

Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



ELSEVIER

Journal of Environmental Management 89 (2008) 146–154

 Journal of
Environmental
Management

www.elsevier.com/locate/jenvman

Thoughts concerning the economic valuation of landscapes

Peter V. Schaeffer*

Division of Resource Management, West Virginia University, P.O. Box 6108, Morgantown, WV 26506-6108, USA

Received 21 December 2005; received in revised form 14 May 2007; accepted 17 May 2007

Available online 4 September 2007

Abstract

The incorporation of economic thinking into the valuation of landscapes is still relatively new. It is an approach that yields valuable new insights and can help with prioritizing the use of scarce resources to improve and/or preserve landscapes. This paper explores and discusses the uses and limitations of economic valuation of landscapes from market failure, policy process, and theoretical and philosophical perspectives.

© 2007 Elsevier Ltd. All rights reserved.

Keywords: Non-market valuation; Market failure; Rationality; Externalities; Allocation efficiency; Amenities; Open space; Land use

1. Introduction

Landscape architects and planners are increasingly using tools from economics to assess the value of and inform decision makers about land and its resources. In this process, to do their part well, they have to understand not only the properties of economic non-market valuation methods, but also their theoretical and philosophical foundations because they determine their limitations. An understanding of the foundations is also important for comparing alternative approaches and understanding and interpreting results. We are interested in economic valuation because scarce resources force us to choose or compromise between competing ends and economic valuation is well suited for assessing trade-offs among feasible alternatives and setting priorities.

Economic non-market valuation estimates often serve as inputs in policy processes designed to allocate land resources efficiently, whereas competitive markets rely on prices to accomplish this task. Market prices are attractive measures of the value of resources because they are usually readily available and, if certain conditions are met, have desirable characteristics. Specifically, competitive market prices send signals about scarcity to suppliers and consumers so that the eventual allocation of resources

among competing uses and users is a Pareto optimal outcome. Such an allocation cannot be changed to make someone better off without causing harm to someone else. An allocation that does not satisfy this criterion does not make the best possible use of available resources and is socially inefficient or wasteful. This explains economists' interest in finding ways to achieve Pareto optimal outcomes or, put differently, their interest in allocation efficiency.

Although market prices can help bring about Pareto optimal outcomes, they fail to do so under the following circumstances: (1) The market for a resource is not competitive, (2) a resource has the characteristics of a public good or a common pool good,¹ or (3) the market for a resource does not exist. These circumstances are referred to as market failures. Economists have developed a number of tools to deal with instances of such failures, which include economic non-market valuation.

The purpose of this paper is to provide background in three areas. (1) Because economic non-market valuation is applied almost exclusively because of market failure, we look at major reasons for market failure. (2) Since value estimates often serve as inputs into policy, we comment on

¹A pure public good has non-rival and non-exclusion characteristics, that is, once it is produced, one person's consumption of the good does not diminish its availability to others. The lighthouse is a classic example of a public good. A common pool good has only non-exclusion characteristics, that is, it is too expensive or it is against the law to exclude others from the good.

*Tel.: +1 304 293 4832x4459; fax: +1 304 293 3752.

E-mail address: Peter.Schaeffer@mail.wvu.edu

the policy process. (3) Finally, we discuss aspects of the theoretical and philosophical background related to the application of economic non-market valuation methods.

Because of space limitations, this article will not focus on a specific method and for information about specific economic non-market valuation methods and their applications we recommend King and Mazzota, with the assistance of Markowitz (not dated).² Many other excellent surveys and reviews of the economic non-market valuation literature exist, and the following references provide entry points: Freeman III (2003), Peterson et al. (1988), and Kopp and Smith (1993). Mitchell and Carson (1989) present a thorough explanation of the contingent valuation method (CVM), which has emerged as one of the most popular approaches for assessing aesthetic resources. CVM is a direct method, that is, it asks individuals directly for their values of a resource. By contrast, the travel cost model (TCM) is an indirect method (revealed preferences) that relies on observing how individuals behave to draw conclusions about their valuations of amenities. Shaw (2005) provides a non-technical review of TCM. For practical guidelines for preparing analyses, see US Environmental Protection Agency (2000), and for a critique of these guidelines, see Knetsch (2005).

The remainder of this article is organized as follows. In Section 2 we define property rights, analyze their central role in determining socially optimal land use outcomes, and explain why and how poorly defined property rights can cause market failure. Section 3 is a discussion of the possible policy uses of economic non-market valuation methods and introduces two pragmatic criteria to help decide how to apply such methods. Then, in Section 4, distinguishing between theoretical and philosophical issues, we look at possible limitations that may prevent the use of economic non-market valuation tools. The last section presents conclusions.

2. The importance of property rights and other institutional factors

Without market failure there would be no need for economic non-market valuation methods.³ Because market failure is often caused by missing or incomplete property rights, we focus on their role for the functioning of markets (Barzel, 1989; Libecap, 1989). Property rights consist of the three distinct rights to (1) exclude others from one's property, (2) transfer all or part of one's property, permanently (sale, trade, gift) or temporarily (rent, lease, lend), and (3) all benefits that accrue from owning the

property. When any of these rights is missing we say that we have incomplete property rights. As the following examples show, incomplete property rights explain some of the most important causes of Pareto inefficient land and other resource use outcomes.

