a subprogramme of the national river health Programme). The objectives of this subprogramme include: (i) undertake a comprehensive assessment of the health of inland waters, by identifying key areas for the maintenance of aquatic and riparian health as well as stressed inland waters; (ii) consolidate and apply techniques for improving the health of inland waters, particularly those identified as stressed. As part of this sub-programme, extensive sampling of macro invertebrate communities has been undertaken throughout Queensland. This study aims at analysing the distribution and diversity of invertebrate taxa, and improving the level of taxonomic identification. In order to address possible threats to biological diversity, a pilot research project is currently under way in the Burnett Basin to map the macro invertebrate taxa of the basin, and attempt to identify the conservation value of particular areas based on indicator species. In Australia, research activities carried out at the Cooperative Research Centre for Freshwater Ecology provide ecological understanding to improve inland waters by collaborative research, education and resource training. Research activities are undertaken under six programmes: flowing waters; standing waters and eutrophication; floodplain and wetland ecology; water quality and ecological assessment; urban management; and fish ecology.

36.China reported on a survey carried out at national level to assess the biological diversity of rivers, lakes and reservoirs. Impacts of human activities on inland water biodiversity were assessed and classified as: impact of fisheries; impact of large-scale water-conservancy works; impact of excessive felling of forests and reclaiming farmland from lakes; impact of water pollution and eutrophication; impact of water-body salinization. As a consequence of the findings of the above-mentioned survey, some measures were taken in order to protect and restore the inland water biological diversity of the country.

37. A document on the Hydrological priority regions and biodiversity in Mexico reports on two workshops, organized in 1998 by the National Commission for the Study and Use of Biodiversity (CONABIO), to diagnose freshwater environments and select areas with respect to: high biological richness; the degree of general knowledge or the lack of information; the actual and potential use; the actual and potential negative impacts on biodiversity; and the environmental services. Of 110 identified hydrological basins of top priority in terms of biodiversity, 82 correspond to areas in use and 75 are threatened in some way. Also, 29 areas were identified that are biologically important but for which there is not enough scientific information on biodiversity. A technical file card was prepared for each identified area, with general information on limnology, geology/edaphology, water resources and biodiversity, as well as the use of the resources, economic aspects and problems on conservation and use. An overall view on biodiversity, the use of resources, actual and potential impacts and threats is also included in the report.

38. To monitor changes in wetland habitats, a programme of long-term monitoring of land use and ecological change in the countryside of the United Kingdom has been carried out in 1979, 1984 and 1990. A further countryside survey is currently under way. The development of improved satellite and land-cover mapping techniques, and the use of aircraft scanning techniques are important parts of this current initiative.

39. In a document entitled "Status of Wetland Inventories in the Mediterranean Region", Portugal reported on various international and national inventories on wetlands in the country, including a recently published preliminary inventory compiling and updating all the existing data on wetlands. The preliminary inventory includes 49 wetland sites, of which 19 (39 per cent) are inland wetlands. Inland wetlands represent 24 per cent of the total surface area of all wetlands in Portugal.

40. The information contained in the national reports was also analysed. There follows an overview of Parties' reports on inland water biological diversity, efforts and actions in this area, with some emphasis on gaps:

- (a) When available, relevant information on inland water ecosystems varies greatly among Parties, ranging from information on ecosystem diversity to information on species diversity;
- (b) Most Parties have not yet defined and categorized their respective countries' inland water ecosystems according to a standardized classification;
- (c) In terms of species diversity, fishes are the most assessed of all freshwater taxonomic groups, which include crustaceans, molluscs, plants and algae;
- (d) Wetlands are also assessed and documented more often than other inland water ecosystems. Information is often presented in terms of number of Ramsar sites and surface area;
- (e) Little information is reported about how the biological diversity of inland water ecosystems is used, except as it relates to fisheries, which have been studied more extensively. Data on fisheries are mainly expressed as total catches, production units (e.g., tonnes/year) and other information on the commercial species;
- (f) The types of threats are known better than the impact of those threats to inland water ecosystems. Threats to inland water ecosystems are

mainly water pollution (e.g., acidification, industrial and municipal discharges, eutrophication), habitat loss, exploitation of water resources, physical modification to watercourses (e.g., diversion of rivers, construction of dams, draining of wetlands), overfishing, and introduction of alien species. The importance of these threats varies according to regions;

(g) Parties are preparing or implementing national strategies for the conservation of biological diversity. Although national strategies provide general guidance for the conservation of biological diversity, the general guiding principles found in many national biodiversity strategies and action plans (NBSAP) can also be applied to inland water ecosystems;

(h) Parties are developing, implementing or modifying measures for the conservation of biological diversity. Three common measures to protect and conserve the biological diversity of inland water ecosystems are legislation, protected areas, and international conventions;

(i) Most Parties have water-related acts setting conditions for a wide range of issues, for example prohibiting the contamination of water resources and management schemes; and fisheries acts which, *inter alia*, impose restrictions and conditions on fishing activities;

(j) Protected areas include national parks, nature reserves, and other sites designated to be of special interest according to the Parties' criteria;

(k) The majority of the Parties to the Convention on Biological Diversity are also contracting parties to other biodiversity-related conventions, such as the Convention on Wetlands and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);

(l) Parties are currently planning or carrying out assessments of the biological diversity of inland waters, ranging from ecosystems to species levels. Assessment programmes are conducted as part of national or international initiatives.

