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CAPACITY-DEVELOPMENT WORKSHOP FOR THE CARIBBEAN REGION ON NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS, MAINSTREAMING OF BIODIVERSITY AND THE INTEGRATION OF CLIMATE CHANGE
Trinidad and Tobago, 3- 7 November 2008

FACT-SHEET ON CLIMATE CHANGE AND BIODIVERSITY IN THE CARIBBEAN REGION

Introduction

1. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change 1/ revealed that climate change is threatening the very basis of life. In fact, 20–30% of species assessed so far will face increased risks of extinction if global temperatures increase by 1.5–2.5°C, and critical ecosystems are already being degraded. For example, over the past 100 years, the thickness of sea ice in the Arctic has decreased by 40%, while total available water in the Niger, Lake Chad and Senegal basins has decreased by 40-60%. In the face of such changes to the basic structure and functions of ecosystems, climate change is already forcing biodiversity to adapt either through shifting habitat, changing life-cycles, or the development of new physical traits.

2. At the same time that climate change is placing increasing pressure on biodiversity, the components of biodiversity have a significant role to play in adapting to and mitigating climate change, since biodiversity contributes to many ecosystem services, including the provision of food and fodder, nutrient cycling and the maintenance of hydrological flows. The assessed benefits of mobilizing biodiversity for climate-change mitigation and adaptation are significant. For example, in Malaysia, the value of mangroves for coastal protection is estimated at US$ 300,000 per km of coast, 2/ while adaptation activities linked to agricultural biodiversity is expected to avoid 10-15% of the projected reductions in yield under changing climatic conditions. With regard to climate-change mitigation, forests account for as much as 80% of the total above-ground terrestrial carbon while peatlands, which cover only 3-4% of the world's terrestrial surface, store 25-30% of the carbon contained in both terrestrial vegetation and soils. As such, healthy forests and wetland systems have the potential to capture a significant portion of projected emissions while the conservation and sustainable use of such ecosystems can contribute to the sustainable management of carbon sinks.

1/ IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

2/ Imperiled Waters, Impoverished Future: The Decline of Freshwater Ecosystems. Worldwatch Institute, 1996

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3. This fact-sheet presents some of the observed and projected impacts of climate change in the Caribbean, as well as the impacts these changes have on biodiversity and the response measures related to these impacts.

A. Observed and projected impacts of climate change in the Caribbean

4. There have been a number of reports highlighting the impacts of climate change on biodiversity in the Caribbean region. In fact, climate change impacts are already being observed. For example:

(a) Analyses show warming ranging from 0 to 0.5°C per decade for the 1971 to 2004 period and a mean relative sea-level rise of 1 mm/yr during the 20th century;

(b) The percentage of days having very warm maximum or minimum temperatures has increased considerably since the 1950s, while the percentage of days with cold temperatures has decreased;

(c) The maximum number of consecutive dry days is decreasing and the number of heavy rainfall events is increasing; and

(d) Beginning with 1995, all but two Atlantic hurricane seasons have been above normal (relative to the 1981-2000 baseline).

5. In addition to the above-mentioned observed impacts, a number of predicted impacts of climate change on the Caribbean have been identified. These include:

(a) An increase of 2.45°C in mean annual temperatures in the Caribbean by 2040;

(b) Increased water stress for many islands in the region; and

(c) Escalating sea-level rise exacerbating inundation, storm surge, erosion and other coastal hazards.

B. Impacts of climate change on biodiversity in the Caribbean

Sea-level rise

6. The above-mentioned changes to the physical environment in the Caribbean could have a significant negative impact on biodiversity. If total sea-level rise reaches 0.5 m, turtle-nesting habitats will be reduced by one-third and, in the Antilles, up to 38% of the total current beach area could be lost. Coastal wetlands may suffer from salt-water intrusion as a result.

7. A one-metre rise in sea level would cause further damage including the complete collapse of the Port Royal mangrove wetland in Jamaica. Furthermore, if sea level rise rates increase to 10 millimetres a year, mangroves could disappear from Antigua and Barbuda as early as 2030.

Increasing air temperatures

8. Increases in air temperature are having both direct and indirect impacts on biodiversity in the Caribbean. Directly, the impact of invasive alien species is projected to increase as non-native species shift into the region as a result of higher temperatures. Indirectly, sea turtles are facing an increase in the number of female sea-turtle hatchlings when compared to males as a result of higher nest temperatures.

