

# Economic Values and the Natural Environment

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## *Introduction*

Economics is not widely regarded as a friend of the earth. Economic man conjures up the image of the selfish individual seeking personal gain from the execution of personal choices over material goods and services, indifferent to whom or what else suffers in that process. As for the individual, so it is for nations, with national wealth or gross national product substituting for individual wealth and individual income. This kind of picture-thinking continues to spawn critics in the tradition of John Ruskin's anti political economy, though none is today as eloquent or as informed as he was (1). The essential charge is that economic values are at best only part of the total system of values which either does or should determine our attitude toward natural environments. At worst, economic values are irrelevant to that attitude. Instead, there must be a recognition that there is a multiplicity of values, of which economic values are only one. Further, not all values have equal moral standing. As with Ruskin, some values are more important than others, and, for many of the critics, economic values do not figure highly in the scale of importance. As philosopher-economist Mark Sagoff puts it:

"Economic methods cannot supply the information necessary to justify public policy. Economics can measure the intensity with which we hold our beliefs: it cannot evaluate those beliefs on their merits. Yet such evaluation is essential to political decision-making."(2)

This discontent with economic philosophy is widespread in the policy arena relating to natural environments. Here, as with works of art or music, sculpture or building, we are dealing with the characteristics of beauty, often unique and often non-reproducible. We are also dealing with sentient non-human beings which unquestionably experience pain and pleasure as we do, and with complex concepts relating human experience and existence to natural and manipulated ecosystems. The apparent simplicity of the economist's approach to the value of things seems at odds with these intricate life systems. Small wonder, then, that one reaction to this perception is a retreat from economic values towards either total rejection of economics or a search for an 'alternative' economics.

In this lecture I shall explore this relationship between 'economic values' and the totality of values that appears to many to be relevant to environmental decision-making. In so doing, I hope to show that the critics are partly ill-informed about economists and their work on environmental issues. I hope to show, too, that economists might usefully reflect more on the wider concept of value that seems to underlie the environmentalists' concerns, and on some views concerning the functional relationship between man, economy and environment that contrast with those implicit in the standard economic model.

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## *On Economic Values*

I take an economic value to be the value placed on a good by an individual person and which value can be expressed, at least in principle, in terms of some willingness to pay for the good, or some compensation to forego the good. Given the prevailing model of human behaviour which economists use to explain individual choice, those economic values will, if the model is a correct one, reflect the preferences of those individuals. Thus economic values arise from individual preferences. While there are many qualifications to such a statement, it will suffice for our purposes.

There are, however, some important observations about this fundamental statement.

The values in question belong to *people*. Economics is anthropocentric, although, as we shall see, people may well not be.

While the economic model exists ostensibly as a description of the world -it offers what should be a falsifiable statement about how people make choices- one of the most powerful and elegant developments in economic theory tells us that, under certain conditions, if all persons act in accordance with their economic values the sum total of economic values in the society as a whole will be made as large as possible. In so far as the conditions necessary for this theorem to hold actually do hold, then this model of human behaviour is also a prescription for how people should behave. Exactly that transition from the positive to the normative -from what is, to what should be- underlies the beneficial features that many economists feel are possessed by the working of free markets.

For 'economic values' we might substitute the term 'value in use', coined by Adam Smith, or 'benefit', the term used by modern economists.

It is not necessary for a market to exist for this value-in-use or benefit to exist. Very simply, we know that individuals exhibit preferences and dispreferences for many things that have no market -fine scenic views, clean air, peace and quiet, the beauty of the songthrush, the awesome spectacle of the mass migration of the wildebeest. Since economic values relate to preferences and not all preferences are expressed in markets, markets cannot be necessary for economic values to exist. This should be sufficient to remove one criticism of economists, that they would have all things which generate benefit routed through a market.

