



## Assessing and measuring vulnerability

Vulnerability assessment measures the seriousness of potential threats on the basis of known hazards and the level of vulnerability of societies and individuals. It can be used to translate early warning information into preventive action (IDNDR 1999) and is a necessary element in early warning and emergency preparedness. Ideally, the results should be incorporated directly into the long-term planning of institutions and governments, and should foster institutional responsiveness to increasing vulnerability, and action for disaster preparedness and mitigation. Vulnerability assessments are widely applied and used in the fields of climate change and natural disaster management, where they provide the basis for effective warning systems.

Assessments of vulnerability can be made for both people and the environmental systems that provide goods and services. They should identify the location of vulnerable populations, the threats to their wellbeing and the extent of their vulnerability; the risks to the environmental capacity to provide goods and services; and the preventive steps that can be taken to improve environmental conditions and reduce the negative impacts of human action on the environment. This information is then assembled into a knowledge base that is accessible, scientifically reliable and easy to use, which can help policy-makers and planners seeking to formulate adequate responses (see box).

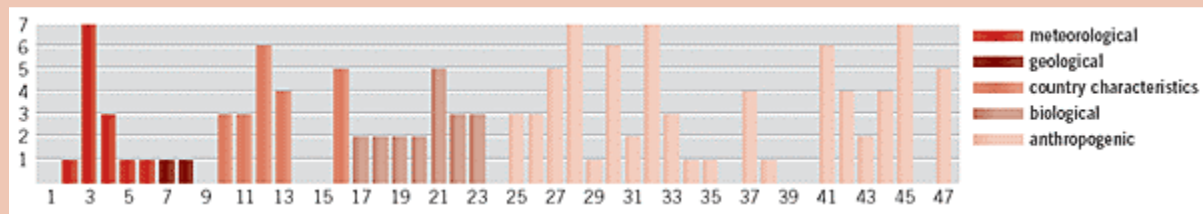
### Environmental vulnerability of small island developing states

The South Pacific Applied Geosciences Commission (SOPAC) is developing an index of the vulnerability of the environment to both human and natural hazards. SOPAC identifies three aspects of environmental vulnerability: level of risks (or pressures) on the environment; resilience of the environment to pressures, or intrinsic vulnerability; and the level of degradation of ecosystems, or extrinsic resilience. A total of 47 indicators are used: 26 indicators of risk, 7 indicators of resilience and 14 indicators of environmental degradation. The indicators are also classified by category; meteorological, geological, biological, anthropogenic and intrinsic country characteristics. Data were collected for five countries (Fiji, Samoa, Tuvalu, Vanuatu and Australia) for initial testing. The environmental vulnerability of small island developing states arises from an interplay of factors such as remoteness, geographical dispersion, vulnerability to natural disasters, ecological fragility, a high degree of economic openness and small internal markets, and limited natural resources.

The objective of the project is to promote the use of environmental vulnerability considerations in national development planning and thereby encourage sustainable development. The Environmental Vulnerability Index (EVI) provides a relatively quick and inexpensive way of characterizing the vulnerability of natural systems at the level of a region, state, province or island.

The figure below shows the scores obtained by Fiji for each of the 47 indicators in the EVI. Areas of vulnerability can be easily identified, information that could lead to better management and possibly better

vulnerability scores in the future. A score of 1 is the least vulnerable, 7 the most vulnerable.



Sources: SOPAC 1999 and 2000, Kaly and Craig 2000, Pratt and others 2001

Calculation of coping capacity would be a valuable tool for understanding how and why burdens of environmental degradation are unevenly distributed around the globe, and why the potential impact of different threats may be more or less catastrophic depending upon a group's ability to cope. In the case of diseases such as cholera, governments of high-income countries would be likely to respond to the risk of an outbreak with costly prevention and early warning programmes such as a cholera-monitoring network. Yet this response would not be affordable in many other parts of the world.

When calculating vulnerability, geographical scale is important. A single national figure may hide many significant variations. Although an assessment for high-income countries would show low overall vulnerability, there may be sub-populations that are highly vulnerable. For instance, one country may be less vulnerable to outbreaks of vector-borne disease triggered by climate change than another, because of the medical system's capacity to respond, but those without medical insurance may still be particularly vulnerable. Furthermore, societies that are well equipped to cope with present vulnerability may lack the experience or technology to respond to emerging threats.