Economic Valuation of Wetlands: Total Economic Value

288

Lucy Emerton

Contents

Abstract

Total economic value (TEV) is one of the most widely used and commonly accepted frameworks for classifying wetland economic benefits and for attempting to integrate them into decision-making. Its major innovation is that, rather than just considering commercial or extractive values, TEV also takes into account subsistence and nonmarket values, ecological functions, and nonuse benefits. TEV is used to overcome the problems associated with the under-valuation of wetland benefits that has plagued conventional economic analysis and decision-making.

Keywords

Economic value · Wetland services · Decision-making

Introduction

Total economic value (TEV) is an all-encompassing framework that is used by economists to identify and categorize environmental benefits. The concept of TEV first came into general use in the late 1980s and early 1990s (Pearce et al. 1989). It

L. Emerton (✉)
Environment Management Group, Colombo, Sri Lanka
e-mail: lucy@environment-group.org

C. M. Finlayson et al. (eds.), *The Wetland Book*,
https://doi.org/10.1007/978-90-481-9659-3_301

has now become one of the most widely used and commonly accepted systems for classifying wetland economic benefits and for attempting to integrate them into decision-making (Barbier et al. 1997).

TEV emerged largely in response to the perception that conventional economic approaches tended to see the value of the natural environment only in terms of the raw materials and physical products generated for human production and consumption, especially focusing on market activities and commercial profits. It was argued that this persistent under-valuation of environmental goods and services had in many cases led to decisions being made which resulted in economically suboptimal outcomes and, in the worst case, had incurred substantial costs and losses to the economy (Emerton 2005).

Rather than just considering commercial or extractive values, TEV also takes into account subsistence and nonmarket values, ecological functions, and nonuse benefits. Looking at the TEV of a wetland essentially involves considering its full range of characteristics as an integrated system – its resource stocks or assets, flows of environmental services, and the attributes of the ecosystem as a whole (Barbier 1994). As well as presenting a more complete picture of the economic importance of wetlands, TEV clearly demonstrates the high- and wide-ranging economic costs associated with their degradation, which extends beyond the loss of direct use values.

Total Economic Value

Total economic value distinguishes between use values and nonuse (or passive use) values. Whereas use values refer to the value of actual, planned, or possible uses of a wetland and its resources, nonuse values are the values that people ascribe to keeping the wetland in existence, even when there is no actual, planned, or possible use (OECD 2006).

The TEV categories of use and nonuse values are usually disaggregated further into four components: direct use value, indirect use value, option value, and existence value (Pearce 1993; see Fig. 1).

The TEV of a wetland would thus typically include (from Emerton and Bos 2004):

- **Direct values**: the raw materials and physical products that are obtained from wetlands, which are used directly for production, consumption, and sale – such as those providing energy, shelter, foods, agricultural production, water supply, transport, and recreational facilities
- **Indirect values**: wetland ecological functions which maintain and protect natural and human systems – such as maintenance of water quality and flow, flood control and storm protection, nutrient retention and microclimate stabilization, and the production and consumption activities they support
- **Option values**: the premium placed on maintaining a pool of wetland sites, species, and genetic resources for future possible uses, some of which may not

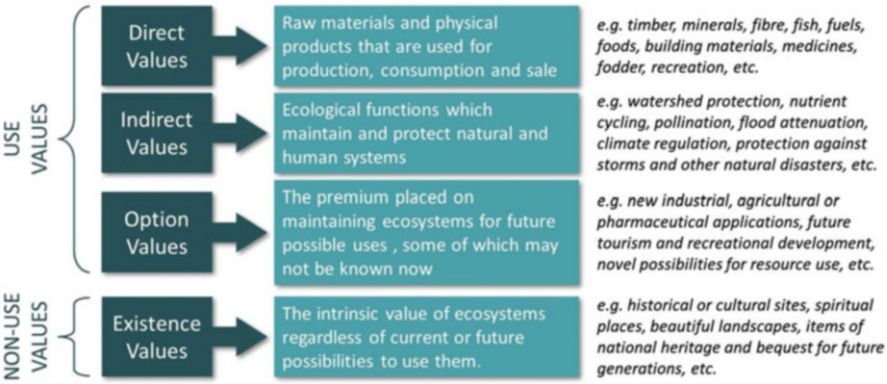

Fig. 1 The total economic value of wetland ecosystems

be known now – such as leisure, commercial, industrial, agricultural, and pharmaceutical applications and developments

