

Commentary

Why Australian tropical scientists should become international leaders

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Following a recent public lecture at James Cook University in Cairns, I was asked my views of Australia's tropical biologists and environmental scientists, especially those working in the Wet Tropics of north Queensland. As a visiting biologist who has worked in tropical Queensland on and off for the past two decades, what, specifically, did I feel were their greatest strengths and weaknesses?

Detailing the strengths of Australian tropical scientists is challenging only in that there are so many merits to list. They are, in my view, among the world's leaders in studies of tropical palaeoecology and phylogeography, in ecological and bioclimatic modelling, in fine-scale vegetation mapping, in the development of computerized species-identification keys, in forest-canopy biology, in fire ecology, in projecting the potential impacts of future climate change, in wildlife epidemiology, in studies of habitat fragmentation and landscape ecology, and in tropical restoration ecology, among others. A foundation for many of these advances is arguably the world's best and most complete databases on tropical species distributions, especially for terrestrial vertebrates, trees, fish, and some terrestrial and stream invertebrate groups.

What about the weaknesses? Although one can always nit-pick, there is one deficiency that I believe overwhelms all others. Despite many strengths and an abundance of talent, Australian tropical science has failed to realize its true potential as an international research leader, partner and capacity builder, especially in the megadiversity centres of Melanesia, South-east Asia and the Pacific Islands that sit just on Australia's doorstep. Surmounting this deficiency would, I believe, not merely benefit Australia's developing-nation neighbours but could also greatly energize Australian tropical science.

INWARD-LOOKING SCIENCE

With some notable exceptions,¹ Australian tropical scientists have not developed strong collaborative projects and initiatives overseas. Why? First and foremost, Australian government funding for such work has been limited. By government mandate, the recently terminated Rainforest Cooperative Research Centre had a mainly Australia-centric focus, as did the other Australian Cooperative Research Centres, all of which were designed to link academic research with Australian private-sector users of that research. The Australian Research Council is also frequently inward-looking in the projects it supports (although the ARC Linkage International programme does support overseas collaborations). Second, living in a vast and sparsely populated land, many Australian biologists and environmental scientists have historically felt that their attentions were best focused on the many research challenges at home. Finally, conducting research overseas involves grappling with a range of linguistic, cultural, logistic, bureaucratic and personal-safety issues that can present serious impediments to researchers.

The limited scope of Australian tropical science parallels another worrying trend: the broad decline of Asian studies programmes in Australia. In 1989, for example, 15 of 19 Australian universities taught some subjects about India, but the proportion has declined to just five of 37 universities today (Lane 2006). Although tens of thousands of foreign students from Asian countries are being educated and trained in Australian institutions – Malaysia alone currently has

¹A partial list includes the ACIAR programme, which promotes mainly agriculture and aquaculture research in the Asia-Pacific region; CSIRO's joint project with Conservation International to promote nature conservation in Melanesia; student field courses in Borneo run by Griffith University; the University of Queensland's international studies of Asian-Pacific reefs; collaborations between researchers in Singapore and Charles Darwin University; and studies of Papua New Guinea at the Research School of Pacific and Asian Studies at Australian National University.

19 000 students in Australia and around 250 000 alumni from Australian educational institutions (Sheridan 2006) – the reverse is not true. According to World Bank president James Wolfensohn, Australian students ‘are not putting the effort in to understand, learn and provide bridges to India and China’, which are among the world’s most rapidly growing economies (Lane 2006).

For Australian tropical researchers, the net effect of such trends is that parts of Queensland and the Northern Territory have become hotbeds of scientific talent, albeit with a somewhat parochial focus. In the Wet Tropics World Heritage Area in north Queensland, for example, hundreds of scientists and graduate students are working in a biogeographical region that, at around a million hectares in area, is far smaller than that presently being deforested by either Brazil or Indonesia each year. Under these conditions, researchers must sometimes scramble to claim priority for the most interesting questions. For example, dozens of scientists are currently studying the aftermath of Cyclone Larry in north Queensland, and they have been forced to very finely partition the available research questions to reduce overlap. Moreover, at least in the Wet Tropics region, most remaining forests are protected from serious threats such as large-scale deforestation, logging and overhunting (but not future climate change), and thus the prospects for research in environmental conservation are relatively limited.

A WORLD OF OPPORTUNITIES

The wealth of scientific talent in tropical Australia contrasts starkly with that of its northern neighbours. Just on Australia’s doorstep are some of the most biologically important and imperiled ecosystems in the world – in New Guinea, the Solomon Islands, New Caledonia, the Sundaland region of Indonesia and Malaysia, and the scattered archipelagos of Polynesia and Micronesia (e.g. Brooks *et al.* 1997; Sodhi *et al.* 2004, 2006). These regions are not a complete scientific vacuum but, relative to Australia, they are grossly understudied and suffering direly as a consequence. In Indonesia and Papua New Guinea, for example, science and environmental planning have an alarmingly small influence on the rampant, ongoing exploitation of forest resources (e.g. Laurance 2001, 2004; Curran *et al.* 2004; Fig. 1), creating a panoply of environmental and societal problems. Many international organizations now see training and capacity building for scientists and decision-makers in developing nations as a vital step in building a local constituency to promote the wise use of natural resources.

