Putting a value on ecosystem goods and services

How much is a clean beach or pristine rainforest worth? Putting a value on ecosystem services is more than an analytical exercise. Figures help us assign non-zero values to services we clearly desire, but we also need to understand how numerical values are derived, as they can give a misleading impression of precision, and hide assumptions that are too simplistic or require further scrutiny.

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Economic costs and benefits can be readily estimated through existing market prices. Impacts that are of an environmental or social nature, however, often do not have a market, making it harder to assess the value of different policy or resource management options.

One way of quantifying these 'nonmarket' impacts for the purposes of decision-making is to estimate the dollar value associated with a gain or loss in



Ecological valuation approaches have been used to estimate the broader value of Kakadu National Park beyond its recreational value to the Northern Territory tourist industry. Northern Territory Tourism Commission

- *revealed preference* techniques, where value is revealed through a directly related market from which individuals' values can be inferred; and
- *stated preference* techniques, where value is stated, usually by respondents of a questionnaire or by attendees at a focus group.

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community welfare as a result of the impact. This is known as non-market valuation.

Three important principles underpin this non-market valuation approach.

First, we should only focus on the estimated *change* to asset value – known as the margin – as a result of the policy or development being implemented. Second, the aim of valuation is to identify the benefit or damage to individuals through estimating 'willingness to pay' or 'willingness to accept'. Finally, individual values are added together to deliver a community or societal value which assumes the benefit of an additional dollar to each individual is the same.

Next comes the challenging question of how to assess the value of ecosystem goods or services when they don't have an identifiable market. There are two main approaches used in this form of ecosystem valuation: Examples of *revealed preference* techniques are the travel cost and hedonic (pleasure) pricing approaches. The travel cost approach, often used to infer the value of the recreation area or activity, is based on the costs of travel incurred when people undertake a certain activity such as a bushwalking trip in a national park. Hedonic pricing seeks to estimate a relationship between the quality and quantity of the environmental good and the price of a marketed good, such as the amenity value of a scenic view.

Both techniques require an appropriate 'proxy measure' which is often not available for environmental goods. A number of related cost-based techniques – such as avoided cost (the cost incurred in the absence of the service) – are also available, but these focus on the costs rather than the benefits, which are likely to be quite different. Stated preference techniques can be used to estimate a wide range of values. These techniques almost always rely on using a hypothetical question in a questionnaire format that asks people to behave as if they were faced with a market choice. This raises many issues and much effort has helped reduce, but not remove, criticisms.

The main examples are contingent valuation and choice modelling. Contingent valuation asks people how much they are willing to pay for one option over another. Choice modelling asks people to choose their preferred option from a range, each of which comes at a different cost and provides different environmental quality or quantity levels.

When non-market valuation methods are used, it is important to identify which environmental impacts the non-market value estimate represents and which it does not.

For example, in 1991 the travel cost method was used to estimate the value of recreational tourism in Kakadu National Park as \$35.6 million. In the same year, contingent valuation estimated the economic value of preserving Kakadu National Park to be \$647 million per year. As recreational value is only one benefit of Kakadu National Park, it is not surprising that this amount is less. It's also clear from this example why it is so important to select the right valuation approach. • Anna Straton and Stuart Whitten

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More information:

Ecosystem valuation website, www.ecosystemvaluation.org/uses.htm

NSW Department of Environment and Climate Change database of environmental valuations, www.environment.nsw.gov.au/ envalue/

Department of Environment, Sport and Territories; Department of Finance; and Resource Assessment Commission (1995) *Techniques to Value Environmental Resources: An Introductory Handbook*. Australian Government Publishing Service, Canberra.

www.ecosmagazine.com