IDENTIFICATION OF ECOLOGICAL ECONOMICS ISSUES

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1. Introduction

In identifying the issues for ecological economics, it is useful to note the way this subject differs from the longer-established environmental economics. Environmental Economics springs largely from conventional, neoclassical economics, using the model of rational actors confronting market failure, which result from the existence of externalities.

For ecological economics, the assumption is much broader B that humans and nature interact, in a way which is sustaining for humans, but potentially damaging to nature, and therefore also potentially damaging to humans in the long-run.

The range of issues for ecological economics is therefore potentially very broad, and only an outline of some of those issues addressed in the literature can be attempted here. One can use a two-fold classification of issues, distinguishing between those which are ‘conceptual’ and those which are ‘practical=. Of course, many other classificatory schemes could be used (e.g. distinguishing between issues which are ‘scientific=, ‘political and ethical’, concerning ‘measurement and policy’, etc.). Also, the distinction between ‘conceptual= and ‘practical’ issues is necessarily porous. For example, biodiversity and its definition appear as ecological economic conceptual issues, while measures of biodiversity would also appear under the practical issue category of indicators for implementing sustainability.

2. Conceptual Issues

This area concerns the ways that issues can be thought about within the framework of ecological economics. As it addresses environmental concerns from a transdisciplinary perspective, the range of conceptual issues is correspondingly broad, ranging from philosophy, through social science, to biology and physics.

2.1. Ethical B the Limits and Degree of Moral Considerability

Unlike conventional (neoclassical) economics, ethics is problematic for ecological economics. The stance of mainstream economics has been characterized as 'methodological individualism'; i.e. the focus is on individual actions deriving from individual desires. The roles of other persons, or other parts of nature, are not considered. Ecological economics rejects this individualistic, anthropocentric stance, and particularly finds two ethical issues to be of concern: future generations, and other species. In both cases the issue can be interpreted as one of 'moral considerability'; i.e. what is worthy of moral awareness and moral treatment?

2.1.1. Future Generations

Within most neoclassical economics, the well-being of others is mostly irrelevant, and the welfare of future generations is barely approached, except through the 'overlapping generations' consideration. This is mainly used to defend the notion that, by the current generation caring for its own well-being, as long as generations overlap (i.e. parents and offspring share the world) then the well-being of future generations is also assured. That is, future generations are taken care of without being given moral consideration.

Ecological economics tends to reject this approach, and implicitly or explicitly to treat future generations as morally considerable. The relationship between the present generation(s) and those yet unborn can be thought of in two ways. First, there is the notion of 'stewardship'; those currently inhabiting the earth do not 'own' it B rather they hold it in trust for future generations. Their duty is to ensure that it is passed on to posterity in no worse a state than that in which they inherited it. The second approach to this issue of 'inter-generational justice' is through the notion of social intertemporal decision making. Decisions made today affect the state of the world in the future, so society today must take account of its effects on those as yet unborn. However, the degree to which future generations should be taken account of is an area of debate, revolving around the notion of discounting.

Neoclassical economics generally requires that, like (supposed) individuals, societies should value returns in the future less than those in the present. However, if the future is far enough distant as to consist of the as-yet-unborn, then the analogy with individual decision making fails. While it is reasonable to assume that individuals should bear the responsibility for deciding on the intertemporal structure of their consumption, and other aspects of their lives, it is not at all apparent that the same holds for societies. Decisions made today, for and by the current generations, may be binding on future generations, even though those generations took no part in the decision making. Thus the very nature of

social discounting the future is problematic; the rate at which such discounting should take place is doubly difficult.

2.1.2. Other Species

In most conventional economics, the issue of other species does not arise. Even in neoclassical resource economics, the implicit assumption is that the value of other species resides only in their usefulness to humans. Clearly, in this framework other species are not morally considerable.

In ecological economics, particularly influenced by Aldo Leopold's Land Ethic, nature, and the species that constitute it, is generally regarded as being of morally worth; i.e. it is owed a duty of care which extends beyond that simply to maintain and extend human well-being. The issue to confront in ecological economics is therefore the nature of the moral duty to nature, its implications for human conduct, and the way such moral duty can be translated into legal constraints and policy formulation.

