VALUING THE ENVIRONMENT

Summary

Environmental valuation seeks to establish an explicit value, usually monetary, for environmental factors in order to help planning and decision making where, for example, the balance of benefit between development or preservation of natural resources must be weighed and loss or damage to environmental assets has to be priced.

Economists argue that this is beneficial for the environment as it attempts to take into account externalities and issues of social well-being in a logical, transparent way. However, many environmentalists question the ability of market based tools to adequately value natural resources.

Much effort has gone into identifying and quantifying the contribution the environment makes to economies, although the perspectives of so-called “green economics” often fundamentally vary from those of conventional economics.

The feasibility of accurate environmental valuation is questionable but it is nevertheless worthy of effort, and debate on the issues can only be useful in advancing understanding of the issues.

Relevance to business

An increasing number of companies are seeking to account for environmental factors in their business models and in their reporting. This reflects increased regulatory constraints and pressure from investors and consumers. But it is also the outcome of new awareness of externalities and emphasis on sustainable growth within companies themselves (see R 4.3 Economic Externalities and R 4.4 Approaches to the Integration of Externalities). Growing interest in environmental valuation is one result. The quality of relevant decision making largely depends on the extent to which the contribution the environment makes to economic activity – and the consequences of that activity – are understood and measurable.

Valuing the environment

The environment is an imprecise concept but, at a simplistic level, most people would agree that the natural world around us has some sort of intrinsic value. That value has been largely ignored by historic and current economic models, which have contributed to an accelerating, unprecedented decline in environmental quality. The view that key components of the environment are common resources that do not need to be accounted for has prevailed through most of the last two centuries. This is changing, but placing a rational value on natural assets is far from straightforward.

The primary objective of economic valuation is to assign monetary values to what are normally referred to as intangibles, so comparison with economic factors is possible and damage or loss to them can be evaluated and accounted for. Most techniques are contentious because of the limitations of market based tools to measure intangibles, and because many of the assumptions inherent in assigning value are highly subjective. Timber, for example, may sell at a given price which reflects market value and the cost of extraction and processing. Whilst you may be
able to put some counter value on loss of local amenity, how do you account for ecological damage cause by the loss of forests?

Growing awareness of the complicated short- and long-term linkages between business activity and the environment is partly the result of improved understanding of human dependence on the diversity, complexity and quality of our environment. This, in turn, underscores the need for more comprehensive value systems to support the development of regulatory public policy and guide business decision making processes.

The environment supports all economic activity in the macro sense that it sustains human life. We rely upon basic ecosystem services for air, water and food. In a narrower sense, it provides raw materials to support primary industries on which most other business activity – hence, much of our social infrastructure – is built. Our relationship with the environment is primarily based on these fundamental considerations but must also take into account many local or micro considerations related to amenity and physical quality.

Figure 1. The Five Capitals

The “five capitals” approach was developed by Project Sigma as a tool for organizations to apply sustainability principles. However, it also has wider applicability. The five capitals are:

- **Natural capital** – the environment
- **Social capital** – social relationships and structures
- **Human capital** – people
- **Manufactured capital** – fixed assets
- **Financial capital** – profit and loss, sales, shares, cash etc.

Natural capital encompasses the other capitals as natural resources and ecological systems form the basis of life on which all organizations (and wider society) depend. Social, human and manufactured capitals are critical components of an organization and its activities. High levels of these capitals deliver value to organizations and society as well as stakeholders. Financial capital is crucial to the ongoing survival of an organization and is derived from the value that the other four capitals provide. All of the capitals are heavily interlinked and there is some overlap between them.

Where conventional economics and so-called “green economics” part company is that the former views the environment as a component of the human economy – in effect, primarily focusing on the raw materials relationship. The latter views the relationship from a scientific perspective and considers economics as a sub-set of ecology and the distribution of energy, matter and biological systems (see R 1.1 Principles of Environmental Systems). However, both recognize the importance of economic development to human well-being.

It is increasingly evident that the evaluation challenge is, in effect, circular, with two distinct but interrelated component parts. The first is to assess the economic contribution of the environment itself, the second is to assess the impact of
economic activities on the value of the environment. Far from easy! At a practical level, many companies and organizations are investing in research to try to develop a better understanding of how to disentangle the complex motivations that drive behaviours underlying this equation and measure their economic impacts.

## The environmental economy

The environment and the economy are complex concepts whose characteristics vary in space and time, making analysis and quantification of their relationship exceptionally difficult. Efforts to improve understanding of the linkages tend to take one of two forms: sector based, or environmental-capital based. However, they are not mutually exclusive.

Traditional assessments of the “environmental economy” were mostly sector based, focusing on those associated with intensive land use and others such as tourism that directly depend on “landscape”. A more recent, more sophisticated approach seeks to define relationships between economic activities and the environment based on the concept of “environmental capital”. It assumes that the environment has embedded value in the form of raw materials, services and commercial opportunities and represents a basic stock of capital that can be exploited in a variety of ways. Some are positive in that they increase the stock of capital; others negative, and reduce it (see R 6.5 Natural Capital and Ecosystem Services).

As previously noted, there are actual or potential axes of relationship that include the value of the environment as a primary resource (agriculture, extractive industries, fisheries) and economic dependence on the quality of the environment (tourism, inward investment). Each makes use of environmental capital and, in each case, the functional relationship between environment and economy involves inputs and outputs that affect its cumulative balance.

Environmental-capital methods of assessment can also be useful in integrating economic considerations with sustainability assessments. The Five Capitals system (Figure 1) is a good tool for considering these relationships. However, it only goes part-way towards assessing their value or negative impacts and the trade-offs implicit in them. It is important to recognize the limitations of stock accounting models: not all environmental capital is substitutable and it can also have a range of non-market values.

