

Annex I

RECOMMENDATIONS ADOPTED BY THE SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE AT ITS FIFTH MEETING

V/1. Cooperation with other bodies

The Subsidiary Body on Scientific, Technical and Technological Advice,

Noting with appreciation the ongoing cooperation with many other agreements and institutions, including the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, the United Nations Environment Programme, the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat and the International Programme for Biodiversity Science (DIVERSITAS),

1. Requests the Executive Secretary, in collaboration with the United Nations Environment Programme, to explore with the Interim Steering Committee of the Millennium Assessment and other relevant conventions and organizations, ways and means of collaborating in undertaking the proposed Millennium Assessment of Global Ecosystems, and to inform the Conference of the Parties at its fifth meeting on the outcome of these discussions;

2. Takes note of the prospective Global Biodiversity Information Facility, recognizes that the Facility must ensure the scientific integrity of its work, encourages its development in conformity with the Convention on Biological Diversity, and invites the Facility to include as many countries as possible in its development and implementation;

3. Requests the Executive Secretary, in consultation with the Bureau of the Subsidiary Body on Scientific, Technical and Technological Advice, to identify with the Facility's Interim Steering Committee arrangements for cooperation between the Convention and the Facility, and mechanisms to involve countries that are not currently participating in the elaboration and implementation of the Global Diversity Information Facility project, and to inform the Conference of the Parties at its next meeting on the outcome of these discussions;

4. Recommends that the Conference of the Parties at its fifth meeting:

(a) Takes note of ongoing cooperation activities;

(b) Invites the Executive Secretary to strengthen cooperation, particularly in the area of scientific and technical assessment of biodiversity, bearing in mind the importance of biodiversity assessments in identifying emerging issues and reviewing the programmes of work and the impact of measures taken under the Convention;

(c) Takes note of the proposed Millennium Assessment of Global Ecosystems, taking into account and making use of the Global Biodiversity Assessment, and decides on follow-up action based on the outcome of the consultations of the Executive Secretary with the Interim Steering Committee of the Millennium Assessment;

(d) Invites the Executive Secretary to strengthen the cooperation with the United Nations Framework Convention on Climate Change, including its Kyoto Protocol, on issues relevant to forest biological diversity and coral reefs;

(e) Takes note of the International Biodiversity Observation Year of DIVERSITAS, to take place from 2001 to 2002, and requests the Executive Secretary to find ways and means of collaborating with this initiative and ensure complementarity with the initiative foreseen to be undertaken by the United Nations Educational, Scientific and Cultural Organization and the Secretariat of the Convention on Biological Diversity to increase scientific knowledge and public awareness of the crucial role of biodiversity for sustainable development;

(f) Welcomes and endorses the second joint work plan (2000-2001) between the Convention on Biological Diversity and the Ramsar Convention on Wetlands, and commends it as a useful example of future cooperation between the Convention on Biological Diversity and other environmental conventions;

(g) Notes that the second joint work plan between the Convention on Biological Diversity and the Ramsar Convention on Wetlands includes a range of cooperative actions in relation to several ecosystem themes and cross-cutting issues of the Convention on Biological Diversity, as well as proposing actions to harmonize institutional processes, and requests the Subsidiary Body on Scientific, Technical and Technological Advice and the Executive Secretary to take these actions fully into consideration in furthering the respective programmes of work for these areas.

V/2. Pilot phase of the clearing-house mechanismThe Subsidiary Body on Scientific, Technical and Technological Advice

1. Acknowledges the contributions and valuable role that have been provided by the Informal Advisory Committee in the formulation of the independent review of the pilot phase of the clearing-house mechanism (), its strategic plan (UNEP/CBD/SBSTTA/5/INF/2) and longer-term programme of work (UNEP/CBD/SBSTTA/5/INF/3);

2. Acknowledges the progress made in developing the clearing-house mechanism in its pilot phase, and calls for the continued engagement and support of the Executive Secretary in the further development of the clearing-house mechanism;

3. Recommends that the Conference of the Parties at its fifth meeting:

(a) Notes with appreciation the report of the independent review of the pilot phase of the clearing-house mechanism, as contained in document UNEP/CBD/SBSTTA/5/INF/1;

(b) Endorses the immediate implementation of the strategic plan for the clearing-house mechanism, as contained in document UNEP/CBD/SBSTTA/5/INF/2, and takes into consideration that it would form part of an overall strategic planning of the Convention on Biological Diversity;

(c) Also endorses the longer-term programme of work for the clearing-house mechanism, as contained in document UNEP/CBD/SBSTTA/5/INF/3, while recognizing that the role of the Informal Advisory Committee is limited to advising the Executive Secretary;

(d) As priorities for the biennium 2001-2002, recommends Parties and Governments, subject to availability of resources and relevance, to:

- (i) Establish a national directory of scientific institutions and experts working on specific thematic areas of the Convention on Biological Diversity and make it available through the clearing-house mechanism;
- (ii) Conduct a survey to establish a national baseline of existing scientific and technical cooperation initiatives relevant to the implementation of the provisions of the Convention on Biological Diversity;
- (iii) Establish, through the national clearing-house mechanism focal points, links to non-governmental organizations and other institutions holding important relevant databases or undertaking significant work on biodiversity;
- (iv) Establish regional or subregional clearing-house mechanism focal points;
- (v) Establish national, regional and subregional clearing-house mechanism thematic focal points;

- (vi) Further develop the clearing-house mechanism to assist developing countries in gaining access to information in the field of scientific and technical cooperation, in particular on:
    - a. Funding opportunities;
    - b. Access to and transfer of technologies;
    - c. Research cooperation facilities;
    - d. Repatriation of information;
    - e. Training opportunities; and
    - f. Promoting and facilitating contact with relevant institutions, organizations, and the private sector, providing such services;
  - (vii) Consider information providers as primary partners to ensure that a critical mass of scientific and technical information is made available;
  - (viii) Consider the general public as an important target audience of users of the clearing-house mechanism;
  - (ix) Develop initiatives to make information available through the clearing-house mechanism more useful for researchers and decision makers;
  - (x) Develop, provide and share services and tools for the purposes of enhancing and facilitating the implementation of the clearing-house mechanism and further improving synergies with the biodiversity-related and Rio conventions;
  - (xi) Undertake cost-effectiveness analyses regarding the effective implementation of the clearing-house mechanism, taking into account investments related to institutional, human, financial, technological and informational resources;
- (e) Requests the Executive Secretary, in consultation with the Informal Advisory Committee and other relevant bodies, to:
- (i) Develop ways and means to ensure a broader understanding of the role of, and value added by, the clearing-house mechanism;
  - (ii) Further develop non-Internet-based tools to assist Parties in their national implementation efforts;
  - (iii) Identify and establish cooperative arrangements with international thematic focal points, which can provide relevant and appropriate thematic information, using the following criteria:
    - a. Expertise on themes directly relevant to the Convention on Biological Diversity;

- b. Experience and expertise at the international level;
  - c. Endorsement of proposed thematic focal points by at least three national focal points;
  - d. Designation of a specific theme and a defined period of time;
  - e. Selection between one or more thematic focal points for each theme;
  - f. Ability to leverage infrastructure;
  - g. Provision of relevant content;
  - h. Experience with specific issues;
  - i. Ability to advance the clearing-house mechanism's objectives;
  - j. Ability to advance partner's objectives;
  - k. Provision of open access to information;
  - l. Allowance for the custodianship to remain with the provider of information, as well as the provision of metadata in the public domain;
- (iv) Convene regional workshops to support capacity-building for clearing-house mechanism activities, training and awareness, with a focus on cooperation in biodiversity information related to the implementation and management of the clearing-house mechanism at the national, subregional, bio-geographic and regional levels, as appropriate;
- (v) Develop a pilot initiative for supporting the thematic issues directly linked to the work programme of the Subsidiary Body on Scientific, Technical and Technological Advice, including:
- a. Identification of national institutions and experts working on that specific theme by national focal points, including through inter-linkages with the rosters of experts in the relevant fields of the Convention on Biological Diversity;
  - b. Provision of particular information to the Subsidiary Body on Scientific, Technical and Technological Advice by national focal points;
  - c. Use of the clearing-house mechanism to facilitate a consultation process for relevant assessments;
  - d. Identification of needs for scientific and technical cooperation at the national level to ensure the implementation of pilot initiatives;

- (vi) Propose options for improving the means for facilitating access to and transfer of technology by the clearing-house mechanism;
- (vii) Develop a list of best practices and identify potential functions recommended for implementation by clearing-house mechanism national focal points;
- (viii) Identify possible formats, protocols and standards for the improved exchange of biodiversity-related data, information and knowledge, including national reports, biodiversity assessments and Global Biodiversity Outlook reports, and convene an informal meeting on this issue;
- (ix) Identify options and explore cooperative arrangements to overcome language barriers as regards the use of the clearing-house mechanism, including the development or consolidation of tools and services;
- (x) Develop a global electronic platform for scientific and technical cooperation in biodiversity on the Internet to match the demands and needs of Parties with respect to Article 18 of the Convention, as a transparent, open and publicly accessible forum;
- (xi) Encourage the establishment and maintenance of mirror sites of the Secretariat's website, within the other United Nations regions, as appropriate, in order to expedite access to Internet-based information.

V/3. Review of the Global Taxonomy InitiativeThe Subsidiary Body on Scientific, Technical and Technological Advice

1. Recommends that the Conference of the Parties at its fifth meeting:

(a) Establishes a Global Taxonomy Initiative coordination mechanism to assist the Executive Secretary to facilitate international cooperation and coordinate activities under the Global Taxonomy Initiative. The coordination mechanism should include representatives from key taxonomic institutions (regionally balanced) and initiatives, the International Council of Scientific Unions, the Global Biodiversity Information Facility, the Food and Agriculture Organization of the United Nations, the United Nations Environment Programme and the United Nations Educational, Scientific and Cultural Organization. The Global Taxonomy Initiative coordination mechanism should work closely with the clearing-house mechanism;

(b) Urges Parties, Governments and relevant organizations to undertake the following priority activities to further the Global Taxonomy Initiative:

- (i) The identification of national and regional priority taxonomic information requirements;
- (ii) Assessments of national taxonomic capacity to identify and, where possible, quantify national and regional-level taxonomic impediments and needs, including the identification of taxonomic tools, facilities and services required at all levels, and mechanisms to establish, support and maintain such tools, facilities and services;
- (iii) Establishment or consolidation of regional and national taxonomic reference centres;
- (iv) The building of taxonomic capacity in particular in developing countries, including through partnerships between national, regional and international taxonomic reference centres;
- (v) Communicate to the Executive Secretary and Global Taxonomy Initiative coordination mechanism suitable programmes, projects and initiatives for consideration as pilot projects under the Global Taxonomy Initiative;

(c) Requests that the Executive Secretary, with the assistance of the Global Taxonomy Initiative coordination mechanism:

- (i) Draft as a component of the strategic plan for the Convention on Biological Diversity, a work programme for the Global Taxonomy Initiative defining timetables, goals, products and pilot projects, emphasizing its role in underpinning conservation, sustainable use and equitable sharing of benefits, for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice;
- (ii) Initiate short-term activities, in particular regional meetings of scientists, managers and policy makers to

prioritize the most urgent global taxonomic needs, and facilitate the formulation of specific projects to meet the needs identified, and to report thereon to the Conference of the Parties at its sixth meeting;

(iii) Synthesize the findings of previous meetings of experts on the Global Taxonomy Initiative (as contained in the note by the Executive Secretary on the review of the Global Taxonomy Initiative (UNEP/CBD/SBSTTA/5/4)), relevant sections of national reports submitted to the Conference of the Parties and recommendations of the Subsidiary Body on Scientific, Technical and Technological on the Global Taxonomy Initiative, as advice for the proposed regional meetings;

(iv) Use the Global Taxonomy Initiative as a forum to promote the importance of taxonomy and taxonomic tools in the implementation of the Convention;

(d) Requests all Parties and Governments to designate a national Global Taxonomy Initiative focal point, linked to other national focal points, and participate in the development of regional networks to facilitate information-sharing for the Global Taxonomy Initiative;

2. Requests the Executive Secretary to develop terms of reference for the Global Taxonomy Initiative coordination mechanism for submission to the Conference of the Parties at its fifth meeting.