But there is a link to markets. Economists generally do not believe that we can measure preferences for all things, although environmental economists have been in the vanguard of the attempts to extend such measurement. When preferences can be measured or not, the economist prefers to use money as the measuring rod, the yardstick of those benefits. That establishes the link to markets since markets also tend to use money as the medium of exchange. In this way, economists can 'anchor' the measured economic values of things outside markets to things inside markets. They do this partly for convenience, partly because prices are measured in money units and prices have a particular relation to preferences, and partly because the money units permit comparison. The economic value of beefburgers can then be compared to the economic value of a scenic vista. This, of course, merely confirms the critics' suspicions about the brutish nature of economics. It begins by denying that it seeks to reduce beauty to coinage, and then proceeds to do exactly that. But if we are more careful in analysing the transition, we shall see that it is only the economic value that has been estimated. Nothing has been said, so far anyway, about those economic values being the *only* relevant values. A good many economists would make that assertion, but it is not a necessary or logically implied result.

The last observation about economic values is that, while they are necessarily *of* persons, nothing has been said about who the relevant group of persons are. Philosophers debate endlessly as to whether persons belonging to generations yet to come possess any attributes at all, let alone the attribute of possessing preferences. The answer will matter for the alternative views I shall discuss. (3)

## *Economy - Ecology Equilibrium*

A great deal of the environmentalist critique of economics is ill-informed, particularly that which is embodied in the modern movement to create a 'new' or 'alternative' economics. With the help of my observations about the structure and nature of economic values, we can, however, pinpoint the source of an apparently real criticism, a genuine concern about the relationship between economic values and the natural environment. This concern is that economic science appears to say nothing about any existential



relationship between the organisation of an economy and the set of ecosystems to which that economy relates. Economics, it is argued, tends to assume that economic organisation is largely independent of the set of ecological rules and cycles which govern the dynamic stability of biophysical systems. In so far as economic activity impinges upon the environment it is the exercise of economic values that should determine how much of the environment is preserved, how much destroyed, and how much impaired or enhanced in quality. The implication is either that economic values will somehow automatically guarantee the continued existence of at least the minimum necessary number of ecological systems, or, if it does not, the extinction of those systems is, in some sense, socially desirable.

The difficulty the environmentalist is having arises from more than conflict of economic values. He is saying that economics talks a lot about equilibrium and balance between the component parts of economic systems, but apparently says little or nothing about equilibrium between the economic system as a whole and the natural environments to which it relates. For social welfare to be sustained through time, it is necessary to observe certain ecological rules of the game, to honour certain precepts about how the environment can and cannot be used. But these biophysical rules appear not to be part of economic science and hence it is not just possible, but likely, that the functioning of an economy, however organised, will damage natural environments, adversely impairing the economy's ability to generate social welfare in the process.

That *economic systems* contain no in-built guarantees or even limited insurance for being *sustainable* is surely correct. Moreover, natural environments do appear to be consistent victims of the working of such systems. The recursive nature of the damage done, the fact that human welfare itself suffers because of the environmental loss, is amply illustrated in many poor economies in the Sahel, in Haiti, in Nepal, and elsewhere, where the renewable resource base -soil, water, biomass- is being destroyed and is simultaneously removing the productive base of at least the agricultural sector of the economy.

Whether *economic science* can be criticised in the same way is much more questionable. For environmental economics as a subject has devoted a lot of attention to the conditions that need to exist for sustained production of renewable resources, whether a fishery, a forest, a groundwater system or soil fertility. It would not be surprising to find the environmentalist critic ignorant of this vast literature for most of it is confined to professional journals and books, and little of it is designed for lay consumption. Even within that literature, however, the sources of instability between economy and environment can be identified, and dominant among these is the present-oriented nature of economic values, their current generation bias. In the economics jargon, positive discount rates can readily dictate destruction of ecosystems and hence self-destruction. Some writers then prefer to substitute a 'conservation ethic' in place of the normal objectives that economists assume for a rational society. This in turn acknowledges that economic organisation is a two-stage procedure. First, obey the ecological rules of the game to offer some guarantee of a sustainable society. Second, within that ecologically constrained system, pursue whatever social goals are prudent (4). Some contractarian arrangement establishes the rules, and within those rules one might adopt the utilitarian stance of the kind familiar in economics.

