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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.

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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. ■

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

States is the only democracy that has risen to the challenge, and remarkable though its achievement in this sphere has been, it has left an ambivalent legacy.

The Apollo programme was politically sustainable because it resonated with various aspects of America's self-image as a nation that is technologically peerless, internationally exceptional and defined by the notion of frontiers. These resonances persist today. Few Americans are passionately devoted to the space programme, but many think of it, on the occasions they have cause to, with affection. Given the great cost of its limited benefits, this popular support seems a touch perverse.

For any US president, the political cost of being the person who abandons the dream of space flight outweighs the financial cost of "keeping the dream alive" (the term under which this sort of support for the aerospace establishment is invariably masked). At the same time, the financial costs that would have to be borne in order dramatically to expand the role of astronauts in space exploration are seen as outweighing any possible political rewards from such an expansion. So there is a compromise: the United States is left with an extraordinarily expensive and simultaneously rather unambitious programme, the main purpose of which is its own continuation.

This may not be a very good deal for US taxpayers, but it does have benefits for the world at large. It means that human presence in orbit, a largely symbolic matter, is not restricted to the citizens of one-party states (China) and their cash-strapped successors (Russia, a country which in terms of gross domestic product per capita ranks between Chile and Malaysia). It is good to know that, if there are men and women beyond Earth, some of them should be from democracies. But unless the US political landscape undergoes a radical shift, that will remain the case whatever Europe does, and it is hard to see what extra value is to be gained by any other democracies deciding to join in the venture. There are better ways to convince the world of your technological prowess.

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The fact that the United States cannot bring itself to give up human space flight is, at the end of the day, no reason for Europe to join in with a programme of its own. ■

Wiki's wild world

Researchers should read Wikipedia cautiously and amend it enthusiastically.

Sometimes the stupid-sounding ideas turn out to be the ones that take off. Almost five years ago, a free online encyclopaedia known as Wikipedia was launched. To those familiar with the peer-review process, the premise behind the new publication seemed crazy: any user, regardless of expertise, can edit the entries. It sounded like a method for creating garbled and inaccurate articles, and many critics said so.

Fast-forward to 2005, and some of that criticism is looking misplaced. Wikipedia is now a huge reference source, with something approaching a million articles in the English version alone. It's true that many of its entries are confusing and badly structured; some of them are badly wrong, and sometimes the errors are deliberate. After the discovery of an outrageously false description of John Seigenthaler, a former editor of *The Tennessean* newspaper, Wikipedia's publishers introduced registration in an attempt to discourage (though it cannot prevent) "impulsive vandalism".

But as an investigation on page 900 of this issue shows, the accuracy of science in Wikipedia is surprisingly good: the number of errors in a typical Wikipedia science article is not substantially more than in Encyclopaedia Britannica, often considered the gold-standard entry-level reference work. That crazy idea is starting to look anything but stupid.

So can Wikipedia move up a gear and match the quality of rival reference works? Imagine the result if it did: a comprehensive, accurate and up-to-date reference work that can be accessed free from Manhattan to rural Mongolia. To achieve this, Wikipedia's administrators will have to tackle everything from future funding problems — the site is maintained by public donations — to doubts about whether enough new contributors can be found to increase the quality of the mushrooming number of entries. That latter point is critical, and here scientists can make a difference.

Judging by a survey of *Nature* authors, conducted in parallel with the accuracy investigation, only a small percentage of scientists currently contribute to Wikipedia. Yet when they do, they can make a significant difference. Wikipedia's non-expert contributors are, by and large, dedicated to getting things right on the site. But scientists can bring a critical eye to entries on subjects they study, often highlighting errors and misunderstandings that others have unintentionally introduced. They can also start entries on topics that other users may not want to tackle. It is no surprise, for example, that the entry on 'spin density wave' was originated by a physicist.

Editing pages is not always straightforward, as some users may disagree with changes. In politically sensitive areas such as climate change, researchers have had to do battle with sceptics pushing an editorial line that is out of kilter with mainstream scientific thinking. But this usually requires no more than a little patience. Wikipedia's users are generally interested in the reasoning behind proposed changes to articles. Backing up a claim with a peer-reviewed reference, for example, makes a world of difference.

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Nature would like to encourage its readers to help. The idea is not to seek a replacement for established sources such as the Encyclopaedia Britannica, but to push forward the grand experiment that is Wikipedia, and to see how much it can improve. Select a topic close to your work and look it up on Wikipedia. If the entry contains errors or important omissions, dive in and help fix them. It need not take too long. And imagine the pay-off: you could be one of the people who helped turn an apparently stupid idea into a free, high-quality global resource. ■