In western societies property rights are usually well defined, and for most types of property the owners alone decide their use. Land is different, however, in that government significantly influences land use decisions. Use rights in land are usually constrained by zoning, environmental, and safety laws and regulations because land uses can have significant effects on others besides the land owner.

Fischel (1985) has interpreted zoning as a publicly held property right. It is an example of an incomplete property right, however, because the government is not legally permitted to transfer the right to regulate land uses. The resulting separation of the benefits from the costs of regulation frequently causes Pareto inefficient land use outcomes (Fischel, 1985, 2000, 2004). Consider the example of community residents who are enjoying open space amenities of farmland. They may oppose that land's development since they currently receive, at no charge to them, the benefits of having open space close to where they live, which may also enhance the market value of their homes. Furthermore, if the proposed development does not generate new tax revenues sufficient to at least cover the required additional local government services, then current residents and real estate property owners have to make up the difference through increased taxes paid by them. Thus, residents who oppose the development act to protect their interests. The problem is that such pursuits of self-interest can result in a smaller supply of developments than is socially desirable and/or their construction in suboptimal locations.

To illustrate how the outcome might differ if zoning rights could be traded, assume that community residents would lose \$1 million if the development occurred. If the developer finds it cheaper to pay current residents at least \$1 million rather than build elsewhere, then the benefits of the site exceed those of any available alternative and the development would increase society's welfare. Alternatively, the refusal to pay \$1 million would demonstrate that the site's benefits are insufficient to compensate the losses suffered by current residents and therefore lower total social welfare.

Sometimes property owners may find it legally impossible or otherwise infeasible (e.g., because of high transaction costs) to obtain all returns, or be held responsible for all costs, generated by their efforts. Cases of positive (owner does not receive all returns) externalities result in underinvestment relative to the socially optimal level and negative (owner does not bear all costs) externalities result in overinvestment. Occasionally the problem can be solved by creating a market for the externality. The purchase of development rights (PDR) to preserve open space amenities is an example of the creation of a market to solve a

²Their review discusses the range of common approaches without getting embroiled in technical details. They consider the advantages and disadvantages of each method for particular purposes and their article is therefore a particularly useful resource for scholars in the early stages of exploring the use of economic non-market valuation methods.

³However, the absence of market failure does not address the argument of those who oppose economic valuation. Such critics may therefore still argue for non-economic, non-market valuation methods.

social problem (externality). For a short history of PDRs in the United States see [Buckland \(1987\)](#). In the United States PDRs have also become a relatively popular tool for farmland preservation,⁴ (e.g., [Daniels, 1991](#); [Daniels and Bowers, 1997](#); [Steiner, 1999](#)). However, high transaction costs usually prevent the establishment of markets for externalities and the competing interests of owners of different properties may require government regulation and/or a court decision to resolve them.

[Coase's \(1960\)](#) framing of such issues as “the problem of social costs” ranks among the most influential contributions to applied economics and alerted us to the importance of property rights. In his celebrated contribution he showed that (1) if property rights are completely defined, (2) if the originator of the externality can be identified, and (3) if the cause and effect of the externality are certain, then externalities will not be a problem because they would be compensated, provided that (4) the transaction costs of doing so are not prohibitive.

Consider the case of a view. If the four conditions hold and a builder who proposes a project that would impact the view were liable for damages, then the builder would either build so that there is no impact or offer compensation. If paying compensation makes building unprofitable, the builder would move the project elsewhere or quit.

What if the builder were not liable for damages? If [Coase's](#) four conditions are met, then those whose view would be affected will either have to accept the loss, pay to alleviate the impact of the new building, or buy out the developer who will then either quit or build elsewhere.⁵ Since the cost of remedy does not depend on who pays, the most cost effective option and therefore the outcome will be Pareto optimal and the same in either case.

However, this result, known as [Coase's Theorem](#), holds only if the assignment of liability (that is, of rights) has no significant wealth effect. If the law holds the agent who causes the externality liable, the outcome depends on the “willingness-to-accept” (WTA) of those affected. The WTA is the minimum they would have to be paid to accept the environmental loss. Alternatively, if the agent is not liable the “willingness-to-pay” (WTP) determines the outcome. The WTP is the most that those who are adversely affected are willing to pay to avoid the environmental loss (of the view).

WTA and WTP should be equal. To see this even more clearly, consider a numerical example. Assume that the builder wants to build a new house which would block the view of one home owner. He offers \$50,000 in compensation, which the home owner rejects because she believes that the property value would be diminished by more than that amount. Rather than offering more, the builder

changes the plans and builds the new house in such a way that home owner's view is not impacted. This means that the change of plans either reduced the value or increased the cost of the new house by at most \$50,000. Otherwise the builder would have to offer more compensation as the cheaper alternative. Hence, if the situation had been different and the home owner had no legal rights to the view, then, if she were a skilled negotiator, she should be able to get the builder to change his plans for about \$50,000. In either case, although the wealth effects are clearly different, the eventual outcome is Pareto optimal.