Against this background I wish now to pursue the issue of the composition of economic values, to look at the sources of preferences for the natural environment. I shall then try to see if the wider concept of economic value that environmental economists now tend to use can be said to contain or approximate a conservation ethic. Put another way, if the size and nature of natural environments was to be determined by the application of an extended concept of economic value, would the outcome be the same as if we applied the two-stage conservation ethic procedure?

### ***Total Economic Value***

While the terminology is still not agreed, environmental economists have gone some considerable way towards a taxonomy of economic values as they relate to natural environments. Interestingly, this taxonomy embraces some of the concerns of the environmentalist. It begins by distinguishing user values from intrinsic values. User values, or user benefits, derive from the actual use of the environment. An angler, wildfowl hunter, fell walker, ornithologist, all use the natural environment and derive benefit from it. Those who like to view the countryside, directly or through other media such as photograph and film, also 'use' the environment and secure benefit. The values so expressed are economic values in the sense we have defined. Slightly more complex are values expressed through *options* to use the environment,

that is, the value of the environment as a potential benefit as opposed to actual present use value. Economists refer to this as *option value*. It is essentially an expression of preference, a willingness to pay, for the preservation of an environment against some probability that the individual will make use of it at a later date. Provided the uncertainty concerning future use is an uncertainty relating to the availability, or 'supply', of the environment, the theory tells us that this option value is positive. (5) In this way we obtain the first part of an overall equation for total economic value. This equation says:

$$\text{Total User Value} = \text{Actual Use Value} + \text{Option Value}$$

Intrinsic values present more problems. They suggest values which are in the real nature of the thing and unassociated with actual use, or even the option to use the thing. The briefest introspection will confirm that there are such values. A great many people value the remaining stocks of blue, humpback and fin whales. Very few of those people value them in order to maintain the option of seeing them for themselves. What they value is the *existence* of the whales, a value unrelated to use, although, to be sure, the vehicle by which they secure the knowledge for that value to exist may well be film or photograph or the recounted story. The example of the whales can be repeated many thousands of times for other species, threatened or otherwise, and for whole ecosystems such as rainforests, wetlands, lakes, rivers, mountains and so on.

These *existence values* are certainly fuzzy values. It is not very clear how they are best defined. We can agree with David Brookshire and his colleagues that these values are not related to vicarious benefit, i.e. securing pleasure because others derive a use value (6). Vicarious benefit belongs in the class of option values, in this case a willingness to pay to preserve the environment for the benefit of others. Nor are existence values what the literature calls 'bequest' values, a willingness to pay to preserve the environment for the benefit of our children and grandchildren. That motive also belongs with option value. Note that if the bequest is for our immediate descendants we shall be fairly confident at guessing the nature of their preferences. If we extend the bequest motive to future generations in general, as many environmentalists would urge us to, we face the difficulty of not knowing their preferences. This kind of uncertainty is different to the uncertainty about availability of the environment in the future which made option value positive. Assuming it is legitimate to include the preferences of as yet unborn individuals, uncertainty about future preferences could make option value negative (7). In pursuit of our exploration of the nature of intrinsic values, let us pause for a moment and provisionally state that:

$$\text{Intrinsic Value} = \text{Existence Value}$$

where, for now, existence value relate to values expressed by individuals such that those values are unrelated to use of the environment, or future use by the valuer or the valuer on behalf of some future person.

In this way we can write our formula for total economic value as:

$$\text{Total Economic Value} = \text{Actual Use Value} + \text{Option Value} + \text{Existence Value}$$

Within this equation we might also state that:

Option value = Value in Use (by the Individual) + Value in Use by Future Individuals (Descendants and Future Generations) + Value in Use by Others (Vicarious Value to the Individual).

