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CAPACITY-DEVELOPMENT WORKSHOP FOR THE PACIFIC REGION ON NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS, MAINSTREAMING OF BIODIVERSITY AND THE INTEGRATION OF CLIMATE CHANGE
Nadi, Fiji, 2-6 February 2009

FACT-SHEET ON CLIMATE CHANGE AND BIODIVERSITY IN THE PACIFIC 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 per cent 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 per cent, while total available water in the Niger, Lake Chad and Senegal basins has decreased by 40-60 per cent. In the face of such changes to the basic structure and functions of ecosystems, climate change is already forcing species 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 per cent of the total above-ground terrestrial carbon while peatlands, which cover only 3-4 per cent of the world's terrestrial surface, store 25-30 per cent 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. The Conference of the Parties, at its ninth meeting, called for a capacity-development workshop for small island developing States on the integration of climate change within national biodiversity strategies and actions plans and the implementation of the Convention (decision IX/16). In order to support this capacity-building, this fact-sheet presents some of the observed and projected impacts of climate change in the Pacific, 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 Pacific 3/

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

(a) In the Pacific Region, ten of the 15 most extreme weather events reported over the past half a century occurred in the last 15 year and the number of hurricane-strength cyclones has increased in the southwest Pacific in the past 50 years, with an average of four events now occurring each year; 4/

(b) There has bee more than double the number of category 4 and 5 storms in the South-West Pacific from 1990–2004 compared to the period 1975–1989;

(c) The southern Pacific is now experiencing about 15 per cent less precipitation and is 0.8˚C warmer than pre-industrial levels while the Central Equatorial Pacific is experiencing 30 per cent more rain and mean annual temperature increases of 0.6˚C;

(d) Annual and seasonal ocean surface and island air temperatures have increased by 0.6 to 1.0°C since 1910 throughout a large part of the South Pacific; and

(e) The average rate of observed sea-level rise in the Pacific over the past 50 years is 1.6 mm/yr with a maximum rate in the central and eastern Pacific (near 90°E) of over 3 mm/yr.

5. With regards to future projections for the Pacific Region:

(a) Sea surface temperature by 2030 is projected to increase by 0.6-0.9 ºC in the southern Tasman Sea and off the north-west shelf of Western Australia, and 0.3-0.6 ºC elsewhere; 5/

(b) Surface air temperature by 2100 is estimated to be at least 2.5°C higher than the 1990 level;

(c) A mean sea level rise of between 25–58cm is projected by 2050 along the coastlines of Pacific island countries: 6/ and

(d) Cyclones are expected to increase in intensity by about 5–20 percent.

B. Impacts of climate change on biodiversity in the Pacific

Sea-level rise

6. Sea-level rise is expected to have many impacts on marine and coastal species. Sea turtle nesting beaches will come under threat, especially in low-lying islands.

7. Sea level rise will also threaten inland ecosystems; for example, Kiribati could experience inundation of 18–80 per cent in parts of North Tarawa (Buariki) by 2050. Furthermore, most of Tuvalu is only 1m above the high water mark; as such projected sea level rises of up to 58cm by 2050 could lead to

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3/ Facts from the IPCC Fourth Assessment Report unless otherwise indicated.

4/ World Bank, Not If, But When: Adapting to Natural Hazards in the Pacific Island Region: A Policy Note, 2006.

5/ CSIRO Climate Change Fact Sheet, 2008.

6/ SPREP Climate Change Fact Sheet, 2008.

the destruction of many coastal and inland ecosystems. In Papua New Guinea, a rise of 50 centimetres could affect all of the country's coastal plains and swamplands.

Increasing air temperatures

8. Increases in air temperature are having both direct and in-direct impacts on biodiversity in the Pacific. 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. In-directly, 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.

9. A number of studies suggest that the influence of increased atmospheric temperatures could be a major factor in accentuating current climate variability such as ENSO events. This could lead to an increase in the frequency and intensity of extreme weather events. For example, even in high islands such as Viti Levu (Fiji), climate change could result in as much as a 100 per cent increase in cyclone damage to inland ecosystems, and yield an associated 9–15 per cent decline in the yield of major crops. 7/

Increasing water temperatures

10. Increase ocean temperatures will increase stresses on many coastal and reef ecosystems which are already highly vulnerable. For example, from 2000-2006 the size of coral reefs around Fiji's remote Lau Islands contracted by about 50 percent, in part because of coral bleaching events associated with climate change.

Changing precipitation patterns

11. In the Pacific, a 10 per cent reduction in average rainfall by 2050 would lead to a 20 per cent reduction in the size of the freshwater lens on Tarawa Atoll, Kiribati. Reductions in precipitation (including those associated with increasing ENSO events) may pose a significant threat to forests in the Pacific. For example, during the 1998 ENSO forest fires during the drought destroyed up to 15,400 acres of land in Samoa.

C. Response measures

12. 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.

13. 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.

14. 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

7/ World Bank, 2000.

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).

15. 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.

16. 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) conducted in November, 2008, 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 8/ address biodiversity and climate change as a strategic objective with related actions;

(b) Five Parties 9/ address biodiversity and climate change as a strategic objective but have not developed related actions;

(c) Twelve Parties 10/ 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.

17. 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.

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

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

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