



Convention on Biological Diversity

Distr.
GENERAL

UNEP/CBD/SBSTTA/14/6*
10 February 2010

ORIGINAL: ENGLISH

SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE

Fourteenth meeting

Nairobi, 10-21 May 2010

Item 3.1.5 of the provisional agenda**

IN-DEPTH REVIEW OF THE WORK ON BIODIVERSITY AND CLIMATE CHANGE

Note by the Executive Secretary

EXECUTIVE SUMMARY

The cross-cutting issue on biodiversity and climate change was included in the work under the Convention in 2004 through decision VII/15 of the Conference of Parties (COP). In annex II to decision VIII/10, the Conference of the Parties decided to undertake an in-depth review of the cross-cutting issue at its tenth meeting. Based on national reports received and information gathered from organizations and reports submitted under other relevant international processes, the Executive Secretary prepared this note to facilitate the work of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its fourteenth meeting.

With regard to the implementation of activities by Parties, the links between biodiversity and climate change are well recognized. There are a number of national and regional studies on impacts and vulnerability. However, when considering the implementation of programmes and activities addressing both climate change and biodiversity, Parties still face a number of obstacles, especially when considering climate change mitigation.

A review of implementation of activities reveals good progress with regards to activities to be implemented by the Secretariat alone. However, implementation of activities in collaboration with partners has been limited.

* Reposted for technical reasons.

** UNEP/CBD/SBSTTA/14/1.

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SUGGESTED RECOMMENDATIONS

The Subsidiary Body on Scientific Technical and Technological Advice may wish to recommend that the Conference of the Parties adopt a decision along the following lines:

The Conference of the Parties

1. *Welcomes* the report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change, and *invites* Parties, other Governments, relevant organizations and the Executive Secretary to take its findings into consideration when carrying out work on biodiversity and climate change
2. *Notes* the opportunities to bring the biodiversity and climate change agendas together; and *requests* the Executive Secretary to convey a proposal for the development of a draft joint work programme between the three Rio conventions (UNEP/CBD/SBSTTA/14/6/Add.2) to the executive secretaries of the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification and to present the proposed joint work programme at the thirty-second meeting of the Subsidiary Body for Scientific and Technological Advice of the United Nations Framework Convention on Climate Change (UNFCCC) and the tenth meeting of the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD) with a view to (i) convening in 2010 a preparatory meeting of representatives of the Parties of each of the three Rio conventions to consider the elements of the draft joint work programme and (ii) call for a joint meeting of the Conference of the Parties of the three Rio conventions in 2012 as part of the celebration of the Rio+20;
3. *Invites* Parties to enhance harmonized reporting and data collection at the national level;
4. *Further invites* Parties, other Governments and relevant organizations to:

Impacts of climate change on biodiversity

- (a) Assess the risks to biodiversity from climate change using available vulnerability and impact assessment guidelines;
- (b) Identify areas of high biodiversity value and high carbon sequestration and storage potential to assist with strategic environmental assessment;
- (c) Assess the impacts of climate change on biodiversity-based livelihoods, particularly with regards to livelihoods within those ecosystems that have been identified as being particularly vulnerable to the negative impacts of climate change with a view to identifying adaptation priorities;

Reducing the impacts of climate change on biodiversity

- (d) Reduce some of the negative impacts from climate change through conservation and management strategies that maintain and restore biodiversity, bearing in mind that there are rates and magnitude of climate change for which natural adaptation will become increasingly difficult;
- (e) Implement activities to increase the adaptive capacity of species and ecosystems in the face of accelerating climate change, including, *inter alia*: (i) reducing non-climatic stresses, such as pollution, over-exploitation, habitat loss and fragmentation and invasive alien species; (ii) wider adoption of conservation and sustainable use practices including through the strengthening of protected area networks; and (iii) facilitating adaptive management through strengthening monitoring and evaluation systems;

(f) Consider relocation, assisted migration, captive breeding, and *ex situ* storage of germplasm, which could contribute to maintaining the adaptive capacity of species, while recognizing that such measures are often expensive, less effective than *in situ* actions, not applicable to all species, usually feasible only on small scales, and rarely maintain ecosystem functions and services. In the case of relocation and assisted migration, consider unintended ecological consequences;

Ecosystem-based adaptation

(g) Implement, where appropriate, ecosystem-based adaptation measures which use biodiversity and ecosystem services in an overall adaptation strategy including through the sustainable management, conservation and restoration of ecosystems to provide services that help people adapt to the adverse effects of climate change, including disaster risk reduction and sustainable land management strategies, with a view to achieving co-benefits for biodiversity and climate change adaptation, including by generating multiple social, economic and cultural co-benefits for local communities, contributing to the conservation and sustainable use of biodiversity, and contributing to climate change mitigation by conserving carbon stocks, reducing emissions caused by ecosystem degradation, or enhancing carbon stocks;

(h) Implement activities to enhance the natural adaptive capacity of biodiversity including, *inter alia*, through enhancing networks of protected areas, restoring degraded ecosystems and reducing other threats to biodiversity;

Implications of reducing emissions from deforestation and forest degradation (REDD) and other land-use management activities on biodiversity and climate change mitigation

(i) Implement a portfolio of land-use management activities, including the protection of natural forest and peatland carbon stocks, the sustainable management of forests, the use of native assemblages of forest species in reforestation activities, sustainable wetland management, restoration of degraded wetlands, sustainable agricultural practices and soil management as a contribution to the objectives of the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity (CBD);

(j) In forest landscapes currently subject to harvesting, clearing and/or degradation, address the underlying drivers of deforestation and degradation, and improve the sustainable management of forests;

(k) In natural forest landscapes that have already been largely cleared and degraded, implement, as appropriate, reforestation, forest restoration and improved land management which, through the use of native assemblages of species, can improve biodiversity and its associated services while sequestering carbon;