- **Existence values**: the intrinsic value of wetland ecosystems and their component parts, regardless of their current or future use possibilities – such as cultural, spiritual, esthetic, and heritage significance

Some authors have proposed a further breakdown of these four, generally agreed, categories of value. For example, some interpretations of TEV separate out "bequest value": the value of preserving resources for the use of future generations (Bateman et al. 2003). This has elements of both option and existence value. "Quasi-option value" may also be included as an element of option value. This reflects the value of information gained by delaying an irreversible decision to develop a natural environment or of waiting for the resolution of uncertainty (Pascual and Muradian 2010).

The Monetary Valuation of Wetlands

One of the main applications of the TEV framework has been as a basis for estimating and communicating the monetary value of wetland goods and services. The basic aim of economic or monetary valuation is to determine people's preferences: how much they are willing to pay for wetland goods and services and how much better or worse off they would consider themselves to be as a result of changes in their supply. By expressing these preferences, valuation aims to make wetland goods and services directly comparable with other sectors of the economy when investments are appraised, activities are planned, policies are formulated, or land and resource use decisions are made (Emerton 2005).

The question of how to place a monetary value on wetlands has long posed something of a challenge to economists. The easiest and most straightforward way to value a good or service, and the method used conventionally, is to look at its market

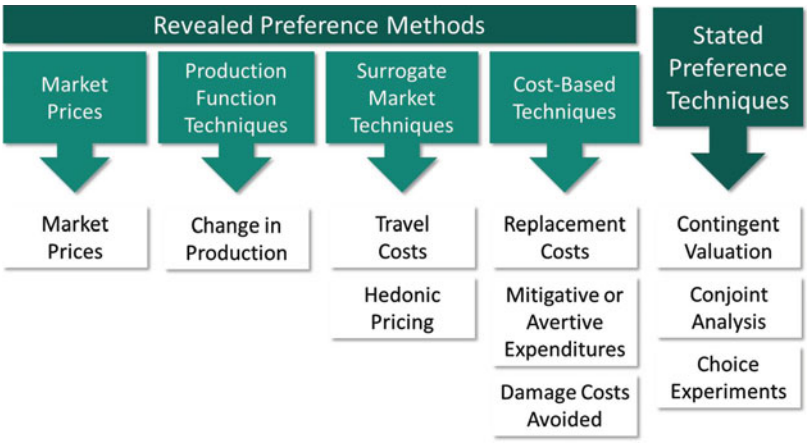

Fig. 2 Commonly used wetland valuation techniques

price: what it costs to buy or is worth to sell. Wetland goods and services, however very often have no price, are subject to prices that are highly distorted or have characteristics of public goods which mean that they are not adequately allocated or priced by the free market. Whereas it is relatively easy, for example, to estimate the revenues from a hydropower scheme or the returns to a fishing enterprise just by looking at the market prices involved, it is virtually impossible to carry out a comparable calculation for wetland water flow and water quality regulation services or for the provision of natural habitat for fish breeding and nursery. For these reasons, many wetland values cannot be calculated accurately via market prices.

Parallel to the advances made in the definition and conceptualization of TEV, techniques for quantifying environmental values and expressing them in monetary terms have also evolved over the last decades. Today a wide range of methods are available, and used, for valuing wetland benefits which move beyond the use of direct market prices (Barbier 1994; see Fig. 2). These include approaches which relate changes in the quality or quantity of ecosystem goods and services to changes in the output of a marketed good or service ("production function" techniques), look at the ways in which the value of ecosystem goods and services are reflected indirectly in people's expenditures or in the prices of other market goods and services ("surrogate market" techniques), assess the market trade-offs or costs avoided of maintaining ecosystems for their goods and services ("cost-based" techniques), or ask consumers directly how they value ecosystems ("stated preference" techniques).

