Environmental change and human security in Pacific island countries

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Introduction

Pacific island people have a history of dynamic interactions with their environments. They have modified environments to make them better suited to human habitation (for example, making taro pits on atolls) with the occasional failure (for example, Rapa Nui). However, environments change as a result of both human-induced processes and 'natural' processes.

In the case of natural changes, both short-term (such as cyclones) and long-term (such as seasonal shifts associated with the El Niño/Southern Oscillation phenomena) Pacific island people have proven to be resilient and adaptable. In the case of human-induced changes, the limits of adaptability have occasionally been surpassed, as the rate of change is faster and the size of the change greater.

When environmental change puts at risk the economic, cultural, spiritual and social needs and values of communities, as well as expectations of a better life, it is a human security problem. This article explains why environmental problems may be security problems. It focuses on the capabilities of Pacific islanders to adapt to environmental changes. It argues that most Pacific islanders have considerable, if not measurable, adaptive capacities, but that these may be surpassed by future environmental problems, particularly climate change. It also proposes some policies that may foster community-level human and institutional development, to improve the capacity of Pacific island people to adapt to environmental changes.

Human security

The United Nations Development Programme (UNDP) uses the concept of human security to assist in the framing of development issues. The UNDP adopts a comprehensive approach to human security, identifying seven sectors of security: economic, food, health, environmental, personal, community and political (1994). The 1994 *Human Development Report* (UNDP 1994:23) says that:

> Human security is people-centred. It is concerned with how people live and breathe in a society, how freely they exercise their many choices, how much access they have to market and social opportunities — and whether they live in conflict or peace.

Humans have basic material needs such as nutritious food, clean air and water, and shelter. However, additional needs are fundamental to an individual's existential wellbeing and security, including an emotional support network for giving and receiving care, strong family ties, opportunities for extended community interaction, and a personal sense of involvement, purpose, belonging, satisfaction, love and confidence (Boyden 1987:79).

In this context, environmental (human) security may be defined as

> Reducing human vulnerability to the effects (and risks) of environmental degradation by addressing the root causes of environmental degradation and human insecurity (after Barnett 2001a:129).

Environmental security seeks the security of the individual and local groups and, more immediately, the security of those people who are most vulnerable to the effects of environmental degradation.

Exactly which aspects of individual and community life must be secured is a matter for communities themselves to determine. It is therefore important to see human security as being about not just the needs, but also the values of communities — economic, cultural, spiritual and social. There is a range of environmental problems that put these needs and values at risk.

Environmental change in the Pacific islands

Pacific island countries contend with an array of environmental problems. The causes of, and solutions to, such problems require recognition of these countries' low levels of economic and human development, their expectations of better standards of living, and their particular and diverse environmental attributes. Environmental problems are intricately linked to economic development, which, while traditionally understood to be a cause of environmental degradation, is now ironically seen as an important determinant of capacity to adapt to climate change.

It is difficult to make generalisations about environmental problems in the Pacific islands given that the region includes 22 island states and territories. It is a region of great cultural diversity, containing only 0.1 per cent of the world's population, but some 20 per cent of the world's languages (Pawley 1999:181). There is considerable geographic diversity as well. The Melanesian countries are generally large and mountainous, with fertile soils and mineral resources. The Polynesian and Micronesian islands vary in type, from smaller volcanic islands to low-lying coral atolls (see Nunn 1994).

The 1999 *Pacific Islands Environment Outlook* (UNEP 1999) provides a comprehensive discussion of the major environmental

problems experienced in the region. Although comprehensive data about environmental change is lacking in the region, the report identifies six key problems:

- land degradation, particularly in coastal lands, including coastal erosion, nutrient depletion, and soil loss, believed to be mainly caused by overgrazing;
- deforestation, particularly in the Federated States of Micronesia, Fiji, Niue, Papua New Guinea, Samoa, the Solomon Islands, Tonga and Vanuatu, caused by logging for timber exports, clearing for agriculture and mining, the downstream effects of mining, and fuel wood collection;
- biodiversity losses across a range of terrestrial and marine flora and fauna (this is a result of what is considered to be the ecological fragility of small islands, deforestation, the expansion of agricultural land, fire, introduced species, the degradation of reefs and the clearing of mangroves);
- the depletion and unreliability of freshwater resources, particularly on low-lying coral atolls, as a result of saline incursions, contamination from urban, agricultural and industrial sources (because of inadequate solid and liquid waste-water systems), inadequate and inefficient supply systems, climate variability, and sedimentation from farming, mining and forestry;
- coastal and marine degradation, including coastal erosion, coral loss and coral bleaching, contracting artisanal fisheries, pollution of lagoons, and potential overfishing of oceanic stocks, the complex causes of which include land-based pollution (caused by mining, deforestation, farming and urban waste water), the clearing of mangroves, the dumping of wastes on reefs, inappropriate infrastructure developments, the increased harvesting of artisanal sources, the increased harvesting of oceanic fisheries, the use of reefs for building materials, and the arrival of introduced species on reefs and in lagoons; and
- climate change and sea level rise, the most important physical effects of which are likely to be slowly rising sea levels, more intense if not more frequent extreme climatic events such as cyclones and droughts, the contamination of freshwater resources as a result of short and long-term sea level rises and more variable replenishment, depleted inshore fisheries as a result of coral bleaching, and changed patterns of flora and fauna distribution and reproduction (Nurse and Sem 2001). These changes are likely to affect the region's most important industries, agriculture, fishing and tourism. The principal cause is global emission of greenhouse gases such as carbon dioxide and methane. However, when these changes are superimposed on island systems already stressed by unsustainable development, habitability and security is seriously at risk (Barnett and Adger 2001).