The context in which we tend to look for total economic values should also not be forgotten. In many of those contexts three important features are present. The first is *irreversibility*. If the asset in question is not preserved it is likely to be eliminated with little or no chance of regeneration. The second is *uncertainty*: the future is not known, and hence there are potential costs if the asset is eliminated and a future choice is forgone. A dominant form of such uncertainty is our ignorance about how ecosystems work: in sacrificing one asset we do not know what else we are likely to lose. The third feature is *uniqueness*. What empirical experiments we have on existence values tend to relate to endangered species and unique scenic views. Economic theory tells us that this errs on the cautious side of exploitation. That is, preservation will be relatively more favoured in comparison to development.



Lest I have implied otherwise, there is no particular agreement on the nature of the equation for total economic value. Some writers regard intrinsic value as part of existence value rather than as its equivalent (8). Others regard intrinsic value as being inclusive of option value (9). To a considerable extent the variations in definition appear to relate to what is meant by 'use'. Thus if it means actual current use by the individual expressing the preference, bequest values are not use values. The view taken here, however, is that the issue of when use occurs and by whom cannot be regarded as differentiating characteristics: all uses, whenever they occur and whoever they are by, give rise to use values. Equally, all use values are conceptually distinct from the intrinsic value of the environment which we currently equate with existence value. It is clear that the concept of existence value needs further investigation.

### *Existence Value*

Our argument is that existence value is a value placed on a natural asset and unrelated to actual or potential use. To narrow it further we follow Kevin Boyle and Richard Bishop in regarding existence value as distinct from indirect use value: the value some people place on natural things because they can then be filmed or described for consumption (10). What is consumed is the film, not the natural asset. The film cannot exist without the asset, at some stage in time anyway. Existence value as an intrinsic value is something different to this 'indirect use value'.

It is possible that two types of altruism underlie existence values. The first would be altruism towards other individuals. The second would be altruism towards at least other sentient species, perhaps other living things in general, and maybe toward whole ecosystems. But altruism to other people would seem to relate to some use which others are making of the environment. An example would be the concern to protect rainforests as the habitats of many aboriginal people. The use aspect of this motive suggests that it is not therefore a component of existence value. Altruism for other sentient things - 'Q-altruism' as some authors have called it - seems clearly to play a part. Many people prefer natural environments to be preserved because the alternative to preservation is the pain, suffering and death of living species. Let us then admit altruism to non-human species as one motivation for existence value.

The other chief candidate in the literature for the motivation of existence value is some concept of 'stewardship'. Stewardship suggests managing a resource for someone else, where the someone else is a kind of absentee landlord perhaps. In terms of economic values, then, the positive valuation must reflect a willingness to pay for the preservation of the environment because the environment belongs to someone else and because they have entrusted its management to the individual. Arguably, the value reflects an insurance payment to avoid the costs of the landlord's vengeance should the resource be degraded while the individual is steward. Since such a valuation arises out of duty or obligation it sits uneasily with the basic assumption in the economic model of individual behaviour, namely that freely exercised, self oriented with the economic model: many definitions of altruism would say that it is the unselfish regard for the welfare of other beings, so that altruistic acts cannot reflect back as gains in satisfaction to the individual undertaking the altruistic act. This haziness about the consistency of existence value and the economic model has been noted several times in the literature, though not, as far as I am aware, in the terms I have used.

If existence value has something to do with altruism to non-humans and with stewardship, how far apart is the economic model from that suggested by the non-economists? "I wish now to suggest that there are more similarities than either viewpoint might acknowledge. I shall also suggest that there is still something more to existence value than the economics literature admits. And I shall finally argue that this 'something more' may well mean that individuals' values of natural environments are wider and more complex than the economic model suggests, and that they could encompass a conservation ethic.

### *Leopold's Land Ethic*

The similarities between the economic and non-economic approaches to valuing the environment can be readily illustrated by looking at one of the gurus of environmentally sound land-use, Aldo Leopold.