(l) When implementing afforestation activities for climate-change mitigation consider biodiversity through, for example: (i) converting only degraded land or ecosystems largely composed of exotic species; (ii) including native tree species when selecting species for planting; (iii) taking into account the invasiveness of non-native species; and (iv) strategically locating afforestation activities within the landscape to enhance connectivity;

(m) Enhance the benefits from REDD (m) and other sustainable land management activities for mitigation for forest-dwelling indigenous and local communities, through considering land ownership; respecting, preserving and maintaining the knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biological diversity; and ensuring space for the full and effective participation of indigenous and local communities in relevant policy-making processes;

(n) Implement a range of activities in the agricultural sector including conservation tillage and other means of sustainable cropland management, sustainable livestock management, and agroforestry systems that can result in the maintenance and potential increase of current carbon stocks and the conservation and sustainable use of biodiversity;

(o) Adopt policies that integrate and promote the conservation and enhanced sequestration of soil carbon, including in peatlands and other wetlands as well as in grasslands, savannahs and degraded drylands;

Impacts of adaptation activities on biodiversity

(p) Increase positive and reduce negative impacts of adaptation on biodiversity through strategic environmental assessments (SEA), environmental impact assessments (EIA), and technology impact assessments that facilitate the consideration of all adaptation options;

(q) In planning and implementing effective adaptation activities that take into account impacts on biodiversity: (i) consider traditional knowledge, including the full involvement of indigenous peoples and local communities; (ii) define measurable outcomes that are monitored and evaluated; (iii) build on a scientifically credible knowledge base; and (iv) apply the ecosystem approach.

(r) Optimize their effectiveness and generate biodiversity co-benefits, and implement adaptation activities that maintain intact and interconnected ecosystems to increase resilience and allow biodiversity and people to adjust to changing environmental conditions; restore or rehabilitate fragmented or degraded ecosystems, and re-establish critical processes such as water flow to maintain ecosystem functions; ensure the sustainable use of renewable natural resources; collect, conserve and disseminate traditional and local knowledge, innovations and practices related to biodiversity conservation and sustainable use with prior and informed consent from traditional knowledge holders;

Impacts of alternative energy and geo-engineering on biodiversity

(s) Assess the impacts of other geo-engineering techniques, such as the intentional and large-scale manipulation of the radiative balance of the atmosphere through injecting sulphate aerosols into the troposphere or stratosphere, on biodiversity;

Valuation and incentive measures

(t) Ensure that the economic (market and non-market) and non-economic values of biodiversity and ecosystem services are taken into account when planning and undertaking climate-change-related activities by using a range of valuation techniques;

(u) Implement both economic and non-economic incentives to facilitate climate-change-related activities that take into consideration biodiversity, while ensuring conformity with provisions of the World Trade Organization and other international agreements;

(v) Ensure that incentives for climate-change-related activities are carefully designed to simultaneously consider cultural, social, economic and biophysical factors while avoiding market distortions, such as through tariff and non-tariff barriers;

5. *Requests* the Executive Secretary to:

(a) Compile case-studies on tools to assess the direct and indirect impacts of climate change on biodiversity including proposals on indicators to monitor and assess change at the genetic level and in species and ecosystems (including vulnerability and resilience indicators) and means to address uncertainties, which limit the ability to project climate-change impacts on biodiversity, ecosystem

services and land systems, noting that the extent of the additional increase in global mean temperature is currently unknown;

(b) Develop proposals on guidance for the design and implementation of ecosystem-based adaptation, taking into account that decisions to implement ecosystem-based adaptation are subject to risk assessment, scenario planning and adaptive management approaches that recognize and incorporate these potential trade-offs;

(c) Convene, in collaboration with the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) an expert workshop on REDD plus with a view to enhancing the coordination of capacity-building efforts on REDD under the two Rio conventions;

(d) In collaboration with the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), the World Bank Forest Carbon Partnership Facility and other relevant programmes, to identify possible indicators to assess the contribution of reducing emissions from deforestation and forest degradation to the objectives of the Convention on Biological Diversity;

(e) Bring to the attention of relevant organizations, including the Global Environment Facility, the Consortium of Scientific Organizations and the Consortium of Universities, the knowledge and information gaps identified by Parties as preventing the implementation of activities and to report on activities undertaken by such organizations to address such gaps;

(f) Recognizing the distinct mandates of each of the Rio conventions, identify common indicators between national reports under the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification;¹

(g) Develop a toolkit of possible management responses to the observed and projected impacts of climate change on biodiversity as identified by Parties;

(h) Compile additional views from Parties on the integration of biodiversity into climate-change related activities with a view to submitting such views, along with views received so far, to the relevant case-study databases of the United Nations Framework Convention on Climate Change (UNFCCC) and to submit a report to the Conference of the Parties to the United Nations Framework on Climate Change at its sixteenth meeting and to the Conference of the Parties to the United Nations Convention to Combat Desertification at its tenth meeting;

(i) Develop proposals on actions to address the obstacles listed in section IV of the information note "Compilation of Views Submitted by Parties on Ways to Integrate Biodiversity Considerations into Climate Change-related Activities" for the consideration of SBSTTA at a meeting prior to the eleventh meeting of the Conference of the Parties.

Climate change and the biodiversity of dry and sub-humid lands

6. *Invites* Parties and other Governments and relevant organizations to develop down-scaled climate change models that combine temperature and precipitation information with multi-stressor biological models in order to better predict the impacts of drought on biodiversity;

¹ UNCCD adopted such indicators at the ninth meeting of their Conference of the Parties.