V/4. Alien species: guiding principles for the prevention, introduction and mitigation of impacts

The Subsidiary Body on Scientific, Technical and Technological Advice,

Acknowledging that the definition of alien species for this work programme has to be developed,

Recommends that the Conference of the Parties at its fifth meeting:

1. Invites Parties to take into account the interim guiding principles contained in annex I to the present recommendation in the context of activities aimed at implementing Article 8(h) of the Convention on Biological Diversity;

2. Adopts the outline for case-studies contained in annex II of the present recommendation;

3. Invites Parties to submit case-studies particularly focusing on thematic assessments to the Executive Secretary on the basis of the outline contained in annex II to the present recommendation;

4. Requests the clearing-house mechanism to disseminate and compile these case-studies;

5. Requests the Executive Secretary, in close collaboration with the Global Invasive Species Programme, relevant organizations and other relevant international and regional binding and non-binding instruments to ensure consistency with the development of standard terminology on alien species (as referred to in recommendation IV/4, paragraphs 4 (f) and 4 (i)), and to further elaborate the interim guiding principles on the prevention, introduction and mitigation of the impacts of alien species, to be considered by the Subsidiary Body at its sixth meeting, in preparation for the sixth meeting of the Conference of the Parties;

6. Requests Parties, other Governments, relevant bodies and other relevant international and regional binding and non-binding instruments, in the light of discussions by the Subsidiary Body at its fifth meeting, to submit to the Executive Secretary written comments on the interim guiding principles, to be taken into account, together with the case-studies, in the further elaboration of the interim guiding principles, to be considered by the Subsidiary Body at its sixth meeting, and requests the Executive Secretary to distribute those comments through the national focal points;

7. Invites the Global Invasive Species Programme to report on its September 2000 meeting on the "synthesis of GISP phase 1" to the Subsidiary Body on Scientific, Technical and Technological Advice at its sixth meeting;

8. Requests the Executive Secretary to cooperate with other international bodies and other relevant international and regional binding and non-binding instruments, such as the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar), the Convention on the Conservation of European Wildlife and Natural Habitats, the International Plant Protection Convention and regional plant protection

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organizations, Codex Alimentarius, DIVERSITAS, the Office International des Epizooties, the United Nations Educational, Scientific and Cultural Organization, and the organizations mentioned in paragraph 4 (f) of recommendation IV/4, with the aim to coordinate work on alien species, and to report on potential joint programmes of work to the Subsidiary Body at its sixth meeting;

9. Requests the Executive Secretary to develop a paper, for consideration at the sixth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice and the sixth meeting of the Conference of the Parties, setting out options for future work of the Convention on Biological Diversity on alien species, which would provide practical support to Parties, Governments and organizations in the implementation of Article 8(h) of the Convention and the guiding principles on alien species;

10. Urges Parties, other Governments and relevant bodies to give priority to the implementation of alien invasive species strategies and actions plans, as soon as they are developed.

#### Annex I

##### INTERIM GUIDING PRINCIPLES FOR THE PREVENTION, INTRODUCTION AND MITIGATION OF IMPACTS OF ALIEN SPECIES

It should be noted that in the interim guiding principles below, terms are used for which a definition has not yet been developed, pending a decision by the Conference of Parties on the development of a standardized terminology on alien species, as mentioned in paragraph 5 of recommendation V/4. In the interim and for the purpose of these interim principles, to avoid confusion the following definitions are used: (i) "alien" or "alien species" refers to a species occurring outside its normal distribution; and (ii) "alien invasive species" refers to those alien species which threaten ecosystems, habitats or species.

#### A. General

##### Guiding principle 1: Precautionary approach

Given the unpredictability of the impacts on biological diversity of alien species, efforts to identify and prevent unintentional introductions as well as decisions concerning intentional introductions should be based on the precautionary approach. Lack of scientific certainty about the environmental, social and economic risk posed by a potentially invasive alien species or by a potential pathway should not be used as a reason for not taking preventative action against the introduction of potentially invasive alien species. Likewise, lack of certainty about the long-term implication of an invasion should not be used as a reason for postponing eradication, containment or control measures.

##### Guiding principle 2: Three-stage hierarchical approach

Prevention is generally far more cost effective and environmentally desirable than measures taken following introduction of an alien invasive species. Priority should be given to prevention of entry of alien invasive species (both between and within States). If entry has already taken place, actions should be undertaken to prevent the establishment and spread of alien

species. The preferred response would be eradication at the earliest possible stage (principle 13). In the event that eradication is not feasible or is not cost-effective, containment (principle 14) and long-term control measures (principle 15) should be considered. Any examination of benefits and costs (both environmental and economic) should be done on a long-term basis.

#### Guiding principle 3: Ecosystem approach

All measures to deal with alien invasive species should be based on the ecosystem approach, in line with the relevant provisions of the Convention and the decisions of the Conference of the Parties.

#### Guiding principle 4: State responsibility

States should recognize the risk that they may pose to other States as a potential source of alien invasive species, and should take appropriate actions to minimize that risk. In accordance with Article 3 of the Convention on Biological Diversity, and principle 2 of the 1992 Rio Declaration on Environment and Development, States have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. In the context of alien invasive species, activities that could be a risk for another State include:

(a) The intentional or unintentional transfer of an alien invasive species to another State (even if it is harmless in the State of origin); and

(b) The intentional or unintentional introduction of an alien species into their own State if there is a risk of that species subsequently spreading (with or without a human vector) into another State and becoming invasive.

#### Guiding principle 5: Research and monitoring

In order to develop an adequate knowledge base to address the problem, States should undertake appropriate research on and monitoring of alien invasive species. This should document the history of invasions (origin, pathways and time-period), characteristics of the alien invasive species, ecology of the invasion, and the associated ecological and economic impacts and how they change over time. Monitoring is the key to early detection of new alien species. It requires targeted and general surveys, which can benefit from the involvement of local communities.

#### Guiding principle 6: Education and public awareness

States should facilitate education and public awareness of the risks associated with the introduction of alien species. When mitigation measures are required, education and public-awareness-oriented programmes should be set in motion so as to inform local communities and appropriate sector groups on how to support such measures.

### B. Prevention

#### Guiding principle 7: Border control and quarantine measures

1. States should implement border control and quarantine measures to ensure that:

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(a) Intentional introductions are subject to appropriate authorization (principle 10);

(b) Unintentional or unauthorized introductions of alien species are minimized.

2. These measures should be based on an assessment of the risks posed by alien species and their potential pathways of entry. Existing appropriate governmental agencies or authorities should be strengthened and broadened as necessary, and staff should be properly trained to implement these measures. Early detection systems and regional coordination may be useful.

Guiding principle 8: Exchange of information

States should support the development of database(s), such as that currently under development by the Global Invasive Species Programme, for compilation and dissemination of information on alien species that threaten ecosystems, habitats or species, to be used in the context of any prevention, introduction and mitigation activities. This information should include incident lists, information on taxonomy and ecology of invasive species and on control methods, whenever available. The wide dissemination of this information, as well as national, regional and international guidelines, procedures and recommendations such as those being compiled by the Global Invasive Species Programme should also be facilitated through, *inter alia*, the clearing-house mechanism.

Guiding principle 9: Cooperation, including capacity-building

Depending on the situation, a State's response might be purely internal (within the country), or may require a cooperative effort between two or more countries, such as:

(a) Where a State of origin is aware that a species being exported has the potential to be invasive in the receiving State, the exporting State should provide information, as available, on the potential invasiveness of the species to the importing State. Particular attention should be paid where exporting Parties have similar environments;

(b) Agreements between countries, on a bilateral or multilateral basis, should be developed and used to regulate trade in certain alien species, with a focus on particularly damaging invasive species;

(c) States should support capacity-building programmes for States that lack the expertise and resources, including financial, to assess the risks of introducing alien species. Such capacity-building may involve technology transfer and the development of training programmes.

C. Introduction of species

Guiding principle 10: Intentional introduction

No intentional introduction should take place without proper authorization from the relevant national authority or agency. A risk assessment, including environmental impact assessment, should be carried out as part of the evaluation process before coming to a decision on whether or not to authorize a proposed introduction. States should authorize the

introduction of only those alien species that, based on this prior assessment, are unlikely to cause unacceptable harm to ecosystems, habitats or species, both within that State and in neighbouring States. The burden of proof that a proposed introduction is unlikely to cause such harm should be with the proposer of the introduction. Further, the anticipated benefits of such an introduction should strongly outweigh any actual and potential adverse effects and related costs. Authorization of an introduction may, where appropriate, be accompanied by conditions (e.g., preparation of a mitigation plan, monitoring procedures, or containment requirements). The precautionary approach should be applied throughout all the above-mentioned measures.

#### Guiding principle 11: Unintentional introductions

1. All States should have in place provisions to address unintentional introductions (or intentional introductions that have established and become invasive). These include statutory and regulatory measures, institutions and agencies with appropriate responsibilities and with the operational resources required for rapid and effective action.

2. Common pathways leading to unintentional introductions need to be identified and appropriate provisions to minimize such introductions should be in place. Sectoral activities, such as fisheries, agriculture, forestry, horticulture, shipping (including the discharge of ballast waters), ground and air transportation, construction projects, landscaping, ornamental aquaculture, tourism and game-farming, are often pathways for unintentional introductions. Legislation requiring environmental impact assessment of such activities should also require an assessment of the risks associated with unintentional introductions of alien invasive species.

#### D. Mitigation of impacts

##### Guiding principle 12: Mitigation of impacts

Once the establishment of an alien invasive species has been detected, States should take steps such as eradication, containment and control, to mitigate the adverse effects. Techniques used for eradication, containment or control should be cost-effective, safe to the environment, humans and agriculture, as well as socially, culturally and ethically acceptable. Mitigation measures should take place in the earliest possible stage of invasion, on the basis of the precautionary approach. Hence, early detection of new introductions of potentially invasive or invasive species is important, and needs to be combined with the capacity to take rapid follow-up action.

##### Guiding principle 13: Eradication

Where it is feasible and cost-effective, eradication should be given priority over other measures to deal with established alien invasive species. The best opportunity for eradicating alien invasive species is in the early stages of invasion, when populations are small and localized; hence, early detection systems focused on high-risk entry points can be critically useful. Community support, built through comprehensive consultation, should be an integral part of eradication projects.

Guiding principle 14: Containment

When eradication is not appropriate, limitation of spread (containment) is an appropriate strategy only where the range of the invasive species is limited and containment within defined boundaries is possible. Regular monitoring outside the control boundaries is essential, with quick action to eradicate any new outbreaks.

Guiding principle 15: Control

Control measures should focus on reducing the damage caused rather than on merely reducing the numbers of the alien invasive species. Effective control will often rely on a range of integrated techniques. Most control measures will need to be regularly applied, resulting in a recurrent operating budget and the need for a long-term commitment to achieve and maintain results. In some instances, biological control may give long-term suppression of an alien invasive species without recurrent costs, but should always be implemented in line with existing national regulations, international codes and principle 10 above.

Annex II

OUTLINE FOR CASE-STUDIES ON ALIEN SPECIES

To the extent possible, case-studies should be short and succinct summaries of experience on alien species at the country and regional levels. A case-study should focus on the prevention of introduction, control, and eradication of alien species that threaten ecosystems, habitats or species.

Case-studies should include the following sections (a summary of the information may be provided under each heading, and a more detailed paper may be attached; if the information were not available, this should be indicated in the appropriate section):

1. Description of the problem

- (a) Location of the case-study
- (b) History (origin, pathway and dates, including time-period between initial entry/first detection of alien species and development of impacts) of introduction(s)
- (c) Description of the alien species concerned: biology of the alien species (the scientific name of species should be indicated if possible) and ecology of the invasion(s) (type of and potential or actual impacts on biological diversity and ecosystem(s) invaded or threatened, and stakeholders involved)
- (d) Vector(s) of invasion(s) (e.g. of deliberate importation, contamination of imported goods, ballast water, hull-fouling and spread from adjacent area. It should be specified, if known, whether entry was deliberate and legal, deliberate and illegal, accidental, or natural)

- (e) Assessment and monitoring activities conducted and methods applied, including difficulties encountered (e.g. uncertainties due to missing taxonomic knowledge)

2. Options considered to address the problem

- (a) Description of the decision-making process (stakeholders involved, consultation processes used, etc.)
- (b) Type of measures (research and monitoring; training of specialists; prevention, early detection, eradication, control/containment measures, habitat and/or natural community restoration; legal provisions; public education and awareness)
- (c) Options selected, time-frame and reasons for selecting the options
- (d) Institutions responsible for decisions and actions

3. Implementation of measures, including assessment of effectiveness

- (a) Ways and means set in place for implementation
- (b) Achievements (specify whether the action was fully successful, partially successful, or unsuccessful), including any adverse effects of the actions taken on the conservation and sustainable use of biodiversity
- (c) Costs of action

4. Lessons learned from the operation and other conclusions

- (a) Further measures needed, including transboundary, regional and multilateral cooperation
- (b) Replicability for other regions, ecosystems or groups of organisms
- (c) Information compilation and dissemination needed

V/5. Inland water biological diversity

The Subsidiary Body on Scientific, Technical and Technological Advice,

Noting with appreciation the fruitful cooperation between the Secretariat and organizations, institutions, and conventions working on topics related to inland water biological diversity in the implementation of general activities pertaining to the programme of work on inland water biological diversity,

Noting the need to broaden this cooperation by involving organizations and activities such as the Global International Waters Assessment, the Global Action Plan on Peatlands, the World Resources Institute, as well as to take into account, as appropriate, the finalized Water Policy Strategy of the United Nations Environment Programme, and to make use of the experience of organizations such as the Food and Agriculture Organization of the United Nations and IUCN-The World Conservation Union in the development of databases and in the identification of indicators for inland water biological diversity,

Noting also the need to cooperate, as appropriate, with other non-governmental organizations developing activities relevant to the programme of work,

Recommends that the Conference of the Parties at its fifth meeting:

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;
2. Endorses the proposed joint work plan 2000-2001 of the Convention on Biological Diversity and the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (UNEP/CBD/SBSTTA/5/INF/12), bearing in mind that not all Parties to the Convention on Biological Diversity are Parties to the Ramsar Convention;
3. Encourages Parties to address the lack of information on the status of inland water biological diversity at the national level and to include this information in their national reports;
4. Requests the Executive Secretary to compile systematically information on the implementation of the programme of work on inland water biological diversity for dissemination through the clearing-house mechanism and to report on it as part of the review of the work programme that the Subsidiary Body on Scientific, Technical and Technological Advice will carry out at its eighth meeting;
5. Invites relevant organizations and activities, in particular the Global International Waters Assessment, to contribute to the assessment of inland water biological diversity and to fully integrate a biological diversity component in its methodology protocol.



