Guest editorial

Scientists' responsibility for balanced communication

The role and value of plantation forestry as a land-use system continue to be subject to debate. Examples include arguments about the merits and demerits of planting exotic or native species, and the potential effects (positive and negative) of plantation forestry on ecosystem values including those involving water.

In recent months the public has been subjected to an increasing flow of misinformation and questionable statements in the popular media and influential magazines, with headlines alleging adverse effects of tree planting and man-made forests on the environment.

During the latter months of 2005, the UK Department of International Development (DFID) released a much-publicised report *From the Mountain to the Tap* (http://www.dfid.gov.uk/casestudies/files/research/forestry-research.asp). This 55-page report is based on results from a network of research sites which examined the effect of reforestation, as a part of watershed management, on water resources in catchments in selected developing countries. The authors argued vigorously that several watershed management projects using 'environmental forestry' have aggravated water shortages and that they are a grossly-misdirected use of resources.

It would appear that DFID and the authors are planning to influence watershed management programs in developing countries through the World Bank and other agencies. My concern about the report and associated media coverage is that those involved have resorted to disturbing techniques to sell their message. Some of the past or prevailing ideas are elevated as 'myths' and then demolished. Unfounded but implicitly invoked relationships are used to sensationalise the conclusions. Examples include an implied association between the potential impact of reforestation on water, and the gross inequalities in access to water faced by poor people. In fact, millions of people experience chronic water shortages for reasons which have nothing to do with forestry!

Although any extrapolation of results from small-scale studies to the larger landscape must be done cautiously, the authors do not hesitate to apply the conclusions from 'initial results' of 'field research principally in micro-watersheds' to the large and diverse Indian states of Himachal Pradesh and Madhya Pradash.

The report and accompanying statements released to the media provided flavoured views and muddled messages, which would fuel the 'spins' and 'sexing-up' of the topic for the popular magazine industry. Following the release of the report, adverse headlines about forests and forestry appeared, including: 'Down with trees' (*The Economist* 30 July 2005) and 'Planting trees may create deserts' (*New Scientist* 29 July 2005). These accounts are not from UK's tabloid press.

Such preposterous views echoed an earlier headline, 'A forest minister who wants deforestation' (*Times of India* 9 June 2004). The honourable minister advocated large-scale deforestation for sustainable land use as the best way to improve water supplies in the Indian state of Uttaranchal — a land with fragile ecosystems situated at the base of the Himalayan mountain range. When such thoughtless messages on the 'negative hydrological effects' of planted forests are promulgated, they contribute to media hyperbole (a recent example: 'Plantations may do more harm than good, says CSIRO' ABC Online, 1 January 2006).

The availability of water and its equitable distribution to all are great challenges of our time, yet around the world we see large-scale abuse of water in farming and elsewhere. In January 2006 an eminent economist and the Vice-Chancellor of a reputable Indian university said, in a public lecture in Canberra, that in India 90 per cent of the water pumped out of hundreds of wells by farmers is wasted, and that this would continue as long as farmers are able to pump water freely.

While South Africa has introduced a water levy and strict control on forestry as a land use system (because trees intercept rainfall and use that water to grow wood), I saw late last year thousands of hectares of sugarcane being irrigated with overhead sprinklers in the middle of the day when rapid evaporation would ensure that only a small fraction of that water fell on the crop canopy, let alone reached the soil beneath it. And in the Murray-Darling Basin irrigation areas in southern Australia, very large amounts of precious water are lost in transit or wasted by end users.

Heated media debate on the Australian Capital Teritory's future land use options after the severe 2003 summer fires fuelled many unreasonable headlines and statements attributed to some scientists. These pronouncements often lacked a balanced perspective and left the community confused about the economic and environmental benefits of good forestry in the long term.

Science to support balanced policies

Extensive afforestation in previously unforested catchments will certainly reduce water flow. However, the hydrological effects of planted forests are dependent on several factors including the amount and seasonal distribution of rainfall, the fraction of the catchment planted with trees, the location of the trees, landscape features, several soil properties and other environmental variables[1].

[1] For a detailed discussion on the topic, especially for low-rainfall environments, see O'Loughlin, E.M. and Nambiar, E.K.S. (2001) *Plantations, Farm Forestry and Water — A discussion paper.* Water and Salinity Issues in Agroforestry No. 8, RIRDC Publication Number 01/137, http://www.rirdc.gov.au

We should examine catchment management programs in the light of continuously developing knowledge. Those of us contributing to science and policy related to land use recognise the critical need for data specific to particular ecosystems, sites and situations, and for well-interpreted knowledge and tools to assist in balanced and judicious decisions. In each case, there is an inevitable need to work out trade-offs, sometimes between opposing values. Improvements in land use are not possible without accepting trade-offs.

Contemporary thinking and best practice using planted forests do not include the sweeping conversion of land to plantations, although this has been the experimental basis of most traditional forest hydrology studies. Rather, retention of native vegetation including woodlands, and establishment of other perennial vegetation, are recognised as essential for the integrated management of landscapes (catchments) for wood production and ecosystem services. Only a mistaken few would advocate the one-size-fits-all approach. In Australia, for example, even where industrial-scale forestry provides crucial support for regional economies and environments, plantations cover only 2–8% of the land area in any major catchment.

It is important to formulate ecosystem-, site- and situation-specific solutions. Catchment bio-geographical properties, the locations of plantations and their area in relation to other activities in the landscape, their size and purpose, the nature of forest management and ecosystem services, the comparative benefits to the community from all forms of land use, and attractiveness for investment, are important factors to be taken into account. Substantial progress is being made in developing tools to assist sound land management decisions.

The authors of the DFID report can justifiably advocate well-conceived, science-based investment in watershed management. The nature and style of their assault on planted forests, however, discourage much-needed investment in these forests, especially in tropical countries. Forestry can contribute much to sustainable land- and water-management programs by providing both economic and environmental benefits.

I find it difficult to fully share the view of some scientists that they are innocent of spin and that the media 'misquote' them 'out of context'. This of course is possible, but the response is also a tedious standard line. It is my experience (shared by colleagues) that if our pronouncements do not overstate the messages, one way or another, and if we are conscious of the uncertainties and limitations of our science, it is possible to get across sensible information in interesting ways to inform the community through the media.

Science-based policies are not advanced by negatively portraying forestry as a land-use system which uses all the water and causes drought, ignoring knowledge from climate science. We should reflect on what and how we communicate science to the diverse world to promote informed discussion to secure balanced outcomes and benefits, economic and environmental, for society. This is increasingly important to enable us to continually serve society through science.

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