It is the localised, human-induced environmental changes induced by mining and forestry that currently pose the most direct and intense human security risks to certain Pacific communities. These are activities most often implemented by foreign-owned companies, and which cause intense environmental (and social) changes in a very short time. The rate of change allows insufficient time for communities to adapt in ways that maintain their basic needs and values. The negative effects of such change may be so great that, in conjunction with other attending social and economic factors, violent resistance becomes an option, as was the case at the Panguna mine on Bougainville Island. Solutions to these problems for the most part rest with resource developers.

However, in the medium term (10–30 years) climate variability associated with climate change will become a substantial risk across the region. In the even longer term (50–100 years plus), sea level rise will also pose substantial risks to human security across the region.

Adaptation to climate change in the Pacific islands

If social and ecological systems are able to absorb and adjust to the effects of climate change without affecting their basic needs and values, then climate change will not be a human security problem (this discussion draws on Barnett 2001b). However, given the expected magnitude of changes (up to an 88 centimetre rise in sea level by 2100 and more intense extreme events) there is concern about the ability of social–ecological systems to successfully adapt.

Pacific communities are generally able to cope with extreme events, providing that time is allowed between them for recovery, learning and readjustment. However, climate change may see reduced recovery periods, and multiple impacts are also possible (for example, more intense droughts and larger sea level rises that add to water resource problems). When sudden changes are successive, or multiple changes are combined, then social–ecological systems thresholds may be crossed, and insecurity may be the result.

Indeed, the former chair of the Intergovernmental Panel on Climate Change (IPCC) has said that low-lying, small island states face 'the possible loss of whole cultures' through climate change (Watson 2000). The issue of *adaptation* is therefore important, and if adaptation options are limited, or unsuccessful, then environmental problems become human security problems.

Adaptation means 'modification' or 'fitting to suit'. In climate research it is defined as 'the adjustment in ecological, social or economic systems in response to actual or expected climatic stimuli, their effects or impacts' (Smit and Pilifosova 2001). However, the measures that determine successful (and unsuccessful) adaptation are not clearly defined. If a community's only available response to the insecurity caused by increasingly intense cyclones is to relocate, with all the attendant consequences, has it successfully adapted

and is it still secure? Adaptation is an imprecise policy goal. Like security, it is a value that must be set by communities themselves, and policy makers can specify adaptation targets consultatively.

According to the IPCC, the ability of a social or ecological system to adapt — its adaptive capacity — is determined by factors that include:

- economic resources, which permit the necessary responses to climate change;
- technology, which expands the range of present and future possible responses to climate change;
- information and skills, which improve awareness of the need to adapt, the nature of the likely changes, ways of devising appropriate responses, and ways of implementing those responses successfully;
- infrastructure, which allows access to resources and information, and the means of their delivery;
- institutions, which coordinate collective responses to changes; and
- equity — it is generally considered that communities with a fairly even distribution of power and resources are better able to adapt to external changes than those that are strongly stratified (Smit and Pilifosova 2001, see also Adger 1999, Kates 2000, Tol et al 1998).

These determinants of adaptive capacity reflect the standard idea of 'development', which emphasises strong economies, technological capabilities, good governance, infrastructure, education and sustainable resource use. The islands of Oceania are seen to be vulnerable to climate change because they are insufficiently developed in these areas. Of course, while such development is desirable, in the past the means have been problematic, and the ends elusive.

Small Pacific island states are not like small continental states, and standard development models often fail to deliver sustainable human development. However, Pacific island communities do have unique characteristics and inherent strengths, and strategies to improve human security and adaptive capacity should recognise these.

In the Pacific islands, communities have at least four less tangible adaptive attributes (environmental human security strategies). First, social interaction across space, at a variety of scales, is important. Campbell (1990) reasons that the precolonial resilience of people in the Banks Islands resulted from the well established and complex sets of political and social interactions among the island peoples. More recently, migration between home islands was observed in Samoa and Tokelau during cyclone Ofa (Fauolo cited in Campbell 1998, Hooper 1990). Migration, particularly from the Polynesian islands, has led to the formation of complex metasocieties with common identities living in different places, and engaging in transnational exchanges of finance, materials and labour.