41. More information on status and trends of inland water biological diversity, its uses and threats, has been found in the following publications:

(a) Global Freshwater Biological Diversity: Striving for the Integrity (McAllister *et al.*, 1997). This book provides an overview of the status of freshwater biological diversity. According to this source, freshwater biological diversity includes about 45,000 scientifically described species and perhaps a million, if undescribed ones are included;

(b) The World Conservation Monitoring Centre recently published the book Freshwater Biological Diversity: A Preliminary Global Assessment (WCMC, 1998). This book provides information on inland waters and their biological diversity and yielded the first global overview of freshwater biological diversity hotspots (i.e., areas that appear to be of especially high biological diversity value) for key animal groups.

42. A more detailed survey of publications will assist in the identification of information necessary to improve the picture of inland water biological diversity.

B. Ways and means for implementing paragraph 8 (b) of the work programme

43. As stated in paragraph 8(b) of the work programme, the work plan for SBSTTA should include the development and dissemination of regional guidelines for

rapid assessment of inland water biological diversity for different types of inland water ecosystems.

44. Rapid assessment is needed when threats require urgent actions and as a tool for policy makers to rapidly assess the status of biological diversity in order to set clear priorities for the conservation of inland water biological diversity. Although rapid-assessment methodologies do not provide as much information as does a thorough survey, they remain useful tools for overviewing the biological diversity in a region. The following are a few of the existing rapid-assessment tools for inland water biological diversity:

(a) The Australian River Assessment Scheme (AUSRIVAS) is a new rapid, standardized approach for assessing riverine ecological health. The bio-assessment component of AUSRIVAS uses a series of models to predict the composition of the macro-invertebrate community at a river site which would occur in the absence of human impact. AUSRIVAS assessments are reported as the ratio of observed to expected (O/E) taxa for the site and the O/E ratio is then assigned to a band indicating a level of impact. These models provide managers with a means of assessing the health of rivers in a fast, cost-effective and standardized way, allowing priorities to be set for rehabilitation programs. The Key Centre for Biological Diversity and Bioresources (MacQuarie University, Australia) is currently developing methods that analyse both the functional and genetic diversity of the microbiota and correlate this to river condition. Detection of impacts at this low trophic level may serve as an early warning system for more responsive catchment management;

(b) The United Kingdom has developed a rapid-assessment methodology for all terrestrial, freshwater and coastal wildlife habitats. This methodology classifies land and water cover types in accordance with a broad classification system in order to map these on to base maps. The final result could serve as a baseline against which future exercises could be compared. The advantage of this system is its simplicity and the relative rapidity with which ground could be covered and assessed. The detailed description of this methodology can be found in the Nature Conservancy Council (1990). Moreover, the River Invertebrate Prediction and Classification System (RIVPACS) is based on the number and type of macro-invertebrates found along specified river stretches by timed sampling, using mainly a pond net (or dredge for deep sites). By using this technique, a river classification has been devised on the basis of results from 684 reference sites in the United Kingdom. The reference sites are selected as being characteristic of different river types which are relatively free of man-made stress. The system has the advantage that it is simple to operate and requires only modest levels of taxonomic expertise;

(c) FishBase, developed by FAO and ICLARM in collaboration with other organizations, represents one of the most comprehensive databases on inland aquatic biodiversity harvested. Analysis of these data in time series can quickly reveal trends on national, regional, global, ecological and taxonomic bases. This database allows further rapid assessment of trends and testing of hypothesis (see, for example, Pauly et al. 1998);

(d) A rapid assessment programme (AquaRAP) for aquatic ecosystems has been developed by Conservation International. AquaRAP's goal is to provide rapid assessment of the biological and conservation value of freshwater ecosystems and make recommendations for integrative conservation and management. AquaRAP expeditions are designed to uncover the maximum amount of conservation-related information in the minimum amount of time. During

AquaRAP expeditions, the field teams, which includes in-country scientists, study the biological, physical and, when possible, the anthropological aspects of the watersheds. The watersheds are also categorized according to a set of 13 criteria, such as: habitat heterogeneity, habitat uniqueness, level of current threat and degree of fragility. Organisms are identified to the most appropriate taxonomic level (genus or species). The results of AquaRAP are completed within a year of the field study. For the next five years, the AquaRAP Steering Committee has identified ten basin projects of global priority across South America. The Steering Committee also plans to use the protocols on other continents once they are well established in South America.

