



Harris, Jonathan M. "Overview Essay: Definition, Scope, and Interdisciplinary Issues," Part II, Frontier Issues in Economic Thought, Volume 1: A Survey of Ecological Economics. Island Press: Washington, D.C. 1995. pp.49-54.

Social Science Library: Frontier Thinking in Sustainable Development and Human Well-being

“Definition, Scope, and Inter-Disciplinary Issues” by Jonathan M. Harris

Ecological economics in its modern form is a relatively new field. We have seen that there is a significant background in the history of economic theory for the emergence of ecological economics; but its claim to the status of a discipline in its own right is recent. Mainstream economic theorists would perhaps attempt to subsume it under "environmental economics," a sub-field of neoclassical theory, but the broader logic of analysis already presented in Section I, and developed in greater detail in this section, argues against such a classification. To address the issues of the relationship between the economic system and its resource and environmental base involves more than simply pricing natural resources and environmental services. An attempt must be made to integrate the very different principles governing the operations of the natural world and of the human-made economy.

This effort necessarily requires insights from different disciplines, certainly including the physical sciences, ecology, and economics, but also extending to sociology, political science, psychology, and philosophy. The distinction between positive and normative analysis, so much emphasized by economic theorists, breaks down when we attempt to address questions of the large-scale impact of economic activity on the natural world. It is not simply a question of how the equilibrium and feedback mechanisms in economics and ecology interrelate - that is to say, it is not merely a question of economy/ecosystem modelling, important though that effort is. The issues raised include more fundamental questions such as: what is the purpose of economic activity?; what are the goals of economic development?; how important is the preservation of the natural world as compared to the production of economic goods?; how do principles of social and inter-generational equity affect the use of resources and the choice of basic and luxury goods to be produced? Standard economic theory has a limited capacity to respond to such questions, while disciplines other than economics must be supplemented with some form of economic theory to address them. In an era when questions of resource depletion and environmental degradation have come dramatically to the forefront of public debate, the need for a discipline of ecological economics is evident.

The articles summarized in this section address the issues involved in the development of an interdisciplinary approach to the area. They fall roughly into two categories. The first group deals with conceptual and methodological problems of interdisciplinary research. The second focuses on the now widely used, but poorly defined, concept of sustainable development. Properly understood, sustainable development means the replacement of the standard concept of economic growth with a more balanced set of goals taking into account environmental carrying

capacity, social and inter-generational equity, and community values, in addition to the production of goods and services. We must draw on all the different disciplines which contribute to ecological economics to get a good sense of what we mean by sustainable development. Once defined, or at least delimited, this concept replaces such abstract constructs as "maximizing utility" for the purposes of economic analysis. The "economic" issues of production, resource use, technology, consumption, income distribution, international trade, etc., can then be addressed in the context of a new perspective on the overall goals of economic activity.

In two of the original articles outlining the need for a field of ecological economics, Robert Costanza, Herman Daly, and David Pearce establish conceptual links between fundamental issues in economic theory and the biophysical logic of ecology. Costanza and Daly provide an overview of the argument, while Pearce goes into more detail on its philosophical underpinnings. Distribution of wealth and income have always been important in economic theory, but this theory has been limited to considerations of human welfare only, and has tended to define welfare in terms of consumption of goods. Treatment of inter-generational distribution has been limited in economics, and heavily dependent on the use of current interest rates to discount future benefits. The importance of natural resource and environmental constraints in distribution has not generally been recognized, but is now inescapable. These two articles grapple with these shortcomings, rejecting the use of interest rates and present-oriented distributional rules in favor of long-term sustainability. Sustainability, it is argued, extends the principle of distributional justice to take into account both non-human species and future generations. Neither article goes very far towards making the concept of sustainability specific, or focusing on whether and how the differing methodologies of economic and ecology can be fruitfully combined. Rather, these two articles can be considered as setting the stage for the more specific methodological and policy issues which follow.

Richard Norgaard's essay, "The Case for Methodological Pluralism," introduces a fundamental proposition of ecological economics - that there is no single formal theory suitable for the analysis of all economic and environmental issues. This contradicts the neoclassical belief that a single theoretical construct based on relatively simple assumptions can be used to analyze all economic activity, as well as environmental issues associated with the economic system. Within economics, critics of the neoclassical market model have argued that it neglects social, historical, and cultural factors and oversimplifies human motivations. When we take into account the complex and multifaceted questions of ecosystems and their interactions with the economy, this shortcoming is even more glaring. While formal theory also plays a part in ecology, the more pragmatic and empirical methodologies common in ecological research provide a contrast to the mathematical formalism of standard economics. Norgaard suggests an approach of drawing insights from varied methodologies without selecting one as superior or rejecting any out of hand. As a general principle, this sounds unexceptionable; but it leaves open the question of how a rigorous body of theory can be developed which is neither solely ecology nor solely economics.

The articles by Jason Shogren and Clifford Nowell, and by Malte Faber and John Proops, go into greater detail regarding different methodologies and the possibility of effective interdisciplinary work. Shogren and Nowell make the point that economic theorizing is generally based on an explicit "objective function," assuming that the goals of economic actors can be expressed

simply as utility or profit maximization. This is questionable as a description of economic reality, but becomes even more so when attempts are made to apply market valuations to the environment through "contingent valuation" theory. They suggest that combining the empirical and descriptive efforts of ecologists with more cautious use of formal mathematical models may be productive for both fields. This search for a middle ground is commendable, since much of the debate over the relative merits of theoretical and empirical investigation has so far proved to be more contentious than productive.