## Contingent valuation

Contingent valuation is a measurement concept based on relative rather than absolute values. It is a survey based approach in which respondents place a value on the non-use of an asset – in other words, their willingness to pay for conservation (or for something not to happen). It is “contingent” in the sense that valuation is specific to an alternative – for example, if this area of wetland were to be drained and replaced with agriculture, what would you require as compensation?

Two global studies by Constanza et al. (1997) and Balmford et al. (2002) used contingent valuation to assess environmental value. The findings of the former group were highly controversial and criticized by neoclassical economists (see also R 2.1 The economic system) and ecologists alike. Others saw it as a heroic attempt to place a value on ecosystem services in relation to global economic activity. Constanza calculated ecological services contributed US$33 trillion globally (at 1997 prices) to human welfare and therefore there was a strong economic case for conservation of natural resources as opposed to their development. The work of the latter group took this further, claiming that the benefits of conservation often outweighed those of development or conversion to other non-natural uses.
The limitations of contingent valuation are obvious. It asks respondents to put a monetary figure on the environment with very little structure or guidance. It only seeks to value the environment in terms of its direct economic productive value. It fails to take into account issues of co-dependency and the wider role of the environment in an ecosystems context. For example, an area of wetland may be economically unproductive but plays a key role in freshwater management, flood and storm protection, and in the production and maintenance of biodiversity. It may well also have cultural and recreation value. Contingent valuation seeks no more that a subjective relative valuation of specific development/non-development options. It cannot contribute towards putting a value on the integrity of ecological systems.

**Types of values**

Other issues relate to “use” value and “non-use” values of environmental assets. Problems can arise (loss of environmental capital; increased social costs) if use values are not accurately priced by the market. There are many controversial issues in quantifying non-use values because conventional economics measures only transactional value and challenges the premise of contingent valuation methods. Environmentalists would argue that neoclassical economics fails to recognize that economic activity takes place within a social structure that is ultimately dependent on the environment as the origin of all resources and value (see also R 2.2 Free market and the capitalist system).

Many environmental resources of undisputed benefit to society exist “beyond markets”. They are priceless in the literal sense. It is therefore difficult if not impossible to make direct comparison to what exists within markets. This “asymmetry of valuation” (Pearce, 1993) has stimulated many theories but so far no accepted solution. “Non-use” or “passive” concepts require people to put a value on things they do not have direct use for, like the “existence value” society attaches to the mere existence of a species or a place, or the “bequest value” of something to be preserved for future generations. Allied to this is the idea of the “option” or “potential value” attached to things as yet unrecognized, such as genetic resources or plant compounds. It is possible – and, indeed, helpful – to identify values of this kind but extremely difficult to quantify them in meaningful ways.

**Beyond economic production and opportunity cost**

Approaches such as contingent valuation focus on the direct financial cost and the relative benefits of exploiting or preserving a given natural resource. As suggested earlier, the commercial value of an area of forest can be calculated through a combination of market pricing and extraction, processing and transportation costs, and the “opportunity cost” of alternative uses of capital. However, as knowledge of ecosystem services grows, so does consciousness of our so far very limited ability to translate hidden environmental costs into values that could definitively influence this equation.

**More holistic valuation and accounting methods**

Full Cost Accounting (FCA) is a procedure used to evaluate impacts which substantially functions retrospectively. FCA and the similarly named True Cost Accounting (TCA) seek to identify and quantify all costs and advantages. Because these are normally categorized as economic, environmental and social, the technique is known as Triple Bottom Line accounting. It has been adopted and developed by a range of bodies including the United Nations and is reflected in a number of international standards including ISO 19011 (quality management systems and environmental management systems auditing). FCA is broader and more far-reaching than traditional accounting techniques because it considers costs...
Valuing the environment (including ongoing and hidden costs) rather than simple outlay, and takes into account identified externalities and past and future outlays implicit in product life cycle management.

This approach is more sensitive to environmental and social impacts than traditional accounting because it includes known externalities and predictable future costs. It is a more realistic approach to real-world resource relationships and the time frames needed for sound decision making. It is particularly useful in scenarios such as power generation or waste disposal that have potential for long-term consequences for society and the environment. FCA is extensively used for strategy and planning purposes in the public and private sector and seen as a useful tool in pursuing sustainability (see also R 6.4 Ecological footprint).

Databases of environmental valuations

Work on environmental valuations has been compiled in a number of international databases that aid comparison and cross-referencing. They are particularly useful in benefit transfer approaches that draw on information gathered by research in other locations – not ideal, but a method of avoiding repeated costly surveys.

Perhaps the best known database is Environment Canada's Environmental Valuation Resource Inventory (EVRI), developed to help policy analysts use a benefits transfer approach. It is a searchable depository of empirical studies of the economic value of environmental benefits and human health effects. The New South Wales Environment Protection Authority's Envalue System is also worthy of note.

Conclusion

Developing meaningful values for environmental factors is perhaps the most significant challenge on the path to sustainability. It is fundamental to the ability of businesses and policy makers to make sound long-term decisions. The approaches developed so far help to some extent, but most still seek to reduce environmental complexity to metrics based on the direct exploitation (or otherwise) of specific areas of land. The real test for environmental valuation is to support not just this level of decision making, but to provide a means of ensuring the continued healthy existence of ecosystems on which human life on Earth depends.

References


Sources of further information

Environment Canada: Environmental Valuation Resource Inventory  
http://www.evri.ca/english/about-m.htm


New South Wales Environment Protection Authority's Envalue System  
www.epa.nsw.gov.au/envalue/

Basic introduction to ecosystem valuation for non-economists  
http://www.ecosystemvaluation.org/index.html

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