Secretariat of the
Convention on Biological Diversity

CBD

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Biodiversity and Climate Change

SUBMISSION OF THE CONVENTION ON BIOLOGICAL DIVERSITY TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE: ADAPTATION PLANNING AND PRACTICES

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA) of the United Nations Framework Convention on Climate Change (UNFCCC) invited Parties and relevant organizations to provide structured submissions, by 31 May 2007, on adaptation approaches, strategies, practices and technologies for adaptation at the regional, national and local levels in different sectors, as well as on experiences, needs and concerns.

2. Since climate-change adaptation is integrated into all of the programmes of work of the Convention on Biological Diversity (CBD), with the exception of the programme of work on technology transfer, in response to the request from SBSTA, the Executive Secretary of the CBD has prepared this document on adaptation activities within the framework of the CBD and its programmes of work and cross-cutting issues.

3. Information for inclusion in this document was derived from national reports submitted by Parties to the CBD, the reports of the Convention's Ad Hoc Technical Expert Group on Biodiversity and Climate Change, and a review of the implementation of relevant programmes of work and cross-cutting issues of the CBD.

4. Information in the requested table format is presented in section I below however, please note that the status of all adaptation activities is "ongoing" and, as such, this column is excluded from the table. Additional information on experiences and lessons learned is presented in section II and on needs and obstacles in section III. Section IV contains additional resources available from the Secretariat of the Convention on Biological Diversity.

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I. MANDATED AND ONGOING ACTIVITIES UNDER THE CONVENTION ON BIOLOGICAL DIVERSITY ON APPROACHES, STRATEGIES, PRACTICES AND TECHNOLOGIES FOR ADAPTATION

Type of adaptation action	Decision containing adaptation actions	Mandate under the Convention on Biological Diversity on adaptation	Example of experiences from Parties and partners
Regional			
Approaches and strategies	Programme of work on inland waters biodiversity Decision VII/4	"The programme of work should pay particular attention to the impacts of climate change and the role of inland waters in mitigation of and adaptation to climate change. In this process, the programme of work should consider, support and collaborate with ongoing and/or new initiatives in these areas and in particular those related to the conservation and sustainable use of peatlands."	**Stress reduction in the Andean Paramos** The IUCN Netherlands Committee facilitated, through the Global Peatland Initiative, funding of the Grupo Paramo regional network for promoting the wise use and conservation of the paramos in the Andes. The regional project 'Conservation of the Biodiversity of the Paramo in the Northern and Central Andes', funded by the Global Environment Facility (GEF) was implemented to ensure the conservation and sustainable use of the Paramos biodiversity.
Approaches and strategies	Programme of work on traditional knowledge, innovations and practices Decision VIII/5 B, para. 6	"Notes…the specific vulnerabilities of indigenous and local communities… concerning the impacts of climate change and accelerated threats…to traditional knowledge, innovations and practices, and requests further research be conducted, subject to the availability of resources, into highly vulnerable indigenous and local communities, with a focus on causes and solutions…"	**Arctic Climate Impact Assessment** The ACIA was produced by the Arctic Council and the International Arctic Science Committee (IASC) to evaluate and synthesize knowledge on climate change and its consequences including a focus on adaptation planning among indigenous people.