Leopold's "land ethic" is widely quoted. Leopold lamented the absence of an ethic relating man to the land, remarking that:

"It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value. By value, I of course mean something far broader than mere economic value; I mean value in a philosophical sense." (11)

Elsewhere, he states his much quoted maxim:

"...quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (12)

The common ground between Leopold and the approach based on total economic value is revealed. Leopold is clearly using 'economic' to mean costs and benefits to the developer of the land, in other words, financial costs and revenues of development. The total economic value approach refers to all costs and benefits, whoever bears them or reaps them, and regardless of whether they relate to actual cash flows in actual markets.

The contrast in the approaches becomes more obvious by referring to another of Leopold's essays on 'Some Fundamentals of Conservation in the Southwest'. (13) Here he quotes with approval from the Russian philosopher Ouspensky to the effect that earth is an indivisible organism, an integrated and a living thing. Leopold concludes:

"Philosophy, then, suggests one reason why we can not destroy the earth with moral impunity: namely that the 'dead' earth is an organism possessing a certain kind and degree of life, which we intuitively respect as such." (14)

Leopold nowhere refers to James Lovelock's *Gaia* published in the same year as that quotation. (15) We must assume that he had not read it when preparing the essay. Yet how similar is Leopold's perception with Lovelock's science-based hypothesis that:

"...the Earth's living matter, air, oceans, and land surfaces form a complex systems which can be seen as a single organism and which has the capacity to keep our planet a fit place for life". (16)

What Leopold and Lovelock are referring to is categorically not a new perception of earth and its environments. J. Donald Hughes has traced the Gaia concept through centuries of ancient philosophy and concludes that it is the dominant theme (17). It exists or existed too among aboriginal peoples, only to be displaced by the modern European concept of nature as inert, as Leopold's 'dead' earth.

### ***Gaian Motivations for Existence Value***

Regardless of whether we acknowledge existence value in the broad band sense that I have defined it, the concept of total economic value has already taken us a great deal further than the environmentalist's image of the so-called 'conventional' economist. I would like to feel that this much, anyway, can emerge from our discussion. What happens beyond that is largely uncharted territory for economists and the ground becomes sticky and uncertain. But let us squeeze the comparison of economic and Gaian values a little further and see what happens.

Recall that we left existence value as having two bases in motivation: altruism to non-human species and some concept of stewardship. I suggest that the altruism motive presents no problem, though I prefer not to press too hard at its extent. So called 'deep ecologists', for example, would argue that the class of things over which altruism extends must include non-sentient living things *and* physical matter (18). I do not understand a view that says that sentient beings cannot feel pain. I suspect I am not alone in feeling that physical matter is another issue.

The altruism motive can be extended. Rights to existence are widely conferred on non-human species. The search for a motive for the ascription of these rights may be sterile: the issue, at least as far as sentient species are concerned, is not why, but why not?

The stewardship motive is suggestive. There can be no doubt that in expressing existence values some, perhaps many, people are motivated by a stewardship concept. But a Gaian interpretation would be wider than that embraced in the environmental economics literature, for the stewardship need not be on behalf of other people, now or in the future. Instead it becomes a stewardship on behalf of the living



organism of which the individual as human is only a part. Some modern Gaianists would argue differently, to the effect that man cannot be a steward at all, because his role in the overall equilibrating mechanism of planet earth is without significance. Man needs earth, but earth does not need man. But what matters for our purposes is what people believe, not what may or may not be the case. If people believe in a stewardship motive, narrowly defined or broadly defined in a Gaian sense, that belief will translate into a preference. It is possible, I suggest, that what is being uncovered in the expression of existence values is the revelation of a conservation ethic, widely shared and which embraces both our duty to sentient beings and perhaps to wider ecosystems, and our concern for future generations.