V/6. Marine and coastal biological diversity: implementation tools for the programme of work and analysis of coral bleaching

The Subsidiary Body on Scientific, Technical and Technological Advice,

Commending the Executive Secretary for the excellent quality of the results of the Expert Consultation on Coral Bleaching organized under his auspices in Manila from 11 to 13 October 1999,

Recommends that the Conference of the Parties at its fifth meeting:

1. Takes note of the tools that have been used for the implementation of the programme of work on the conservation and sustainable use of marine and coastal biological diversity and requests the Executive Secretary to report to future meetings of the Subsidiary Bodies on the application of these tools;

2. Endorses the results of the Expert Consultation on Coral Bleaching, as contained in the annex to the present recommendation;

3. Requests the Executive Secretary to integrate fully the issue of coral bleaching in the programme of work on the conservation and sustainable use of marine and coastal biological diversity and to develop and implement a specific work plan on coral bleaching, taking into account the recommendations in the annex to the present recommendation, as appropriate, and invites Parties, other Governments and relevant bodies to contribute to its implementation. In conducting his work on coral bleaching, the Executive Secretary will liaise with, inter alia, the United Nations Framework Convention on Climate Change, the Convention on Wetlands, the United Nations Educational, Scientific and Cultural Organization (including the World Heritage Convention), the Food and Agriculture Organization of the United Nations, regional fisheries organizations, the Intergovernmental Panel on Climate Change, the Global International Waters Assessment, the Global Coral Reef Monitoring Network, and the International Coral Reef Initiative;

4. Notes that there is significant evidence that climate change is a primary cause of the recent and severe extensive coral bleaching, and that this evidence is sufficient to warrant remedial measures being taken in line with the precautionary approach and transmits that view to the United Nations Framework Convention on Climate Change and urges the United Nations Framework Convention on Climate Change to take all possible actions to reduce the effect of climate change on water temperatures and to address the socio-economic impacts on the countries and communities most affected by coral bleaching;

5. Urges Parties, other Governments and relevant bodies to implement response measures to the phenomenon of coral bleaching by:

(a) Identifying and instituting additional and alternative measures for securing the livelihoods of people who directly depend on coral-reef services;

(b) Encouraging and supporting multi-disciplinary approaches to action relating to coral-reef management, research and monitoring, including the use of early-warning systems for coral bleaching, and collaborating with the International Coral Reef Initiative and the Global Coral Reef Monitoring Network;

(c) Building stakeholder partnerships, community participation programmes, and public education campaigns and information products that address the causes and consequences of coral bleaching;

(d) Using appropriate policy frameworks to implement integrated marine and coastal area management plans and programmes that supplement marine and coastal protected areas and the multiple conservation measures outlined in the Renewed Call to Action of the International Coral Reef Initiative;

(e) Supporting capacity-building measures, including training of and career opportunity for marine taxonomists, ecologists, and members of other relevant disciplines, particularly at the national level;

(f) Implementing and coordinating targeted research programmes, including predictive modeling, in the context, as appropriate, of ongoing activities referred to in paragraph 3 of the present recommendation;

6. Invites Parties, other Governments and relevant bodies to submit case-studies on the coral bleaching phenomenon to the Executive Secretary, for dissemination through the clearing-house mechanism;

7. Considers the need for arrangements to make resources available to support the implementation of specific actions identified in paragraph 5 of the present recommendation.

#### Annex

### CONCLUSIONS AND RECOMMENDATIONS OF THE EXPERT CONSULTATION ON CORAL BLEACHING ON PRIORITY AREAS FOR ACTION

#### A. Information-gathering

Issue: Our ability to adequately project, and thus mitigate, the impacts of global warming on coral-reef ecosystems and the human communities which depend upon coral-reef services is limited by the paucity of information on:

(a) The taxonomic, genetic, physiological, spatial, and temporal factors governing the response of corals, zooxanthellae, the coral-zooxanthellae system, and other coral-reef-associated species to increases in sea-surface temperature;

(b) The role of coral reefs as critical habitat for marine species and natural resources for human communities;

(c) The current status of coral-reef health and threats to coral reefs; and

(d) The potential capacity of recovery 1/ of corals and resilience of the ecosystem after mass mortality.

Response:

(a) Implement and coordinate targeted research programmes, including predictive modeling, that investigate: (1) the tolerance limits and adaptation capacity of coral-reef species to acute and chronic increases in sea-surface temperature; (2) the relationship among large-scale coral-bleaching events, global warming, and the more localized threats that already place reefs at risk; and (3) the frequency and extent of coral-bleaching and mortality events, as well as their impacts on ecological, social and economic systems;

(b) Implement and coordinate baseline assessments, long-term monitoring, and rapid response teams to measure the biological and meteorological variables relevant to coral bleaching, mortality and recovery, as well as the socio-economic parameters associated with coral-reef services. To this end, support and expand the Global Coral Reef Monitoring Network (GCRMN) and regional networks, and data-repository and dissemination systems including ReefBase - the Global Coral Reef Database. Also, the current combined Sida-SAREC and World Bank programme on coral reef degradation in the Indian Ocean (CORDIO), as a response to the 1998 coral-bleaching event, could be used as an example;

(c) Develop a rapid response capability to document coral bleaching and mortality in developing countries and remote areas. This would involve the establishment of training programmes, survey protocols, availability of expert advice, and the establishment of a contingency fund or rapid release of special project funding;

(d) Encourage and support countries in the development and dissemination of status of the reefs reports and case studies on the occurrence and impacts of coral bleaching.

Issue: The remoteness of many coral reefs and the paucity of funding and personnel to support on-site assessments of coral reefs requires that remote-sensing technologies are developed and applied in the evaluation of coral-bleaching events.

Response: Extend the use of early-warning systems for coral bleaching by:

(a) Enhancing current NOAA AVHRR HotSpot mapping by increasing resolution in targeted areas and carry out ground-truth validation exercises;

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1/ Recovery is the return of a coral colony to a state of health, including a symbiotic relationship with zooxanthellae, after the health and/or symbiotic relationship has been disrupted by a stress or perturbation. Recovery may involve a change in the genetic composition of species of the zooxanthellae. Resilience is the return of a coral reef ecosystem to a state in which living, reef-building corals play a prominent functional role, after this role has been disrupted by a stress or perturbation. A shift toward high dominance by frondose algae accompanied by a reduction in the functional role of coral would indicate a situation of low resilience.

(b) Encouraging space agencies and private entities to maintain deployment of relevant sensors and to initiate design and deployment of specialized technology for shallow-oceans monitoring; and

(c) Making the products of remote sensing readily accessible to coral reef scientists and managers worldwide with a view to those scientists and managers that are based in developing countries.

#### B. Capacity-building

Issue: There is a substantial lack of trained personnel to investigate the causes and consequences of coral bleaching events.

Response: Support the training of and career opportunities for marine taxonomists, ecologists, and members of other relevant disciplines, particularly at the national and regional level.

Issue: Coral bleaching is a complex phenomenon. Understanding the causes and consequences of coral bleaching events requires the knowledge, skills, and technologies of a wide variety of disciplines. Any action aimed at addressing the issue should bear in mind the ecosystem approach, incorporating both the ecological and societal aspects of the problem.

Response: Encourage and support multidisciplinary approaches to coral-reef research, monitoring, socio-economics and management.

Issue: Public awareness and education are required to build support for effective research, monitoring, and management programmes, as well as policy measures.

Response: Build stakeholder partnerships, community participation programmes, and public education campaigns and information products that address the causes and consequences of coral bleaching.

#### C. Policy development/implementation

Issue: Nearly 60 per cent of the world's coral reefs are threatened by localized, human activities that have the potential to exacerbate the impacts of coral-bleaching events. Evaluations of the 1998 coral-bleaching events suggest that marine protected areas alone may not provide adequate protection for at least some corals and other reef-associated species as sea-surface-temperature rise.

Response: Use existing policy frameworks to implement the multiple conservation measures outlined in the Renewed Call to Action of the International Coral Reef Initiative, and develop and implement comprehensive local to national scale integrated marine and coastal area management plans that supplement marine protected areas.

Issue: Most coral reefs are located in developing countries, and the majority of the people living near coral reefs are often extremely poor. Thus, even minor declines in the productivity of coral-reef ecosystems as a result of coral bleaching events could have dramatic socio-economic consequences for local people who depend on coral-reef services.

Response: Identify and institute additional and alternative measures for securing the livelihoods of people who directly depend on coral-reef services.

Issue: Coral bleaching is relevant not only to the Convention on Biological Diversity but also the United Nations Framework Convention on Climate Change and the Convention on Wetlands. The ultimate objective of the United Nations Framework Convention on Climate Change is to reduce emissions in a manner that "allows ecosystems to adapt 'naturally' to climate change". The United Nations Framework Convention on Climate Change calls upon Parties to take action in relation to funding, insurance, and technology transfer to address the adverse effects of climate change. The Convention on Wetlands provides guidance on the conservation and wise use of wetlands, including coral reefs.

Response: Initiate efforts to develop joint actions among the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the Convention on Wetlands to:

- (a) Develop approaches for assessing the vulnerability of coral reef species to global warming;
- (b) Build capacity for predicting and monitoring the impacts of coral bleaching;
- (c) Identify approaches for developing response measures to coral bleaching; and
- (d) Provide guidance to financial institutions, including the Global Environment Facility, to support such activities.

Issue: Coral bleaching has the potential to impact local fisheries, as well as certain high-value commercial pelagic fisheries and coastal ecosystems.

Response: Encourage the Food and Agriculture Organization of the United Nations and regional fisheries organizations to develop and implement measures to assess and mitigate the impacts of sea surface temperature rise on fisheries.

Issue: Coral-bleaching events are a warning of even more severe impacts to marine systems. If anomalous sea-water temperatures continue to rise, become more frequent, or are prolonged, the physiological thresholds of other organisms will be surpassed. Not only will local fisheries be impacted, but certain high-value commercial pelagic fisheries and coastal ecosystems will be affected as well.

Response: Emphasize that coral bleaching can be monitored as an early warning of the impacts of global warming on marine ecosystems and that the collapse of coral-reef ecosystems could impact ecological processes of the larger marine system of which coral reefs are a part.

Issue: The observations of the 1998 coral-bleaching events suggest that coral-reef conservation can no longer be achieved without consideration of the global climate system and that it requires efforts to mitigate accelerated global climate change.

Response: Emphasize the interdependencies and uncertainties in the relationships among marine, terrestrial, and climatic systems.

#### D. Financing

Issue: Because the issue of climate change is global and long-term in scale, Governments around the world need to work together to make funds available to

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implement initiatives to address the causes and consequences of coral bleaching.

Response: Mobilize international programmes and mechanisms for financial and technical development assistance, such as the World Bank, the United Nations Development Programme, regional development banks, as well as national and private sources to support implementation of these priority actions.

V/7. Forest biological diversity: status and trends and identification of options for conservation and sustainable use

The Subsidiary Body on Scientific, Technical and Technological Advice,

Noting the desire expressed to enhance progress made in the implementation of the work programme for forest biological diversity,

Stressing that in implementing the work programme, due consideration should be given to all types of forest, including planted forests, and to the restoration of forest ecosystems,

Recalling the need to address the underlying causes of deforestation and forest degradation, such as poverty,

Noting the need to ensure the conservation and sustainable use of biological diversity in future forest activities under the United Nations Framework Convention on Climate Change,

Recommends that the Conference of the Parties at its fifth meeting:

1. Urges the Parties, Governments and organizations to advance the implementation of the work programme for forest biological diversity;

2. Considers expanding the focus of the work programme from research to practical actions in order to address urgently the conservation and sustainable use of forest biological diversity, applying the ecosystem approach and taking into consideration the outcome of the fourth session of the Intergovernmental Forum on Forests;

3. Establishes an ad hoc technical expert group on forest biological diversity, taking into account the outcome of the Intergovernmental Forum on Forests. Its mandate, as proposed in recommendation V/14, should last until the seventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice;

4. Requests Parties, countries, international organizations and other relevant bodies to provide relevant information on the implementation of the work programme through, inter alia, case-studies, entries in national reports and other means, as appropriate;

5. Requests the Executive Secretary to invite the Food and Agriculture Organization of the United Nations and other forest-related bodies, institutions and processes to contribute to the assessment of status and trends, including gaps and priority actions needed to address threats to forest biological diversity;

6. Requests the Executive Secretary to liaise with the United Nations Framework Convention on Climate Change with regard to, inter alia, the Special Report on Land Use, Land-Use Change and Forestry of the Intergovernmental Panel on Climate Change, and with the Ramsar Convention on Wetlands, and to seek ways and means to integrate consideration of forest biological diversity in future activities of the United Nations Framework Convention on Climate Change addressing forests and carbon sequestration.

