

Bridging the gulf

Ecologists and conservationists need to work more closely with economists and policy-makers if they are to make things happen on the ground.

Conservation biology is continually developing new tools and concepts that contribute to our understanding of ecosystems. In too many cases, however, that leaves scientists positioned only to track the loss of these systems. So far, researchers have been less effective at achieving the level of impact on policy decisions needed to implement actual conservation measures.

As long as this remains the case, it is hard to see how political pledges to conserve global biodiversity will be fulfilled. Under the 1992 Convention on Biological Diversity, for example, 188 nations are supposed to be taking steps to ensure that the rate of biodiversity loss slows down by 2010. But at the current rate of progress, it is hard to see how nations will reach even this modest goal.

The development of tools to monitor global biodiversity has helped to promote awareness of the scale of the environmental challenges facing the planet. But appropriate responses to these challenges are inevitably political and economic in nature. The considerable advances in monitoring and understanding made in conservation science cannot themselves generate such responses.

Translating the ramifications of environmental and conservation science into practical solutions requires much more work to close the gap between conservation biologists and the policy-makers and environmental managers who take action on the ground. One such effort is the RUPES programme run by the Nairobi-based World Agroforestry Centre, which is bringing together land managers, conservation groups, development agencies and researchers to design a system to reward mountain communities in Asia for the environmental services they provide by conserving local habitat.

If the drive for conservation comes only from scientists and a few allies in the environmental movement, ameliorative action won't get far. Economists and other policy-makers inside powerful government departments and development agencies are needed to design and develop plans to tackle the problem on a meaningful scale.

The most comprehensive survey yet of the economic and other benefits that natural ecosystems provide — the Millennium Ecosystem Assessment, published earlier this year — highlights the urgent need for closer dialogue between these different parties. The potential advances to be made from such discussion have never been more apparent. There is an increasing realization that economic arguments should be brought to bear in persuading policy-makers to protect environmental resources (see page 614). The United Nations and the World Bank are, at least in their public statements, stressing the potential of environmental conservation for improving quality of life in poor countries (see *Nature* 437, 180; 2005).

Putting these ideas into practice will require unprecedented collaboration between ecologists, economists, statisticians, businesses, land managers and policy-makers. As researchers continue to gather information about the kinds of benefits that ecosystems provide, it is critical that their findings are disseminated far beyond the scientific community.

This requires national institutions such as the US Department of the Interior, and international ones like the World Bank, to ensure that they have the necessary mechanisms and scientific expertise in place to absorb the information. Third parties, such as the H. John Heinz III Center for Science, Economics and the Environment in Washington DC, can also help to forge the necessary interactions.

A fuller dialogue will greatly benefit researchers, who can use it to establish exactly what kinds of information policy-makers and environmental managers need in order to translate science into effective action. Most of all, it will help the environment, by encouraging conservation policies that are soundly based on the facts. ■

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A missed opportunity?

Japan's prime minister has a valuable chance to reform his nation's tired scientific institutions.

This month's landslide re-election of Japan's Liberal Democrat government seems, on the face of it, to give Prime Minister Junichiro Koizumi a clear mandate to reform the country's institutions. One might reasonably expect that the universities and science agencies — whose performance today will help to determine Japan's technical and economic competitiveness tomorrow — would be near the top of the list. Unfortunately, there is scant indication that this rare opportunity will be grasped.

Japan's scientific and technical infrastructure is grounded in the two decades after the Second World War, when the country experienced rapid and remarkably successful industrialization. Its main elements are a proficient but profoundly conservative university system; a powerful civil service that briskly dispenses policy and priorities to the rest of the country; and a strong industrial research sector dominated by a handful of large corporations whose names have become synonymous with technical excellence.

This is a formidable combination that many other nations would envy — but, for the twenty-first century, it isn't enough. The system, however impressive in scale and scope, isn't flexible enough to take Japanese science to the next level, or to fuel the development of sectors, in biotechnology or computer software for example, that will fuel future economic growth. It is not set up to support research in

areas such as environmental and public health that match the non-economic aspirations of modern Japan. And it has demonstrably failed to impart Japan's government with the scientific know-how it needs if it is to assert badly needed regional leadership in Asia, on issues ranging from bird flu and global warming to the construction of large research facilities.