7. *Requests* the Executive Secretary to include in the agenda of the next meeting of the Joint Liaison Group of the three Rio conventions, elements of a joint work programme on climate change, biodiversity and land degradation for the consideration by the Parties of the respective conventions;

I. INTRODUCTION

1. In accordance with the multi-year programme of work of the Conference of the Parties up to 2010 (decision VII/31, annex), the in-depth review of the implementation of the cross cutting issue on biodiversity and climate change is scheduled to take place at the tenth meeting of the Conference of the Parties. Furthermore, decision IX/16 on biodiversity and climate change requests the Executive Secretary to include in the in-depth review, a compilation of case-studies, good-practice examples and lessons learned on activities, tools and methods to promote synergies between activities addressing biodiversity, desertification/land degradation and climate change at the national and, where appropriate, the local level.

2. Accordingly, this note has been prepared by the Executive Secretary including information from the fourth national reports to the Convention on Biological Diversity, the second, third and fourth national communications and national adaptation programmes of action under UNFCCC. The note specifically addresses implementation of decisions VII/15, VIII/30 and IX/16.

3. Additional information for this review includes the finding of the Ad hoc Technical Expert Group on Biodiversity and Climate Change, submissions of views from Parties on the integration of biodiversity within climate change related activities and submissions from relevant organizations, who have contributed to implementation. A draft of this note was posted for comments under notification 2009-156, and comments were incorporated as appropriate.

4. This note is supported by the following information to be made available:

(a) Input into the in-depth review on the enhanced integration of climate change within the programme of work on the biodiversity of dry and sub-humid lands (UNEP/CBD/SBSTTA/14/6/Add.1);

(b) Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change (UNEP/CBD/AHTEG/BD-CC-2/2/6);

(c) Compilation of views submitted by Parties on ways to integrate biodiversity considerations into climate change-related activities (UNEP/CBD/SBSTTA/14/6/Add.2);

(d) Compilation of experiences in the field of climate change mitigation and adaptation, soil management and pastoralism in dry and sub-humid lands.

5. The note contains a review of activities conducted by the Secretariat under the cross-cutting issue (section II), the status of implementation of activities requested of Parties under the cross-cutting issue (section III), a review of activities conducted by other relevant organizations and processes are requested by the Conference of the Parties, (section IV) case-studies, good-practice examples and lessons learned on activities, tools and methods to promote synergies between activities addressing biodiversity, desertification/land degradation and climate change (section V), and ways and means to apply the ecosystem approach to the management of biodiversity and climate change (section VI).

II. REVIEW OF ACTIVITIES CONDUCTED BY THE SECRETARIAT

A. *Activities promoting synergies between the secretariats of the Convention on Biological Diversity and other relevant international processes*

6. The cross-cutting issue on biodiversity and climate change emphasizes the need to strengthen synergies between the Convention on Biological Diversity and other relevant processes including UNFCCC, UNCCD, the Ramsar Convention on Wetlands, and the Intergovernmental Panel on Climate Change (IPCC).

7. Accordingly a number of steps have been taken including through the Joint Liaison Group of the Rio conventions and the Joint Work Plan with the Ramsar Convention. The Executive Secretary has also provided submissions, as requested to the UNFCCC process and has convened joint workshops with Ramsar to address the links between climate change, biodiversity, water and wetlands.

8. With regards to the Joint Liaison Group, the effectiveness of this group has been hampered by a lack of resources and significant differences in mandates between the three Rio conventions. A number of activities with low resource requirements were identified (UNEP/CBD/SBSTTA/13/7) and four were selected for priority implementation (decision IX/16):

(a) *Publish an electronic bulletin on synergies between the three Rio conventions, including reports on progress from Parties.* The Convention on Biological Diversity Secretariat contributed to the UN-REDD website the REDD & Biodiversity E-Newsletters and the draft findings of the AHTEG on biodiversity and climate change.

(b) *Create tools to inform Parties about relevant activities on biodiversity conservation and sustainable use, on combating environmental degradation, desertification/land degradation and climate change, including through updating existing tools and publications such as the clearing-house mechanism under the Convention and national biodiversity information systems.* An interoperability project has begun with the aim of making the best use of web services and exchange basic public data on national focal points and events. However, it had not been easy to define or adapt to a common format due to different existing database structures. Further difficulties arose as a result of differences in the SOAP (Simple Object Access Protocol) implementation and resource constraints.

(c) *Produce educational materials bearing in mind cultural circumstances and delivery methods based on the needs of the target audiences.* A workshop on increased synergy between the secretariats on education, communication and web tools was held in Bonn on 31 January and 1 February 2008 to discuss common information products and communication strategies. The workshop determined that: (i) more work is needed on joint messaging; (ii) the conventions would continue to produce the Rio Conventions calendar; (iii) the conventions would collaborate on educational activities; and (iv) more products would be planned jointly. Furthermore, during the workshop held in February 2008, it was agreed that educational material should focus on: (i) the goals of the Rio conventions and sustainable development, (ii) understanding climate change, (iii) biodiversity, (iv) desertification/land degradation in ecosystems around the world and (v) simulation of MEA negotiations. A medium and long-term plan was proposed however, no action has yet been taken to implement these plans. At the UNESCO Decade of Education for Sustainable Development (DESD) Conference, the UNFCCC and the Convention on Biological Diversity held workshops, and both climate change and biodiversity were integrated into the Bonn declaration for the DESD, including a call for all Governments to integrate both of these into sustainable development;

(d) *Develop Web-based communication tools.* The website of the Convention on Biological Diversity on ecosystem-based adaptation was updated and re-designed to include a number of new features including an expert database and country fiches on climate change impacts and biodiversity-related response activities. The updated website will be available in early 2010.