V/8. Biological diversity of dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems: options for the development of a programme of work

The Subsidiary Body on Scientific, Technical and Technological Advice recommends that the Conference of the Parties at its fifth meeting:

1. Establishes a programme of work on the biological diversity of dryland, Mediterranean, arid, semi-arid, grassland, and savannah ecosystems, which may also be known as the programme on "dry and sub-humid lands", bearing in mind the close linkages between poverty and loss of biological diversity in these areas;
2. Endorses a first phase of the programme of work, contained in the annex to this recommendation, and urges Parties, countries, international and regional organizations, major groups and other relevant bodies to implement it;
3. Considers the need to provide the necessary financial support, in accordance with Articles 20 and 21 of the Convention on Biological Diversity, for activities required for the implementation of the programme of work, and for capacity-building;
4. Requests the Subsidiary Body on Scientific, Technical and Technological Advice to review and assess periodically (initially after two years, thereafter every four years) the status and trends of the biological diversity of dry and sub-humid lands on the basis of the outputs of the activities of the programme of work, and make recommendations for the further elaboration of the programme of work, as appropriate;
5. Requests the Executive Secretary to collaborate with the Secretariat of the Convention to Combat Desertification, including through the development of a joint work programme, as well as with other relevant bodies, in the implementation and further elaboration of the programme of work;
6. Requests the Executive Secretary to establish a roster of experts on the biological diversity of dry and sub-humid lands and to explore the possibility of establishing an ad hoc technical expert group to assess the loss of biological diversity of dry and sub-humid lands;
7. Requests the Executive Secretary to make available relevant information on the biological diversity of dry and sub-humid lands through various means, including the clearing-house mechanism, including the development in the clearing-house mechanism of a database on drylands.

Annex

DRAFT PROGRAMME OF WORK ON DRY AND SUB-HUMID LANDS

I. INTRODUCTION

1. The overall aim of the programme of work is to promote the three objectives of the Convention in dry and sub-humid lands.
2. The elaboration and implementation of the programme of work should:

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(a) Build upon existing knowledge and ongoing activities and management practices, and promote a concerted response to fill knowledge gaps while supporting best management practices through partnership among countries and institutions;

(b) Ensure harmony with the other relevant thematic programmes of work under the Convention on Biological Diversity, as well as the work on cross-cutting issues;

(c) Promote synergy and coordination, and avoid unnecessary duplication, between related conventions, particularly the Convention to Combat Desertification, and the programmes of various international organizations, while respecting the mandates and existing programmes of work of each organization and the intergovernmental authority of the respective governing bodies;

(d) Promote effective stakeholder participation, including the identification of priorities, in planning, in research and in monitoring and evaluating research;

(e) Respond to national priorities through the implementation of specific activities in a flexible and demand-driven manner;

(f) Support the development of national strategies and programmes and promote the integration of biological-diversity concerns in sectoral and cross-sectoral plans, programmes and policies, in furtherance of Article 6 of the Convention on Biological Diversity, in seeking harmonization and avoiding duplication when undertaking activities relevant to other related conventions, in particular the United Nations Convention to Combat Desertification.

3. The elaboration and implementation of the programme of work should aim at applying the ecosystem approach adopted under the Convention on Biological Diversity. Implementation of the programme of work will also build upon the knowledge, innovations and practices of indigenous and local communities consistent with Article 8(j) of the Convention.

## II. PROPOSED PROGRAMME OF WORK

4. The proposed programme of work is divided in two parts, "Assessments" and "Targeted actions in response to identified needs", to be implemented in parallel. Knowledge gained through the assessments will help guide the responses needed, while lessons learned from activities will feed back into the assessments.

### Part A: Assessments

#### Operational objective

5. To assemble and analyse information on the state of the biological diversity of dry and sub-humid lands and the pressures on it, to disseminate existing knowledge and best practices, and to fill knowledge gaps, in order to determine adequate activities.

### Rationale

6. Ecosystems of dry and sub-humid lands tend to be naturally highly dynamic systems. Assessment of the status and trends of the biological diversity of dry and sub-humid lands is therefore particularly challenging. A better understanding of the biological diversity of dry and sub-humid lands, their dynamics, their socio-economic value and the consequences of their loss and change is needed. This also includes the merits of short-term adaptive management practices compared with long-term management planning. This should not, however, be seen as a prerequisite for targeted actions for the conservation and sustainable use of the biological diversity of dry and sub-humid lands. Indeed, lessons learned from practices, including indigenous and local communities practices, contribute to the knowledge base.

### Activities

Activity 1. Assessment of the status and trends of the biological diversity of dry and sub-humid lands, including landraces, and the effectiveness of conservation measures.

Activity 2. Identification of specific areas within dry and sub-humid lands of particular value for biological diversity and/or under particular threat, such as, *inter alia*, endemic species and low lying wetlands, with reference to the criteria in Annex I to the Convention on Biological Diversity.

Activity 3. Further development of indicators of the biological diversity of dry and sub-humid lands and its loss, for use in the assessment of status and trends of this biological diversity.

Activity 4. Building knowledge on ecological, physical and social processes that affect the biological diversity of dry and sub-humid lands, especially ecosystem structure and functioning (e.g., grazing, droughts, floods, fires, tourism, agricultural conversion or abandonment).

Activity 5. Identification of the local and global benefits derived from the biological diversity of dry and sub-humid lands, and assessment of the socio-economic impact of its loss.

Activity 6. Identification and dissemination of best management practices, including knowledge, innovations and practices of indigenous and local communities that can be broadly applied.

### Ways and means

7. The activities of part A are to be carried out through:

(a) Consolidation of information from various ongoing sources, including those under the Convention to Combat Desertification and other international conventions, the Global Observing Systems, and other programmes. This process would draw upon ongoing work of these existing programmes, with additional catalytic activities, such as workshops, further use of the clearing-house mechanism under the Convention on Biological Diversity, and partnerships between organizations, including, where appropriate, joint activities of the secretariats of the Convention on Biological Diversity and of the Convention to Combat Desertification;

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(b) Targeted research, including existing programmes of international and national research centres and research systems and other relevant international or regional programmes, with additional funding for priority work needed to overcome barriers to the conservation and sustainable use of the biological diversity of dry and sub-humid lands;

(c) Case-studies on management practices, carried out primarily by national and regional institutions, including civil-society organizations and research institutions, with support from international organizations for catalysing the preparation of studies, mobilizing funds, disseminating results, and facilitating feedback and lessons learned to case-study providers and policy makers. New resources could be needed to promote such studies to analyse the results and to provide necessary capacity-building and human-resource development;

(d) Dissemination of information and capacity-building required by assessment activities.

#### Part B: Targeted actions in response to identified needs

##### Operational objective

8. To promote the conservation of the biological diversity of dry and sub-humid lands, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of its genetic resources, and to combat the loss of biological diversity in dry and sub-humid lands and its socio-economic consequences.

##### Rationale

9. The activity needed to promote the conservation and sustainable use of the biological diversity of dry and sub-humid lands will depend on the state of the dry and sub-humid lands resources and the nature of the threats. Hence, a range of options needs to be considered, from sustainable use to in situ and ex situ conservation.

10. Many dry and sub-humid land resources must be managed at the level of watersheds, or at higher spatial levels, implying community or inter-community, rather than individual, management. This is often further complicated by multiple user groups (e.g., agriculturalists, pastoralists and fisherfolk) and the migratory habits of some animal species and users of biological diversity. Institutions need to be developed or strengthened to provide for biological diversity management at the appropriate scale and for conflict resolution.

11. Sustainable use of biological diversity in dry and sub-humid lands may require the development of alternative livelihoods, and the creation of markets and other incentives to enable and promote responsible use.

##### Activities

Activity 7. Promotion of specific measures for the conservation and sustainable use of the biological diversity of dry and sub-humid lands, through, inter alia:

(a) The use and the establishment of additional protected areas and the development of further specific measures for the conservation of the biological diversity of dry and sub-humid lands, including the strengthening of measures in existing protected areas; investments in the development and promotion of sustainable livelihoods, including alternative livelihoods, and conservation measures;

(b) The rehabilitation or restoration of the biological diversity of degraded dry and sub-humid lands;

(c) The management of invasive alien species;

(d) The sustainable management of dry and sub-humid land production systems;

(e) Where necessary, the conservation in situ as well as ex situ, as a complement to the latter, of the biological diversity of dry and sub-humid lands, taking due account of better understanding of climate variability in developing effective in situ biological conservation strategies;

(f) The economic valuation of the biological diversity of dry and sub-humid lands, as well as the development and the use of economic instruments and the promotion of the introduction of new technologies that enhance productivity of dry and sub-humid lands ecosystems;

(g) The sustainable harvesting of plant biomass and appropriate forms of animal husbandry that take into account their natural potential and limitations as well as socio-economic factors and, on the other hand, sustainable pastoralism;

(h) The establishment and promotion of educational and public-awareness programmes;

(i) The facilitation and improvement of the availability, the accessibility and exchange of information on sustainable use of the biological diversity of dry and sub-humid lands;

(j) The establishment and promotion of research and development programmes with a focus on, inter alia, building local capacity for effective conservation and sustainable use of the biological diversity of dry and sub-humid lands;

(k) The cooperation with the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat and the Convention on the Conservation of Migratory Species of Wild Animals with regard to, inter alia, the creation of migratory-species corridors across dry and sub-humid lands during seasonal periods, as well as with the Convention on International Trade in Endangered Species of World Fauna and Flora (CITES) with regard to rare and endangered species in dry and sub-humid lands;

(l) Cooperation with all relevant conventions, in particular with the Convention to Combat Desertification with respect to, inter alia, the sustainable use of the biological diversity of dry and sub-humid lands, the ecosystem approach, the assessment of the status and trends of this biological diversity as well as to its threats.

Activity 8. Promotion of responsible resource management, at appropriate levels, applying the ecosystem approach, through an enabling policy environment, including, inter alia:

(a) Decentralization of management to the lowest level, as appropriate, keeping in mind the need for common resource management and with due consideration to, inter alia, involving indigenous and local communities in planning and managing projects;

(b) Creating or strengthening appropriate institutions for land tenure and conflict resolution;

(c) Encouraging bilateral and subregional cooperation to address transboundary issues (such as facilitating access to transboundary rangelands);

(d) Harmonizing sectoral policies and instruments to promote the conservation and the sustainable use of biological diversity of dry and sub-humid lands, including by, inter alia, taking advantage of the existing national action programmes under the Convention to Combat Desertification frameworks at the country level, as well as, as appropriate, of other existing and relevant sectoral plans and policies.

Activity 9. Support for sustainable livelihoods through, inter alia:

(a) Diversifying sources of income to reduce the negative pressures on the biological diversity of dry and sub-humid lands;

(b) Promoting sustainable harvesting as well as ranching;

(c) Exploring innovative sustainable uses of the biological diversity of dry and sub-humid lands for local income generation, and promoting their wider application;

(d) Developing local markets for products derived from the sustainable use of biological diversity in dry and sub-humid lands, adding value to harvested produce; and

(e) Promoting fair and equitable sharing of the benefits arising out of the utilization of the genetic resources of dry and sub-humid lands, including bioprospecting.

#### Ways and means

The activities of part B to be carried out through:

(a) Capacity-building, particularly at the national and local levels, as well as investments in the development and promotion of sustainable livelihoods, including alternative livelihoods, and conservation measures, through participatory and bottom-up processes, with funding from bilateral and multilateral sources, and catalytic support from international organizations;

(b) Establishment of an international network of designated demonstration sites to facilitate the sharing of information and experience in implementing the programme of work, as well as to demonstrate and to promote

conservation and sustainable use integration on the context of dry and sub-humid lands;

(c) Case-studies on successful management of dry and sub-humid lands that could be disseminated through, inter alia, the clearing-house mechanism;

(d) Improved consultation, coordination and information-sharing, including, inter alia, documentation on knowledge and practices of indigenous and local communities, within countries among respective focal points and lead institutions relevant to the implementation of the Convention to Combat Desertification, the Convention on Biological Diversity and other relevant global conventions and programmes, facilitated by the secretariats of the various conventions and other international organizations;

(e) Enhanced interaction between the work programmes of the Convention on Biological Diversity and the Convention to Combat Desertification, through, inter alia, the regional networks and action plans of the latter; and

(f) Partnerships between all relevant stakeholders at all levels, including international organizations and programmes, as well as national and local partners, scientists and land users.

### III. REPORTING FRAMEWORK

12. It is proposed that Parties and other bodies be requested to report on the implementation of the programme of work through, inter alia:

(a) Appropriate sections of the national reports on biological diversity prepared for the Conference of the Parties under Article 26 of the Convention on Biological Diversity; and/or

(b) Reports made in the context of the Convention to Combat Desertification and other relevant conventions, with due regard to, inter alia, promoting harmonization, avoiding duplication, and enhancing transparency;

13. The Subsidiary Body on Scientific, Technical and Technological Advice is to review such reports after two years, and make recommendation for the further elaboration of the programme of work at that time. Thereafter, it is proposed that the implementation of the programme be reviewed every four years.

