



“Summary of article by Michael A. Toman: Economics and "Sustainability": Balancing Trade-offs and Imperatives” in Frontier Issues in Economic Thought, Volume 6: A Survey of Sustainable Development. Island Press: Washington DC, 2001. pp. 25-28

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### **“Summary of article by Michael A. Toman: Economics and "Sustainability": Balancing Trade-offs and Imperatives”**

The discussion of sustainability has been hampered by uncertainty and lack of uniformity regarding the meaning of the term itself. This paper seeks to identify some common ground among economists, ecologists, and environmental ethicists. Central issues include the requirements for intergenerational equity and the degree of substitutability between natural capital and other forms of capital. The concept of "safe minimum standard", which has been recognized in the ecology, philosophy, and economics literatures, is suggested as a defining principle.

#### **Intergenerational Fairness**

Theories of distributive justice can be divided into teleological theories (based on achievement of goals or preferences) and deontological theories (based on innate rights and obligations). A further division is between "presentist" theories that emphasize the current generation and its immediate descendants, and theories that place more emphasis on the future. Yet another division exists between individual-oriented theories and "organicist" conceptions which put greater weight on community interests. The typical economic concept of discounted intertemporal utility maximization is teleological, presentist, and individualist. It has been subject to ethical criticism on these grounds.

The concept of intergenerational economic efficiency, as defined by the Pareto criterion, does not seem problematical -- it simply requires that there be no waste. However, the use of discounting without concern for distributional considerations can impart a presentist bias to calculations of economic welfare. Howarth and Norgaard have shown that intergenerational equity can be viewed as establishing a fair allocation of endowments among generations. The use of a Rawlsian maximin criterion<sup>1</sup> in their context implies that economic growth should be coupled with a requirement that future generations be no worse off than the present. This approach, however, is still focused on maximization of individual welfare.

A "stewardship" perspective, by contrast, is based on deontological and organicist arguments that invoke an obligation to the entire context of future human life, rather than just future individuals. This perspective "emphasizes the safeguarding of the large-scale ecological processes that support all facets of human life, from biological survival to cultural existence." (403) The

organicist position suggests that there are important social values which cannot be captured in individual utility functions. While this gives a clearer basis for extending concepts of fairness to the intergenerational scale, it raises questions of individual rights, and poses the danger of the supremacy of the group over the individual.

### **Resource Substitutability**

Assuming that there is some responsibility to future generations, what combinations of capital resources (including natural capital) should be left to our descendants? The answer depends on assumptions about the degree of substitutability between different types of capital. Many economists tend to view capital resources as relatively fungible. From this point of view, large-scale damages to ecosystems are not intrinsically unacceptable, provided compensatory investments in other forms of capital are undertaken.

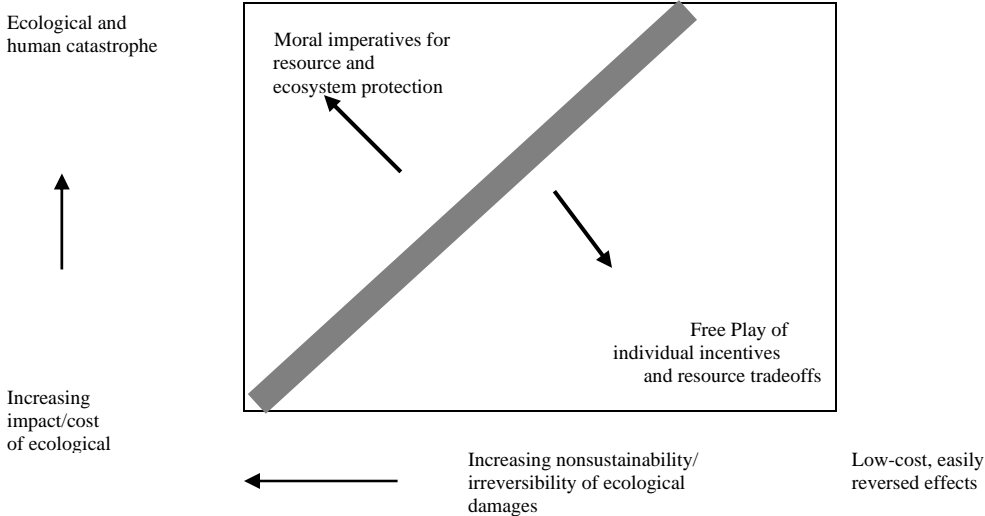
An alternative view, held by many ecologists and some economists, is that the compensatory investment approach is both ethically indefensible and physically infeasible. While there may be substitutes for some non-renewable resources, there are no practical substitutes for healthy ecosystems. A related issue is the distinction between local and global impacts. It may be possible to compensate for local environmental degradation through trade, diversification, or migration. But on a global scale, such compensation merely shifts environmental damages around, and ultimately leads to degradation of the entire planetary system.