### *Economic Values and Decision-Making*

My discussion of existence value is unsatisfactory, but I hope enough has been said to indicate that, in their development of the concept of total economic value, economists have already embraced many of the concerns that environmentalists feel underlie their own valuations of natural environments. Some can be re-expressed in terms of option values for later use and appreciation. These values present no fundamental problem to economists. Moreover, I have suggested that economics can explain why such option values are likely to be large in relation to current use values in contexts of uncertainty, irreversibility and uniqueness. Other environmentalist values present more problems, but I have advanced the suggestion, no more than that, that existence values may well be motivated by concerns of stewardship and altruism that are much wider than economists might suppose. Those concerns come close to a Leopold-style land ethic, and perhaps touch on atavistic motives of the kind suggested by the Gaian movement.

The final issue is whether these motives are consistent with the economic model of man the decision-maker. If the motives are counter-preferential then they are inconsistent with the economic model. This has been argued by David Brookshire and his colleagues (19). They see existence values as a wedge between personal choice and personal welfare, a kind of 'commitment' value. If existence values are counter preferential, then the way in which economic calculus is used to evaluate such things as land use will need some rethinking whenever we have reason to believe existence values are important. That may be suggestive of an explanation for the eternal conflict between the economists and others when it comes to sensitive land-use issues. Perhaps neither side has embraced total economic value and its implications.

### **Notes**

- (1) There were doubts about Ruskin's understanding of political economy, but for a refutation of them see. J.T.Fain, *Ruskin and the Economists*, Vanderbilt University Press, Nashville, especially Chapter 1, 1956.
- (2) M.Sagoff, 'Economic Theory and Environmental Law' *Michigan Law Review*, 79, June, 1393-1419, 1981.
- (3) See. J.Broome, 'Some Principles of Population', in D. Collard, D.W.Pearce and D.Ulph, *Economics, Growth and Sustainable Environments*, Macmillan, London, 1987.
- (4) See, for example, T. Page *Conservation and Economic Efficiency*, Johns Hopkins University Press, Baltimore, 1977; and D.W.Pearce, 'Foundations of An Ecological Economics', *Ecological Modeling*, forthcoming 1987.
- (5) For a proof see R.Bishop, 'Option Value: an Exposition and Extension', *Land Economics*, Vol.58, No.1, February, 1-15, 1982.
- (6) D. Brookshire, L. Eubanks, C.Sorg, 'Existence Values and Normative Economics', *Mimeo*, Department of Economics, University of Wyoming, Laramie, September 1985.
- (7) Bishop, *op. cit.*
- (8) A. Randall and J.R.Stoll, 'Existence Value in a Total Valuation Framework', in R.Rowe and L.Chestnut (eds), *Managing Air Quality and Scenic Resources at National Parks and Wilderness Areas*, Westview Press, Boulder, Colorado, 1983.
- (9) A. Fisher and R. Raucher, 'Intrinsic Benefits of Improved Water Quality: Conceptual and Empirical Perspective', *Mimeo*, US Environmental Protection Agency, 1983.
- (10) K.Boyle and R. Bishop, 'The Total Value of Wildlife Resources: Conceptual and Empirical Issues', *Mimeo*, Department of Agricultural Economics, University of Wisconsin at Madison, 1985.
- (11) A. Leopold, 'The Land Ethic', in *A Sand County Almanac and Sketches Here and There*, Oxford University Press, New York, 1968.
- (12) *Ibid.*
- (13) A.Leopold, 'Some Fundamentals of Conservation in the Southwest', *Environmental Ethics*, 1, No.2, 131-141, Summer 1979.

(14) *Ibid*

(15) J.Lovelock, *Gaia: A New Look at Life on Earth*, Oxford University Press, Oxford, 1979.

(16) *Ibid*

(17) J. Donald Hughes, 'Gaia: an Ancient View of the Planet', *Environmental Review*, Vol. 6, No.2, 1982.

(18) See, for example, J. McDaniel, 'Physical Matter as Creative and Sentient', *Environmental Ethics*, Vol.5, No.4, 291-317, Winter 1983.

(19) Brookshire et al., *op.cit*