Reflecting these methodological innovations, there is today a growing body of literature on the valuation of wetland ecosystem services (see, e.g., Barbier et al. 1997; Emerton and Bos 2004; Ledoux 2004; de Groot et al. 2006). There are also a large number of published studies on the value of particular wetland sites, services, and benefits across the world (see, e.g., Brouwer et al. 1999; Woodward

and Wui 2001; Schuyt and Brander 2004; Emerton 2005; Brander et al. 2006; Pascual and Muradian 2010).

Future Challenges

New adaptations of economic concepts, methods, and models have enabled wetland values to be much more easily and accurately expressed and have yielded important information and insights. Yet, despite the steps forward that have been made in calculating and articulating the value of wetland goods and services, a major challenge remains – to ensure that the results of these studies, and the figures they generate, are actually fed into decision-making processes and used to influence development agendas.

However high the value of wetlands is demonstrated to be in theory, this has little meaning unless it actually translates into changes in real-world policy and practice. The better understanding and more accurate quantification of the economic value of wetlands is still reflected weakly in the policies, markets, and prices which determine the decisions faced and trade-offs reached by policy-makers, investors, producers, and consumers (Finlayson et al. 2005). While much more is now known and understood about the economic benefit of wetland services and the economic costs of their degradation and loss, these values are only just starting to be captured and internalized in the private and public decisions that are made in the real world (TEEB 2010).

References

Barbier E. Valuing environmental functions: tropical wetlands. Land Econ. 1994;70:155–73.

Barbier E, Acreman M, Knowler D. Economic valuation of wetlands: a guide for policy makers and planners. Gland: Ramsar Convention Bureau; 1997.

Bateman I, Lovett A, Brainard J. Applied environmental economics. Cambridge: Cambridge University Press; 2003.

Brander LM, Florax R, Vermaat JE. The empirics of wetland valuation: a comprehensive summary and a meta-analysis of the literature. Environ Resour Econ. 2006;33:223–50.

Brouwer R, Langford L, Bateman L, Turner R. A meta-analysis of wetland contingent valuation studies. Reg Environ Chang. 1999;1:47–57.

de Groot R, Stuip M, Finlayson M, Davidson N. Valuing wetlands: guidance for valuing the benefits derived from wetland ecosystem services. Gland: Ramsar Bureau Secretariat; 2006.

Emerton L, editor. Values and rewards: counting and capturing ecosystem water services for sustainable development, Water, nature and economics technical paper No. 1. Gland: IUCN; 2005.

Emerton L, Bos E. Value. Counting ecosystems as an economic part of water infrastructure. Gland: IUCN; 2004.

Finlayson CM, D'Cruz R, Davidson NC. Ecosystems and human well-being: wetlands and water. Synthesis. Millennium ecosystem assessment. Washington, DC: World Resources Institute; 2005.

Ledoux L. Wetland valuation: state of the art and opportunities for further development, Working paper PA 04-01. London: CSERGE; 2004.

OECD. Total economic value. In: OECD, editor. Cost-benefit analysis and the environment: recent developments. Paris: OECD; 2006.
Pascual U, Muradian R. The economics of valuing ecosystem services and biodiversity. In: Kumar P, editor. The economics of ecosystems and biodiversity: ecological and economic foundations. London/Washington: Earthscan; 2010.
Pearce D. Economic values and the natural world. London: Earthscan; 1993.
Pearce D, Markandya A, Barbier E. Blueprint for a green economy. London: Earthscan; 1989.
Schuyt K, Brander L. The economic values of the world's wetlands. Gland: WWF International; 2004.
TEEB. The economics of ecosystems and biodiversity: mainstreaming the economics of nature: a synthesis of the approach, conclusions and recommendations of TEEB. Nairobi: United Nations Environment Programme; 2010.
Woodward R, Wui Y. The economic value of wetland services: a meta-analysis. Ecol Econ. 2001;7:257–70.