The distinction between WTA and WTP is critical in applications of CVM. The [US Environmental Protection Agency \(2000\)](#) suggests substituting WTP for WTA, based on the assumption that the two measures will be close in practice (see [Knetsch, 2005](#) for a critique). The measures are rarely equal in practice, however, or even close, because of reference dependence and endowment effects ([Kahneman and Sugden, 2005](#); [Knetsch, 2005](#)). While the wealth (endowment) effect can be important, what is more important is that individuals treat losses differently from gains (e.g., [McFadden, 1999](#); [Kahneman and Sugden, 2005](#)). This results in violations of underlying assumptions about the economic rationality of economic agents that underlie economic models. For those who are interested in this literature, we recommend [Simon \(1986\)](#) which contains an excellent discussion of the different meaning of rationality in economics and psychology, respectively. It is a useful background for an understanding of the literature.

In practice, endowment and reference effects significantly affect outcomes and the values obtained using WTP are smaller than those using WTA. This has led to the recommendation that WTP should be used as the more conservative measure. [Alheim and Bucholz \(2000\)](#) present a theoretical argument against this practice and conclude that a preference for WTP is likely to result in the systematic underestimation of environmental improvements and amenities (see also [Knetsch, 2005](#)).⁶ They recommend that the choice of WTA vs. WTP should be dictated by the political and socio-economic circumstances of each case. We agree, and in many instances WTP is the preferred measure. For example, if we want to elicit information to charge a fee for a currently free amenity, WTP is more pertinent than WTA. Second, since WTP yields lower values, the eventual policy recommendation is more likely to overcome possible political resistance. On the other hand, WTP has the disadvantage of eliciting more protest responses. Such responses are usually in the form of zero bids and/or non-responses and we often do not know

⁴Farmland preservation, particularly at the urban–rural fringe, tends to generate externalities.

⁵In resort towns, where views tend to be particularly highly valued, the author has witnessed several instances of home owners paying someone who was planning to build a home that would have blocked their view to alter their plans to minimize the impact.

⁶Part of the reason is that the two measures do not exactly measure the same thing. In the example given above, WTA measures the amount of money required for the homeowner to regain her initial utility if she loses her view. The reference point is her initial state with the view intact. By contrast, the WTP is defined as the amount of money that she would be willing to pay to avoid the loss of the view. The reference point is the state with the view lost, even if the loss can be avoided ([Knetsch, 2005](#)).

if they are true zero valuations or protest votes (Jorgensen et al., 1999) and are therefore difficult or impossible to interpret.

Sometimes institutional arrangements also create incomplete property rights and thus contribute to inefficiencies. For example, in West Virginia the Division of Forestry (DOF) is responsible for forest management, while the Division of Natural Resources (DNR) is in charge of wildlife management. The DNR derives revenues from selling hunting licenses and therefore benefits from maintaining deer herds that attract hunters. The negative impact of large herds on reforestation may not be given full consideration because this cost is born by the DOF and forest owners. Thus, the separation of benefits and costs may result in socially inefficient deer herd management. A recent news article describes another institutional problem resulting in land use inefficiencies in conjunction with development near national forest and park lands. The developments increase the losses from fires, but the federal government, which has no voice in determining the size and nature of, or choice of materials in, these developments, has been paying for the costs of fighting the fires (Johnson, 2007). Thus, sometimes we can deal with market failure either by changing institutional responsibilities so as to align benefits with costs to avoid externalities or by using non-market estimates of the social value of a resource in conjunction with policy measures to achieve the same outcome.

3. Economic non-market valuation and policy considerations

3.1. Policy applications of economic non-market valuation

In principle, economic non-market valuation can be used whenever markets do not exist or when significant externalities distort the usefulness of prices as signals for the allocation of scarce resources. In practice, they are mostly used when markets fail to form. There are two general reasons for estimating dollar values when markets fail. First, governments or non-governmental organizations may want to determine priorities for projects, such as the acquisition of land or rights in land or environmental improvements.

Second, market prices signal the relative scarcity of a commodity. When there is no market to serve this function and something is available free of charge, there is a tendency to underestimate its value. This in turn can lead to underinvestment into and/or overuse of the commodity (Hardin, 1968). The purpose of using non-market valuation techniques in such instances is to make the public and government officials aware of the potentially significant value of and/or to determine the price to be charged for

- recreational activities on public lands for which no fee is currently charged or the fee does not reflect the activities' value;
- recreational activities on public lands which are being considered for alternative uses;

- business activities on public lands for which no fee is charged or the fee does not reflect the activities' value;
- the protection provided by a forest of built-up areas against avalanches;
- a beautiful view that is being threatened by development; and/or
- ecological services provided by land for which no fee is or can be charged.