C. Ways and means for implementing paragraph 8 (c) of the work programme

45. As stated in paragraph 8 (c) of the work programme, the work plan of SBSTTA should include a compilation of case-studies and a synthesis of the lessons that emerge from these studies to disseminate information through the clearing-house and other appropriate mechanisms.

46. Eight case-studies were submitted to the Secretariat, provided by four Parties. Five case studies were identified through a search of the national reports and two more were found in other relevant font of information. A compilation and synthesis of all the case studies can be found at the Secretariat website. An overall analysis of the case-studies may be provided as follows:

(a) Many case-studies correspond to more than one area identified in subparagraphs 8 (c), (i) (vii). For example, the ecosystem-based approach (subparagraph 8(c)(i) is frequently used for restoration actions (subparagraph 8(c) (iv)). In addition, the ecosystem approach and its advantages are becoming more and more recognized;

(b) Based on the case-studies in each of the areas described in the programme of work, remedial actions outnumber the other types of actions. Restoration and rehabilitation projects reported in the case-studies yield successful results;

(c) The importance of community involvement at different stages of water or habitat management schemes is recognized, as many case-studies report on the role of the community in different types of projects.

IV. GAPS AND OBSTACLES IN IMPLEMENTING THE WORK PLAN OF SBSTTA

A. Gaps and obstacles in implementing paragraph 8 (a) of the programme of work

47. Although some useful information provided by Parties, the limited number of submissions does not allow to develop an improved picture of inland water biological diversity at this stage.

48. The poor level of knowledge at the national level is one of the biggest impediments in assessing the status of inland water biological diversity. According to experts who participated in the workshop on the biodiversity of inland waters held at Wageningen, the Netherlands in 1997 (see UNEP/CBD/SBSTTA/3/Inf.26), "knowledge (on the status and trends of inland water biological diversity, and its threats) is available for some regions, but for most regions, information is patchy and unavailable". As such, one of

the priorities should be to improve the current base of knowledge of biological diversity in inland water ecosystems.

B. Gaps and obstacles for implementing paragraph 8 (b) of the programme of work

49. The main obstacle to the development and dissemination of regional guidelines for rapid assessment of inland water biological diversity is that, presently, a comprehensive review of rapid assessment methodologies, their advantages and disadvantages does not exist.

50. Although some countries and organizations are developing rapid assessment methodologies, there is a need to harmonize and coordinate efforts.

C. Gaps and obstacles for implementing paragraph 8 (c) of the programme of work

51. The case-studies submitted to the Executive Secretary are not sufficient, either in number or in their degree of details. The analysis of information should be continued by the Executive Secretary, on the basis of additional submissions, in order to achieve a representative and reliable assessment of the conservation and sustainable use of inland water biological diversity.

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Annex

ORGANIZATIONS WORKING ON THE BIOLOGICAL DIVERSITY OF SMALL ISLAND STATES AND STATES SUFFERING FROM ECOLOGICAL DISASTERS

1. The Global Conference on Sustainable Development of Small Island Developing States (held in Barbados in 1994) adopted a Programme of Action for Sustainable Development of Small Island Developing States. The Programme of Action targeted 14 agreed priority areas, including freshwater and biological diversity resources, and defines a number of actions and policies related to environmental and development planning that should be undertaken by small island developing States, with the cooperation and assistance of the international community.
2. The Food and Agriculture Organization of the United Nations (FAO) has a programme of fisheries assistance for small island developing States, which includes a component on aquaculture and inland fisheries conservation, management and development.
3. UNESCO's activities in small island developing States under the World Heritage Convention include promotion of international instruments for protecting biological diversity and the natural heritage, conservation as part of sustainable development, integrated coastal management, and traditional ecological knowledge on the biological diversity of small island developing States.
4. UNEP's work under the subprogramme "Caring for freshwater, coastal and marine resources (1998-1999)" includes facilitation of policy-relevant assessments of the state of fresh and marine waters of small island developing States and their living resources, as well as development of tools and guidelines for sustainable management and use of small island developing States' fresh and coastal waters and living resources.
5. The South Pacific Applied Geoscience Commission developed an environmental vulnerability index (EVI) for small island developing states. The aim of EVI is to describe the relative vulnerability of the environment of small island developing States to human and natural hazards. This includes effects on the physical and biological aspects of ecosystems, including biological diversity (Kaly et al., 1999).
6. On the subject of ecological disasters, the Joint UNEP Office for the Coordination of Humanitarian Affairs (OCHA) Environment Unit brings together the technical and policy expertise of UNEP with OCHA, whose mandate is to coordinate the international response to all disasters. The goal is to provide rapid emergency response for countries facing chemical and oil spills, industrial accidents, forest fires and other sudden crises that can damage the environment, human health and welfare. When requested, the Joint UNEP/OCHA Environment Unit provides an independent assessment of the disaster or accident.

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