Increasing water temperatures

9. The impacts of climate change on biodiversity in the Caribbean are of particular concern when considering the high level of non-climate related threats that are already affecting marine ecosystems. Currently, 45% of reefs in the Caribbean are classed in the high- to very high-risk of extinction category—coral bleaching and increased storm surges are expected to exacerbate these risks. In fact, within the next 30 to 50 years, coral bleaching could become an annual event in small island developing States.

Changing precipitation patterns

10. Shifts in precipitation patterns are expected to disrupt hydrological cycles in some Caribbean countries. Predictions estimate that the region will have to adapt to both increased periods of drought and increased periods of heavy rain. This change is expected to have a negative impact on those ecosystems that are already at the limit of their drought tolerance, such as arid and semi-arid lands. Changing precipitation patterns may also negatively impact fresh-water wetlands by disrupting water fluxes.

C. Response measures

11. Some species and ecosystems will naturally adapt to climate change. For example, some corals are more resilient to coral bleaching and, as such, will be less impacted by changes in sea temperatures and chemistry. Likewise, in the face of sea-level rise, mangroves can move inland while maintaining a functioning coastal ecosystem so long as the inland route is not blocked by development.

12. There are a number of species, however, which are unable to shift. Endemic species in small island developing States are particularly vulnerable given the isolated nature of many islands. Species restricted to lakes or high mountains also have limited migration avenues to follow. Such species may require more active interventions in the face of climate change including, for example, *ex situ* conservation.

13. In response to the need to enhance the adaptive capacity of biodiversity, a number of biodiversity-related conventions have already adopted decisions concerning biodiversity and climate change. Conference of the Contracting Parties to the Ramsar Convention on Wetlands, for example, adopted resolution VIII.3 recognizing the potentially important role of wetlands in adapting to and mitigating climate change. The Parties to the Convention on Migratory Species adopted resolution 8.13 on climate change and migratory species. Finally, the Conference of the Parties to the Convention on Biological Diversity has integrated climate change into all its programmes of work, with the exception of the programme of work on technology transfer, and adopted a series of decisions on climate change and biodiversity (IX/16, VIII/30, and VII/15).

14. Within the programme of work on island biodiversity under the Convention on Biological Diversity, the particular vulnerability of islands to the impacts of climate change is acknowledged. Accordingly, the programme of work outlines a number of actions for Parties including:

(a) Research and implement adaptation and mitigation measures in land-use and coastal zone planning and strategies to strengthen local-level biodiversity resilience to climate change;

(b) Create, where feasible, viable national systems of protected areas that are resilient to climate change;

(c) Develop monitoring techniques to identify and monitor the impacts of climate change on key species;

(d) Consider afforestation and reforestation projects that enhance island biodiversity, noting that it may be possible for these projects to be eligible to generate certified emission reduction units under the Kyoto Protocol Clean Development Mechanism;

(e) Develop models to understand the vulnerability of island biodiversity to climate change;

(f) Strengthen national capacity to address climate change issues for island biodiversity;

(g) Identify species (e.g., corals) that are resilient to climate change in order to use those species for restoration; and

(h) Reduce chemical and physical degradation of coral reefs to facilitate recovery from climate-induced bleaching.

15. In light of the attention given to climate change under the Convention on Biological Diversity, it is expected that climate change be fully considered during implementation of the Convention. However, a review of 152 national biodiversity strategy and action plans (NBSAPs) reveals that only a small minority contain specific objectives or actions to link biodiversity and climate change. From the Caribbean region, this would apply to three countries (Barbados, Cuba, Dominica) only.

(a) Eleven Parties 3/ address biodiversity and climate change as a strategic objective with related actions;

(b) Five Parties 4/ address biodiversity and climate change as a strategic objective but have not developed related actions;

(c) Twelve Parties 5/ have developed actions to address biodiversity and climate change under strategic objectives dealing with research, monitoring, protected areas, forests, energy and transport sector, and carbon sequestration capacity.

16. In response to the threats from climate change, the commitments adopted by Parties, and in recognition of the fact that synergies are best implemented at the national level, the ninth meeting of the Conference of the Parities to the Convention on Biological Diversity, at its ninth meeting, requested the Executive Secretary to convene capacity-development workshops for small island developing States to enhance the integration of climate-change considerations within national biodiversity strategies and action plans and implementation of the Convention.

3/ Barbados, Cambodia, Czech Republic, Dominica, European Community, Finland, Germany, Japan, Namibia, Peru, South Africa.

4/ Canada, Nigeria, Portugal, Slovakia, Sweden.

5/ Belgium, Brazil, Chile, Cuba, Guatemala, Lithuania, Micronesia, Spain, Tajikistan, United Kingdom, Venezuela, Yemen.