V/9. Agricultural biological diversity: assessment of ongoing activities and priorities for a programme of work

The Subsidiary Body on Scientific, Technical and Technological Advice recommends that the Conference of the Parties at its fifth meeting:

1. Endorses the programme elements, contained in the annex to this recommendation, contributing to the implementation of decision III/11 of the Conference of the Parties;
2. Urges Parties, Governments, international and regional organizations, civil-society organizations and other relevant bodies to promote, and, as appropriate, carry out, the programme of work and to promote regional and thematic cooperation, as appropriate, within this framework;
3. Considers the need for arrangements to provide financial support, in accordance with Article 21 of the Convention, for activities and capacity building for the implementation of the programme of work;
4. Requests the Executive Secretary to invite the Food and Agriculture Organization of the United Nations to continue to work together with other relevant bodies, and also to expand cooperation by inviting other relevant organizations (such as the United Nations Development Programme, the United Nations Environment Programme, the World Bank, regional development banks, the centres of the Consultative Group on International Agricultural Research and other international agricultural research centres, and IUCN-The World Conservation Union), in supporting the implementation of the programme of work, and to avoid duplication of activities.

Annex

DRAFT PROGRAMME OF WORK ON AGRICULTURAL BIODIVERSITY

A. Overall objectives, approach and guiding principles

1. The overall aim of the programme of work is to promote the objectives of the Convention in the area of agricultural biodiversity, in line with relevant decisions of the Conference of Parties, notably decisions II/15, III/11 and IV/6. This programme of work will also contribute to the implementation of chapter 14 of Agenda 21 (Sustainable agriculture and rural development). The scope of agricultural biodiversity is described in the appendix hereto.
2. More specifically, the objectives, as spelt out in paragraph 1 of decision III/11 of the Conference of the Parties to the Convention on Biological Diversity, are:
  - (a) To promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biological diversity in agro-ecosystems and their interface with other ecosystems;
  - (b) To promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture;
  - (c) To promote the fair and equitable sharing of benefits arising out of the use of genetic resources.

3. The proposed elements of the programme of work have been developed bearing in mind the need:

(a) To support the development of national strategies, programmes and action plans concerning agricultural biodiversity, in line with decision III/11 of the Conference of the Parties to the Convention on Biological Diversity, and to promote their integration in sectoral and cross-sectoral plans, programmes and policies;

(b) To build upon existing international plans of action, programmes and strategies that have been agreed by countries, in particular, the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, the Global Strategy for the Management of Farm Animal Genetic Resources, and the International Plant Protection Convention (IPPC);

(c) To ensure harmony with the other relevant programmes of work under the Convention on Biological Diversity, including those relating to forest biological diversity, inland water biological diversity, marine and coastal biological diversity, and dry and sub-humid lands, as well as with cross-cutting issues such as access and benefit-sharing, sustainable use, indicators, alien species, the Global Taxonomy Initiative, and issues related to Article 8(j);

(d) To promote synergy and coordination, and to avoid duplication, between relevant programmes of various international organizations and between programmes at the national and regional levels established under the auspices of international organizations, while respecting the mandates and existing programmes of work of each organization and the intergovernmental authority of the respective governing bodies, commissions and other forums.

4. In implementing the programme of work, the ecosystem approach adopted under the Convention on Biological Diversity will be applied. The application of this approach implies, *inter alia*, intersectoral cooperation, decentralization of management to the lowest level appropriate, equitable distribution of benefits, and the use of adaptive management policies that can deal with uncertainties and are modified in the light of experience and changing conditions. The implementation process will also build upon the knowledge, innovations and practices of local communities and thus complement Article 8(j) of the Convention. A multi-disciplinary approach that takes into account scientific, social and economic issues is required.

5. The proposed programme of work has been developed in the light of the basis for action annexed to decision III/11. Its implementation, particularly the implementation of programme element 1, will shed further light on the status and trends of agricultural biodiversity.

#### B. Proposed elements of a programme of work

6. Based on the above, the following elements for a programme of work are proposed as options to be considered by the Conference of the Parties. It is important to note that the four programme elements are intended to be mutually reinforcing: outputs of certain elements would feed into others. Accordingly, the ordering of the elements does not imply sequential implementation. However prioritization of activities within each programme element will be necessary as set out in the sections on ways and means and



timing of expected outputs. Within the framework of this programme of work, targeted cooperative initiatives may be launched. For example, an "International Pollinators Initiative" is proposed based on the recommendations of the Sao Paulo International Workshop on the Conservation and Sustainable Use of Pollinators in Agriculture, with Emphasis on Bees.

### Programme element 1. Assessments

#### Operational objective

To provide a comprehensive analysis of status and trends of the world's agricultural biodiversity and of their underlying causes (including a focus on the goods and services agricultural biodiversity provides), as well of local knowledge of its management.

#### Rationale

Processes for country-driven assessments are in place, or under development, for the crop and farm-animal genetic resources components. The assessments draw upon, and contribute to, comprehensive data and information systems. There is also much information about resources that provide the basis for agriculture (soil, water), and about land cover and use, climatic and agro-ecological zones. However, further assessments may be needed, for example, for microbial genetic resources, for the ecosystem services provided by agricultural biodiversity such as nutrient cycling, pest and disease regulation and pollination, and for social and economic aspects related to agricultural biodiversity. Understanding of the underlying causes of the loss of agricultural biodiversity is limited, as is understanding of the consequences of such loss for the functioning of agricultural ecosystems. Moreover, the assessments of the various components are conducted separately; there is no integrated assessment of agricultural biodiversity as a whole. There is also lack of widely accepted indicators of agricultural biodiversity and its various components. The further development and application of such indicators, as well as assessment methodologies, are necessary to allow an analysis of the status and trends of agricultural biodiversity and its various components and to facilitate the identification of biodiversity-friendly agricultural practices (see programme element 2).

#### Activities

1.1. Support the ongoing or planned assessments of different components of agricultural biodiversity, for example, the reports on the state of the world's plant genetic resources for food and agriculture, 2/ and the state of the world's animal genetic resources for food and agriculture, as well as other relevant reports and assessments by FAO and other organizations, elaborated in a country-driven manner through consultative processes.

1.2. Promote and develop specific assessments of additional components of agricultural biodiversity that provide ecological services, drawing upon the outputs of programme element 2. This might include targeted assessments on

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2/ It should be noted that the FAO Commission on Genetic Resources for Food and Agriculture has decided that the second report on the state of the world's plant genetic resources will be prepared, only once the negotiations for the revision of the International Undertaking have been completed.

priority areas (for example, loss of pollinators, pest management and nutrient cycling).

1.3. Develop methods and techniques for assessing and monitoring the status and trends of agricultural biodiversity, including:

(a) For a limited set of criteria, indicators of agricultural biodiversity to facilitate monitoring and assessment of the status and trends in different production systems and environments, and the impacts of various practices, building wherever possible on existing work, in accordance with SBSTTA recommendation V/11, on the development of indicators on biological diversity;

(b) An agreed terminology and classification for agro-ecosystems and production systems to facilitate the comparison and synthesis of various assessments and monitoring of different components of agricultural biodiversity, at all levels and scales, between countries and partner organizations; 3/

(c) Data and information exchange on agricultural biodiversity, in particular through the clearing-house mechanism under the Convention on Biological Diversity, building on existing networks, databases, and information systems;

(d) Methodology for analysis of the trends of agricultural biodiversity and its underlying causes, including socio-economic causes.

#### Ways and means

Exchange and use of experiences, information and findings from the assessments shall be facilitated by Parties, Governments and networks with consultation between countries and institutions, including use of existing networks.

Country-driven assessments of genetic resources of importance for food and agriculture (activity 1.1) shall be implemented, including through programmes of FAO and in close collaboration with other organizations, such as CGIAR. Resources may need to be identified to support additional assessments (activity 1.2), which would draw upon elements of existing programmes of international organizations, and the outputs of programme element 2.

This programme element, particularly activity 1.3, will be supported through catalytic activities, building upon and bringing together existing programmes, in order to develop agricultural biodiversity indicators, agreed terminology, etc., through, inter alia, technical workshops, meetings and consultations, e-mail conferences, preparation of discussion papers, and

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3/ This would draw upon, and not seek to replace, existing classification systems for ecosystems and farming systems (e.g. eco-region, agro-ecological zones, landscapes, land evaluation systems, production systems/environments, farming systems and farm typologies, etc.), taking into account physical resources (air, climate, land, water, vegetation types), human resource attributes (population intensity, land-use pressures, settlement patterns), and degree of market integration.

travel. Funding of these catalytic activities would be through the Secretariat, with in-kind contributions from participating organizations.

#### Timing of expected outputs

A key set of standard questions and a menu of potential indicators of agricultural biodiversity that may be used by Parties at their national level, and agreed terminology of production environments by 2002.

Reports on the state of the world's genetic resources, as programmed, leading progressively towards a comprehensive assessment and understanding of agricultural biodiversity, with a focus on the goods and services it provides, by 2010.

#### Programme element 2. Adaptive management

##### Operational objective

To identify management practices, technologies and policies that promote the positive and mitigate the negative impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods, by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity.

##### Rationale

There are large and fairly well-defined research agendas for genetic resources for food and agriculture. These include the development of complementary conservation and use strategies, and a focus on developing the conservation and use of under-utilized species. There are also an increasing number of case-studies on, for example, farm and in situ conservation of genetic resources, and community integrated pest management. However, far more understanding is needed of the multiple functions of biodiversity in production systems. Much more research is needed, for example, to examine the relationship between diversity, resilience and production in agro-ecosystems.

A blend of traditional and newer practices and technologies is used in agriculture, which utilize, or impact on, agricultural biodiversity in different ways, with particular consequences for biological diversity and for the sustainability and productivity of agricultural systems. A better understanding and application of these complex interactions could help to optimize the management of agricultural biodiversity in production systems.

Such work is essential in order to meet the objectives of decision III/11 of the Conference of the Parties to promote the positive and mitigate the negative impacts of agriculture on biological diversity, and enhance productivity and capacity to sustain livelihoods.

##### Activities

2.1. Carry out a series of case-studies, in a range of environments and production systems, and in each region:

(a) To identify key goods and services provided by agricultural biodiversity, needs for the conservation and sustainable use of components of

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this biological diversity in agricultural ecosystems, and threats to such diversity;

(b) To identify best management practices; and

(c) To monitor and assess the actual and potential impacts of existing and new agricultural technologies.

This activity would address the functions of agricultural biodiversity and the interaction between the various components, as set out in the appendix hereto with a focus on certain specific and cross-cutting issues, such as:

(a) The role and potential of wild, under-utilized and neglected species and products;

(b) The role of genetic diversity in providing resilience, reducing vulnerability, and enhancing adaptability of production systems to changing environments and needs;

(c) The synergies and interactions between different components of agricultural biodiversity;

(d) The role of pollinators, with particular reference to their economic benefits, and the effects of introduced species on indigenous pollinators and other aspects of biological diversity;

(e) The role of soil and other below-ground biodiversity in supporting agricultural production systems, especially in nutrient cycling;

(f) Pest and disease control mechanisms, including the role of natural enemies and other organisms at field and landscape levels, host plant resistance, and implications for agro-ecosystem management;

(g) The wider ecosystem services provided by agricultural biodiversity;

(h) The role of different temporal and spatial patterns in mosaics of land use, including complexes of different habitats;

(i) Possibilities of integrated landscape management as a means for the conservation and sustainable use of biodiversity.

2.2. Identify and promote the dissemination of information on cost-effective practices and technologies, and related policy and incentive measures that enhance the positive and mitigate the negative impacts of agriculture on biological diversity, productivity and capacity to sustain livelihoods, through:

(a) Comprehensive analyses in selected production systems of the costs and benefits of alternative management practices as identified from activity 2.1, and the valuation of the goods and services provided by agricultural biodiversity;

(b) Comprehensive analyses of the impacts of agricultural production, including their intensification and extensification, on the environment and identification of ways to mitigate negative and promote positive impacts;

(c) Identification, at international and national levels, in close collaboration with relevant international organizations, of appropriate marketing and trade policies, legal and economic measures which may support beneficial practices:

- (i) Promotion of neglected and under-utilized crops;
- (ii) Promotion of local and indigenous knowledge;
- (iii) Measures to add value to products of production systems that sustain biodiversity, and to diversify market opportunities;
- (iv) Access and benefit-sharing measures and intellectual property issues;
- (v) Economically and socially sound measures that act as incentives, in accordance with Article 11 and consistent with Article 22; and
- (vi) Training and capacity-building in support of the above.

#### Ways and means

Case-studies will be carried out by national institutions, civil-society organizations, and research institutes, with support from international organizations for catalysing preparation of studies, mobilizing funds, disseminating results, and facilitating feedback and lessons learned to case-study providers and policy makers. Resources may need to be identified to promote such studies, to analyse the results and to provide necessary capacity-building and human-resource development, especially at the inter-community or district level. Where a need is identified, for example, through lessons learned from earlier case-studies, the Subsidiary Body on Technical, Technological Advice or the Conference of the Parties will be consulted to consider the promotion of regional or global programmes of case-studies, or focused research activities.

