

WHAT IS ECOLOGICAL ECONOMICS?

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INTRODUCTION

Ecological Economics addresses the relationships between ecosystems and economic systems in the broadest sense. These relationships are the locus of many of our most pressing current problems (i.e. sustainability, acid rain, global warming, species extinction, wealth distribution) but they are not well covered by any existing discipline. Environmental and resource economics, as it is currently practiced, covers only the application of neoclassical economics to environmental and resource problems. Ecology, as it is currently practiced, sometimes deals with human impacts on ecosystems, but the more common tendency is to stick to "natural" systems. *Ecological Economics* aims to extend these modest areas of overlap. It will include neoclassical environmental economics and ecological impact studies as subsets, but will also encourage new ways of thinking about the linkages between ecological and economic systems.

We have chosen the name *Ecological Economics* for this area of study because it implies a broad, *ecological*, interdisciplinary, and holistic view of the problem of studying and managing our world. The "earth from space" cover of the journal reflects this global, holistic perspective. We did *not* intend to imply with the ordering of the two words in the title that the journal is mainly an economics journal: it is intended to be a new approach to *both* ecology and economics that recognizes the need to make economics more cognizant of ecological impacts and dependencies; the need to make ecology more sensitive to economic forces, incentives, and constraints; and the need to treat integrated economic-ecologic systems with a common (but diverse) set of conceptual and analytical tools.

There was much discussion of other possible names, such as "Economic Ecology" or "Ecology and Economics" or some conjoining of the two words that to me end up being confusing tongue twisters like "Ecolnomics" or "Econology." But *Ecological Economics* seemed to get closest to the meaning we desired while still being evocative to the uninitiated.

Ecological Economics will, in the end, be what *Ecological Economists* do. A fair amount of space in the journal (especially in the first few years) will be devoted to introspective discussions of what the field is or should be, its historical roots, and where it is going or should be going (see Paul Ehrlich's and John Proops' contributions in this issue).

In studying the relationships between ecosystems and economic systems a large measure of "conceptual pluralism" is warranted (Richard Norgaard's article in this issue is an eloquent description of this idea). There is probably not one *right* approach or paradigm, because, like the blind men and the elephant, the subject is too big and complex to touch it all with one limited set of perceptual tools. The Journal will therefore pursue a strategy of pluralism.

Rather than reiterate the detailed list of issues that concern *Ecological Economics* (this list can be found in the journal's aims and scope statement and in more detail in Proops' article), I'd like to briefly discuss what I see as a fundamental question that underlies the need for an *Ecological Economics* and on which these other issues depend.

TECHNOLOGICAL OPTIMISM VS. PRUDENT PESSIMISM

Current economic paradigms (capitalist, socialist, and the various mixtures) are all based on the underlying assumption of continuing and unlimited economic growth. This assumption allows problems of intergenerational, intragenerational, and interspecies equity and sustainability to be ignored (or at least postponed), since they are seen to be most easily solved by additional growth. Indeed, most conventional economists define "health" in an economy as a stable and high *rate of growth*. Energy and resource limits to growth, according to these paradigms, will be eliminated as they arise by clever development and deployment of new technology. This line of thinking is often called "technological optimism".

An opposing line of thought (often called "technological pessimism") assumes that technology will *not* be able to circumvent fundamental energy and resource constraints and that eventually economic growth will stop. It has usually been ecologists or other life scientists that take this point of view (a notable exception among economists is Daly, 1977), largely because they study natural systems that *invariably do* stop growing when they reach fundamental resource constraints. A healthy ecosystem is one that maintains a stable level. Unlimited growth is cancerous, not healthy, under this view.

The technological optimists argue that human systems are fundamentally different from other natural systems because of human intelligence. History has shown that resource constraints can be circumvented by new ideas. Technological optimists claim that Malthus' dire predictions about popula-

tion pressures have not come to pass and the “energy crisis” of the late 1970s is behind us.