Type of adaptation action	Decision containing adaptation actions	Mandate under the Convention on Biological Diversity on adaptation	Example of experiences from Parties and partners
Approaches and strategies	Biodiversity and climate change cross cutting issue Decision VIII/30, para. 7	"Invites Parties to consider the needs of the most vulnerable regions and ecosystems, and their indigenous and local communities…in order to enhance understanding, design and communication of synergies in the national implementation of the three Rio conventions…Ramsar…the World Heritage Convention, the Convention on Migratory Species, and other multilateral environmental agreements, and to support the preparation of adaptation activities and plans, including…financial resources, technology transfer, education and outreach, capacity-building, research and systemic observation, and harmonized reporting."	**Canada Northern Ecosystem Initiative** The NEI supports projects that address climate change science and capacity-building needs throughout the Canadian North. These projects are led by or involve partnerships with Aboriginal organizations, communities, universities, northern colleges and research institutes, non-governmental organizations, as well as government and international agencies.
Technologies	Biodiversity and climate change as a cross-cutting issue Decision VIII/30 Para. 5	"Invites Parties, other Governments, relevant organizations and research institutions, to address…the research gaps…summarized in paragraph 3 of recommendation XI/14 of SBSTTA and to promote research on climate change response activities related to biodiversity…in order to further facilitate the incorporation of biodiversity considerations into…activities aimed at the mitigation and adaptation of the impacts of climate change..." "Encourages Parties, other Governments, relevant organizations and research institutions to develop rapid assessment tools for the design and implementation of biodiversity conservation and sustainable use activities which contribute to adaptation to climate change…"	**Web-based guidance on the integration of biodiversity in adaptation planning** A number of examples of research activities and assessment tools are summarized in the associated document databases of the web-based guidance. The web-based guidance is available in English, French and Spanish at: http://adaptation.cbd.int.

Type of adaptation action	Decision containing adaptation actions	Mandate under the Convention on Biological Diversity on adaptation	Example of experiences from Parties and partners
Technologies	Global Taxonomy Initiative Decision VIII/3, para. 17	"Mobilization and augmentation of specimen and observational-level data pertaining to species to allow modelling of current distributions and distributions under different models of climate change and of other biotic and a biotic changes (e.g. land-use change, invasive species)."	**Norway National Centre for Biosystematics** The NCB examines Arctic flora in response to climate change. Deliverables include a new revision of 'Lid's flora' and the completion of a draft version of the first consensus checklist for all arctic countries ('The Panarctic Flora checklist').
National			
Approaches and Strategies	Programme of work on protected areas Decision VII/28, annex Programme element 1. Goal 1.4.	"Integrate climate change adaptation measures in protected area planning, management strategies, and in the design of protected area systems."	**World Heritage Convention** Published Case-studies on Climate Change and World Heritage examining expected impacts, vulnerabilities and adaptation options in natural and cultural World Heritage sites.
Practices	Programme of work on mountain biodiversity Decision VII/27 Programme element 1. Goal 1.2	"Develop and implement programmes…in order 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 and taking appropriate measures to maintain ecological functions of natural corridors, where appropriate, to enable vertical migration of species, ensuring minimal viable population sizes to enable genetic adaptation to changing environmental conditions."	**Australia National Biodiversity and Climate Change Action Plan of Australia 2004-2007** Objective 5: To minimise the impacts of climate change on native terrestrial species, communities and ecosystems. Strategy 5.2. Reviewing reserve acquisitions to strengthen the capacity of the reserve system to act as refuges for vulnerable terrestrial species and integrate reserve planning and management with broader landscape protected area networks to allow the movement of species across bioclimatic gradients.

Type of adaptation action	Decision containing adaptation actions	Mandate under the Convention on Biological Diversity on adaptation	Example of experiences from Parties and partners
Practices	Programme of work on marine and coastal biodiversity Decision V/3 annex Decision VII/5 appendix 1	"Implement and coordinate targeted research programmes…that investigate: (1) the tolerance limits and adaptation capacity of coral-reef species…; (2) the relationship among large-scale coral-bleaching events, global warming, and the more localized threats… and (3) the frequency and extent of coral-bleaching and mortality events, as well as their impacts on ecological, social and economic systems 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. Develop a rapid response capability to document coral bleaching and mortality in developing countries and remote areas…; 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." "Implement action to manage coral reefs for resistance and resilience to, and recovery from, episodes of raised sea temperatures and/or coral bleaching."	**St-Lucia National Climate Change Policy and Adaptation Plan** Policy directives concerning coastal and marine resources: 1. Ensure the continuation, expansion and strengthening of coastal monitoring and data collection; 2. Promote and facilitate the undertaking of a national assessment of coastal areas and resources at risk; 3. Adopt short medium and long-term measures to protect coastal lands and to increase resilience; 4. Promote and enable the restoration of damaged or destroyed coastal resources and coastal ecosystems; 5. Develop a comprehensive national land use and management plan, which *inter alia*, incorporates climate change concerns; 6. Foster increased awareness and knowledge regarding climate change impacts on the coastal and marine environment.
Practices	Programme of work on forest biodiversity Decision VI/22 programme element 1. goal 2.	"Mitigate the negative impacts of climate change on forest biodiversity. Promote monitoring and research on the impacts of climate change on forest biodiversity and investigate the interface between forest components and the atmosphere; Develop coordinated response strategies and action plans at global,	**Tanzania National Adaptation Programme of Action** Existing adaptation activities in forest ecosystems include: 1. Collaborative forest management in various districts 2. Ensured ecosystem stability though conservation of forest biodiversity, water catchment and soil fertility