9. In addition to the activities carried out through the Joint Liaison Group, the following achievements were realized with other partners: (i) Summary of available scientific information on ocean fertilization, with the International Maritime Organization; (ii) Literature review on the impacts of climate change on pests of plants, with the International Plant Protection Convention Secretariat (to be completed); (iii) Ongoing joint input to the Intergovernmental Panel on Climate Change, with the Ramsar Convention on Wetlands; (iv) Co-hosting of the Global Meeting on Indigenous and Local Communities and REDD with UN REDD and World Bank (see workshop report at <http://www.cbd.int/doc/meetings/tk/redd-ilc-01/official/redd-ilc-01-02-en.pdf>); (v) Ongoing input on the

links between biodiversity and REDD, with the World Bank Forest Carbon Partnership Facility; (vi) Case-studies on pastoralism, biodiversity and climate change with IUCN, published as “*Pastoralism, Nature Conservation and Development: A Good Practice Guide*” (<http://www.cbd.int/development/doc/cbd-good-practice-guide-pastoralism-booklet-web-en.pdf>); (vii) Co-hosting of Subregional Capacity-Building Workshop on Forest Biodiversity and Climate Change, with the United Nations Forum on Forests (UNFF) (see workshop report: <https://www.cbd.int/doc/meetings/for/wscb-fbdcc-01/official/wscb-fbdcc-01-02-en.doc>); and (viii) Co-hosting “Forest Day 2 and 3”, with the Collaborative Partnership on Forests (see <http://www.cbd.int/climate/copenhagen/>).

10. Also, to further promote synergies between the Rio conventions, the Secretariat participated in the UNFCCC COP 14 and 15 in a number of ways, including preparation of information materials, a biodiversity and climate change website² and side events on climate change within the Convention on Biological Diversity. The Secretariat also made interventions to the UNFCCC SBSTA 30 and 31 on ecosystem-based adaptation under the Nairobi work programme item and on ecosystem-based mitigation under the Reducing Emissions from Deforestation in Developing Countries (REDD) item.³

B. *Activities to support the mainstreaming of climate change considerations within other programmes of work and cross-cutting issues*

11. The Conference of the Parties has requested the Executive Secretary to provide support for the mainstreaming of climate change within other programmes of work and cross-cutting issues through two main processes (i) consideration of climate change elements during in-depth reviews of implementation and (ii) capacity-building for mainstreaming climate change considerations within National Biodiversity Strategies and Action Plans. In support of these activities, the Secretariat will make available information on the integration of climate change within the programmes of work on inland waters, marine and coastal biodiversity and the biodiversity of dry and sub-humid lands as well as the cross-cutting issue on protected areas respectively. Additional information on existing climate change elements within the programmes of work is available in the annex to this note.

12. Furthermore, the Secretariat convened two capacity-building workshops on mainstreaming climate change considerations within National Biodiversity Strategies and Action Plans for the Caribbean small island developing States in Trinidad and Tobago, from 3 to 7 November, 2008 and for the Pacific small island developing states in Fiji, from 9 to 12 February, 2009.

C. *Building knowledge on the impacts on and vulnerability of biodiversity to climate change*

13. The Executive Secretary has been requested to fill knowledge gaps on the impacts of climate change on biodiversity and to establish knowledge management systems to ensure that information on impacts and vulnerability can be shared among and between Parties and processes. In order to meet this request, the website on biodiversity and adaptation was expanded including case-studies on impact and vulnerability assessments.

14. In addition, the second Ad hoc Technical Expert Group on biodiversity and climate change that met twice (17 to 21 November, 2008 in London, and 18 to 22 April, 2009 in Helsinki, plus a meeting of the drafting committee from 20 to 24 July, 2009 in Cape Town) produced a report available as CBD Technical Series No. 41 “Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change, Montreal”. The main findings of the AHTEG with regards to impacts and vulnerability reveal that:

² <http://www.cbd.int/climate/copenhagen/>

³ The interventions are available at <http://www.cbd.int/climate/copenhagen/>

- (a) 10 per cent of the species assessed so far will face an increasingly high risk of extinction for every 1°C rise in global mean surface temperature (up to an increase of about 5°C);
- (b) Wetlands, mangroves, coral reefs, Arctic ecosystems and cloud forests are identified as being particularly vulnerable;
- (c) In the absence of strong mitigation action, there is the possibility that some cloud forests and coral reefs would cease to function in their current forms within a few decades;
- (d) Climate change will have predominantly adverse impacts on many ecosystems and their services essential for human well-being.

15. The AHTEG also, however, identified a number of gaps in knowledge and information for assessing the vulnerability of biodiversity to climate change including:

- (a) *Climate Data* - Readily available downscaled probabilistic projections at appropriate spatial scales for regional and local management, including extreme events in addition to mean values;
- (b) *Climate impact models need to be linked with other physical models* – Currently most models only link two items together (e.g., climate and species ranges, or climate and hydrological regime). Ideally, systems need to be developed that link bioclimatic models with other physical models (CIAS). For example, linking bioclimatic models with land-use models, fire models, hydrological models, vegetation change models, etc., preferably with the ability to look at feedbacks;
- (c) *Climate impact models need to be linked with other biological models* – Ideally, systems need to be developed that link bioclimatic models with eco-physiological, demographic and viability models (e.g., using SCS (strategic cyclical scaling)). Furthermore, currently, most bioclimatic models look either at single species, or groups of species as one (e.g., plant functional types). Models need to be developed that take into account interactions between species and through trophic levels. What is further needed are more conjoined studies that simultaneously look at projections of changes to current climates over time using bioclimatic models, coupled with observed changes in the same species as a measure of a model's potential to capture future shifts in species range;
- (d) *The establishment of multi-purpose monitoring programmes that include the impacts of climate change on biodiversity would be beneficial in maximizing the use of limited resources* - A monitoring programme that integrates biodiversity status, within a framework that includes threat status monitoring and the recording the effectiveness of adaptation measures is also recommended.