The technological pessimists argue that many natural systems also have “intelligence” in that they can evolve new behaviors and organisms (including humans themselves). Humans are therefore a part of nature, not apart from it. Just because we have circumvented local and artificial resource constraints in the past does not mean we can circumvent the fundamental ones that we will eventually face. Malthus’ predictions have not come to pass *yet* for the entire world the pessimists would argue, but many parts of the world are in a Malthusian trap now, and other parts may well fall into it.

This debate has gone on for several decades now. It began with Barnett and Morse’s (1963) *Scarcity and Growth* and really got into high gear with the publication of *The Limits to Growth* by Meadows et al. (1972) and the Arab oil embargo in 1973. There have been thousands of studies over the last 15 years on various aspects of our energy and resource future and different points of view have waxed and waned. But the bottom line is that there is still an enormous amount of uncertainty about the impacts of energy and resource constraints. In the next 20 to 30 years we may begin to hit *real* fossil fuel supply limits. Will fusion energy or solar energy or conservation or some as yet unthought of energy source step in to save the day and keep economies growing? The technological optimists say yes and the technological pessimists say no. Ultimately, no one knows. Both sides argue as if they were certain but the most insidious form of ignorance is misplaced certainty.

Whatever turns out to be the case, a more ecological approach to economics and a more economic approach to ecology will be beneficial in order to maintain our life support systems and the aesthetic qualities of the environment. But there are vast differences in the specific economic and environmental policies we should pursue today, depending on whether the technological optimists or pessimists are right. Given this fundamental uncertainty about such a fundamentally important piece of information, what should we do? This is a key area of research for *Ecological Economics*.

The optimists argue that unless we believe that the optimistic future is possible and behave accordingly it will never come to pass. The pessimists argue that the optimists will bring on the inevitable leveling and decline sooner by consuming resources faster and that to sustain our system we should begin to conserve resources immediately. *Ecological Economics* will attempt to reduce our ignorance about the real energy, environmental, and economic state of the world (see, for example, Kümmel, 1989), develop methodological and ideological options for better understanding of our dilemma (see Christensen’s article), and look for the optimal social paths and more effective social instruments given our very real and, unfortunately very large, ignorance (see Hansen’s and Perrings’ articles).

		Real State of the World	
		Optimists Right	Pessimists Right
Current Policy	Technological Optimist Policy	High	Disaster
	Technological Pessimist Policy	Moderate	Tolerable

Fig. 1. Payoff matrix for technological optimism vs. pessimism.

We can cast this optimist/pessimist choice in a classic (and admittedly oversimplified) game theoretic format using the “payoff matrix” shown in Fig. 1. Here the alternative policies that we can pursue today (technologically optimistic or pessimistic) are listed on the left and the real states of the world are listed at the top. The intersections are labelled with the results of the combinations of policies and states of the world. For example, if we pursue the optimistic policy and the world really does turn out to conform to the optimistic assumptions then the payoffs would be high. This high potential payoff is very tempting and this strategy has paid off in the past. It is not surprising that so many would like to believe that the world conforms to the optimist’s assumptions. If, however, we pursue the optimistic policy and the world turns out to conform more closely to the pessimistic technological assumptions then the result would be “Disaster”. The disaster would come because irreversible damage to ecosystems would have occurred and technological fixes would no longer be possible.

If we pursue the pessimistic policy and the optimists are right then the results are only “Moderate”. But if the pessimists are right and we have pursued the pessimistic policy then the results are “Tolerable”.

Within the framework of game theory, this simplified game has a fairly simple “optimal” strategy. If we *really* do not know the state of the world then we should choose the policy that is the maximum of the minimum outcomes (i.e. the MaxiMin strategy in game theory jargon). In other words, we analyze each policy in turn, look for the worst thing (minimum) that could happen if we pursue that policy, and pick the policy with the largest (maximum) minimum. In the case stated above we should pursue the pessimist policy because the worst possible result under that policy (“Tolerable”) is a preferable outcome to the worst outcome under the optimist policy (“Disaster”).

