

**International Society for Ecological Economics
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**Contemporary Welfare Economics and Ecological
Economics Valuation and Policy**

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1. Introduction

The question of value has been central to economics since its inception as a scientific discipline. The Classical economists thought deeply about the distinction between use value and exchange value and the relationship between human happiness and the market prices of goods and services. With the development of marginal value theory, beginning in the 1870s, the value problem seemed to be solved. The value of something was equal to its marginal utility, that is, to the additional satisfaction derived in consuming one more unit of it. A fundamental relationship in consumer theory is that a consumer maximizing her utility subject to a budget constraint will end up at the point where marginal utility divided by price will be the same for all goods purchased. This is equivalent to maximizing utility subject to a budget constraint. After the marginalist revolution, the valuation problem was reduced to insuring that market prices reflected the "true" social value of the goods and services. Environmental economics became concerned almost exclusively with estimating various kinds of market failure--market power, public goods, and externalities--so that they could be corrected and markets could efficiently allocate society's scarce resources. As welfare economists frame it, the problem with valuing environmental features is that, for the most part, they are not traded in markets. Economists have developed a variety of techniques to place monetary values on environmental features. Most of these, including the widely used contingent valuation method (CVM), are variants of cost benefit analysis, the basic approach of neoclassical environmental economics.

Within the system of neoclassical welfare economics, environmental features are relegated to the realm of ordinary commodities. In this system the environment is treated as a commodity in two senses, as an input to the production process and as a commodity giving utility to consumers.

As environmental valuation techniques became more sophisticated in the 1970s and 1980s, long-neglected but fundamental questions were raised about the nature of human preferences and value. Ecological economists, ecologists, and social philosophers began to question the characterization of value in neoclassical welfare economics and the treatment of the environment as just another commodity. This scepticism has now spread to the mainstream of the economics profession.

When the International Society for Ecological Economics was formed in the late 1980s, its members were by and large alienated from mainstream economics. Building on the work of two heterodox economists, Kenneth Boulding and Nicholas Georgescu-Roegen, ISEE economists began the process of building theoretical alternatives to the self-contained, circular flow

system of neoclassical theory. The focus of early ecological economists was on the production side of the economy and on building economic models that accounted for the biophysical nature of productions. Eventually some ecological economists turned their attention to developing alternatives to the notion of rational economic man and welfarist notions of value. In the 1990s, ecological economists developed models of participatory decision-making to describe economic behaviour as a social process. The progress in developing these alternatives is not surprising. What is surprising, however, is that mainstream theorists have all but abandoned the core of neoclassical theory, the general equilibrium system variously known as Walrasian general equilibrium theory, the new welfare economics, and computable general equilibrium. In the next section I briefly describe the demise of the New Welfare Economics as a result of the dual assault on it from within mainstream theory consisting of (1) the theoretical inconsistency of that system, and (2) the empirical evidence against "rational economic man" from behavioural economics and game theory. The second half of the paper will present some ecological economic alternatives to environmental valuation and policy.

2. The New Welfare Economics in Retrospect

The new welfare economics was a reaction, in the late 1930s, to the "old" welfare economics of Pigou. Building on Pareto, it attempted to construct a welfare economics based on ordinal utility and without relying on interpersonal utility comparisons. Two broad approaches to this task were the potential Pareto Improvement (PPI) approach of Kaldor and Hicks, and the social welfare function approach of Bergson, Samuelson and others.

The notion of Pareto optimality is one of the most venerated concepts in economics. An economic situation is Pareto optimal if no further change can make someone better off without making someone else worse off. If some change in the state of the economy helps at least one person and harms no one, then everyone would agree to it. There is no need to make interpersonal comparisons of individual well-being. Figure 1 shows two utility possibility frontiers. If we are at a point such as X in figure 1, then a move to any point northeast of X, such as X', should be made since both people are made better off. The problem is that such opportunities are rare in real economies. Most economic policies help some people and hurt others. The Kaldor-Hicks PPI principle was meant to expand the scope of economic policy advice by asserting that a change of state was desirable if it was *potentially* possible to make everyone better off. If the magnitude of the gains from moving from one state of the economy to another is greater than the magnitude of the losses, then social welfare is increased by making the move even if no actual compensation is made (Kaldor 1939). This concept is central to cost-benefit analysis of environmental policies (Stavins, Wagner and Wagner 2002).