Faber and Proops argue more specifically that the physical scientist's understanding of the constraints on energy availability, process irreversibility, and entropy needs to be combined with economic analysis of technical and social responses to these constraints. Disciplinary boundaries in the academic world, however, make such cooperative research difficult to carry out. One of the goals of ecological economics is to legitimize and gain wide support for such research. Perhaps the outlook here can be hopeful, given the obvious importance of such cross-fertilization for discussion of current issues such as global warming, ozone layer depletion, or species loss.

Mary Clark's essay takes us across another interdisciplinary boundary, that between economics and social theory. She focuses on the conflict between competitive individualism and community relationships. She argues that the uncritical acceptance of a competitive individualist model of human motivation ("Gestalt I") has led inevitably to severe conflict between growth-oriented economic activity and the environment, as well as a weakening of community. The effort by economists to convert all values into prices intensifies these conflicts. She proposes a model of a sustainable community as an alternative goal ("Gestalt II"). This implies a reorientation of educational practice away from formal economics towards developing an understanding of the ecological and psychosocial foundations of sustainability.

If ecological economics represents the synergy of several different disciplines in the theoretical area, industrial ecology can be considered as its practical application. Jesse Ausubel presents some of the main tenets of this emerging field, which spans ecology, economics, and chemical engineering. Industrial ecology replaces a *laissez faire* approach towards technological change with a conscious process of design aimed at creating industrial structures which are compatible with their environment, emphasizing systematic resource recycling, energy conservation and reduced outflows of waste. Technological change has always been one of the "black boxes" of economics; industrial ecology attempts to open the box, examining the relationships of information, incentives, and control structures in shaping new technologies. In the past major new technologies have been "forced" by government policy decision - automobile-centered transport, nuclear power generation. The message of industrial ecology is that the process of introduction of new technologies should be better understood, and turned toward the goal of eco-friendly technology and the transition away from fossil fuel and high material-throughput technologies. (The term *throughput*, introduced by Herman Daly, refers to the whole process in which resources enter the economic system as inputs and emerge as outputs and/or wastes. It is discussed further in section III.)

The six articles dealing with sustainable development attempt in different ways to give focus to the concept. The obvious danger here is the watering-down of the sustainability concept to the point where almost any economic development, including some minimal environmental

protection effort, can be described as sustainable. In fact, sustainability is a demanding goal with environmental, social, and economic components. Properly understood, it also implies a fundamental break with the standard theory and practice of economic development, rather than minor modifications of an existing paradigm. Sustainable development is ecological economics in practice, and as such is very different from the economic growth models of standard economic theory. This becomes apparent as we review the contributions of the different authors whose work is summarized here, themselves drawing on the work of others who have grappled with the concept since it was first introduced by the World Commission on Environment and Development's 1987 report Our Common Future.

Richard Norgaard's "co-evolutionary" perspective on sustainable development (SD) sees it as grounded in an alternative world-view similar to that sketched out by Mary Clark. The inter-relationship of environment, technology, social organization, and value systems in shaping development dethrones economics from its position of primacy in shaping development. A local or regional focus for SD is also emphasized, providing a counterpoint to the market economists' emphasis on an increasingly integrated global economy. Sharachandra Lélé's critical review of SD literature shows that a frequent failure to recognize the broader implications of SD, and an effort to interpret it within the confines of the standard development model, have led to serious policy shortcomings, with examples cited from the areas of international trade, agriculture, and forestry. In each of these three areas, problems of unsustainability have been perpetuated by growth-oriented policies only slightly modified to take environmental considerations into account, and largely ignoring social equity and community sustainability concerns.

Vandana Shiva extends this line of critique, arguing that the ideology of the market system is fundamentally incompatible with sustainability. Development economists take the primacy of human-made capital for granted, seeing the transformation of natural capital (forests, soils, minerals, natural water cycles and ecosystems, etc.) into industrial capital as the essence of development. True sustainability, by contrast, depends on the recognition of the natural systems as primary. Social and economic structures must be adjusted to this reality, rather than the other way round. The clear implication is that a reconceptualization of the whole theory of development is needed, not merely an adjustment of existing theory to internalize environmental factors.

In "The Difficulty in Defining Sustainability," Michael Toman proposes the concept of a "safe minimum standard" as a possible compromise between economists' generally limited concepts of SD and ecologists' more demanding views of ecosystem protection. This approach would establish socially-determined limits to the scope of market exploitation of resources, based on environmental cost and irreversibility. Johan Holmberg and Richard Sandbrook suggest a more ambitious policy of "Primary Environmental Care" developed at the community level to meet basic needs, protect environmental resources, and strengthen community. John Dixon and Louise Fallon consider policy implications of SD from the perspective of the World Bank's Environment Department. (It is worth noting that this department has been far more attuned to SD theory than the Bank's growth-oriented loan officers.) These implications include: the importance of equity considerations in development as an alternative to the rising-tide-lifts-all-ships logic of across-the-board growth; resource planning for future generations; population policy; time horizons for planning and project evaluation; evaluation of species extinction and

other irreversible ecological damage; and an awareness of the limits of the market mechanism for development policy.

On completing this survey of articles dealing with the field of ecological economics and its policy correlate, sustainable development, the reader may well feel that a better case has been made out for the *need* for such a field than for the proposition that the field is already established. Many of the criticisms of the narrowness of neoclassical economics are trenchant, and the general call for interdisciplinary research seems appropriate to the growing importance of problems involving economic and ecological interrelationships. But we cannot yet point to any large body of successful research or case studies of policy implementation along these lines. Indeed, the development of this area is still rudimentary - but the rudiments may be more significant for future intellectual and policy work than the far more fully developed academic fields which have failed thus far to offer an adequate understanding of, or response to, the global environmental crisis.

With this observation in mind, we will move in Section III to a survey of theoretical work in the general area of ecological economics, then in Sections IV, V and VI to specific areas of analysis and policy evaluation.