This is not a complete list and only serves to illustrate types of potential applications. Note that while for the above purposes values are needed, for others purposes rankings to establish priorities might be sufficient.

3.2. Two pragmatic criteria for the application of non-market valuation

Non-market valuation methods are often inputs into policy making for better land use decisions. If the decision is to occur within a democratic process, then the method should satisfy the following two pragmatic criteria. The method(s) used to estimate a dollar value should (1) yield persuasive results and (2) be based on reliable information.

3.2.1. Persuasive results

The best estimates of the value of land or a landscape may be ignored if citizens, politicians, and other decision makers do not find them persuasive (see Steinitz, 2005 for an application of this criterion). The bigger the potential impact of a decision, and the more difficult it is to reverse the decision, the less decision makers should rely on estimates they cannot explain and defend, or they will effectively leave the decision to experts who have no public mandate and are not held accountable. The need for accountability to the public is implied, for example, by the code of ethics of the American Institute of Planners (American Planning Association, 2005).

The proposed solution is to supplement non-intuitive estimates with values obtained using intuitive approaches that can serve as reference points. For example, Lange and Schaeffer (2001) compared the prices charged for and occupancy rates of rooms in the same hotels, identical except for their views. Using simple discounting, they estimated how much the hotel gained from having a side with a great view, in one case the river and old city and the mountains in the background, and in the other case the lake with the mountain panorama as a backdrop. The method can be easily explained and there is a good chance that lay persons may have had comparable experiences while vacationing at the beach or in the mountains. Those who ultimately decide the fate of land or amenities will be more ready to accept a value estimate they do not intuitively understand if it is supplemented by intuitive value information that supports it.

One of the advantages of CVM is also that it is easy to explain and understand (Shaw, 2005). By contrast, Shaw argues, indirect valuation methods such as TCM are more

difficult to explain and this may be one of the reasons why they are not used more frequently.

3.2.2. Reliable information

Deciding how much to ask or pay for something can be a daunting task if the commodity is complex, expensive and if the prospective seller and/or buyer has scant previous experience. Most home sellers and buyers are in this situation. Because the value of a home depends on a variety of factors, sellers and buyers usually work with real estate professionals to advise them. Lenders may require an inspection before they issue a mortgage to protect their investment, as well. Buyers and sellers are willing to pay for information to reduce their risks because the high price of real estate makes even small percentage errors costly.

Landscapes are complex systems and not easily understood.⁷ The results of the first gap analysis, conducted in Hawaii in the 1980s to protect these islands' many endangered bird species, illustrate how easily even experts can err. Gap analysis is a systematic approach based on overlay mapping (see McHarg, 1967/1992) for assessing land areas (for a description of gap analysis see USGS, 2004). The purpose of the Hawaii study was to identify areas that provide valuable habitats for several endangered species, since setting aside such areas would yield protection on the least amount of land. When the areas identified through the gap analysis were compared to areas previously set aside, the overlap was distressingly small. Less than 10% of the ranges of the endangered forest birds were included in the protected areas (Scott et al., 1987). A recent study by Corry and Nassauer (2005) found that even a systematic approach may not result in the reliable evaluation of ecological consequences for small mammal habitat.

Complexity may therefore limit the reliability of some non-market valuation techniques, particularly when we consider the value of whole systems. When even the term used to designate a system is ambiguous, as for example in "landscape" (for a discussion of the importance of language in planning see Guttenberg, 1993), then laypersons may not provide reliable estimates. Complexity may thus determine the method or methods to be used and the target population (experts or citizens).

For democratic decision-making it is less important who provides the information than who makes the decision, as long as the decision-maker can evaluate the information. Thus, both reliable information and reference points are important to make estimates persuasive and understandable.

This criterion may limit the applicability of some economic non-market evaluation methods. For example, Lazo et al. (1992) argue that CVM is better suited to the estimation of environmental use than non-use values since the knowledge of the respondents about the latter could be

too limited to provide meaningful responses. Fortunately, Lazo et al. (1992) also discuss ways to mitigate the problem. Without mitigation, the CVM results for non-use values might be too unreliable.

4. Issues and limitations

In the previous sections we discussed technical issues that may limit applications of economic non-market valuation methods. In this section we consider limitations to the use of economic valuation that stem from either (1) theoretical or (2) philosophical issues. In addition, (3) scarcity of resources may render expensive economic analysis socially suboptimal.

4.1. Theoretical issues

A global Pareto optimum represents an ideal that is achieved if all markets are in a competitive equilibrium. Since reality always falls short of this ideal, a global Pareto optimum is unattainable. If some markets are not competitive or not in equilibrium, will maintaining a competitive equilibrium in all other markets result in the second-best possible outcome for society? In their General Theory of the Second Best, Lipsey and Lancaster (1957) answered this question in the negative. Thus, pursuing a policy that includes estimated market values to address market failures does not guarantee a socially superior outcome than might have been obtained by using an alternative approach. Unfortunately, other than this negative result, the General Theory of the Second Best provides no guidance at all (Donohue, 1998; Boadway, 1999).

