Helping Islands Adapt

A workshop on regional action to combat invasive species on islands to preserve biodiversity and adapt to climate change

11–16 April 2010

Hyatt Regency Auckland
New Zealand

Climate Change and Invasive Species in the Pacific

*A Pacific Information Brief from the **Pacific Invasives Partnership** (a working group of the Roundtable for Nature Conservation in the Pacific Islands*

Pacific island nations are already experiencing the effects of a changing climate. Cyclones and severe flooding have hit Yap, Niue and Fiji recently. Air temperature, the number of cyclones and sea level are all predicted to rise, and changes in rainfall are also predicted across the Pacific [(1)]. Forces driving climate change are beyond the control of island nations. Pacific islands, while constituting 0.12 per cent of the world's population, release only 0.003 per cent of the world's carbon dioxide from fuel combustion [(2)]. Adaptation to climate change should now be the focus of Pacific Island nations. **The most practical climate-change adaptation action is to improve ecosystem resilience and focus on sustainable development.**

Invasive species (introduced pests, weeds and diseases) threaten biodiversity and livelihoods across the Pacific and must be considered when planning climate change adaptation strategies. Found in terrestrial, freshwater and marine environments, invasive species adversely affect the livelihoods, lifestyles and health of island dwellers and cause harm to ecosystems and biodiversity. The global cost associated with invasive species is estimated at US$1.4 trillion annually - 5% of the world economy [(3)].

Islands are extremely vulnerable to the impacts of invasive species, and introduced pests, weeds and diseases have caused biodiversity loss and ecosystem disturbance on islands worldwide. The combination of climate change and invasive species could be devastating for some native plants and animals as well as for food security, international trade and other economic activities in the Pacific. An IUCN report listed invasive species as the most important direct pressure on the environment in Oceania and stated "poor understanding of environmental problems or their root causes" was the most important barrier to addressing pressures on the environment[(4)].

Declines and extinctions continue as invasive species prey on native animals, damage crops and native vegetation, compete for resources, modify habitats on land and in rivers and coastal waters, and cause or spread disease. Introduced species become successful invaders because they are aggressive and able to adapt to a wide range of habitats and climates, while most native species are less competitive, breed more slowly and have limited tolerance to environmental factors. Rapid environmental changes such as increasing temperature or rainfall, or a change in the frequency of disturbance events like cyclones, could have serious impacts on native species while at the same time creating favourable conditions for the invaders.

There is already evidence of such effects in the Pacific. Invasive plants often smother gardens, farmland and forests after destruction by extreme storms. A survey on Niue after Cyclone Heta (a Category 5 storm that caused massive damage to Niue's ecosystems) found that several invasive species already present on the island expanded their range and abundance after the cyclone[5].

The management of invasive species needs to be included in all public awareness programmes in relation to climate change. Many Pacific people rely on native plants and animals to supply them with food, water, shelter and medicine. Damage to ecosystems from climatic events or invasive species, or both, can have a significant effect on island economies Destruction of coastal ecosystems (coral reefs, mangroves) has been identified as the most urgent environmental issue affecting island ecosystems [4], and the negative effects of invasive species can only add to the vulnerability of these fragile ecosystems.

Most invasive species are spread by the movements of goods and people. More business means more trade, more trade means more frequent and novel transport, and increased transport means increased risk from invasive species. With increasing trade and travel around the Pacific, it becomes even more important to manage invasive species given that climate change is likely to increase the impacts of invasives, both existing and new ones.

A crucial part of Pacific island adaptation to climate change will be to reduce pressures on ecosystems, such as those caused by invasive species. Adaptation to climate change requires increased efforts to prevent new invasions and to eradicate or control existing invasives.

REFERENCES:

(1) IPCC (2001). Climate change 2001: Impacts, adaptations and vulnerability. Chapter 17. Small island states. Cambridge, United Kingdom: Cambridge University Press.

(2) IPCC, (2007): Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
(3) Pimentel et al, 2001. Economic and environmental threats of alien plant, animal, and microbe invasions Agriculture, Ecosystems and Environment 84: 1-20
(4) Rietbergen, Simon; Tom Hammond; Chucri Sayegh,; Frits Hesselink and Kieran Mooney (2007). Island voices – island choices: Developing strategies for living with rapid ecosystem change in small islands. Gland, Switzerland: IUCN.
(5) Space, James C.; Barbara M. Waterhouse; Melanie Newfield and Cate Bull (2004) Report to the Government of Niue and the United Nations Development Programme Invasive Plant Species on Niue following Cyclone Heta. UNDP NIU/98/G31 – Niue Enabling Activity 17 December 2004.

Prepared for the Pacific Invasives Partnership by Bill Nagle, Pacific Invasives Initiative (PII) and Shyama Pagad, IUCN SSC Invasive Species Specialist Group (ISSG) Regional Office for the Pacific