#### Timing of expected outputs

Thirty selected case-studies published, analysed and disseminated by 2005. The case-studies should be representative of regional issues and prioritize best practices and lessons learned that can be broadly applied.

#### Programme element 3. Capacity-building

##### Operational objective

To strengthen the capacities of farmers, their communities, and organizations and other stakeholders, including agro-enterprises, to manage agricultural biodiversity so as to increase the benefits they derive from the sustainable use of agricultural biodiversity, and to promote increased awareness and responsible action.

##### Rationale

The management of agricultural biodiversity involves many stakeholders and often implies transfers of costs and benefits between stakeholder groups.

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It is therefore essential that mechanisms be developed not only to consult stakeholder groups, but also to facilitate their genuine participation in decision-making and in the sharing of benefits.

The sustainable management of agricultural biodiversity by farmers and their communities, in particular, is a prerequisite to achieving sustainable increases in food and livelihood security and to protecting natural resources. Decision III/11, paragraph 17 (c), of the Conference of the Parties encourages Parties to promote the "mobilization of farming communities, including indigenous and local communities for the development, maintenance and use of their knowledge and practices in the conservation and sustainable use of biological diversity in the agricultural sector". By paragraph 15 of the same decision, countries are encouraged "to set up and maintain local-level forums for farmers, researchers, extension workers and other stakeholders to evolve genuine partnerships". There is a largely unrealized potential to improve the management of various aspects of agricultural biodiversity at the level of the agro-ecosystem, through, for example, participatory breeding and selection strategies. Farmer groups, and other producer organizations, can be instrumental in furthering the interests of farmers in optimizing sustainable, diversified, production systems and consequently in promoting responsible actions concerning the conservation and sustainable use of agricultural biodiversity. Consumer organizations are also increasingly influential in this regard.

#### Activities

3.1 Promote enhanced capabilities to manage agricultural biodiversity by promoting partnerships among researchers, extension workers and farmers in research and development programmes for biological diversity conservation and sustainable use of biological diversity in agriculture. To achieve this, countries should be encouraged to set up and maintain, inter alia, local level forums for farmers, including indigenous farmers using traditional knowledge, researchers, extension workers and other stakeholders to evolve genuine partnerships, including training and education programmes.

3.2 Enhance the capacity of indigenous and local communities for the development of strategies and methodologies for in situ conservation, sustainable use and management of agricultural biological diversity, building on indigenous knowledge systems.

3.3. Provide opportunities for farmers and local communities, and other stakeholder groups, to participate in the development and implementation of national strategies, plans and programmes for agricultural biodiversity, through decentralized policies and plans, and local government structures.

3.4. Identify and promote possible improvements in the policy environment, including benefit-sharing arrangements and incentive measures, to support local-level management of agricultural biodiversity.

3.5 Promote awareness about the value and functions of agricultural biodiversity for sustainable productivity amongst producer organizations, agricultural cooperatives and enterprises, and consumers, with a view to promoting responsible practices.

3.6 Promote networks of farmers and farmers' organizations at regional level for exchange of information and experiences.

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### Ways and means

This programme element is to be implemented primarily through initiatives within countries, including through extension services, local government, educational and civil-society organizations, including farmer/producer and consumer organizations and mechanisms emphasizing farmer-farmer exchange. This programme element would engage the widest possible range of civil-society organizations, including those not normally linked to biodiversity initiatives.

Funding is likely to be on a project or programme basis. Catalytic support may need to be provided through national, regional and global programmes, organizations, facilities and funding mechanisms, in particular to support capacity-building, exchange and feedback of policy and market information, and of lessons learned from this and programme element 2, between local organizations and policy makers, nationally, regionally and globally.

### Timing of expected outputs

Progressive establishment of local-level forums and regional networks, with a coverage target of at least 1,000 communities by 2010.

Examples at country level of operational mechanisms for participation by a wide range of stakeholder groups including civil-society organizations, by 2002.

Involvement of farmers and local communities in the majority of national programmes by 2010.

### Programme element 4. Mainstreaming

#### Operational objective

To support the development of national plans or strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes.

#### Rationale

Many countries are now developing biodiversity strategies and action plans in the context of the Convention on Biological Diversity, and many also have a number of other policies, strategies and plans related to agriculture, the environment and national development. <sup>4/</sup> Moreover, countries have agreed on global action plans for major components of biological diversity, such as plant genetic resources for food and agriculture, and, in Agenda 21 and the World Food Summit Plan of Action, on plans for sustainable development and food security in general.

In most countries, activities related to agricultural biodiversity are undertaken primarily by ministries responsible for agriculture. There is

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<sup>4/</sup> These include agricultural sector plans, national environment action plans, national sustainable development strategies, national forestry action plans, World Bank plans for structural adjustment, etc.

clearly a need to mainstream the action plans for components of agricultural biodiversity in sectoral development plans concerned with food, agriculture, forestry and fisheries, and to promote synergy and avoid duplication between the plans for the various components. Together with other thematic programmes of work, this could contribute to the integration of biodiversity considerations in national plans.

Development and implementation of action plans requires reliable and accessible information, but many countries do not have well developed information, communication or early-warning systems or the capacity to respond to identified threats.

#### Activities

4.1. Support the institutional framework and policy and planning mechanisms for the mainstreaming of agricultural biodiversity in agricultural strategies and action plans, and its integration into wider strategies and plans for biological diversity, through:

(a) Support for relevant institutions in the conduct of assessments on the status and trends of agricultural biodiversity within the context of ongoing biodiversity and sectoral assessments;

(b) Development of policy and planning guidelines, and training materials, and support for capacity-building initiatives at policy, technical and local levels in agricultural and environmental forums for the development, implementation, monitoring and evaluation of policies, programmes and actions for the conservation and sustainable use of agricultural biodiversity; and

(c) Improved consultation, coordination, and information-sharing within countries among respective focal points and lead institutions, relevant technical committees and coordinating bodies, to promote synergy in the implementation of agreed plans of action and between ongoing assessments and intergovernmental processes.

4.2. Support the development or adaptation of relevant systems of information, early warning and communication to enable effective assessment of the state of agricultural biodiversity and threats to it, in support of national strategies and action plans, and of appropriate response mechanisms.

4.3. Promote public awareness of the goods and services provided by agricultural biological diversity, and the value and importance of such diversity for agriculture and for society in general.

4.4. Promote ongoing and planned activities for the conservation, on farm, in situ, and ex situ, in particular, in the countries of origin, of the variability of genetic resources for food and agriculture, including their wild relatives.

#### Ways and means

Activities would be implemented primarily at national level through enhanced communication, coordination mechanisms and planning processes that involve all stakeholder groups, facilitated by international organizations, and by funding mechanisms.



This programme element should draw upon the experience of ongoing programmes (such as UNEP's support to national biodiversity strategies and action plans) and a critical analysis of existing practice.

National, regional and international projects and programmes that address policy and institutional development within specific sectors should make provision, as appropriate, for integration across sectors. Similarly, the development of guidelines should be carried out within the context of the objectives of this programme element.

Resources may need to be identified to further develop or adapt early-warning systems, including the capacity to identify thresholds and action needed, and for pilot examples of effective and sustainable response mechanisms to address threats at local, national and supranational levels.

#### Timing of expected outputs

Progressively increased capacity at national level for information management, assessment and communication. Over 100 countries to participate in various assessments under activities 1.1 and 1.2 by 2005.

Coordination between sectoral assessments and plans of action at national level in the majority of countries by 2005.

Range of guidelines published at the international level (on topics to be determined according to needs at national and regional levels).

#### Appendix

##### THE SCOPE OF AGRICULTURAL BIODIVERSITY

1. Agricultural biodiversity is a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes, in accordance with annex I of decision III/11 of the Conference of the Parties to the Convention on Biological Diversity.

2. The Conference of Parties has recognized "the special nature of agricultural biodiversity, its distinctive features, and problems needing distinctive solutions". <sup>5/</sup> The distinctive features include the following:

(a) Agricultural biodiversity is essential to satisfy basic human needs for food and livelihood security;

(b) Agricultural biodiversity is managed by farmers; many components of agricultural biodiversity depend on this human influence; indigenous knowledge and culture are integral parts of the management of agricultural biodiversity;

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<sup>5/</sup> See decision II/15 of the Conference of the Parties to the Convention on Biological Diversity.

(c) There is a great interdependence between countries for the genetic resources for food and agriculture;

(d) For crops and domestic animals, diversity within species is at least as important as diversity between species and has been greatly expanded through agriculture;

(e) Because of the degree of human management of agricultural biodiversity, its conservation in production systems is inherently linked to sustainable use;

(f) Nonetheless, much biological diversity is now conserved ex situ in gene banks or breeders' materials;

(g) The interaction between the environment, genetic resources and management practices that occurs in situ within agro-ecosystems often contributes to maintaining a dynamic portfolio of agricultural biodiversity.

3. The following dimensions of agricultural biodiversity can be identified:

(a) Genetic resources for food and agriculture, including:

- (i) Plant genetic resources including pasture and rangeland species and forest genetic resources; 6/
- (ii) Animal genetic resources, including fishery genetic resources; 7/
- (iii) Microbial and fungal genetic resources.

These constitute the main units of production in agriculture, including cultivated species, domesticated species and managed wild plants and animals;

(b) Components of agricultural biodiversity that provide ecological services. These include a diverse range of organisms in agricultural production systems that contribute, at various scales to, inter alia:

- (i) Nutrient cycling, decomposition of organic matter and maintenance of soil fertility;
- (ii) Pest and disease regulation;
- (iii) Pollination;
- (iv) Maintenance and enhancement of local wildlife and habitats in their landscape,

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6/ Forest genetic resources are considered under the work programme on forest biodiversity. For the purpose of the present programme of work, the focus is on trees that are an integral part of farming systems.

7/ Aspects of fishery genetic resources may be considered under the work programmes on inland waters and marine and coastal biodiversity. For the purposes of the present programme of work, the focus is on fish production that is part of farming systems.

- (v) Maintenance of the hydrological cycle;
  - (vi) Erosion control;
  - (vii) Climate regulation and carbon sequestration;
- (c) Abiotic factors, which have a determining effect on these aspects of agricultural biodiversity;
- (d) Socio-economic and cultural dimensions since agricultural biodiversity is largely shaped by human activities and management practices. These include:
- (i) Traditional and local knowledge of agricultural biodiversity, cultural factors and participatory processes;
  - (ii) Tourism associated with agricultural landscapes;
  - (iii) Other socio-economic factors.

V/10. Ecosystem approach: further conceptual elaboration

The Subsidiary Body on Scientific, Technical and Technological Advice recommends that the Conference of the Parties at its fifth meeting:

1. Calls upon Parties, other Governments, and international organizations to apply the ecosystem approach, in line with the principles and guidance contained in the annex to the present recommendation, in particular in the context of activities developed within the thematic areas of the Convention, and national policies and legislation;
2. Endorses these principles and guidance, as reflecting the present level of common understanding and encourages further conceptual elaboration;
3. Invites Parties, other Governments and relevant bodies to identify case-studies and implement pilot projects, and to organize, as appropriate, regional, national and local workshops, and consultations aiming to enhance awareness, share experiences, including through the clearing-house mechanism, and strengthen regional, national and local capacities on the ecosystem approach;
4. Requests the Executive Secretary to prepare a synthesis of case-studies and lessons learned;
5. Requests the Subsidiary Body on Scientific, Technical and Technological Advice to prepare guidelines for the implementation of the ecosystem approach, on the basis of case-studies and lessons learned, and to review the incorporation of the ecosystem approach into various programmes of work of the Convention; and
6. Addresses the need for support for capacity-building to implement the ecosystem approach.

Annex

A. Description of the ecosystem approach

1. The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus, the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
2. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.
3. This focus on structure, processes, functions and interactions is consistent with the definition of "ecosystem" provided in Article 2 of the Convention on Biological Diversity:

"'Ecosystem' means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit."

This definition does not specify any particular spatial unit or scale, in contrast to the Convention definition of "habitat". Thus, the term "ecosystem" does not, necessarily, correspond to the terms "biome" or "ecological zone", but can refer to any functioning unit at any scale. Indeed, the scale of analysis and action should be determined by the problem being addressed. It could, for example, be a grain of soil, a pond, a forest, a biome or the entire biosphere.

4. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often non-linear, and the outcome of such processes often shows time-lags. The result is discontinuities, leading to surprise and uncertainty. Management must be adaptive in order to be able to respond to such uncertainties and contain elements of "learning-by-doing" or research feedback. Measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically.

5. The ecosystem approach does not preclude other management and conservation approaches, such as biosphere reserves, protected areas, and single-species conservation programmes, as well as other approaches carried out under existing national policy and legislative frameworks, but could, rather, integrate all these approaches and other methodologies to deal with complex situations. There is no single way to implement the ecosystem approach, as it depends on local, provincial, national, regional or global conditions. Indeed, there are many ways in which ecosystem approaches may be used as the framework for delivering the objectives of the Convention in practice.