The lack of guidance is one likely reason why we do not very often appeal to the General Theory of the Second Best, but continue to rely on markets, which we know how to organize, which tend to make efficient use of relevant information (prices as signals), and which yield local Pareto optima in individual markets. Market approaches also enjoy broad political support, very likely because they are compatible with individualism and democracy (Hayek, 1944).

A second critique is based on the nature of rationality used in most current economic analysis, a critique forcefully put forward in Simon (1986). He criticizes neoclassical economics for "...its silence about the content of goals and values..." (Simon, 1986, p. S210), a sentiment shared by Sen (1987). Simon also questions the validity of the assumption of objective rationality with respect to present and future that is implicit in the economic approach (see also McFadden, 1999). By contrast, other social science disciplines allow for limited information processing capabilities of individuals and the roles of non-rational factors such as emotions, motivations, and sensory stimuli in influencing preferences and, hence, choices made. In economics "...rationality is viewed in terms of the choices it produces", while in other social sciences "...it is

⁷Jude et al.'s (2005) work demonstrates the difficulty of asking laypersons for an assessment of multiple changes in a landscape.

viewed in terms of the processes it employs” (Simon, 1986, p. S210), which he refers to as substantive rationality and procedural rationality, respectively. In other words, economics considers a choice rational if it results in the desired outcome. The process by which this happens is usually ignored. Other social sciences also consider the process that leads to the desired outcomes. Thus, indirectly, Simon’s (1986) critique is a warning against a “the end justifies the means” approach to public policy making. McFadden (1999) provides a more recent review of the meaning of rationality. His tentative conclusion is that seeking to measure stable preferences, the foundation of much of non-market valuation methods, is illusory. Instead, he suggests that consumers learn in an evolutionary and adaptive manner. He bases his conclusions on the growing research in experimental economics that shows human behaviors that are inconsistent with predictions based on established economic theory.

4.2. Philosophical issues

Nelson (2001) provides a penetrating analysis of the ethics implicit in modern economics and the pursuit of efficient outcomes through markets. While society generally supports market approaches, there are also many instances where society uses other mechanisms to make decisions about the use and allocation of goods and services. Some commodities are considered so important that all citizens should have access to and/or be able to participate in decisions about them. Markets allocate “votes” relative to how much a participant is willing and able to pay and the outcome therefore depends on the initial allocation of assets among individuals and their earning capacity, whereas political participation in a democratic society is independent of income or wealth. Even if market allocations are Pareto efficient, they may violate our sense of what is fair and equitable. While efficiency is important, it may not be the only goal and will sometimes be trumped by equity considerations. That the individualism represented by the use of markets may sometimes have to be subordinated to considerations for the common good was recognized by Adam Smith (Sen, 1987; see Myers, 1983 for a derivation of the philosophical origins of Smith’s ideas). Modern economics has focused on Pareto efficiency and shied away from making the inter-personal comparisons necessary to deal with equity. Sen (1987) considers this to be a weakness of modern economic theory, a critique that is developed comprehensively by Hinkelammert (2001, particularly in Chapter VI).

Roth (1999) is also critical of the “consequence philosophy” underlying modern welfare economics, which also forms the philosophical basis of economic non-market valuation. Instead of spending so much effort on finding values that enhance economic efficiency, he argues for more effort on building institutions that help society achieve its multiple goals (Roth, 1999). His argument

harks back to an idea we briefly mentioned at the end of Section 2.

Equity, health, and safety concerns are among the reasons why society limits the use of markets. However, society’s standards of what can and cannot be legally traded in markets are not constant. Cocaine could at one time be freely traded while alcohol was outlawed in the United States from 1920 until 1933, and (sin) taxes to discourage consumption of goods such as tobacco and alcohol change frequently.

Firey (1945) persuasively argued that non-economic factors such as “sentiment and symbolism” influence land use outcomes. Because of their history and significance, society considers some lands as sacred and, in some cases, off limits to economic considerations altogether. Hence, some lands remain undeveloped or underdeveloped, even though their economic value would be greater otherwise.

The view of landscape as commodity is particularly well captured in the following statement by Mitchell (1994): “As a medium for expressing value, it⁸ has a semiotic structure rather like that of money, functioning as a special sort of commodity that plays a unique symbolic role in the system of exchange-value. Like money, landscape is good for nothing as a use-value, while serving as a theoretically limitless symbol of value at some other level. At the most basic, vulgar level, the value of landscape expresses itself in a specific price: the added cost of a beautiful view in real estate value; the price of a plane ticket to the Rockies, Hawaii, the Alps, or New Zealand. Landscape is a marketable commodity to be presented and re-presented in “packaged tours,” an object to be purchased, consumed, and even brought home in the form of souvenirs such as postcards and photo albums” (Mitchell, 1994, pp. 14–15).