Soon after the PPI principle was proposed it ran into insurmountable theoretical difficulties. In Figure 1 a movement from X to X' is justified, even though person 2 is made worse off, because from X' it is possible to move to point X'' where both people are better off compared to the starting point X. But Scitovsky (1941) pointed out that if a movement from X to X'' in figure 1 meets the PPI criterion, it might also be possible that a movement from X'' back to X is also be desirable. From point X it is possible to move to X''' where both

people are better off compared to X'' ". This is called "cycling" and it is only one of a number of paradoxes in neoclassical welfare theory. The consensus today among welfare economics theorists is that the attempt to make welfare judgments without resorting to interpersonal comparisons of utility has been a heroic failure (Chipman and Moore 1978, Suzumura 1999).

The social welfare function approach was another attempt to arrive at a global utility maximum without conceding that ethical judgments were necessary. Even under the PPI criterion there is no way to compare two Pareto optimal positions on a grand utility possibilities frontier. The purpose of the social welfare function was to extend the notion of Pareto optimality to a full social ordering. But Arrow demonstrated that it is impossible to construct a Pareto consistent social welfare function that satisfies the conditions of (1) *Pareto consistency* – if everyone prefers x to y then the social preference should be x over y , (2) *universality* – the function should hold no matter what individual preferences are, (3) *independence* – if people change their minds about a third irrelevant alternative z this should not affect the choice between x and y , and (4) *non-dictatorship* – there should not be one person who determines the social welfare function (Feldman 1987).

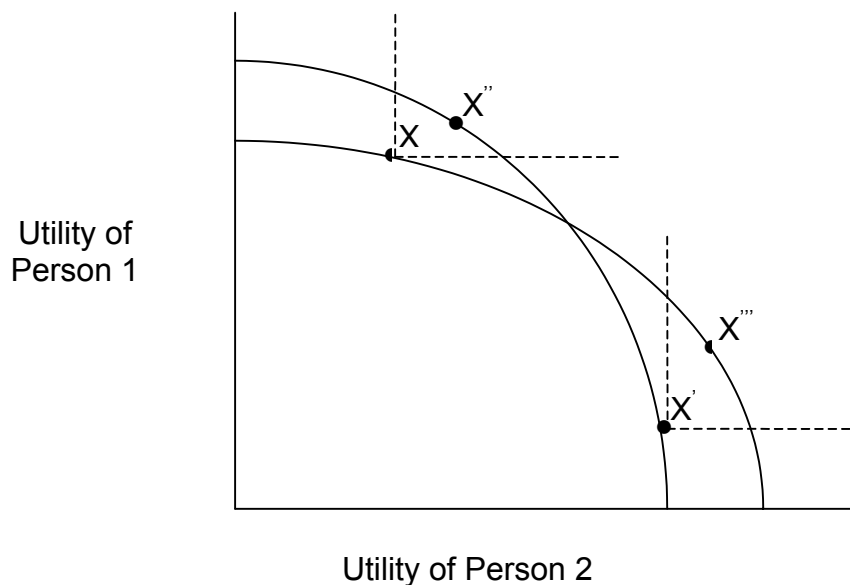


Figure 1. Potential Pareto Improvements and the Scitovsky Paradox

The first problem with welfare-based cost-benefit approach to environmental policy is the insurmountable theoretical difficulties with applying the PPI principle. Without this principle it is impossible to make policy recommendations without resorting to interpersonal utility comparisons. The second problem is the mounting body of empirical evidence against the rational actor model underlying the New Welfare Economics. Recent research shows convincingly that preferences are *endogenous*, that is, they depend on the individual's personal history, interaction with others, and the social context of the individual choice. The relationship between consumption and well-being

is strongly affected by cultural norms. The existence of endogenous preferences confirms the view of human nature held by many ecological economists.

3. Cultural and Economic Behaviour: Support from the Mainstream

Based on advances in mainstream theory, and the decades of work by ecological economists, how can we broaden economic valuation and policy beyond CBA and other market-based criteria? The characteristics of endogenous preferences can offer a guide (Gintis 2000). Two examples of endogenous preferences particularly relevant to the environmental valuation debate are these:

The endowment effect - It seems to be a psychological law that people prefer something they already have to something that do not have (Kahneman and Tversky 1979) The hypothesis that losses from a reference position are systematically valued more than equivalent gains has been verified in numerous experiments. Tests of the endowment effect have shown that it is not due to wealth effects, income disparities, strategic behaviour or transactions costs (Knetch 1989). Preferences depend on the direction of the change, that is, whether people are paid to give up something they have or have to pay to get something they do not have. The psychological model makes good predictions of economic behaviour; the rational actor model does not.

