

# A fundamental measure for progress



The question of the degree of sustainability in our lives now and in the future is a difficult one to answer, since as yet, we have no way of actually measuring it. That problem is now being nailed down by a new, internationally significant three-year project being jointly run in Australia and Sweden.

**Ibis at the Kerang rookery in the Murray-Goulburn catchment region, Victoria.**

CSIRO Land and Water /Willem van Aken

'Measuring and Modelling Sustainable Development in Australia', led by Dr Brian Walker with support from CSIRO's Social and Economic Integration Emerging Science Initiative, has its roots in some 17 years of evolutionary thought on sustainable development.

Following the World Commission on Environment and Development's defining 1987 report<sup>1</sup> outlining sustainable development, Australia adopted the National Strategy for Ecologically Sustainable Development<sup>2</sup> in 1992 to guide sustainability decisions and action by government, industry, business and the community. Since then, however, no single framework or measure for sustainable development has been conceived to determine whether or not our decisions and actions have achieved their objectives. Walker's team's project has set out to provide that measurement.

Project Manager, Dr Leonie Pearson, says 'Often, conventional macroeconomic measures such as Gross Domestic Product or Gross National Product are used in association with other indicators and reports on environmental issues, such as the State of the Environment Report, to make sustainable development-related decisions and assessments. But these methods don't allow us to evaluate the trade-offs between human, natural and manufactured resources that occur in our everyday lives, such as choosing between investing in wetland rehabilitation or building a new bridge or road.'

Recent work by the World Bank (see figure at right), for example, has shown that Australia has a wealth of human resources (such as skills and education), manufactured assets (infrastructure, buildings, roads) and natural resources (minerals, forests, protected areas). However, Pearson says this measure of wealth does not

include critical aspects of human and natural capital – such as ecosystem services – not found in the market place. Because the resources are measured separately, trade-offs between them can't be identified.

Pearson points out that an 'inclusive approach', based on all the resources in a region, needs to be developed to help countries ascertain their state of sustainability.

## The inclusive approach

The CSIRO project team – made up of ecologists and economists – aims to develop a pilot framework for measuring and modelling 'inclusive wealth' (as the basis for assessing sustainable development in Australia), using a regional case study in the Goulburn Broken Catchment (northern Victoria).

'Inclusive wealth' is a formulation developed by the Beijer International Institute for Ecological Economics.<sup>3</sup> It is the sum of all resources or 'capital assets' – natural capital, human capital and manufactured capital – weighted by their social value or contribution to human wellbeing.

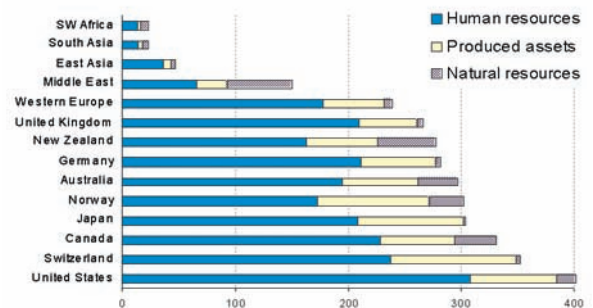
The three-year project aims to place a value on these capital assets using market and non-market prices, and group them together to form measures of human, natural and manufactured capital. A model will then be developed to look at the change in the capitals' quantities and values over time.

'If an area has developed sustainably, then, the value of inclusive wealth should stay the same or increase over time,' Pearson says.

## A regional beginning

In the first 12 months of the project, Pearson's team has identified seven important goods and services – or 'flows to human wellbeing' – provided by the Goulburn Broken Catchment: recreation, nature conservation, dairy production and processing, horticulture and processing, cropping and grazing, forestry, and life services. The human, natural and manufactured capital that make up each of these flows must now be determined so that values can be assigned to each flow. The team have started with nature conservation.

'You can't measure wellbeing directly, but you can measure the stock of human, natural and manufactured capital from which all goods and services (flows) originate. So we're trying to work out which aspects of human, natural and manufactured capital combine to form nature conservation.'



**Components of per capita wealth (US \$'000 1994)**

Hamilton, K. and Dixon, J. (2003) Measuring the Wealth of Nations, *Environmental Monitoring and Assessment* 86:75-89.