One aspect of this transnational economy — remittances of goods and money from migrants to their homelands — is now an important contemporary form of mutual assistance that seems to improve the resilience and adaptability of the Pacific islands to economic change, but also at times to environmental change. In response to the damage caused by cyclone Ofa in 1990, for example, substantial sums of money and goods were remitted to Samoa by Samoans living in New Zealand (Campbell 1998).

Second, many (rural) Pacific communities have diverse supplies of materials. For example, the food supply in many places is maintained by planting a diverse array of plants in gardens, and by using the biodiversity of the immediate environs, which provide 'famine foods' when gardens fail.

Third, culture and local knowledge is also important in the responses of communities to environmental change. Considerable resilience to (short-term) hazards has been documented in the Pacific (Campbell 1990, Lessa 1964, Marshall 1979, Rappaport 1963). Islanders know how best to manage such environmental change, and in their knowledge lies the best hope for a fusion of indigenous and modern approaches to climate change.

Finally, it is important to recognise that, for many Pacific communities, adaptive capacity is as much a matter of what people do with their oceans and coasts as what happens on the land. Food security in the islands is largely dependent on fishing in the inshore zone. Because of this, policies for coastal zone management must focus far more on the effects of climate change on fish habitats, instead of largely on coastal erosion and infrastructure, as they do now. It is also of concern that most harvesting of deep-water fish species in Pacific countries' exclusive economic zones is done by foreign fishing fleets paying licence fees to Pacific governments. Future food security will require a greater effort to sustainably manage deep-water fisheries *for islanders*.

Towards environmental (human) security in the Pacific islands

From this cursory discussion it is possible to construct a broad policy agenda that will improve and complement communities' capacities to adapt to most forms of environmental change (see Barnett 2001b for a fuller discussion of this topic.). However, it is important to note that, in the case of short-term, high-magnitude changes associated with mining and forestry activities, best practice environmental standards and genuine community involvement (at the outset and throughout the life cycle of the project) are the only appropriate strategies.

Rapid economic growth that equitably generates income for the majority of people — as has benefited the highly developed (and generally adaptable and environmentally secure) small island state of Singapore — is not likely to occur in Pacific island countries. The economic strategies that are likely to succeed in the near future will probably be based on resource extraction, which has not been ecologically sustainable so far. This is important because the health of local ecosystems is an vital element of a community's ability to adapt (Berkes and Folke 1998). Given this, what matters for human security in the face of environmental change is human and institutional development that builds on existing capabilities. Specific policies might include:

- *Providing a broad-based education:* educated communities are aware of potential change, sensitive to actual changes, able to determine optimum solutions using existing resources, and better able to attract additional support from state and international organisations.
- *Providing access to basic health care:* the health of people in communities with existing health problems tends to suffer more as a result of environmental fluctuations, for example, in Africa most famine deaths occur in communities where malnutrition was already high. Basic health care and education are prerequisites for sustainable economic growth (Sen 2000), and must be provided even if they provide no environmental benefits. Policies that provide communities with basic schooling and health care also establish lines of communication between communities and other institutions, including the state, NGOs, and regional and multilateral organisations.
- *Obtaining baseline data and continually monitoring key indicators:* this is necessary to understand rates of environmental change and social sensitivity to that change. It need not be the preserve of the formally trained. It is as important to have a large number of people capable of reading equipment and recording data as it is to have a few technical experts to interpret the data. Similarly, basic surveys that monitor changes in social conditions are within the ability of most Pacific communities. Local knowledge is relevant here: Pacific people generally know their environments and do observe change. Developing these information collection systems should involve facilitating opportunities and giving control to communities themselves, rather than creating yet more opportunities for metropolitan country researchers to gather and control data;
- *Expanding the comprehensive hazard and risk management process:* implemented by the South Pacific Applied Geoscience Commission (SOPAC). This is a whole-of-country approach to identifying, prioritising and managing the full gamut of risks faced by Pacific island countries.
- *Increasing communities' participation:* in research, in monitoring, in decision making and in policy implementation, so that they learn.

More generally, strategies should be considered to:

- increase the benefits of migration and remittances to islands,
- nurture and capitalise on the value of kinship and traditional knowledge,
- obtain assistance from metropolitan countries that focuses on human development without major ecosystem disturbances, and
- supplement the inherent skills and knowledge of Pacific people with appropriate technological and policy innovations.

Ultimately, environmental security for Pacific people requires human and institutional development policies that increase and complement the existing abilities of those people to do what they have always done with considerable success — adapt to change.

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