D. *Building knowledge on the links between biodiversity and climate change mitigation and adaptation*

16. The Executive Secretary has carried out a number of activities to improve knowledge on the links between biodiversity and climate change including the establishment of a newsletter on biodiversity and reducing emissions from deforestation and forest degradation (REDD), the publication of a brochure on biodiversity and REDD in collaboration with the Government of Germany and the development of a case-study database on ecosystem-based adaptation. The Convention on Biological Diversity Secretariat also published five technical series on issues related to biodiversity and climate change: (i) No. 46: Scientific Synthesis on the Impacts of Ocean Acidification on Marine Biodiversity; (ii) No. 45: Scientific Synthesis on the Impacts of Ocean Fertilization on Marine Biodiversity; (iii) No. 43: Forest Resilience, Biodiversity, and Climate Change - A Synthesis of the Biodiversity/Resilience/Stability Relationship in Forest Ecosystems; (iv) No. 42: Review of the Literature on the Links between Biodiversity and Climate Change – Impacts, Adaptation and Mitigation; and (v) No. 41: Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change.

III. STATUS OF IMPLEMENTATION OF ACTIVITIES BY PARTIES

17. The review of the status of implementation of activities by Parties is based on fourth national reports under the Convention on Biological Diversity and second, third and fourth national communications and national adaptation programmes of action submitted within the framework of the United Nations Framework Convention on Climate Change.

18. In particular, of the 61 national reports available in English, French or Spanish as of 1 September 2009, 60 national reports⁴ mention actions relevant to the cross-cutting issue on biodiversity and climate change. Furthermore, among 40 national communications to UNFCCC, 37 Parties⁵ mention biodiversity. The most commonly reported element is impact and vulnerability assessments.

A. *Promoting synergies at the national level*

19. Decision IX/17 recognizes that synergies are most effectively implemented at the national level. Such synergies can be implemented through a number of actions as reported by Parties including:

(a) Coordination among national agencies through, for example, national committees for the implementation of the Rio conventions;

(b) Coordination among different planning processes, including national biodiversity strategy and action plans, national adaptation programmes of action and national action plans under the United Nations Convention to Combat Desertification;

(c) The implementation of projects addressing biodiversity, land degradation and climate change at the national level; and

(d) The integration of biodiversity in climate change adaptation and mitigation plans in other ministries (e.g. forestry, water, fisheries, etc).

20. Obstacles to further implementation reported by Parties include a lack of knowledge on the impacts of climate change on biodiversity. Furthermore, even where such information does exist, Parties cite a lack of awareness of the links between biodiversity, land systems and climate change as a factor preventing further implementation of synergies. Finally, some Parties have mechanisms in place to promote synergies at the national level however a lack of human, technical and financial capacity prevents the effective implementation of these mechanisms.

21. One mechanism for promoting synergies at the national level, which was not mentioned by any Party, is harmonized reporting which was identified as a priority in decision IX/17. Elements to enhance harmonized reporting may include identifying common indicators, developing common databases and convening joint teams for the production of national reports.

⁴ Afghanistan, Algeria, Armenia, Australia, Benin, Bhutan, Botswana, Burundi, Cambodia, Cameroon, Canada, China, Comoros, Congo, Côte d'Ivoire, Croatia, Cuba, Czech Republic, Democratic Republic of the Congo, Djibouti, Dominica, Estonia, European Community, Finland, France, Ghana, Guinea, Hungary, India, Indonesia, Italy, Japan, Kenya, Kyrgyzstan, Lebanon, Liberia, Malaysia, Mexico, Mongolia, Morocco, Nepal, Niger, Niue, Norway, Philippines, Poland, Republic of Korea, Republic of Moldova, South Africa, Spain, Sri Lanka, Sudan, Sweden, Syria, Tunisia, Turkmenistan, United Kingdom of Great Britain and Northern Ireland, Uganda, Viet Nam and Yemen.

⁵ Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, European Community, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kyrgyzstan, Latvia, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland, Kazakhstan, Republic of Korea, Tajikistan, the Former Yugoslav Republic of Macedonia, and Uzbekistan.

B. *Enhancing the integration of biodiversity within climate change mitigation and adaptation*

22. Fifty-six Parties⁶ reported on activities linking biodiversity and climate change adaptation within their fourth national reports. Furthermore, all 37 Parties mentioning biodiversity in their national communications integrate biodiversity within climate change adaptation. The range of adaptation activities integrating biodiversity are broad and include: (i) the development of adaptation plans for biodiversity, protected areas or ecosystem services; (ii) the establishment of corridors to improve connectivity and facilitate migration; (iii) improved water management; (iv) the expansion of protected areas networks; (v) the rehabilitation of degraded ecosystems; (vi) the establishment of gene banks and seed banks for vulnerable species; (vii) control of invasive alien species, pollution and other threats to species and ecosystems vulnerable to the impacts of climate change; and (viii) linking climate change and biodiversity to disaster risk management.

23. With regards the integration of biodiversity within climate change mitigation, far fewer Parties report relevant activities. In fact only 35 Parties report on relevant activities within their national reports and only four Parties report on relevant activities within their national communications. Almost all activities linking biodiversity and climate change mitigation occur in forests and are linked to sustainable forest management, reforestation and reducing emissions from deforestation and forest degradation.

C. *Identifying and addressing impacts of and threats to biodiversity from climate change*

24. Forty-nine Parties⁷ reported on observed and/or projected impacts of climate change on biodiversity within their fourth national reports. Of the Parties that did not report on impacts in their fourth national reports two did provide relevant information through their national communications.⁸ The range of impacts of climate change on biodiversity as reported by Parties include: (i) shifts in extent of species and ecosystems; (ii) increased threats of species extinctions; (iii) habitat loss; (iv) changes in the timing of life events; (v) changes in species interactions; (vi) changes in migration patterns; (vii) changes to ecosystem composition and structure; (viii) increased weather-related mortality; (ix) damage to coastal ecosystems; (x) changes in hydrology; (xi) changes in ocean circulation patterns; (xii) ocean acidification; (xiii) increased land degradation and desertification; (xiv) coral bleaching; (xv) increased wildfires; (xvi) reductions in ecosystem productivity; (xvii) increased instances of invasive alien species; and (xix) increased exposure to pests and weeds.