At the risk of oversimplification, three alternative concepts of sustainability can be derived from this discussion of fairness criteria and substitutability:

- **Neoclassical presentism.** In this view, sustainability has little standing as a concept distinct from efficient resource use. The present-value criterion is used to evaluate intergenerational welfare, and different forms of capital are considered to be substitutable.
- **Neoclassical egalitarianism.** This view assumes capital substitutability, but assigns a stronger weight to future interests than is implied by the present-value criterion.
- **Ecological organicism.** This view emphasizes limited substitutability between natural capital and other assets, and extends the concept of intergenerational fairness from individuals to the species as a whole.

### **An Extended "Safe Minimum Standard"**

A conceptual framework based on the "safe minimum standard" promulgated by Ciriacy-Wantrup and Bishop, and developed by Norton, Page, and Randall, may be useful in balancing the competing claims of neoclassical efficiency and ecological organicism. "In broad outline, the framework is a two-tier system in which standard economic trade-offs (market and non-market) guide resource assessment and management when the potential consequences are small and reversible, but these trade-offs increasingly are complemented or even superseded by socially-determined limits for ecological preservation as the potential consequences become larger and more irreversible." (405)



**Figure I.1.** Illustration of the Safe Minimum Standard for Balancing Natural Resource Trade-Offs and Imperatives for Preservation

In this framework, human impacts on the environment are characterized in terms of "cost" and "irreversibility". The irreversibility metric introduces the ecological concept that large-scale damage to ecosystems is much more harmful and harder to reverse than small-scale disturbances. This gives a two-dimensional classification of resource and environmental impacts, as shown in Figure 1.

The safe minimum standard was developed in the context of species preservation, and its advocates suggest that benefit-cost analysis is inadequate when long-term costs are uncertain but possibly very large. In such cases, the presumption should be in favor of environmental preservation. In Figure I.1, the safe minimum standard applies to the area above and to the left of the dividing line. When impacts are higher in cost and, especially, are likely to be irreversible, the safe minimum standard should override standard economic calculations of cost and benefit. For impacts in the bottom right portion, with modest costs and a high degree of reversibility, individualistic valuations and trade-offs can be relied on. The orientation and placement of the fuzzy demarcation line will be a matter of debate, with ecologists possibly favoring a more vertical line, and neoclassical economists advocating a more horizontal one.

This dualistic approach to decision-making is consistent with the belief that people themselves are dualistic, acting as citizens as well as consumers. In acting as consumers, we use individualistic valuations, while as citizens we may favor social institutions for environmental management. This view, put forward by Vatn and Bromley, suggests that societies have evolved norms for environmental governance as a way of circumventing the limits of individualistic valuation. This "justifies in particular the imposition of safe minimum standards determined through political discourse and other complex social processes." (409)

## Conclusion

Sustainability concerns human values and institutions as well as ecological functions. At the same time, economic analysis without adequate ecological underpinnings is misleading. Both ecologists and economists can contribute to an interdisciplinary understanding of sustainability. Ecologists need to provide information in a form that can be used in economic assessment, and to recognize the importance of human behavior and incentives. Economists must consider the function and value of ecological systems as a whole, and make greater use of ecological information. While there are difficulties, it may also sometimes be possible to combine economic and ecological perspectives in a single model.

"Despite its continued abuse as a buzz-word in policy debates, the concept of sustainability is becoming better established as a consequence of studies in economics, ecology, philosophy, and other disciplines. With a better understanding of the interdisciplinary theoretical issues, and a better empirical understanding of both ecological conditions and social values, sustainability can evolve to the point of offering more concrete guidance for social policy." (410)

## Notes

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1. A maximin criterion for income distribution choices implies that the best distribution is one which offers the highest minimum income.