**'Inclusive wealth' ... is the sum of all resources or 'capital assets' – natural capital, human capital and manufactured capital – weighted by their social value or contribution to human wellbeing.**

By mining state and federal government databases (such as the Australian Bureau of Statistics Census and Victorian Ecological Vegetation Class databases), talking to experts in nature conservation, and working with people in the catchment, the team has identified a range of capital stocks that are important for nature conservation.

'Natural capital stocks include the quality and diversity of native vegetation, the diversity of fauna and the impact of exotic species,' Pearson says.

'Human capital stocks include the number and type of people employed in education and in implementing nature conservation. Manufactured capital stocks include the road infrastructure, fences and firebreaks that allow access to and management of native vegetation and waterways.'

Once the capital stocks for each flow have been identified, values can be placed on them using market and non-market prices. For example, stocks such as dairy cows have market values, however, the value people place on parklands or native forests will need to be determined from other studies that have already identified how much people would be willing to pay to maintain these stocks.<sup>4</sup>

The capital stocks for each of the seven flows will be valued based on information gathered in the Goulburn Broken Catchment in 1991 and 2001. A model, still to be developed, will then be used to determine whether inclusive wealth has risen, fallen or remained the same.

'We anticipate that our model of inclusive wealth will be able to show policy-makers the trade-offs that they are making between capitals, such as human and infrastructure, to achieve current and future policy goals,' Pearson says.

### High impact research

Once the measuring and modelling framework has been proven in the Goulburn Broken Catchment, the team expect it could be applied to demonstrate sustainable development over time at the local government, regional, state and national levels. The eventual aim is to have a national measurement program based on a representative sample of Australian regions.



'Both regional and national frameworks for inclusive wealth will help us question our current activities and how we can better use our resources to ensure their availability for our children,' Pearson says.

She uses the sale of Telstra to illustrate this concept.

'Telstra was manufactured capital that was sold to reinvest into natural capital, through the Natural Heritage Trust. But there were no research mechanisms or models to determine where the best points of intervention for the investment would be, such as which capitals to invest in or even which assets to target,' she says.

'Maybe that money could have been invested in human capital, such as farmer education, because a large amount of nature conservation occurs on-farm. This education could have flowed through, as changes in farming practices, to conserve more native vegetation. Or maybe it could have been put directly into built assets, such as fences, as these are critical to achieving nature conservation on farms.'

'Now, when such policy decisions arise, our model will identify the best place to intervene to achieve a sustainable long-term future.'

The Goulburn Broken Catchment case study, and a sister project in Stockholm, Sweden<sup>5</sup>, are a step towards ensuring future sustainable development in Australia, and globally. Recent international collaborations have resulted in agreement for a new focus to be established through the Ecological and Environmental Economics Program (a joint programme of ICTP – The Abdus Salam International Centre for Theoretical Physics<sup>6</sup>, FEEM – Fondazione Eni Enrico Mattei<sup>7</sup>, and The Beijer International Institute of Ecological Economics<sup>8</sup>) to support research and further develop inclusive wealth in developing countries.

● Wendy Pyper and Leonie Pearson

**The Goulburn River. Bankside erosion is affecting the efficiency of the wider water catchment.**

Goulburn Broken Catchment Management Authority

1. World Commission (1987) *Our Common Future* (the Brundtland Report). New York, Oxford University Press <http://www.brundtlandnet.com/brundtlandreport.htm>

2. National Strategy for Ecologically Sustainable Development: <http://www.deh.gov.au/esd/national/nsesd/>

3. <http://www.beijer.kva.se/>

4. A number of such studies are listed on the NSW EPA database EnValue <http://www.epa.nsw.gov.au/envalue/StudyCnt.asp>, which includes a specific study on understanding recreation and preservation values of Barmah wetlands in the Goulburn Broken Catchment.

5. <http://www.webforum.com/IWAP>

6. <http://www.ictp.trieste.it/>

7. <http://www.feem.it/>

8. <http://www.beijer.kva.se/>

### More information:

Pearson L., Harris M. and Walker B. (2003) Measuring and Modelling Sustainable Development in Australia using Inclusive Wealth. <http://www.csiro.au/proprietary/Documents/MMSDProjectDescription.pdf>

Pearson L., and Harris M. (2004) Measuring and Modelling Sustainable Development at the Regional and National Scales in Australia. <http://www.csiro.au/proprietary/Documents/BTRE2004Paper.pdf>

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