The economic valuation of landscapes is based on utilitarian philosophy as the basis of society’s relationship with the environment, with economic efficiency as the criterion for what uses are best. This tradition builds on Locke’s liberal philosophy and views private property rights as the foundation of democracy and individual freedom (Barton, 1983; Krueckeberg, 1995). This philosophical underpinning is not universally accepted. Thus, whereas Firey’s “sentiment and value” could be seen as competing in a utilitarian framework with monetary factors to determine land use outcomes, Aldo Leopold rejects the treatment of land as a commodity altogether. “Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect” (Leopold, 1966, pp. xvii–xix). A non-utilitarian approach to nature is also part of the traditional American Indian land ethic. “Central to most Indian religions and ethical systems was the idea that humans and other forms of life constituted a single society” (Nash, 1989, p. 117). Other non-utilitarian

⁸Landscape is referred by “it”.

approaches are based on, for example, human rights and animal rights (Barton, 1983; Wenz, 1988, particularly chapters 6 and 7). Finally, Hay (1989) argues against the use of cost-benefit analysis to decide public policy issues because, in his opinion, the underlying values are incompatible with Christian beliefs. Thus, there are different attitudes represented in our societies and even within individuals (Sober, 1995), and they do not remain constant. Which attitudes and values most influence a decision therefore depends on the issue or issues, participants, decision-making process, place, and time. This becomes a practical consideration when we try to understand protest responses in CVM questionnaires. If a respondent rejects the philosophical foundations of CVM and refuses to value environmental resources at all, how do we count or otherwise deal with the (non)response?⁹

4.3. Scarcity

Since economic analysis is a scarce resource, estimating the market value of a landscape is the best use of this resource only if outcomes are sufficiently superior to outcomes based on a cheaper “quick-and-dirty” analysis to compensate for the additional resource used (Leman and Nelson, 1981).

5. Conclusions

Although there is often strong support for economic valuation approaches, the Theory of the Second Best provides a justification for the use of alternatives if society is dissatisfied with the results of the former. Therefore, the appropriateness of an approach or method should not be determined only by how well it meets some criterion of economic or ecological efficiency, but by what it contributes toward achieving society's goals and objectives, in general.

In unregulated markets, individual economic actors, that is, persons and organizations, set their own goals and objectives and express them through their demand and supply. When there are no externalities, the final outcome is socially efficient, making the absence of public discussion irrelevant. In many land use decisions, however, externalities are common, requiring collective action to overcome some of the problems created by them. We must therefore together prioritize goals, depending on the benefits and costs of reaching them. The focus on goals and objectives alerts us to the fact that subjective values often determine what we consider desirable outcomes. Since experience demonstrates that individually and collectively held values can change over time, we should proceed to limit future regret. This is particularly important if decisions have irreversible outcomes (Pearce, 1983; Pindyck, 1991), as is

often the case when a decision impacts a large area and/or historically, culturally, or environmentally significant sites.

Governments are often accused of being inefficient providers of goods and services, and collective ownership is similarly thought to lead to inefficient outcomes (Hardin, 1968). However, we should avoid using economic approaches for ideological reasons and judge each case on its merits. While it is true that collectively held resources may be used inefficiently and that privatization may contribute to their preservation (Demsetz, 1967), Ostrom (1990) has shown that inefficiency of collective ownership is not inevitable, provided certain conditions are met, and Barton (1983) argues that democratic control over land use has benefits that may justify some loss in economic efficiency.

Finally, in the pursuit of its many goals and objectives, society encounters policy resource constraints, and therefore Tinbergen (1952) cautions against ambitions that exceed society's capabilities. In common sense terms, the principle named after him says that the number of goals and objectives must be commensurate with the means dedicated to achieving them. Expressed more formally, Tinbergen's Principle¹⁰ states that to achieve a given number of independent goals, there must be at least the same number of independent policy instruments. Economic non-market valuation estimates can help create new land use policy instruments, and thus enhance society's capability of dealing with land use policy. For this reason alone, economic non-market valuation approaches deserve to be studied and incorporated into our repertoire of policy tools. As long as we respect their shortcomings and limits, they should advance policy making.

Acknowledgments

Partial research support from the West Virginia Agricultural and Forestry Experiment Station is gratefully acknowledged. Comments by Dale Colyer, Gerard D'Souza, Markus Gmünder, Hala Nassar, Tim Phipps, and Michael Strager have resulted in improvements in the content and organization of this paper. I have also benefited from comments by referees of this journal and ideas obtained at the conference “Our Shared Landscape: Integrating Ecological, Socio-economic and Aesthetic Aspects in Landscape Planning and Management,” held in Ascona, Switzerland, May 2–6, 2005. The usual caveat applies.

References

- Alheim, M., Bucholz, W., 2000. WTP or WTA—is that the question? Reflections on the difference between “Willingness to Pay” and “Willingness to Accept”. *Zeitschrift für Umweltpolitik und Umweltrecht* 23, 253–271.

⁹For some guidance, dealing with selection bias only, see Strazzer et al. (2003). They do not deal with the more profound underlying philosophical issues.

¹⁰Tinbergen's Principle bears some analogy to a system of equations that can only be solved if there are at least as many independent equations (goals) as there are variables (policy variables or tools).