25. Obstacles to the assessment of the impacts of climate change on biodiversity as identified by Parties include a lack of baseline information on status and trends, the lack of ongoing monitoring and evaluation programmes and difficulty differentiating between multiple drivers of loss in order to isolate the causal relationship with climate change. With regards to addressing impacts and threats associated with climate change, far fewer activities have been reported. Many Parties have identified the projected impacts but have not yet identified the most vulnerable areas or components of biodiversity or the scale on which such impacts will affect biodiversity. Furthermore, gaps remain with regards to identifying what appropriate responses to impacts would be.

⁶ Afghanistan, Algeria, Armenia, Australia, Benin, Bhutan, Botswana, Burundi, Cambodia, Cameroon, Canada, China, Comoros, Congo, Côte d'Ivoire, Croatia, Cuba, Czech Republic, Democratic Republic of the Congo, Djibouti, Dominica, European Community, Finland, France, Ghana, Guinea, Hungary, India, Indonesia, Italy, Japan, Kyrgyzstan, Liberia, Malaysia, Mexico, Mongolia, Morocco, Nepal, Niger, Niue, Norway, Philippines, Poland, Republic of Korea, Republic of Moldova, South Africa, Spain, Sri Lanka, Sudan, Sweden, Syria, Tunisia, Turkmenistan, United Kingdom of Great Britain and Northern Ireland, Uganda, and Viet Nam.

⁷ Afghanistan, Algeria, Armenia, Australia, Benin, Botswana, Burundi, Cameroon, Canada, China, Comoros, Congo, Côte d'Ivoire, Cuba, Czech Republic, Democratic Republic of the Congo, Djibouti, Estonia, European Community, Finland, France, Ghana, Guinea, Hungary, India, Indonesia, Italy, Japan, Kenya, Kyrgyzstan, Lebanon, Mexico, Mongolia, Morocco, Nepal, Norway, Philippines, Republic of Korea, Republic of Moldova, South Africa, Spain, Sri Lanka, Sweden, Syria, Tunisia, Turkmenistan, United Kingdom of Great Britain and Northern Ireland, Uganda, and Viet Nam.

⁸ Croatia and Poland.

26. As many Parties have yet to progress beyond the stage of understanding key vulnerabilities, they are at the early stage of risk assessment with regard to climate risk management. A recent UNFCCC technical workshop⁹ highlighted the challenges to future-looking risk assessment which include the significant uncertainties associated with local climatic scenario information, the lack of socio-economic information and the absence of economic estimates of climate change impacts and adaptation options that often makes it impossible to carry out policy-relevant risk assessment.

D. Applying the ecosystem approach to biodiversity – climate change links

27. Although only two Parties¹⁰ reported on applying the ecosystem approach to biodiversity-climate change links, a number of Parties reported related approaches such as integrated marine and coastal zone management and ecosystem management at the basin or watershed level. Furthermore, many impact and vulnerability assessments were conducted at the ecosystem level, especially for forests and mountain ecosystems. Such an approach may constitute a first step to facilitate the broader application of the ecosystem approach.

E. Enhancing the participation of indigenous and local communities in activities linking biodiversity and climate change

28. Within national reports and national communications, Parties recognized the impacts of climate change on indigenous and local communities, especially within vulnerable regions including the Arctic and small island developing States. With regards to enhancing the participation of indigenous and local communities in activities linking biodiversity and climate change, only three Parties¹¹ reported on relevant activities including through education programmes in schools and supporting local adaptation programmes related to the conservation and sustainable use of biodiversity.

29. Obstacles to the broader inclusion of indigenous and local communities in activities linking biodiversity and climate change include a lack of awareness of the links among such stakeholders.

IV. REVIEW OF ACTIVITIES CONDUCTED BY OTHER INTERNATIONAL PROCESSES

A. United Nations Framework Convention on Climate Change

30. In addition to the above, information and experiences have been exchanged, and continue to be exchanged, on cross-cutting issues such as outlined in decision IX/16 of the CBD Conference of the Parties and its annex I, e.g. on:

- **Adaptation** - Under the Nairobi Work Programme, the active participation of organizations and their contribution of expertise is encouraged.
- **Education** – The UNFCCC is a member of CBD's Informal Advisory Group on Communication, Education and Public Awareness (CEPA) and contributes to the development/implementation/monitoring of the CEPA programme of work under the Convention on Biological Diversity. The UNFCCC's CC:iNet is showcasing CEPA products.
- **Communication** – Joint workshop on education, communication and web tools (February 2008, Bonn), and joint outreach activities, including work on the 2010 calendar.
- **International Year of Biodiversity (2010)** – A UNFCCC Focal Point has been appointed.

31. The UNFCCC secretariat has also provided support to the Convention on Biological Diversity during sessions, for example, by facilitating the distribution of the main messages and draft reports of the

⁹ FCCC/SBSTA/2009/5 Report on technical workshop on integrating practices, tools and systems for climate risk assessment and disaster risk reduction strategies into national policies and programmes.

¹⁰ Nepal and Australia.

¹¹ Australia, Cameroon and Finland.

AHTEG and by assisting colleagues from the Convention on Biological Diversity in delivering statements and submissions under the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA).

32. With regard to specific information requested:

- **Collaboration with CPF/promotion of sustainable forest management, including traditional knowledge** – The UNFCCC is a member of CPF and collaborates with other members of CPF in various activities to promote the sustainable management and conservation of all types of forests and long-term political commitment to enhance sustainable forest management and its integration into broader development strategies. The UNFCCC participated in the development of a “Strategic Framework for Forests and Climate Change” to enhance a coordinated forest sector response to climate change.
- **Ecosystems and adaptation** – This concept is currently being discussed under the AWG-LCA with the context of ecosystem services, ecosystem vulnerability and ecosystem approaches to adaptation.