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		regional and national levels; Promote the maintenance and restoration of biodiversity in forests in order to enhance their capacity to …adapt to climate change; Promote forest biodiversity conservation and restoration in climate change mitigation and adaptation measures; Assess how the conservation and sustainable use of forest biological diversity can contribute to the international work relating to climate change."	
Practices	Programme of work on inland water biological diversity Decision VII/4, annex programme element 1.	"Integrate into land-and water-use management approaches appropriate adaptive management and mitigation responses to combat, and prevent where possible, the negative impacts of climate change…on the biodiversity of inland water ecosystems."	**Cambodia National Adaptation Programme of Action to Climate Change** A number of high priority projects address land-and water-use management approaches including the development and improvement of community irrigation systems and the rehabilitation of: 1. A multiple-use reservoir in Takeo Province; 2. Upper Mekong and provincial waterways; and 3. Multiple-use canals in Banteay Meas District, Kampot Province.
Practices	Programme of work on island biodiversity Decision VIII/1, annex	"Integrate climate change adaptation measures when establishing networks of island protected areas." "Resilience of the components of biodiversity to adapt to climate change in islands maintained and enhanced Research and implement adaptation and mitigation measures in land-use and coastal zone planning and strategies to strengthen local-level biodiversity resilience to climate	**Samoa National Adaptation Programme of Action** Project Profile 8: Establishing conservation programs in highly vulnerable marine and terrestrial areas of communities project. Action: To establish and or strengthen community-based conservation programs for the protection of highly vulnerable terrestrial and marine biodiversity.

Type of adaptation action	Decision containing adaptation actions	Mandate under the Convention on Biological Diversity on adaptation	Example of experiences from Parties and partners
		change Identify species (e.g., corals) that are resilient to climate change in order to use those species for restoration. Reduce chemical and physical degradation of coral reefs to facilitate recovery from climate-induced bleaching. Create where feasible viable national systems of protected areas that are resilient to climate change."	**Maldives National Adaptation Programme of Action** Project 16. Increase resilience of coral reefs to reduce the vulnerability islands, communities and reef-dependent economic activities to predicted climate change. Activity 2.1. Develop a coral-reef management framework that enables relevant institutions to designate zones, uses and Marine Protected Area (MPA) systems. Activity 4.2. Review the effectiveness of designated MPAs and recommend ways and means to strengthen MPA management.
Practices	Programme of work on marine and coastal biodiversity Decision VII/5 Research priorities - priority 2.3	"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."	**Australia National Biodiversity and Climate Change Action Plan of Australia 2004-2007** Strategy 4.2. Identifying and integrating into marine, coastal, and estuarine management strategies (particularly Marine Protected Areas-MPAs), activities that minimize the impacts of climate change and sea level change on vulnerable marine, coastal and estuarine species and ecosystems. Strategy 4.5. Consider the impacts of climate change on marine, estuarine and coastal biodiversity when selecting new MPAs and management planning and monitoring regimes.

