Progress

Natural services open for business

Early morning before sunrise at Lake Joondalup, Wanneroo, WA. Willem van Aken.

To help get the services provided to humans by the environment acknowledged, valued and protected, researchers have sought ways of 'commoditising' them. The recent emergence of fledgling trading markets in certain key 'ecosystem services' signals that this is being achieved. Steve Davidson reports on moves to establish such market mechanisms in Australia.

Nature's good works, the 'ecosystem services' on which all life on Earth depends – and which actually underpin our entire economy – have long been taken for granted. In modern society we've tended to undervalue such integral environmental provisions as clean water, liveable climates, carbon sequestration, pollination of crops, soil conservation and the general maintenance of biodiversity.[1]

But now a worldwide push has commenced to turn this around by actually establishing particular markets for the functions that ecosystems provide. With trading already having begun in some services, it appears that these markets won't be too different from those we already have for trading regular commodities or services such as wheat, coal, tourism or information technology.

1. See *ECOS* issue 102.

The world trade in carbon credits, to counter global warming, is an example of this approach, but it is just one case. A number of other 'market-based instruments' (MBIs) – policy tools that use market-like approaches to influence people's behaviour and so achieve positive outcomes – are under investigation in Australia. They all have the aim of improving natural resource management by giving ecosystem services a value and developing a market or trading system for the services or goods.

Why turn to markets?

A Productivity Commission research paper (*Creating Markets for Ecosystem Services*, 2002) pointed out that markets for ecosystem services are few and far between, and this can cause problems. 'Typically, those who supply ecosystem services are not rewarded for all the benefits they provide to others, and those who reduce ecosystem services do not bear all the costs they impose on others,' wrote the authors.

Historically, our markets have rewarded farmers and miners, but generally failed to conserve environmental and cultural goods and services because they don't send the right signals to landholders and others – signals that would encourage sustainable use and management of natural resources. Economists call this 'market failure'.

'This is where markets for ecosystem services come in,' says Dr Stuart Whitten of CSIRO Sustainable Ecosystems. 'Traditionally, governments have often addressed environmental problems like loss of vegetation and salinity by coercive regulations. However, this is using a really blunt tool to tackle complex problems and we believe there is a better, and often less costly, way to go.'

Dr Whitten, Mr Dave Shelton, and their CSIRO colleagues, argue that MBIs are gaining acceptance because they use positive incentives or market signals to motivate and reward better management of natural resources.

'MBIs can often deliver environmental outcomes right where they are needed, by those who are best-placed to take action and at considerably lower cost than government regulation,' says Shelton.

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Wetlands play a multiple-services role in wetter ecosystems. Willem van Aken.

How do they work?

This new thinking doesn't mean governments don't have a role. The Productivity Commission says governments can create a market for an ecosystem service by defining a new property right that is both linked to the ecosystem service and able to be exchanged for reward. (Put simply, 'property right' is basically an entitlement to use a particular good or service, for example, water, in a certain way.)

Whitten's team is exploring how markets for ecosystem services can work at a regional level in Australia, often working with Catchment Management Authorities and directly with landholders or managers.

'We are investigating where market mechanisms are most effective in improving environmental outcomes, where other methods might be more effective and how market mechanisms fit or nest into existing regional programs or institutions,' says Whitten.

There are three broad types of market-based instruments. These are:

- *price-based instruments* – which influence people's behaviour by changing prices – for example, auctions, grants, rebates or taxes;
- *quantity-based instruments* – which influence behavioural change by specifying an amount of new rights or obligations – for example, cap-and-trade mechanisms (such as the water market) and offsets;
- *market-friction instruments* – which seek to change behaviour by making existing private markets work better – for example, by providing more information, by encouraging private investment in natural resource management or by introducing product differentiation such as labelling.

One can quickly become entangled in economic jargon here, and probably the best way to get a handle on how market-based instruments work is to take a look at some Australian case studies.

Some of the following examples include projects from the National Market-based Instruments Pilots Program (NMBIPP), launched in 2003 with $5 million in funding from Commonwealth, State and Territory Governments (www.napswq.gov.au/mbi/index.html). The first round of 11 pilot projects are trialling a range of MBIs with the aim of investigating ways to use innovative financial arrangements to encourage better land and water management and to reduce salinity in irrigation-based agriculture.

Amphibians, like the Southern bell frog, found throughout the swamps of the River Murray and South East, South Australia, perform their own crucial sub-functions within the complex services of local ecosystems. Courtesy of Coleambally Irrigation Cooperative Ltd.

Bush Tender – conservation up for auction

Bush Tender is a (price-based) pilot programme aiming to conserve remnants of native vegetation. In exchange for payments from government, landholders agree to fence off and manage an agreed area of their native vegetation for a set time.

An initiative of the Victorian Department of Natural Resources, the program is innovative in that it relies on a reverse-auction to set the price of conservation contracts; landholders making the lower bids – agreeing to do the most conservation with the least money – win the auction.

Many landholders see uncleared native vegetation as lost income. So the key to the Bush Tender approach is that it requires landholders to name their own price for setting aside and improving a proportion of their native vegetation.

In all, 98 landholders submitted 148

The common honey bee performs a pollination service that keeps the integral plant systems within ecosystems running. CSIRO Entomology.

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The Bush Tender programme's reverse auction scheme creates financial incentive for landholders to preserve fast-disappearing bush habitat. David Maczkowiack

bids for 186 sites and, at the end of the process, the department accepted 97 bids from 73 landholders, together agreeing to conserve some 3200 hectares of vegetation under three-year agreements. The biodiversity benefits are shaping up to be substantial with field staff concluding that most of the successful bids cover sites of high to very high conservation significance.