- American Planning Association, 2005. AICP code of ethics and professional conduct. <<http://www.planning.org/ethics/conduct.html>> (Accessed January 2, 2007).
- Barton, S.E., 1983. Property right and human rights: efficiency and democracy and criteria for regulatory reform. *Journal of Economic Issues* 27, 915–930.
- Barzel, Y., 1989. *Economic Analysis of Property Rights*. Cambridge University Press, New York.
- Boadway, R., 1999. Le rôle de la théorie de l'optimum du second rang en économie publique. *L'Actualité Économique* 75, 29–65.
- Buckland, J.G., 1987. The history and use of purchase of development rights in the United States. *Landscape and Urban Planning* 14, 237–252.
- Coase, R.H., 1960. The problem of social cost. *Journal of Law and Economics* 3, 1–44.
- Corry, R.C., Nassauer, J.I., 2005. Limitations of using landscape pattern indices to evaluate the ecological consequences of alternative plans and designs. *Landscape and Urban Planning* 72, 265–280.
- Daniels, T., 1991. The purchase of development rights: preserving agricultural land and open space. *Journal of the American Planning Association* 57, 421–431.
- Daniels, T., Bowers, D., 1997. *Holding Our Ground: Protecting American Farms and Farmland*. Island Press, Washington, DC.
- Demsetz, H., 1967. Toward a theory of property rights. *American Economic Review* 57, 347–359.
- Donohue III, J.J., 1998. Some thoughts on law and economics and the general theory of the second best. *Chicago-Kent Law Review* 73, 257–266.
- Fischel, W.A., 1985. *The Economics of Zoning Laws: A Property Rights Approach to American Land Use Controls*. Johns Hopkins University Press, Baltimore.
- Fischel, W.A., 2000. Public goods and property rights: of Coase, Tiebout, and just compensation. Dartmouth College, Hanover, NH: Working Paper 00-19. <<http://www.dartmouth.edu/~wfischel/Papers/00-19.pdf>> (accessed April 22, 2005).
- Fischel, W.A., 2004. An economic history of zoning and a cure for its exclusionary effects. *Urban Studies* 41, 317–340.
- Firey, W., 1945. Sentiment and symbolism as ecological variables. *American Sociological Review* 10, 140–148.
- Freeman III, A.M., 2003. *The Measurement of Environmental and Resource Values. Theory and Methods*. Resources for the Future, Washington, DC.
- Guttenberg, A.Z., 1993. *The Language of Planning. Essays on the Origins and Ends of American Planning Thought*. University of Illinois Press, Urbana and Chicago.
- Hardin, G., 1968. The tragedy of the commons. *Science* 162, 1243–1248.
- Hay, D.A., 1989. *Economics Today: A Christian Critique*. Inter-Varsity Press, Leicester, United Kingdom.
- Hayek, F.A., 1944 renewed 1972. *The Road to Serfdom*. University of Chicago Press, Chicago.
- Hinkelammert, F.J., 2001. *Der Schrei des Subjekts: Vom Welttheater des Johannesevangeliums zu den Hundejahren der Globalisierung*. Luzern, Switzerland: Exodus (originally published in Spanish in 1998).
- Johnson, K., 2007. As costs of wildfires grow, so does a question: who should pay? *The New York Times*, January 3, 2007. <http://www.nytimes.com/2007/01/03/us/03fire.html?_r=2&pagewanted=&oref=slogin> (accessed January 3, 2007).
- Jorgensen, B.S., Syme, G.J., Bishop, B.J., Nancarrow, B.E., 1999. Protest responses in contingent valuation. *Environmental and Resource Economics* 14, 131–150.
- Jude, S., Jones, A., Bateman, I., 2005. Visualization for valuation—investigating the potential role of virtual reality and visualization techniques in the economic valuation of future landscape change. In: Lange, E., Miller, D. (Eds.), *Our Shared Landscape: Integrating Ecological, Socio-economic and Aesthetic Aspects in Landscape Planning and Management*, Proceedings of the Conference held in Ascona, Switzerland, May 2–6. Swiss Federal Institute of Technology, City and Landscape Network, Zurich, Switzerland, pp. 58–59 (Abstracted). <<http://osl.ethz.ch/frames/frameConfInfo.htm>> (accessed February 28, 2007).
- Kahneman, D., Sugden, R., 2005. Experienced utility as a standard of policy evaluation. *Environmental and Resource Economics* 32, 161–181.
- King, D.M., Mazzota, M., with technical assistance from Markowitz, K. J., not dated. *Ecosystem Valuation*. <<http://www.ecosystemvaluation.org/>> site sponsored by the US. Department of Agriculture, Natural Resources Conservation Service, and the National Oceanographic and Atmospheric Administration; accessed September 27, 2006.
- Knetsch, J.L., 2005. Gains, losses, and the US-EPA economic analyses guidelines: a hazardous product? *Environmental and Resource Economics* 32, 91–112.
- Kopp, R.J., Smith, V.K. (Eds.), 1993. *Valuing Natural Assets: The Economics of Natural Resource Damage Assessment*. Resources for the Future, Washington, DC.
- Krueckeberg, D.A., 1995. The difficult character of property. *Journal of the American Planning Association* 63, 301–306.
- Lange, E., Schaeffer, P., 2001. A comment on the market value of a room with a view. *Landscape and Urban Planning* 55, 113–120.
- Lazo, J.K., Schulze, W.D., McClelland, G.H., Doyle, J.K., 1992. Can contingent valuation measure nonuse values? *American Journal of Agricultural Economics* 74, 1126–1132.
- Leman, C.K., Nelson, R.H., 1981. Ten commandments for policy economists. *Journal of Policy Analysis and Management* 1, 97–117.
- Leopold, A., 1966. *A Sand County Almanac*. Ballantine Books, New York (originally published in 1949).
- Libecap, G.D., 1989. *Contracting for Property Rights*. Cambridge University Press, Cambridge.
- Lipsey, R.G., Lancaster, K., 1957. The general theory of the second best. *Review of Economic Studies* 24, 11–33.
- McFadden, D., 1999. Rationality for economists? *Journal of Risk and Uncertainty* 19, 73–105.
- McHarg, I., 1967/1992. *Design with Nature*. Wiley, New York.
- Mitchell, R.C., Carson, R.T., 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Resources for the Future, Washington, DC.
- Mitchell, W.J.T., 1994. Imperial landscape. In: Mitchell, W.J.T. (Ed.), *Landscape and Power*. Chicago University Press, Chicago, pp. 5–34.
- Myers, M.L., 1983. *The Soul of Modern Economic Man. Ideas of Self-Interest: Thomas Hobbes to Adam Smith*. University of Chicago Press, Chicago.
- Nash, R.F., 1989. *The Rights of Nature: A History of Environmental Ethics*. University of Wisconsin Press, Madison.
- Nelson, R.H., 2001. *Economics as Religion: From Samuelson to Chicago and Beyond*. The Pennsylvania State University Press, University Park.
- Ostrom, E., 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, New York.
- Pearce, D., 1983. Ethics, irreversibility, future generations, and the social rate of discount. *International Journal of Environmental Studies* 21, 67–86.
- Peterson, G.L., Driver, B.L., Gregory, R. (Eds.), 1988. *Amenity Resource Valuation: Integrating Economics with other Disciplines*. Venture Publishing, State College, PA.
- Pindyck, R.S., 1991. Irreversibility, uncertainty, and investment. *Journal of Economic Literature* 29, 1110–1148.
- Roth, T.P., 1999. *Ethics, Economics and Freedom: The Failure of Consequentialist Social Welfare Theory*. Ashgate Aldershot, United Kingdom.
- Scott, J.M., Csuti, B., Jacobi, J.D., Estes, J.E., 1987. Species richness: a guide to protecting future biological diversity. *Bio-science* 37, 782–788.
- Sen, A., 1987. *On Ethics and Economics*. Blackwell, Oxford, UK and Cambridge, MA.
- Shaw, W.D., 2005. The road less traveled: revealed preference and using the travel cost model to value environmental changes. *Choices* 20, 183–188.
- Simon, H., 1986. Rationality in psychology and economics. *Journal of Business* 59 (Part 2), S209–S224.