II: EXPERIENCES AND LESSONS LEARNED

5. The following section provides experiences and lessons learned from the application of broad approaches to the integration of biodiversity considerations into adaptation planning. These approaches range from adaptation plans for biodiversity, to

approaches aimed at minimizing the negative impacts on biodiversity from adaptation planning, to adaptation plans which mainstream biodiversity considerations.

Adaptation options to reduce the negative impacts of climate change on biodiversity

6. Biodiversity can be negatively impacted by climate change through: shifts in suitable climatic conditions (towards the poles or upwards in elevation or along precipitation gradients); increased die-offs and extinctions of species and ecosystems; and changes in body size, timing of life cycles, and distribution and abundance of species. In fact the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) revealed that approximately 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5-2.5^{o}C above pre-industrial levels.

7. Planned adaptation for biodiversity aims to maintain and restore ecosystem resilience. Such activities entail three components: (i) maintain adequate space, structure and environmental conditions for ecosystems, species and individuals to respond to climate change; (ii) limit stresses that amplify the impacts of climate change, and (iii) employ adaptive management to allow for the testing of different approaches while implementation is under way.

8. As such, options to reduce the negative impacts of climate change on biodiversity include:

- Reducing other pressures on biodiversity (habitat conversion, over-harvesting, pollution, invasive alien species, etc.);
- Establishing biological corridors to counter fragmentation and facilitate migration poleward, upward, or along precipitation gradients;
- Conserving genetic and habitat heterogeneity and regenerative populations; and
- Maintaining clear monitoring and evaluation programmes to facilitate adaptive management under changing climatic conditions.

Lessons learned

9. There has not been a comprehensive evaluation of adaptation options to reduce the negative impacts of climate change on biodiversity, however, some lessons have been learned from individual projects including:

- The importance of comprehensive baseline information;
- The need for clear monitoring and evaluation systems to facilitate adaptive management;
- Clear targeting of the most vulnerable species; and
- Preserving intact habitats so as to facilitate the long-term adaptation of biodiversity is a very cost-effective option.

Minimizing the negative impacts of adaptation planning on biodiversity

10. Planned adaptation activities are already being implemented that have positive, negative or neutral impacts on biodiversity. Understanding these impacts can facilitate the design and implementation of adaptation planning choices that have minimal negative impacts on biodiversity, in the worst case, and maximum positive benefits for biodiversity in the best case.

11. For example, concrete coastal protections will likely have a negative impact on biodiversity, such as nesting sea turtles, while packed-earth coastal protections will likely have a neutral or positive impact on biodiversity, while delivering the same adaptation benefits.

Lessons learned

12. Adverse consequences to biodiversity can be minimized, and positive benefits enhanced if biodiversity considerations are incorporated formally and routinely into adaptation planning through the use of tools such as environmental impact assessments and the valuation of biodiversity resources.

13. Including traditional and local knowledge in adaptation planning is also very useful for the systematic incorporation of biodiversity considerations.

Mainstreaming biodiversity into climate change adaptation planning

14. Biodiversity resources contribute to many ecosystem services including the provision of food and fodder, nutrient cycling and maintenance of hydrological flows. As such, ensuring that biodiversity is able, to the extent possible, to adapt to climate change is an important component of adaptation planning.

15. Likewise, biodiversity resources such as land races of common crops, mangroves and other wetlands and vegetative cover can form an integral part of adaptation plans for many regions and sectors including agriculture, fisheries and traditional livelihoods.

16. At its eighth meeting, the Conference of the Parties to the CBD requested that Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), while respecting the mandate of the UNFCCC, develop draft guidance on how to integrate relevant climate change impacts and response activities into the programmes of work of the Convention

17. The proposed guidance entails four main steps:

(a) Identification of vulnerable regions, subregions and ecosystem types including vulnerable components of biodiversity within these areas;

(b) Assessment of the threats and likely impacts of climate change on biodiversity in the identified vulnerable areas;

(c) Identification of climate change adaptation and mitigation options and evaluation of their impacts on biodiversity; and

(d) Implementation and monitoring of the selected adaptation and mitigation plans.