Process regarding preferences - People care about processes as well as outcomes. In environmental policy the process of arriving at a decision may be as important in public acceptance as the actual outcome itself. On the production side studies have shown that people care about how products are made as well as the characteristics of the final product itself (Barham 2002). Game theory experiments show the importance of process and fairness in economic decision-making. In the ultimatum game, a “proposer” is given a sum of money and instructed to share it with a “respondent” who can either accept or reject the offer. Results of the game (mean offers and rejection rates) vary significantly according to the process through which money is obtained and offers are made. Offers are substantially lower if proposers win their position by doing well on a quiz (Hoffman et al. 1994). Rejection rates are much lower if respondents are told that the offers were generated by a computer (Blount 1995). In the prisoner’s dilemma game, defection rates are significantly higher if the game is referred to as the “Wall Street Game” rather than the “Community Game” (Ross and Ward 1996).

Results from these and numerous other studies in game theory, experimental economics, and behavioural economics show that models which do not take into account social processes, such as community norms about fairness, are poor predictors of economic behaviour. If humans do not respond to economic choices according to the rational actor model of the New Welfare Economics, this calls into question not only conventional CBA, but also the efficacy of market-based environmental policies. The assumption underlying market-based policies is that people will consistently and predictably respond to price signals, an assumption called into question by contemporary behavioural economics (Ackerman and Gallagher 2000).

People are reluctant to give up something that they feel is theirs by right. There is a status quo bias. This is related to the finding that people are risk averse and lends support to the notion of a safe minimum standard and the precautionary principle. The safe minimum standard (SMS) approach (Bishop 1978) explicitly recognizes that irreversible environmental damage should be avoided unless the social costs of doing so are “unacceptably high.” The concept is necessarily vague because it does not rely on a single money metric as does CBA. It recognizes that losses should be valued higher than gains, that a great amount of uncertainty is involved in judging the effects of environmental losses, and that there are limits to substituting manufactured goods for environmental resources. The safe minimum standard approach has the potential to take into account “rights based” or deontological values. Such values are widely held as indicated by numerous valuation surveys, and if economists are serious about using preferences as a guide to policy these values should be taken into account in policy decisions. There is some sympathy for an SMS approach among neoclassical environmental economists because of the uncertainty issue.

The endowment effect may be related to the wide-spread existence of lexicographic preferences in that for many people *any* loss of some particular thing may be unacceptable. A large percentage of respondents in CVM surveys exhibit “rights-based” preferences consistent with the endowment effect and lexicographic ordering. Spash (2000, 198) defined a modified lexicographic preference as a case where “individuals attain and maintain a minimum standard of living prior to being prepared to defend other humans, non humans or future generations.” Survey results lend credence to the call for a rights-based approach to environmental policy. There is no reason to think that future generations would be any more willing than we are to have clean air, clean water, and an interesting and varied environment taken away from them forever. The idea of compensating them with something “of equal value” is no longer credible. As Bromley (1998, 238) writes: “Regard for the future through social bequests shifts the analytical problem to a discussion about deciding what, rather than how much, to leave for those who will follow.” A rights-based approach to sustainability moves us away from the welfare notions of tradeoffs and fungibility toward the two interrelated concerns of uniqueness and irreversibility. The question of what to leave also moves us away from marginal analysis and worrying about relative amounts of resources, toward looking at discontinuous changes and total amounts of resources.

The existence of process regarding preferences indicates that people care about means as well as ends. Human preferences include strong feelings about how goods are produced, and about fairness in terms of economic rewards and distribution. The process of decision-making, how decisions are reached, may be as important as the decision itself in public acceptance of policy decisions. And the very process of decision-making shapes preferences. These ideas are extensively discussed in the valuation literature in ecological economics on discursive ethics (O’Hara 1996), deliberative democracy (Jacobs 1997), and stakeholder negotiation (O’Connor 2002). A growing trend is to combine environmental valuation with these various forms of deliberative processes. Some of the approaches use monetary values, as in “deliberative monetary valuation” (DVM) which use

“citizens’ juries” to come up with monetary values for environmental impacts. The DVM method does have the advantage of recognizing that preferences are constructed during the deliberation process.

An important contribution to process-oriented valuation in ecological economics is the use of scenarios to examine the potential impacts of policy proposals. Erickson, Gowdy and Limburg (2003) used an integrated assessment model of economic activity (a social accounting matrix or SAM), a Markov model of land use change, and an index of biological integrity to assess the potential impacts of economic development on biodiversity in the Wappinger Creek watershed, a tributary of the Hudson River. Citizen input was solicited at each stage of the project including the initial construction of the economic scenarios. The final model was used by focus groups to examine the socio-economic and environmental consequences of various economic and land use policy options.

