

# Preparing for disaster

Earth scientists should find better mechanisms to disseminate facts about the risks of natural disasters, to help local populations make the necessary preparations.

These days, science offers ever-more-comprehensive assessment of the risks of earthquakes, volcanic eruptions, storms and floods, and technology offers more sophisticated approaches for coping with them. Yet growing urban populations — as well as large rural populations in places such as northern Pakistan and Kashmir, now suffering the fallout from October's massive earthquake — remain hugely vulnerable to such disasters (see page 903).

There is plenty of evidence that the right combination of scientific knowledge, experience, planning and common sense can substantially reduce the risks posed by natural disasters. One such example pertains to Hilo in Hawaii, which was badly damaged by a tsunami in 1946. As a consequence, scientific research into the causes and the physical behaviour of the giant waves was intensified, leading in 1949 to the creation of the Pacific Tsunami Warning Center. The effectiveness of the system was put to the test in 1960, when another tsunami flooded the city. Thanks to building restrictions and regular exercises in preparedness and emergency behaviour, Hilo has again become a relatively safe place to live.

Unfortunately, preparation for a tsunami in the Pacific is the exception, rather than the rule. The dozen countries that were affected by the deadly Indian Ocean tsunami a year ago had made few preparations, despite scientists' familiarity with the risks of such an event. Many countries around the world, such as Turkey and Iran, remain unable or unwilling to take the necessary steps to prepare for disasters that specialists believe are waiting to happen.

Scientists who study these risks have a critical and valuable role to play in ensuring that every effort is made to raise public and political awareness of impending risks. The effective communication of risk is a non-trivial problem: individual researchers who study fault ruptures, volcanoes or cyclone thermodynamics are not always well

positioned to publicize their findings widely, and one cannot always expect local policy-makers and planners to delve directly into the scientific literature for information. So imaginative approaches are needed to forge effective links between the two groups.

Some effort is now being made to implement such approaches at the global level. For example, the World Conference on Disaster Reduction, held last January in Kobe, Japan, called for a worldwide risk-management strategy coordinated by the United Nations. Such a strategy needs solid scientific support, and David King, science adviser to the British government, has suggested setting up an International Science Panel for Natural Hazard Assessment to provide it. A proposed joint initiative by the United Nations' Development Programme and the World Bank might fulfil the same purpose without the need to establish a new organization.

No amount of international coordination activity will make much difference, however, in regions where poverty, illiteracy and corruption stymie preparations against disaster. In many parts of the world, compliance with regulations to ensure that buildings are constructed to withstand earthquakes, for example, would be totally beyond the means of the local population. From Tehran to New Orleans, disaster reduction has an immense social dimension — people can be protected only as part of a broader fight against poverty.

That said, risk management can be improved through international mechanisms that will feed the best science to decision-makers. Global thinking is vital — but saving lives ultimately requires preparation at a local level. ■

**"Disaster reduction has an immense social dimension — people can be protected only as part of a broader fight against poverty."**

## Europe's right stuff

The European Space Agency is making good use of its funds for space exploration.

When ministers from the member states of the European Space Agency (ESA) met in Berlin last week, they made a number of good decisions. They unexpectedly agreed to provide the agency with all of the 2.5% funding boost that it had requested for science missions. They also agreed to funds for additional missions for Mars surface exploration and Earth monitoring. All of this is welcome. Even more surprising, and equally welcome, is their decision not to spend money on the development of a new Russian-led space-plane, Clipper — a decision that surprised some observers but that should be seen as a smart move. Europe does

not need the ability to launch humans into space, and should resist further attempts by Russia to solicit funds for it.

Whether Clipper can actually work is an open question. The history of small space-plane programmes is long and unhappy, with ESA's abortive Hermes programme being as big a let-down as all the others. Many believe that there are fundamental flaws in the idea of adding to the mass of spacecraft by giving them wings with which to fly, rather than just settling for a controlled plummet in the manner of Russia's Soyuz capsules and the United States' proposed Crew Exploration Vehicle. But even if Clipper stood a realistic chance of working, its development would be a hugely inappropriate use of European taxpayers' money.

The idea of human space flight is an inspiring and noble one. Unfortunately, achieving it means devoting vast resources to some markedly unproductive goals in a way normally only possible under political systems that are neither inspiring nor noble. The United