One must conclude that too little attention is currently being given to policies based on technologically pessimistic assumptions. Pursuing these policies (or at least having them worked out in detail and available as part of the policy dialog) might be our most prudent long-run alternative, given our

present large uncertainty about the true energy and environmental state of the world.

Ecological Economics will encourage elaboration of these prudently pessimistic policies and issues, and compare them to alternative optimistic policies while trying to help reduce our uncertainty about the real state of the world vis à vis the ability of technology to circumvent fundamental resource and energy limits.

The more specific issues of concern to the Journal, in my view, all revolve around this central question of limits: the ability of technology to circumvent them, and the long run costs of the technological “cures”. Do we adapt to limits with technologies that have potentially large but uncertain future environmental costs or do we limit population and per capita consumption to levels sustainable with technologies which are known to be more environmentally benign? Must we always increase supply or can we also reduce demand? Is there an optimal mix of the two?

If the limits are not really there then conventional economics’ relegation of energy and environmental concerns to the side of the stage is probably appropriate, and detailed energy analyses are nothing more than interesting curiosities. If the limits *are* there then energy and environmental issues are pushed much more forcefully to center stage and the tracking of energy and resource flows through ecological and economic systems becomes much more useful and important.

Issues of sustainability are ultimately issues about limits. If economic growth is sustainable indefinitely by technology then all environmental problems can (in theory at least) be fixed technologically. Issues of equity and distribution (between subgroups and generations of our species and between our species and others) are also issues of limits. We do not have to worry so much about how an expanding pie is divided, but a constant or shrinking pie presents real problems. Finally, dealing with uncertainty about limits is the fundamental issue. If we are unsure about future limits the prudent course is to assume they exist. One does not run blindly through a dark landscape that *may* contain crevasses. One assumes they are there and goes gingerly and with eyes wide open, at least until one can see a little better.

EDITORIAL POLICY

Ecological Economics is a new field formed at the intersection of two older ones. Our policy (at least until the field becomes established) will be to send papers out for review to one “ecologist”, one “economist” and one of the associate editors (since they were chosen for their superior integrative ability and are therefore assumed to already be *ecological economists*). We

expected (and our experience so far has confirmed this) that we would often get conflicting reviews from the “ecologist” and the “economist.” The “bad” review in these cases is not taken as damning, but rather is used to inform the author of the problems his or her work causes with the other “camp” so that to the greatest extent possible they can be addressed. Since we support conceptual pluralism, expect to find a wide range of approaches and ideas in the journal, rather than a coherent and consistent single point of view.

We have divided the journal into four main sections containing different categories of papers: (1) Commentary; (2) Methodological and Ideological Options; (3) Analysis; and (4) Book Reviews. This format allows enough latitude to address all major issues of concern appropriately, without confusing a personal opinion with an analytical result. In addition, we will have a ‘Letters to the Editor’ section for discussion of controversial issues.

Ecological Economics is an open niche waiting to be filled, a fertile field waiting to be sown and harvested. It will require the best of both ecology and economics, and a good measure of innovative ideas. It may one day surpass both its parents in stature and wisdom. We hope you will participate in this challenging debate about our ecological economic future.

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The journal benefited greatly from a series of conferences and workshops devoted to integrating ecology and economics. The first was the Wallenberg Symposium on integration of economy and ecology held in Stockholm, Sweden, in September, 1982 (Jansson, 1984). The European Centre for Research and Documentation in Social Sciences (the Vienna Center) sponsored a pair of workshops on ecology and economics in Stockholm in 1986 and in Barcelona, Spain in September, 1987. Papers presented at these two workshops eventually resulted in several of the articles appearing in the journal. There was a session at the 1987 Ecological Society of America Meeting in Columbus, Ohio on ecological economics that also contributed several papers to the journal.

Announcements of upcoming meetings of the International Society for Ecological Economics and related events will be published in this journal and in the Society’s newsletter.

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