- Sober, E., 1995. Philosophical problems for environmentalism. In: Elliot, R. (Ed.), *Environmental Ethics*. Oxford University Press, Oxford, pp. 226–247.
- Steiner, F., 1999. *The Living Landscape: An Ecological Approach to Landscape Planning*, second ed. McGraw-Hill, New York.
- Steinitz, C., 2005. Alternative futures for La Paz, Baja California Sur, Mexico. In: Lange, E., David Miller, D. (Eds.), *Our Shared Landscape: Integrating Ecological, Socio-economic and Aesthetic Aspects in Landscape Planning and Management*, Proceedings of a Conference held in Ascona, Switzerland, May 2–6. Swiss Federal Institute of Technology, City and Landscape Network, Zurich, Switzerland, p. 108 (Abstracted). <<http://osl.ethz.ch/frames/frameConfInfo.htm>> (accessed February 28, 2007).
- Strazzer, E., Genius, M., Scarpa, R., Hutchinson, G., 2003. The effect of protest of protest votes on the estimates of WTP for use values of recreational sites. *Environmental and Resource Economics* 25, 461–476.
- Tinbergen, J., 1952. *On the Theory of Economic Policy*. Contributions to Economic Analysis, vol. 1. North-Holland, Amsterdam.
- US Environmental Protection Agency, 2000. *Guidelines for Preparing Economic Analyses*. Environmental Protection Agency, Washington, DC.
- USGS, 2004. *Gap Analysis Program History and Overview*. United State Geological Survey. <http://www.gap.uidaho.edu/about/gap_fs2004.pdf> (accessed April 21, 2005).
- Wenz, P.S., 1988. *Environmental Justice*. State University of New York Press, Albany.