33. Finally, at the fifteenth meeting of its Conference of the Parties, in December 2009, the Parties to UNFCCC took note of the Copenhagen Accord, a step towards negotiating a post-2012 regime for mitigating and adapting to climate change. Some progress was made with regard to reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries (REDD-plus), with details regarding methodological and financing mechanisms to promote synergies to be considered at the next Conference of the Parties to UNFCCC to be held 29 November to 10 December in 2010. The importance of co-benefits of REDD-plus for biodiversity and for indigenous and local communities were recognized by UNFCCC COP-15.

B. Intergovernmental Panel on Climate Change

34. The Intergovernmental Panel on Climate Change (IPCC) published a Technical Paper on Climate Change and Water (<http://www.ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf>). This Technical Paper contains a section on ecosystems and biodiversity which highlights the links between changes in hydrology and species. Specific impacts associated with changing hydrology combined with changing temperatures as identified in the Technical Paper include projected extinctions of amphibians and other aquatic species in Costa Rica, Spain and Australia; drying of wetlands in the Sahel with corresponding negative impacts on migratory birds; unprecedented levels of extinctions among plants and animals in southern Africa; and increase threats to species inhabiting montane cloud forests.

35. The IPCC also held, from the 23 to 26 March, 2009, a scoping meeting on extreme events and disasters: managing the risks. The first lead authors meeting for the IPCC Special Report on Extreme Events and Disasters was held in Panama, from 9-12 November.

V. ACTIVITIES, TOOLS AND METHODS TO PROMOTE SYNERGIES BETWEEN BIODIVERSITY, DESERTIFICATION/LAND DEGRADATION AND CLIMATE CHANGE

36. Case-studies on activities, tools and methods to promote synergies between biodiversity, desertification/land degradation and climate change were gathered from fourth national reports, input provided by relevant organizations and implementing agencies, the adaptation database of UNFCCC and a literature review conducted by the Secretariat. Proposals include: (i) integration of the ecosystem approach within climate-change adaptation strategies; (ii) the establishment and good management of protected areas; (iii) ecosystem restoration; (iv) identifying and protecting climate refugia; (v) increasing connectivity of habitats; (vi) protecting environmental gradients; and (vii) reducing other threats that may be exacerbated by climate change.

37. Specifically with regards to linking biodiversity and climate change adaptation, an analysis of lessons learned and case-studies revealed that elements which could be considered when developing and advancing appropriate activities include: (i) establishing a baseline of knowledge and information; (ii) impact assessment; (iii) assessing natural adaptive capacity; (iv) future-looking strategy development; and (v) monitoring and adaptive management.

38. Further activities linking biodiversity, land degradation/desertification and climate change were proposed by the AHTEG and include:

(a) Reducing non-climatic stresses in combination with conservation, restoration and sustainable management strategies including increasing the adaptive capacity of species and ecosystems in the face of accelerating climate change through: (i) reducing non-climatic stresses, such as pollution, over-exploitation, habitat loss and fragmentation and invasive alien species; (ii) the wider adoption of conservation and sustainable use practices including through the strengthening of protected area networks; (iii) facilitating adaptive management through strengthening monitoring and evaluation systems;

(b) Recognizing that relocation, assisted migration, captive breeding, and ex-situ storage of germplasm could contribute to maintaining the adaptive capacity of species, however, such measures are often expensive, less effective than in-situ actions, not applicable to all species, usually feasible only on small scales, and rarely maintain ecosystem functions and services. In the case of relocation and assisted migration, unintended ecological consequences need to be considered;

(c) Applying ecosystem-based adaptation, which integrates the use of biodiversity and ecosystem services into an overall adaptation strategy;

(d) Implementing a portfolio of land-use management activities, including the protection of natural forest and peatland carbon stocks, the sustainable management of forests, the use of native assemblages of forest species in reforestation activities, sustainable wetland management, restoration of degraded wetlands and sustainable agricultural practices to contribute to the objectives of both UNFCCC and the Convention on Biological Diversity;

(e) In forest landscapes currently subject to harvesting, clearing and/or degradation, addressing the underlying drivers of deforestation and degradation, and improving the sustainable management of forests;

(f) In natural forest landscapes that have already been largely cleared and degraded, implementing reforestation, forest restoration and improved land management which, through the use of native assemblages of species, can improve biodiversity and its associated services while sequestering carbon;

(g) In the agricultural sector adopting practices including; conservation tillage and other means of sustainable cropland management, sustainable livestock management, and agroforestry systems that can result in the maintenance and potential increase of current carbon stocks and the conservation and sustainable use of biodiversity;

(h) Increase positive and reduce negative impacts of adaptation on biodiversity through strategic environmental assessments (SEA), environmental impact assessments (EIA), and technology impact assessments that facilitate the consideration of all adaptation options;

(i) Recognize that to optimize their effectiveness and generate biodiversity co-benefits, adaptation activities should (i) maintain intact and interconnected ecosystems to increase resilience and allow biodiversity and people to adjust to changing environmental conditions; (ii) restore or rehabilitate

fragmented or degraded ecosystems, and re-establish critical processes such as water flow to maintain ecosystem functions; (iii) ensure the sustainable use of renewable natural resources; (iv) collect, conserve and disseminate traditional and local knowledge, innovations and practices related to biodiversity conservation and sustainable use with prior and informed consent from traditional knowledge holders;

(j) Recognize that some renewable energy sources, which displace the use of fossil fuels, and geo-engineering techniques, can have adverse effects on biodiversity depending on design and implementation;

(k) Ensure that the economic (market and non-market) and non-economic values of biodiversity and ecosystem services are taken into account when planning and undertaking climate change related activities. This can best be achieved by using a range of valuation techniques while ensuring conformity with provisions of the World Trade Organization and other international agreements;

(l) Carefully design incentives for climate change related activities to simultaneously consider cultural, social, economic and biophysical factors while avoiding market distortions, such as through tariff and non-tariff barriers.