#### B. Principles of the ecosystem approach

6. The following 12 principles are complementary and interlinked, and need to be applied as a whole.

**Principle 1: The objectives of management of land, water and living resources are a matter of societal choice.**

Rationale: Different sectors of society view ecosystems in terms of their own economic, cultural and societal needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognized. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.

**Principle 2: Management should be decentralized to the lowest appropriate level.**

Rationale: Decentralized systems may lead to greater efficiency, effectiveness and equity. Management should involve all

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stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge.

**Principle 3:** **Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.**

Rationale: Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems; therefore, possible impacts need careful consideration and analysis. This may require new arrangements or ways of organization for institutions involved in decision-making to make, if necessary, appropriate compromises.

**Principle 4:** **Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should:**

- (a) **Reduce those market distortions that adversely affect biological diversity;**
- (b) **Align incentives to promote biodiversity conservation and sustainable use;**
- (c) **Internalize costs and benefits in the given ecosystem to the extent feasible.**

Rationale: The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems.

Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

**Principle 5:** **Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.**

Rationale: Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. The conservation and, where appropriate, restoration of these interactions and processes is of greater significance for the long-term maintenance of biological diversity than simply protection of species.

**Principle 6: Ecosystems must be managed within the limits of their functioning.**

Rationale: In considering the likelihood or ease of attaining the management objectives, attention should be given to the environmental conditions that limit natural productivity, ecosystem structure, functioning and diversity. The limits to ecosystem functioning may be affected to different degrees by temporary, unpredictable or artificially maintained conditions and, accordingly, management should be appropriately cautious.

**Principle 7: The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.**

Rationale: The approach should be bounded by spatial and temporal scales that are appropriate to the objectives. Boundaries for management will be defined operationally by users, managers, scientists and indigenous and local peoples. Connectivity between areas should be promoted where necessary. The ecosystem approach is based upon the hierarchical nature of biological diversity characterized by the interaction and integration of genes, species and ecosystems.

**Principle 8: Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.**

Rationale: Ecosystem processes are characterized by varying temporal scales and lag-effects. This inherently conflicts with the tendency of humans to favour short-term gains and immediate benefits over future ones.

**Principle 9: Management must recognize the change is inevitable.**

Rationale: Ecosystems change, including species composition and population abundance. Hence, management should adapt to the changes. Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential "surprises" in the human, biological and environmental realms. Traditional disturbance regimes may be important for ecosystem structure and functioning, and may need to be maintained or restored. The ecosystem approach must utilize adaptive management in order to anticipate and cater for such changes and events and should be cautious in making any decision that may foreclose options, but, at the same time, consider mitigating actions to cope with long-term changes such as climate change.

**Principle 10: The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.**

Rationale: Biological diversity is critical both for its intrinsic value and because of the key role it plays in providing the ecosystem and other services upon which we all ultimately depend. There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations, where conservation and use are seen in context and

the full range of measures is applied in a continuum from strictly protected to human-made ecosystems.

**Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.**

Rationale: Information from all sources is critical to arriving at effective ecosystem management strategies. A much better knowledge of ecosystem functions and the impact of human use is desirable. All relevant information from any concerned area should be shared with all stakeholders and actors, taking into account, inter alia, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders.

**Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines.**

Rationale: Most problems of biological-diversity management are complex, with many interactions, side-effects and implications, and therefore should involve the necessary expertise and stakeholders at the local, national, regional and international level, as appropriate.

#### C. Operational guidance for application of the ecosystem approach

7. In applying the 12 principles of the ecosystem approach, the following five points are proposed as operational guidance.

##### 1. Focus on the functional relationships and processes within ecosystems

8. The many components of biodiversity control the stores and flows of energy, water and nutrients within ecosystems, and provide resistance to major perturbations. A much better knowledge of ecosystem functions and structure, and the roles of the components of biological diversity in ecosystems, is required, especially to understand: (i) ecosystem resilience and the effects of biodiversity loss (species and genetic levels) and habitat fragmentation; and (ii) determinants of local biological diversity in management decisions. Functional biodiversity in ecosystems provides many goods and services of economic and social importance. While there is a need to accelerate efforts to gain new knowledge about functional biodiversity, ecosystem management has to be carried out even in the absence of such knowledge. The ecosystem approach can facilitate practical management by ecosystem managers (whether local communities or national policy makers).

##### 2. Promote the fair and equitable access to the benefits derived from the functions of biological diversity in ecosystems and from the use of its components

9. Benefits that flow from the array of functions provided by biological diversity at the ecosystem level provide the basis of human environmental security and sustainability. The ecosystem approach seeks that the benefits derived from these functions are distributed equitably. In particular, these functions should benefit the stakeholders responsible for their production and



management. This requires, inter alia: capacity-building, especially at the level of local communities managing biological diversity in ecosystems; the proper valuation of ecosystem goods and services; the removal of perverse incentives that devalue ecosystem goods and services; and, consistent with the provisions of the Convention on Biological Diversity, where appropriate, their replacement with local incentives for good management practices.

### 3. Use adaptive management practices

10. Ecosystem processes and functions are complex and variable. Their level of uncertainty is increased by the interaction with social constructs, which need to be better understood. Therefore, ecosystem management must involve a learning process, which helps to adapt methodologies and practices to the ways in which these systems are being managed and monitored. Implementation programmes should be designed to adjust to the unexpected, rather than to act on the basis of a belief in certainties. Ecosystem management needs to recognize the diversity of social and cultural factors affecting natural-resource use. Similarly, there is a need for flexibility in policy-making and implementation. Long-term, inflexible decisions are likely to be inadequate or even destructive. Ecosystem management should be envisaged as a long-term experiment that builds on its results as it progresses. This "learning-by-doing" will also serve as an important source of information to gain knowledge of how best to monitor the results of management and evaluate whether established goals are being attained. In this respect, it would be desirable to establish or strengthen capacities of Parties for monitoring.

#### 4. Carry out management actions at the scale appropriate for the issue being addressed, with decentralization to lowest level, as appropriate

11. As noted in section A above, an ecosystem is a functioning unit that can operate at any scale, depending upon the problem or issue being addressed. This understanding should define the appropriate level for management decisions and actions. Often, this approach will imply decentralization to the level of local communities. Effective decentralization requires proper empowerment, which implies that the stakeholder both has the opportunity to assume responsibility and the capacity to carry out the appropriate action, and needs to be supported by enabling policy and legislative frameworks. Where common property resources are involved, the most appropriate scale for management decisions and actions would necessarily be large enough to encompass the effects of practices by all the relevant stakeholders. Appropriate institutions would be required for such decision-making and, where necessary, for conflict resolution. Some problems and issues may require action at still higher levels, through, for example, transboundary cooperation, or even cooperation at global levels.

### 5. Ensure intersectoral cooperation

12. As the primary framework of action to be taken under the Convention, the ecosystem approach should be fully taken into account in developing and reviewing national biodiversity strategies and action plans. There is also a need to integrate the ecosystem approach into agriculture, fisheries, forestry and other production systems that have an effect on biodiversity. Management of natural resources, according to the ecosystem approach, calls for increased intersectoral communication and cooperation at a range of levels (government ministries, management agencies, etc.). This might be promoted through, for

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example, the formation of inter-ministerial bodies within the Government or the creation of networks for sharing information and experience.

D. Other remarks

13. The ecosystem approach should be applied in each of the thematic and cross-cutting work programmes of the Convention, based upon the 12 principles and using the five points of operational guidance derived therefrom.

14. The application of the ecosystem approach can help to promote delivery to people of the full array of benefits derived from the functions of biological diversity at the ecosystem level. Lessons learned from case-studies on the ecosystem approach that take into account the three objectives of the Convention should be widely promoted.

V/11. Development of indicators of biological diversityThe Subsidiary Body on Scientific, Technical and Technological Advice,

Acknowledging that the process of indicator development has to be continued at a high speed in order to allow for coordination with, and input to actions and initiatives such as the national reports, the Global Biodiversity Outlook, the Global International Waters Assessment, the assessment process under the Convention on Biological Diversity and many others that develop or use indicators,

Acknowledging that a pragmatic approach is needed and must be based on sound theory and practical experience,

Recommends that the Conference of the Parties at its fifth meeting:

1. Requests the Executive Secretary, in broad consultation with Parties and in collaboration with other relevant organizations/bodies and processes, to carry out the pending activities set out in the work programme on indicators of biological diversity as approved by decision IV/1 A of the Conference of the Parties and, in particular, to develop:

(a) A set of principles for designing national-level monitoring programmes and indicators;

(b) A key set of standard questions and a list of available and potential indicators that may be used by Parties at their national level and in national reporting also to allow for regional and global overviews on the state and trends of biodiversity and, if possible and appropriate, any responses from policy measures;

2. Encourages Parties and Governments to establish or increase regional cooperation in the field of indicators, monitoring and assessment and Invites the Executive Secretary to establish a process through which the documents mentioned above are reviewed and broadly discussed at regional workshops on the basis of national case-studies;

3. Invites Parties, Governments and organizations to undertake appropriate actions to assist other Parties (particularly developing countries) to increase their capacity to develop and use indicators. Appropriate actions may include:

(a) Provision of training;

(b) Assisting in the development of national networks;

(c) Sharing experiences between and among countries, regions and organizations involved in the development and use of indicators;

4. Requests the Executive Secretary to produce an interim report on progress for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice at its sixth or seventh meetings and a final report on the conclusions of this initiative to the Conference of the Parties at its sixth meeting.

V/12. Sustainable use of the components of biological diversity: identification of sectoral activities that could adopt biodiversity-friendly practices and technologies

The Subsidiary Body on Scientific, Technical and Technological Advice recommends that the Conference of the Parties at its fifth meeting:

1. Reminds Parties to integrate, as far as possible and as appropriate, the sustainable use of biological diversity into their relevant sectoral or cross-sectoral plans, programmes, policies and national biodiversity strategies and action plans, in accordance with Articles 6(b) and 10 of the Convention, and taking into account the decisions of the Conference of the Parties and the principles of the ecosystem approach;

2. Requests the Executive Secretary to gather, compile and disseminate through the clearing-house mechanism and other means, case-studies on best practices and lessons learned from the use of biological diversity under the thematic areas of the Convention, drawing on the experience of Parties, Governments and relevant organizations such as the Food and Agriculture Organization of the United Nations, the Commission on Sustainable Development and the Organisation for Economic Co-operation and Development, and including, in particular, the Sustainable Use Initiative of IUCN-The World Conservation Union;

3. Requests the Executive Secretary to assemble, drawing from an assessment of the case-studies in paragraph 2 above, practical principles, operational guidelines and associated instruments which would assist Parties and Governments to develop ways to achieve the sustainable use of biological diversity, within the framework of the ecosystem approach;

4. Notes the important linkages with the programmes of work on indicators (recommendation V/11) and incentive measures and that appropriate indicators and incentive measures are essential elements in developing effective approaches to the sustainable use of biological diversity;

5. Commends to the Executive Secretary the process used to develop the ecosystem approach and requests the Executive Secretary to adapt that process for the work on sustainable use, and report on its progress under paragraphs 2 and 3 above for discussion by the Subsidiary Body on Scientific, Technical and Technological Advice at its seventh meeting;

6. Invites Parties, Governments and organizations to undertake appropriate actions to assist other Parties to increase their capacity to implement the sustainable-use objective at regional, national and local levels. Appropriate actions may include:

- (a) Workshops;
- (b) Assistance to Parties in the identification of sectors where priority action is required;
- (c) Assistance to Parties in the development of appropriate action plans;
- (d) Information dissemination and appropriate technology transfer under mutually agreed terms.