Lessons learned

18. In order to develop the guidance on climate change impact and response activities within the programmes of work of the Convention, a number of case-studies on climate change adaptation planning were examined. A review of these case-studies revealed four key lessons on the design and implementation of climate change impact and response activities:

- Importance of ensuring stakeholder participation;
- Developing adequate technical and informational capacity;

- Considering the long-term sustainability of activities; and
- Developing an appropriate policy framework.

III. NEEDS AND OBSTACLES

19. The report of the Ad Hoc Technical Expert Group on Biodiversity and Climate Change was published in 2006 as CBD Technical Series No. 25. This Group identified a number of obstacles, challenges and gaps on biodiversity and climate change adaptation planning. These obstacles are relevant for all approaches and types of adaptation planning.

Tools and data needs

(a) Need for baseline data and systematic monitoring to assess biodiversity response to climate change and adaptation activities;

(b) Development of predictive models and decision support tools to guide the design and selection of adaptation strategies at different scales (biome, local, sub-national, national, regional; landscape/seascape);

(c) Development of scenarios of likely future changes in drivers, status and condition of ecosystems, and biodiversity outcomes, reflecting both scientific and traditional knowledge; and

(d) Strengthening expertise and institutional capacity in developing countries and indigenous communities for all the above.

Research

(e) Need for improved understanding of how biological and physical systems will respond to climate change and how their interactions influence outcomes on ecosystems. Discerning these complexities represents one of the largest uncertainties for projecting future biodiversity;

(f) An analysis of the impacts on biodiversity of existing and planned adaptation activities in response to climate change and improved understanding of ecosystem/species adaptations to *current* environmental change as it can provide important information for designing future options;

(g) An improved understanding of the biological factors and ecosystem processes that contribute to resilience and natural adaptive capacity;

(h) A critical analysis of the use of key indicators and other methodologies, such as risk assessments, for assessing biodiversity status and trends;

(i) Improved sophistication, robustness, downscaling and coupling of climate and ecosystem models and improved capacity for simulating effects of multiple drivers and pressures (climate and non-climate) on biodiversity, distinguishing anthropogenic and natural climate impacts;

(j) Long-term monitoring of key biophysical parameters so to provide time-series data for developing baselines as climate changes. Monitoring success of adaptation is equally important;

(k) Developing research agendas that reflect priorities for vulnerable communities such as local and indigenous populations and those with limited capacity for adaptation.

Participation and collaboration

(l) Need to incorporate both scientific and traditional knowledge to facilitate adaptation planning and implementation, and collect traditional knowledge prior to is disappearance;

(m) Ensure participatory approaches and partnerships for planning and implementing adaptation strategies;

(n) Document case-studies of adaptation in ecosystems and their limits in conjunction of the records of the present climate variability and extremes as a basis for designing adaptation options;

(o) Synthesize information derived from top-down and bottom-up approaches leading to the development of planned adaptations for biodiversity.

Communication

(p) Need for cooperation, networking, and large-scale (bio-geographical) approaches for documenting present distribution and future shifts in ecosystems and species ranges across political boundaries;

(q) Collection, systematic analysis, and dissemination of information and lessons learned from adaptation activities through the clearing-house mechanism under the Convention on Biological Diversity and similar approaches at national, subnational and local levels, including dissemination of information describing the effectiveness of impact assessment tools.

IV. ADDITIONAL RESOURCES

Convention on Biological Diversity, Technical Series No. 10 – Interlinkages between Biological Diversity and Climate Change: http://www.cbd.int/doc/publications/cbd-ts-10.pdf

Convention on Biological Diversity, Technical Series No. 25 – Guidance for Promoting Synergy among Activities Addressing Biological Diversity, Desertification, Land Degradation and Climate Change: http://www.cbd.int/doc/publications/cbd-ts-25.pdf

Convention on Biological Diversity, Web-based Guidance on the Integration of Biodiversity Considerations within Climate Change Adaptation Planning: http://adaptation.cbd.int