2.2. Epistemological B Limits to our Understanding of the World

As ecological economics has developed, there has come about a concern with the problem of knowledge: what we know, how we know it, how we predict the future. Conventional economics has already approached some of these issues; however, the necessarily long time frame for environmental issues has brought these issues of knowledge and prediction very much to the fore in ecological economics

2.2.1. Risk and Uncertainty

Conventional economics, through mathematical statistics, has a well-developed understanding of 'risk'. This occurs when the world exhibits two features. First, from any present state of the world, a range (perhaps infinite) of possible futures can emerge. Second, associated with each future outcome is a well-defined probability of its occurrence. This notion is central to the practice of cost-benefit analysis. If a certain investment project (e.g. building a dam) has associated with it a range of possible outcomes (e.g. >collapse= or >not collapse=), then the usual approach is to associate with the project not the actual costs and benefits of the outcome, as the actual outcome is not known *ex ante*. Instead, one associates with the project the >expected= costs and benefits; i.e. the weighted sum of the costs and benefits of each outcome, where the weights used are the probabilities of occurrence.

Such probabilistic assessments of risky outcomes have their origin in the analysis of games of chance (e.g. rolling dice), where the 'expected' outcome is indeed what would be the average outcome when there is a large, even infinite, number of repetitions of the game. However, the world of environmental policy does not involve repetitions, and certainly not very large numbers of these. Thus the very basis of project assessment when there is a range of possible outcomes must be thrown into doubt, and remains an area for analysis. Uncertainty is the case where future outcomes may be known, but the associated probabilities may not be, at least not completely. This seems to be the case for many

important environmental issues, but there is considerable debate on the appropriate means by which decisions based on such >uncertain= knowledge should be made.

2.2.2. Ignorance Through Novelty and Chaos

An even more problematic epistemological issue relates to what we do not know; i.e. ignorance. In particular, once we recognize the limits to our understanding, this is useful knowledge, which rational decision makers should utilize fully. There is a variety of sources of ignorance, but two which are current areas of research relate to novelty and chaos. Regarding novelty, over the long time horizons of environmental concern, one can be sure that technologies, tastes and social systems will alter. Reflection on these changes also suggests that they are, to a large extent, unknowable ex ante, and therefore unpredictable. For example, the invention and bringing into use of chlorofluorocarbons (CFCs) brought about ozone layer depletion, through a physico-chemical mechanism which only came to be understood once it had occurred. *Ex ante*, the process was completely unpredictable, and reflected our ignorance about this aspect of the world.

Chaos is the term now used for nonlinear systems with dynamic behavior that is aperiodic and sensitively dependent on initial conditions. Such systems may exhibit the remarkable property of infinite sensitivity to initial conditions. That is, if the system is allowed to evolve from a certain initial state, then it generates a certain path of evolution. If the process is repeated, with an initial state that differs from the original by a vanishingly small (but non-zero) amount, then the new evolutionary path of the system will, eventually bear no resemblance to the original path. That is, even for completely deterministic systems, with no random elements, knowledge of the system which is not infinitely detailed will lead to the system=s evolution being unpredictable.

If, as seems likely, many ecological systems are sufficiently non-linear in their dynamics to be chaotic, then the problem of predicting the impacts of human action on such natural systems becomes problematic in the extreme.

The usual epistemological framework for environmental decision making is that, with enough scientific research, society can come to know enough to make informed decisions leading to known and beneficial outcomes. The combined effect of the epistemological issues of novelty and chaos is to undermine this rather optimistic assumption.

2.3. Social B the Nature of Human Motivation

In conventional economics, human motivation is regarded as straightforward. Individuals have (given) appetites for various commodities, and their motivation is the satisfaction of theses appetites. In other words, individuals are conceptualized solely as consumers, and their actions are understood only in terms of the search for greater satisfaction.

2.3.1. Consumer versus Citizen

This assumption that individuals can be understood in terms of only the satisfaction of wants is flawed, at least if this utilitarian approach is carried to an extreme. For example,

how could one understand the motivation of an individual who helps an elderly person across the road? The utilitarian reply would be that the individual offered the assistance because it was individually satisfying to be helpful. A similar explanation could be offered for the motivation of some one who risks their life rescuing a child from a burning building; the rescue gave the rescuer satisfaction.

This approach is flawed on two counts. First, it seems a very narrow and unsatisfactory way of describing human motivations. Second, it is logically flawed, as it is empty; an approach which explains everything explains nothing. In Popper=s term, the explanation is unfalsifiable, and therefore of no validity.

A way out of this narrow description of human motivation is to follow Sagoff in distinguishing two types of response by any individual: as consumer and as citizen. In consumer mode, one is concerned only with one=s own well-being. As a citizen, however, one is concerned with the wider society, including future generations and even other species.

Sagoff=s approach has practical implications for environmental policy. It suggests that if decision makers are seeking information on the way people value various aspects of nature, then it is imperative that the right 'person' is addressed; i.e. is it consumer or citizen?

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