VI. WAYS AND MEANS TO APPLY THE ECOSYSTEM APPROACH TO THE MANAGEMENT OF BIODIVERSITY AND CLIMATE CHANGE

39. Since the ecosystem approach takes a broad perspective to management, it has been recognized by the Conference of the Parties as an appropriate methodology through which the multiple impacts from climate change, including on biodiversity, can be reflected in comprehensive and responsive adaptation planning. The ecosystem approach can also promote intersectoral cooperation on adaptation.¹²

40. Based on national reports and national communications applying the ecosystem approach to the management of biodiversity and climate change is most broadly achieved within marine and coastal and inland water ecosystems perhaps because of the ease with which boundaries and stakeholders can be defined in such ecosystems.

With regards to enhanced implementation, the AHTEG recalled that at its seventh meeting, the Conference of the Parties recognized that “there is no single correct way to achieve an ecosystem approach to management of land, water, and living resources”. As such, the AHTEG suggests that the underlying principles of the ecosystem approach can be translated flexibly to address climate change and biodiversity management issues in different social contexts.

41. Another approach to applying the ecosystem approach to the management of biodiversity and climate change is through ecosystem-based adaptation which uses biodiversity and ecosystem services in an overall adaptation strategy. Such an approach includes the sustainable management, conservation and restoration of ecosystems to provide services that help people adapt to the adverse effects of climate change, including disaster risk reduction. As such, ecosystem-based adaptation can be a useful and widely applicable approach to adaptation because it:

(a) Can be applied at regional, national and local levels, at both project and programmatic levels, and benefits can be realized over short and long time-scales;

(b) May be more cost-effective and more accessible to rural or poor communities than measures based on hard infrastructure and engineering;

(c) Can integrate and maintain traditional and local knowledge and cultural values;

¹² FCCC/SBSTA/2009/6 Advance version 27 October. Synthesis report on approaches to and experiences in integrating and expanding adaptation planning and action, and lessons learned, good practice, gaps, needs and barriers and constraints to adaptation.

- (d) Can generate multiple social, economic and cultural co-benefits for local communities;
- (e) Can contribute to the conservation and sustainable use of biodiversity;
- (f) Can contribute to climate change mitigation, by conserving carbon stocks, reducing emissions caused by ecosystem degradation and loss, or enhancing carbon stocks.

42. Ecosystem-based adaptation may require managing ecosystems to provide particular services at the expense of others. It is therefore important that decisions to implement ecosystem-based adaptation are subject to risk assessment, scenario planning and adaptive management approaches that recognize and incorporate these potential trade-offs.

Annex

CLIMATE CHANGE ELEMENTS IN THE PROGRAMMES OF WORK

Programme of work (decision)	Relevant text
Agricultural biodiversity (V/5)	Nothing explicit but climate regulation and carbon sequestration are recognized as ecological services provided by agricultural biodiversity
Dry and sub-humid Lands (V/23)	Nothing explicit but activity 7(f) calls for Parties to take due account of better understanding of climate variability in developing effective in situ biological conservation strategies
Forest biodiversity (VI/22)	Goal 2: Objective 3: Mitigate the negative impacts of climate change on forest biodiversity.
Inland waters biodiversity (VII/4)	<p>1.1.2 Develop effective management strategies to maintain or improve the sustainability of inland water ecosystems (...) while giving due consideration to the likely impacts of climate change</p> <p>1.1.7 Provide to the Executive Secretary advice on (...) implementing adaptive management and mitigation strategies for combating the impacts of climate change.</p> <p>1.1.9 Assess the linkages between inland water ecosystems and climate change and the management options for mitigation of and adaptation to climate change.</p>
Island biodiversity (VIII/1)	<p>1.2.1.5. Integrate climate change adaptation measures when establishing networks of island protected areas.</p> <p>Goal 7: Address challenges to island biodiversity from climate change, and pollution</p> <p>8.1.2.1. Identify and implement effective early-warning systems (forecasting) and strategies that address natural (...), such as (...) tropical storms and longer-term trends such as climate change, sea level rise, (...).</p>
Marine and coastal biodiversity (VII/5)	<p>Operational objective 3.3: (b) To address, through appropriate integrated marine and coastal management approaches, all threats, (...) taking into account possible effects of climate change such as rising sea levels.</p> <p>Appendix 1: Specific Work Plan on Coral Bleaching</p> <p>Appendix 4: Priority 2.3(c) develop methods for adapting marine and coastal protected areas management in response to possible changing species and habitat distribution patterns, which may result from climate change.</p>
Mountain biodiversity (VII/27)	<p>1.1.5. Monitor and exchange information on the impacts of global climate change on mountain biological diversity, and identify and implement ways and means to reduce the negative impacts.</p> <p>1.2.1. Develop and implement programmes (...) to enhance the capacity of mountain ecosystems to resist and adapt to climate change, or recover from its negative impacts including, inter alia, by establishing corridors (...).</p> <p>2.3.4. Strengthen collaboration and synergies between the work programmes of the Convention on Biological Diversity and other global conventions and agreements on climate change, (...).</p> <p>3.1.1. Promote the monitoring of susceptible areas subject to climate change.</p> <p>3.1.6. Promote collaboration among the secretariats and national focal points of United Nations Framework Convention on Climate Change, United Nations Convention to Combat Desertification (...) to develop adaptive strategies for mountain ecosystems and for the monitoring of changes due to the impact of global processes, where appropriate.</p> <p>3.2.4. Assess and address the changing status of both local and long-range pollution and global climate change issues with special relevance to mountain ecosystems.</p>
Protected areas (VII/28)	Target 1.4.5. Integrate climate change adaptation measures in protected area planning, management strategies, and in the design of protected area systems.