Developing active partnerships with research institutes and universities in the Asian-Pacific tropics could also have an array of important benefits for Australian



Fig. 1. In eastern Kalimantan, Indonesia, as elsewhere in the Asia-Pacific region, forests often face severe pressures from industrial logging and conversion for farming and oil palm plantations (photo by W. F. Laurance).

science. First, it could create a virtually limitless number of new opportunities for research, most notably in applied fields such as conservation science and environmental planning, but also in more basic areas such as biogeography, ecology and evolutionary biology. Second, it would strengthen Australia’s scientific ties with its northern neighbours, creating new opportunities for dialogue, training and collaboration. Third, it could vastly increase future opportunities for young Australian scientists, particularly those interested in spending at least part of their careers overseas. Finally, it would open up myriad new avenues for research funding and environmental consultancies, given the active interests of international lenders, such as the Global Environment Facility and World Bank, and of environmental organizations, such as Conservation International and the Wildlife Conservation Society, in promoting sustainable development in the region. In this sense, the recent decision by the CSIRO Tropical Forest Research Centre in north Queensland to host a nascent team from Conservation International focused on environmental issues in Melanesia, is a welcome step in the right direction.

SURMOUNTING THE CHALLENGES

Despite the obvious opportunities for mutual benefit, it would be naïve to expect research organizations and local communities in the Asia-Pacific Region to simply throw open their doors to Australian scientists. Formal collaborative relationships will have to be fostered and built up progressively over time, with a clear eye towards identifying areas of mutual benefit and interest. Researchers and students will require access to cultural orientation and language training,

particularly in key tongues such as Indonesian Bahasa and New Guinea pidgin. The Neotropical Environment Option (<http://www.mcgill.ca/neo/>) at McGill University in Montreal, Canada, in which students learn Spanish and receive cultural and multidisciplinary training before developing thesis projects in affiliation with researchers in Latin America, offers one potential model for such a programme. Another possible model is the long-running collaboration between the Georg August University in Göttingen, Germany and research institutes in Sulawesi (<http://www.geogr.uni-goettingen.de/kus/sfb552/A1.htm>), which has facilitated numerous academic exchanges, collaborations and even intermarriages among German and Indonesian scientists. A key element in the success of these programmes is that they prepare their students and scientists to adapt to local conditions, rather than expecting the locals to adapt to them, and to respect their local collaborators as true and equal partners.

It is also inevitable that international collaborations bring some inherent risks that can be minimized with appropriate planning and orientation, but not avoided entirely. Researchers operating in Papua New Guinea, for example, will inevitably face some risk of physical danger, particularly in larger cities such as Lae and Port Moresby. Parts of Indonesia suffer from political instability and rampant corruption, whereas in the Philippines, extremist Islamic groups have on rare occasions targeted foreigners. In the Ivory Coast, Africa, well-equipped field stations established by German scientists were overrun by gun-toting rebels that stole vehicles and equipment, terrorized the staff, and slaughtered habituated chimpanzees and other wildlife. I take such attendant risks philosophically, however. So long as sound judgement is employed, one faces far more peril from a diet rich in saturated fats than is ever likely to arise from working overseas.

What might an Australian initiative to promote overseas research actually look like? Of that, I have no strong opinion. It might be incorporated into an existing research body, such as the Australian Tropical Forest Institute, the recently established Marine and Tropical Science Research Facility, or tropical academic institutions such as James Cook University or Charles Darwin University, and it could either stand on its own or be operated by a consortium of institutions. Given its obvious merits, a well-framed initiative might be competitive for major research funding in Australia, such as the National Collaborative Research Infrastructure Strategy, which recently granted over A\$380 million for Australian research initiatives in fields ranging from marine science to biotechnology and astronomy. Such an initiative could also attract international partners such as the Organization for Tropical Studies, which develops and runs field courses in tropical countries for graduate students and environmental decision-makers. In my expe-

rience, one of the most effective ways to promote student interest in developing countries is to run field-based courses there. In the Neotropics, for example, many North American students who participate in Organization for Tropical Studies courses return there to conduct their postgraduate research.

CONCLUSIONS

The unsavory truth is that many Asian-Pacific nations view Australia as being divorced from them culturally, largely oblivious to the daily challenges of poverty, social inequality and political instability that often buffet them (as an American, I must emphasize that many Latin Americans take a similarly jaundiced view of the USA). The development of an Australian research programme, based on dynamic international partnerships and training, could help to surmount such perceptions and bolster Australia's role as a scientific leader in the region. It would also help to build local constituencies of scientists, students and decision-makers in developing nations that are interested in nature and nature conservation. Such collaborations might merit support not merely as scientific initiatives, but as part of Australia's annual contributions to foreign aid, education and sustainable development in the Asia-Pacific Region.

Despite its many potential benefits, Australian politicians are unlikely to lead such an initiative, at least not at the outset. The initial impetus must come from Australian tropical scientists, who will need to develop a conceptual model for the programme, determine its scope and potential partner institutions, and then sell the proposal to the Australian public and decision-makers. A fledgling programme like this will certainly face impediments and naysayers. It would be important, I believe, for such a programme to start relatively small to achieve some successes quickly and then build on those, rather than trying to construct a complex, expensive programme that could easily collapse because any one of its minor elements fails. It will also be vital to limit the top-heavy bureaucratic, safety and ethical requirements adopted by some Australian institutions, which could easily stultify a ground-breaking international research initiative.

For all the practical hurdles involved, I believe that embracing an international leadership role would have enormous benefits not just for the Asia-Pacific Region, but also for tropical science in Australia. How better to energize conservation science in tropical Australia, than to use it as an international model for rainforest management? How better to attract international funding than to develop cooperative projects that parlay Australian expertise and collaborations into real-life conservation initiatives in nearby developing

nations? How better to galvanize Australian scientists than to offer them a whole world of new challenges?

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