Unsurprisingly, none of this came up during the election campaign: Japanese politics rarely revolves around 'issues' in the Western sense. This time round, Koizumi's plans to reform the post office — the world's largest financial institution — were an exception to that rule. Politicians normally confine themselves to securing spending in the districts that they represent. Career civil servants, meanwhile, are systematically rotated between positions every two years and are sometimes more concerned with avoiding culpability than achieving results.

Scientific research has been popular with both politicians and bureaucrats primarily as a form of local spending, and it has been generously supported. Yet little thought has been given to its governance. This is one reason why Japan's scientific achievements are still falling some way short of its aspirations.

Too often, Japanese policy on important scientific issues is hammered out in back rooms. A public hearing is then held and a decision made. Outcomes are rarely clear-cut, and no one takes responsibility for implementing them. In the case of human embryonic stem-cell research, for example, researchers were told that they had the right to do it, but were so obstructed by red tape that little research has actually been done.

What could a genuinely reformist government do? It could start at

the grass-roots of science, in the universities, and make it a priority for them to open up both junior positions and tenured ones to young researchers, as well as to women and foreigners. It could introduce evaluation systems that encourage creativity instead of rewarding longevity. Some long-overdue changes at the universities, implemented last year, will have only a marginal impact on these issues.

The government should create an office, akin to the US Office of Research Integrity, to police scientific conduct. It should strengthen the Science Council of Japan, which advises the prime minister, and the Council for Science and Technology Policy, which influences the science budget, so the nation can develop a science policy worthy of its size and economic clout. It could fill some rank-and-file bureaucracy positions with scientists or former scientists, opening up a career path for struggling postdoctoral students. Currently the science ministry, the patent office and the main science funding agencies are all woefully short of staff with specialist knowledge.

Japan could then prepare itself to fill the leadership void in the Asia-Pacific region with regard to issues such as bird flu and global warming. It could then use scientific collaboration to improve relations with its neighbours, including China and South Korea.

There is little indication that Koizumi will do any of this. For as long as his government instead maintains its lukewarm embrace of science, Japan will continue to punch below its weight in terms of both scientific output and policy leadership in the region. ■

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Do or die for design

A critical court case is addressing the teaching of 'intelligent design' in American schools.

This week, a federal court in Harrisburg, Pennsylvania, began hearing arguments about whether a school can promote intelligent design in the classroom (see page 607). A lawsuit brought by 11 parents of students in the Dover school district alleges that the local school board is violating the constitutional separation of church and state by requiring a statement promoting intelligent design to be read before teachers begin lessons on evolution.

Over the past few years, many scientists have worked hard to discredit intelligent design — but a favourable court verdict could damage the idea more than any amount of academic condemnation. For intelligent design was itself designed, in large part, to get around earlier court decisions that barred creationism from the classroom.

The first such ruling, by the Supreme Court in 1987, overturned a Louisiana law mandating that 'creation science', which sought to verify biblical creation through scientific enquiry, be taught alongside evolution. The second was a 1992 Arkansas finding that its very teaching violated the separation of church and state.

Intelligent design is a vaguer concept than creation science, and deliberately so. It posits only that an intelligent creator shaped the course of evolution. The general idea has been discussed by

theologians since Darwin's time, but it was only after these court rulings that it gained a significant following in the United States.

Unlike creation science, intelligent design is not affiliated with any specific religion. Rather than trying to prove its own explanation of the origin of species, it aims to punch holes in scientific doctrine. Its supporters, many of them fundamentalist Christians, have been hoping all along that the concept is sufficiently secular for the courts to permit its teaching in public schools.

If these hopes are realized, and the court rules in favour of the Dover school board, the movement is likely to spread quickly into many school districts. Political support for intelligent design, which has thus far been muted, would probably expand (see *Nature* 436, 753; 2005).

But if the court rules in favour of the plaintiffs, this will seriously undermine efforts to get intelligent design into the classroom. What's more, Christian fundamentalists — some of whom are put off by intelligent design's ecumenical flavour — might then be inclined to abandon it for old-fashioned creationism.

Scientific organizations are well aware of this case's significance, and many have lent public support to the plaintiffs. A ruling in their favour will be welcomed not just by scientists and teachers but by American parents, whose children need to be protected from an injection of superstition into science teaching. ■

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