The pioneering Bush Tender scheme, at an all-up cost of about $400 000, also looks much more cost-effective than conventional flat subsidies. Follow-up auctions have been run and an expanded version of the scheme was trialled in the NMBIPP, which is now being wrapped up.

Murrindindi – managing 'tree changers'

Land use is changing rapidly in many areas of Australia, not least near our capital cities where there is growing demand for rural residences and lifestyle farming properties by so-called 'tree changers' (country cousins to 'sea changers'). Ironically though, the very ecosystem services that usually attract people from cities to rural hinterlands can suffer during this changing land use.

In Murrindindi Shire, not far from Melbourne, grazing land is steadily being converted to lifestyle farms, hobby farms and rural residential areas. Consideration is being given to using a quantity-based MBI to ensure that this burgeoning rural development is sustainable.

A preliminary analysis by CSIRO Sustainable Ecosystems researchers suggests that the existing institutions and structures in the Shire have the capability to accommodate a 'development offsets' MBI, particularly to minimise impacts on native vegetation. This would reduce costs. However, more people may be needed to administer any such scheme.

'Insights gained from the workshops so far are allowing us to make improvements to the procedures that will be required in real-life auctions for grants'

An offset is defined as a positive off-site action that counterbalances an on-site activity that is degrading to the environment.

In the Murrindindi case – where a pilot study is looking promising – the offset would operate by requiring landholders or developers to offset the negative impact of a rural development. This could occur by, say, undertaking a counterbalancing revegetation project elsewhere on the site or perhaps at a nearby site by paying another landowner to increase their native vegetation.

In this way, the offset should maintain (but wouldn't usually enhance) the biodiversity status quo. Impacts on some other ecosystem services during rural development, such as on water quality, while possible, seem to be much more difficult to manage via an offset.

Corridors in the desert

One of the collaborative NMBIPP projects, led by Professor John Rolfe of the Central Queensland University, is using an interesting approach known as experimental economics to design an effective competitive auction system for allocation of public and/or private funds by voluntary engagement with landholders. The idea is to create biodiversity corridors or stepping-stones across properties in the Desert Uplands of the Burdekin–Fitzroy region of the Queensland rangelands.

During experimental workshops, landholders were asked to indicate on maps of 'mock' properties the potential corridors and the annual incentive payments they would require to protect the vegetation on their test property. 'In one workshop,' says Whitten, 'the hypothetical auctions gave rise to some 17 to 20 options for various vegetation corridors involving 12 similar cattle properties … indicating potential for impressive cooperation between neighbours.'

'Insights gained from the workshops so far are allowing us to make improvements to the procedures that will be required in real-life auctions for grants,' says Rolfe. 'It looks as if this type of MBI could operate to improve environmental outcomes for Australian rangelands by giving landholders signals about where the environment can be improved without cutting into their property rights.'

Eco-labelling – wine and wetlands

Eco-labelling is a market-friction mechanism that can improve environmental outcomes by differentiating between products, drawing attention to an enterprise's positive environmental performance. At the Hardy Wine Company's Banrock Station vineyards in South Australia, for example, marketing of the wines emphasises the company's sustainability credentials.

Its conservation work, especially involving wetlands, gives the company a 'point of differentiation and a promotional advantage in environmentally conscious markets, such as Europe and North America'. In addition to careful management of wetlands, the station claims that it uses state-of-the-art trellising and computer-controlled drip irrigation to prevent the water table rising and to protect water quality – although verification, as with all MBIs, is an issue here.

The effort is not confined to Australian vineyards. The wine company's website says that everywhere in the world that

Seed disperser, Carnaby's black cockatoo.
Department of the Environment and Heritage/John Baker, CSIRO Entomology

Banrock Station wine is available, there is an association with a major local environmental organisation which benefits from donations generated by sales of Banrock Station wines. Beneficiaries of this particular MBI range from whooping cranes to otters to rainbow fish (www.banrockstation.com/wildlives.html).

MBIs – a panacea?

Not everyone is a fan of markets for ecosystem services. In a guest editorial on the Ecosystem Marketplace website (www.ecosystemmarketplace.net, and see page 20) Simone Lovera, of Friends of the Earth International, said 'markets for environmental services might be a win-win-win strategy for big industries and large landholders, but for the world's poor they are undoubtedly a lose-lose-lose proposition'.

Speaking particularly of poor communities that are dependent on forests for fuel, food, medicinal plants and water, Lovera says, as a general trend, market-based conservation mechanisms tend to block access for those who cannot pay for environmental services. This is a controversial view, as other research, in water markets, for example, has shown no adverse impacts on smaller market participants and communities. However, such scepticism is useful and suggests the application of market-based instruments in developing countries, as with anywhere, needs careful thinking and planning to avoid undesirable consequences for local communities.

Whitten and Shelton are clear that MBIs are not a cure-all everywhere. There are certain environmental problems or situations where marketing of ecosystem services is impractical or costly and where alternative approaches will be needed.

However the researchers emphasise that, in other cases, market instruments are already showing great promise as a way to achieve much needed positive outcomes for both the environment and communities.

Steve Davidson

More information:
The Ecosystem Services Project: www.ecosystemservicesproject.org
Creating Markets for Ecosystem Services report: www.pc.gov.au/research/staffres/cmfes/index.html

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