V/13. Establishment of guidelines for the second national reports, including indicators and incentive measures

The Subsidiary Body on Scientific, Technical and Technological Advice

Notes the interim assessment of biodiversity enabling activities prepared by the Global Environment Facility (UNEP/CBD/SBSTTA/5/INF/9); and

1. Requests the Executive Secretary, for the consideration of the Conference of the Parties at its fifth meeting, to:

(a) Revise the matrix contained in annex I to the note by the Executive Secretary on the establishment of guidelines for the second national reports, including indicators and incentive measures (UNEP/CBD/SBSTTA/5/14), taking into account the views expressed at the fifth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, in particular, cross-referencing the questions on performance with the existing capacity of developing countries, and the need to provide information on the status of biological diversity;

(b) Propose a format for thematic reports by Parties on items for in-depth consideration at meetings of the Conference of the Parties, in accordance with its programme of work;

2. Recommends that the Conference of the Parties establish guidelines for future national reports which:

(a) Request Parties to make use of the matrix contained in annex I to the note by the Executive Secretary, with the revisions referred to in paragraph 1 (a) above, in their national reports;

(b) Recommend that Parties prepare their national reports through a consultative process involving all relevant stakeholders, as appropriate, or by drawing upon information developed through other consultative processes;

(c) Request Parties to submit their reports:

- (i) Every four years;
- (ii) Twelve months prior to the meeting of the Conference of the Parties that will consider the report;
- (iii) In a working language of the Conference of the Parties;
- (iv) In both hard copy and electronic format;

(d) Request Parties to submit their next national report by a date to be decided by the Conference of the Parties, and thereafter for consideration at alternate ordinary meetings of the Conference of the Parties, and include them in their clearing-house mechanism national focal point where feasible;

3. Recommends that the Conference of the Parties invites Parties to prepare detailed thematic reports on one or more of the items for in-depth consideration by meetings of the Conference of the Parties, and invites Parties to submit such reports:

(a) In accordance with the format referred to in paragraph 1 (b) above;

(b) By a date to be determined by the Conference of the Parties;

(c) In a working language of the Conference of the Parties;

(d) In both hard copy and electronic format;

4. Recommends that the Conference of the Parties request the Executive Secretary to:

(a) Prepare reports based on information contained in national reports for consideration by the Conference of the Parties at its meetings, and make them available through the clearing-house mechanism;

(b) Keep the format of national reports under review, and provide further advice to the Conference of Parties on its revision;

(c) Proceed with the further development of the proposals for streamlining national reporting contained in section 5.2 of the "Feasibility study for a harmonized information management infrastructure for biodiversity-related treaties", in collaboration with the secretariats of the other biodiversity-related conventions and report on progress to the Conference of the Parties at its sixth meeting;

5. Recommends that the Conference of the Parties invite organizations, such as the United Nations Development Programme and the United Nations Environment Programme, undertaking regional or global programmes providing support to Parties in biodiversity planning, including capacity development, to provide the Executive Secretary with information on programme activities and lessons learned;

6. Recommends that the Conference of the Parties consider the need for arrangements for making financial resources available to eligible Parties to assist in the preparation of their national reports.

V/14. Ad hoc technical expert groups: terms of reference, and roster of experts and proposal on a uniform methodology for their use

The Subsidiary Body on Scientific, Technical and Technological Advice,

Recognizing the instrumental role to be played by the experts in the rosters in order to assist in the implementation of the Convention,

Stressing that ad hoc technical expert groups should be established only where there is a significant assessment need, with due regard to geographical representation and to the special condition of least developed countries and small island developing States,

Noting recommendation 1 C of the Inter-Sessional Meeting on the Operations of the Convention to the fifth meeting of the Conference of the Parties on the improvement in the operations of the Subsidiary Body on Scientific, Technical and Technological Advice,

1. Requests the Executive Secretary to further develop the methodology for the use of rosters of experts and ad hoc technical expert groups, taking into consideration the modus operandi of the Subsidiary Body on Scientific, Technical and Technological Advice, recommendation 1 C of the Inter-Sessional Meeting on the Operations of the Convention, the report of the brainstorming meeting on scientific assessment held in Oslo in November 1999 (UNEP/CBD/COP/5/INF/1), the guidance provided in annex I to the present recommendation, and the views expressed at the fifth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice;

2. Recommends that the Conference of the Parties:

(a) Approves the terms of reference and the duration of work specified for the ad hoc technical expert groups on marine and coastal protected areas and mariculture, as contained in annex II to the present recommendation;

(b) Establishes the ad hoc technical expert group on forest biological diversity and approve the terms of reference as contained in annex II to the present recommendation, taking into account the outcome of the Intergovernmental Forum on Forests and other relevant international processes;

(c) Encourages Parties, other Governments and relevant bodies when nominating their experts for inclusion in the roster to consider:

- (i) Gender balance;
- (ii) Involvement of indigenous people and members of local communities;
- (iii) Range of relevant disciplines and expertise, including, inter alia, biological, legal, social and economic sciences, and traditional knowledge;

3. Requests the Conference of the Parties to address the budgetary matters related to annex I to the present recommendation, noting in particular that the cost of participation in expert groups may affect the ability of experts to participate.

Annex I

PROPOSAL ON A UNIFORM METHODOLOGY FOR THE USE OF ROSTERS OF EXPERTS

Basic principles

1. The Executive Secretary will seek input from relevant national focal points and relevant organizations for the rosters of experts covering the fields of expertise required for the implementation of the Convention on Biological Diversity, including, inter alia, biological, legal, social and economic sciences, and traditional knowledge.
2. The rosters of experts will be compiled by the Executive Secretary of the Convention on Biological Diversity on the basis of input from Parties, Governments and relevant bodies.
3. The rosters of experts will be accessible through the clearing-house mechanism of the Convention, and other mechanisms as appropriate, and be linked through it to other relevant rosters of experts at the national, regional, and international level.
4. For rosters to be created for specific expert groups with specific terms of reference, the Executive Secretary will solicit input from national focal points and relevant organizations on each such occasion with the intention of using such rosters only for that purpose.
5. In administering the rosters of experts, the Executive Secretary will endeavour to use innovative and efficient means of communication and ensure transparency through the issuance of notifications.
6. The Executive Secretary through the national focal points and relevant bodies will update the rosters of experts regularly and will endeavour to ensure representation from all geographical regions and gender balance.
7. The Secretariat will notify the work currently being carried out by it through the clearing-house mechanism and will invite input to it by mail or e-mail or other cost-effective means from members of the relevant roster of experts who have experience or information to share, who have not been selected for meetings, or who do not currently contribute to listserv discussions.

Functions of the roster of experts

1. To perform specific tasks as requested by the Conference of the Parties and its subsidiary bodies, in particular SBSTTA, including, inter alia, involvement in the activities of ad hoc technical expert groups and liaison groups.
2. To provide the Executive Secretary and, as appropriate, Parties, Governments and relevant bodies with substantive contributions including,



inter alia, peer reviews 8/ on matters relating to the Convention on Biological Diversity by drawing from a wide range of disciplines and expertise available at the national, regional and international levels.

Ways and means to contact/communicate with the experts 9/

1. Clearing-house mechanism of the Convention, and other mechanisms as appropriate.
2. Periodic newsletters (electronic and other forms) produced by the Secretariat, to be distributed to all experts on the roster, to communicate general information on activities - planned or undertaken - of the Secretariat, with a view to keeping the experts involved, well informed, and connected to the process. General information should preferably reach the experts on certain fixed intervals of, for instance, three months.
3. Direct contacts by e-mail, fax, letter, telephone or in person with all the experts or experts on specific themes/issues.
4. Establishment of a listserv to allow and foster discussions by electronic mail between the experts themselves following a specific request from the Executive Secretary. Listservs should run for a fixed period of time, and should preferably be chaired by one or two experts. The lead expert(s) is/are in charge of the discussion on the server, and report to the Secretariat with the results. For such a system to be fruitful, several conditions may apply:
  - (a) The number of experts involved in a listserv discussion should not exceed 20;
  - (b) The Executive Secretary should strictly define: (i) the requests; (ii) the type of expected outputs; and (iii) deadlines.
5. Convene expert group meetings.

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8/ Peer reviews allow for a small group of experts to provide input, thereby broadening the perspective of, and participation in, the final product (reports, draft pre-session documents, etc.). Peer reviews may be used to analyse products of listserv discussions, ad hoc technical expert groups, meetings of experts as well as draft documents. Requests for peer reviews should be accompanied by clear terms of reference from the Secretariat.

9/ As necessary, the Secretariat will copy to the focal points its communications with the experts.

Annex II\*

PROPOSED TERMS OF REFERENCE AND DURATION OF WORK FOR THE AD HOC TECHNICAL  
EXPERT GROUPS ON MARINE AND COASTAL PROTECTED AREAS, MARICULTURE AND  
FOREST BIOLOGICAL DIVERSITY

A. Ad hoc technical expert group on marine and coastal protected areas

Terms of reference 10/

1. Identify pilot research and monitoring projects, based on current proposals and ongoing projects aimed at assessing the value and effects of marine and coastal protected areas or similarly managed areas on sustainable use of marine and coastal living resources.
2. Review the desk-study called for in the operational objective 3.1, activity (c), of the programme of work on marine and coastal biological diversity (decision IV/5, annex). The desk-study to be conducted by the Executive Secretary consists of gathering and assimilating information relevant to the value and effect of marine and coastal protected areas on sustainable use of marine and coastal biodiversity.
3. Identify linkages between marine protected areas and sustainable use of marine and coastal biodiversity.
4. Prepare recommendations on types of research to be carried out to understand the effects of marine and coastal protected or closed areas on population size and dynamics, subject to national legislation.

Duration of work

The ad hoc technical expert group on marine and coastal protected areas should start its work immediately after approval by the Conference of the Parties of the terms of reference and shall endeavour to complete the work not later than the eighth meeting of SBSTTA, at which "protected areas" will be an item for in-depth consideration (see the SBSTTA programme of work in recommendation IV/1 C), and the seventh meeting of the Conference of the Parties at which "protected areas" will be an item for in-depth consideration. Items 1, 3 and 4 can be undertaken immediately, but item 2 will start when the desk-study is complete.

B. Ad hoc technical expert group on mariculture

Terms of reference 11/

1. Evaluate the current state of scientific and technological knowledge on the effects of mariculture on marine and coastal biodiversity.
2. Provide guidance on criteria, methods and techniques that avoid the adverse effects of mariculture, and also subsequent stock enhancement, on

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\* To recommendation V/14.

10/ In accordance with programme element 3, operational objective 3.1, of the Jakarta Mandate programme of work.

11/ In accordance with programme element 4 of the Jakarta Mandate programme of work.

marine and coastal biological diversity and enhance the positive effects of mariculture on marine and coastal productivity.

#### Duration of work

The ad hoc expert group on mariculture should start immediately after the approval on the terms of reference by the Conference of the Parties. The time for the completion of these activities so that their output can be considered in depth by SBSTTA will depend on the time when SBSTTA might be requested by the Conference of the Parties at its fifth meeting to report or advise on aspects relating to sustainable use of biodiversity or when the Conference of the Parties might decide to review the Jakarta Mandate programme of work.

#### C. Ad hoc technical expert group on forest biological diversity

##### Terms of reference

1. Provide advice on scientific programmes and international cooperation in research and development related to conservation and sustainable use of forest biological diversity.

2. (a) Carry out a review of available information on the status and trends of, and major threats to, forest biological biodiversity, to identify significant gaps in that information.

(b) Identify options for the conservation and sustainable use of forest biological diversity applying the principle of ecosystem approach and sustainable forest management, taking into account proposals for action agreed by the Intergovernmental Panel on Forests (IPF) and the Intergovernmental Forum on Forests (IFF) as well as the work of other relevant international processes and organizations including the Food and Agricultural Organization of the United Nations, processes related to criteria and indicators, the International Tropical Timber Organization, and the Centre for International Forestry Research (CIFOR), through activities such as:

- (i) Identifying new measures and ways to improve the conservation of forest biological diversity in and outside existing protected areas;
- (ii) Identifying practical measures to mitigate the direct and underlying causes of forest biodiversity loss;
- (iii) Identifying tools and mechanisms to implement the identified measures and actions;
- (iv) Identifying measures for the restoration of degraded forest;  
and
- (v) Identifying strategies for enhancement of collaborative management with local and indigenous communities.

(c) Prepare advice, in collaboration with the United Nations Framework Convention on Climate Change, in order to integrate biodiversity considerations, including biodiversity conservation, in forest carbon sequestration projects;

(d) To identify innovative, efficient and state-of-the-art technologies and know-how relating to assessment, planning, conservation and sustainable use of forest biodiversity and provide advice on ways and means of promoting the development and transfer of such technologies.

3. On the basis of case-studies, assess the effects of types of forest-related measures taken in accordance with Convention.

Duration of work

The work on forest biodiversity should be initiated immediately after approval by the Conference of the Parties at its fifth meeting of the terms of reference, and completed not later than the seventh meeting of SBSTTA, in time for the sixth meeting of the Conference of the Parties, which will consider forest biodiversity as one of the main priority issues.

Annex II

PROVISIONAL AGENDA FOR THE SIXTH MEETING OF THE SUBSIDIARY BODY  
ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE

1. Opening of the meeting.
2. Organizational matters:
  - 2.1. Election of officers;
  - 2.2. Adoption of the agenda;
  - 2.3. Organization of work.
3. Reports:
  - 3.1. Marine and coastal biological diversity;
  - 3.2. Inland water biological diversity.
4. Priority issue: Alien invasive species.
5. Draft provisional agenda for the seventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice.
6. Dates and venue of the seventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice.
7. Other matters.
8. Adoption of the report.
9. Closure of the meeting.

Annex III

DRAFT PROVISIONAL AGENDA FOR THE SEVENTH MEETING OF THE SUBSIDIARY  
BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE

1. Opening of the meeting.
2. Organizational matters:
  - 2.1. Election of officers;
  - 2.2. Adoption of the agenda;
  - 2.3. Organization of work.
3. Reports:
  - 3.1. Biological diversity of dryland, arid, semi-arid, Mediterranean, savannah and grassland ecosystems;
  - 3.2. Agricultural biological diversity.
4. Priority issue: Forest biological diversity.
5. Draft provisional agendas for the eighth and ninth meetings of the Subsidiary Body on Scientific, Technical and Technological Advice.
6. Dates and venue of the eighth and ninth meetings of the Subsidiary Body on Scientific, Technical and Technological Advice.
7. Other matters.
8. Adoption of the report.
9. Closure of the meeting.

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