4. Real Behaviour and Sustainability Policy: an example from the Nature Conservancy

Contrary to the New Welfare Economics model, people do not ordinarily choose among a set of possibilities and select the most efficient one based on a careful weighing of costs and benefits. Support for environmental and social policies does not necessarily fall on the most “rational” choice. Models of how human behaviour changes have been proposed in a variety of disciplines, but most rely on the rational actor model of neoclassical welfare economics. They share the idea that individuals decide on a course of action by rationally weighing the costs and benefits of alternatives. A new class of models is challenging this notion by arguing that behavioural changes are driven by “biased cultural transmission” (Henrich 2001). Real world examples of innovative changes in behaviour cannot be explained by models of independent agents maximizing utility. Good predictions can be made, however, using models of biased cultural transmission. By *selectively* imitating respected individuals, people may insure that innovations become established in a community. Whether or not a particular innovation is adopted depends not so much on its “superiority” as determined by cost-benefit calculations, but rather on its conformance with established cultural patterns.

Recognizing the importance of biased cultural transmission can help formulate effective policy. The mission of The Nature Conservancy (TNC) is the preservation of biodiversity. Although TNC policy is certainly not based on academic models of human behaviour, the success of TNC biodiversity preservation efforts illustrates the efficacy of the biased cultural transmission model. TNC efforts to establish biosphere reserves in the South Pacific have relied on the “biased cultural transmission” of a conservation ethic. An illustrative example is TNC efforts to preserve biodiversity on the island of Pohnpei in Micronesia (Geatz 2000). The island’s upland rainforest is being threatened by the cultivation of the *sakau* plant used to make a ceremonial drink. Islanders began to grow sakau in the upland areas after a particularly severe drought in 1983. Cultivation continued in the ecological sensitive area after the drought subsided, and the island’s fragile rainforest highlands were rapidly degraded. The Nature Conservancy decided to intervene in 1993 and after two years of intensive village-to-village education about the danger to the

rainforest and the importance of protecting it, a rainforest protection program was implemented between traditional leaders and the government.

The Pohnpei case not only has practical lessons for biodiversity protection, it is also of great theoretical interest. Traditional economists would explain the movement of individual sakau cultivators into the upland areas as a “tragedy of the commons.” Individuals making rational decisions about the use of “open access” resources end up harming the common good. But the story is not as simple as that. Research in Pohnpei showed that sakau growing in the upland areas was actually *uneconomical*, greater returns could be obtained by putting the same effort into lowland cultivation. But upland growing spread because of misinformation and villagers copying trusted community leaders. The TNC recognized this and turned public opinion by convincing tribal elders—using sophisticated scientific information including aerial photographs—that the upland forests were in danger and that high-quality sakau could be grown in the lowlands. This model of biodiversity protection—through providing scientific information to tribal elders who then convince the local population of the importance of preserving ecosystems—has been successfully implemented in Palau, Borneo, and the Andaman islands.

5. Conclusion

The death of rational economic man calls into question traditional CBA valuation methods, and the obsession of economists with market-based approaches to environmental policy. In spite of valiant attempts to build a positive, value-free science, neoclassical welfare economics remains an ethical and ideological system. But contemporary work by neoclassical theorists shows that the question of environmental value cannot be reduced to a “positive”, value-free science. Mainstream theorists now reject the notion of a potential Pareto improvement as a value-free policy guide. Judging from the contents of the leading environmental economics journals, day-to-day work by applied economists is curiously disconnected from current work in mainstream economic theory. A time lag between theoretical frontiers and everyday practice is normal in any science, but its consequences are severe in the case of environmental valuation. Current U.S. policies on climate change and biodiversity preservation, for example, rely heavily on welfare economic models whose legitimacy depends crucially on discredited theoretical formulations, and on assumptions known to be at odds with actual human behaviour. Many of the recommendations of contemporary environmental economics stem not from sound economic analysis but rather an ideological commitment to free markets and an antipathy to government “interference” in the economy. Theoretical work by mainstream economists shows clearly that, even if we grant all the restrictive assumptions of welfare economics, from *Homo economicus* to perfectly operating competitive markets, there is no way to “close” the neoclassical welfare system without making interpersonal comparisons and thus appealing to ethical judgments. With the demise of the New Welfare Economics, and the great advances being made by ecological economists in social-based decision-making, the time is ripe for our field to play a major role in reshaping the entire field of economics.

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