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## **“Summary of article by Giuseppe Munda: Environmental Economics, Ecological Economics and the Concept of Sustainable Development”**

This article offers an overview of economic approaches to the concept of sustainable development. Two different economic approaches to sustainability are contrasted: neoclassical environmental economics and ecological economics. Key issues which are identified include weak versus strong sustainability, commensurability versus incommensurability, and ethical neutrality versus acceptance of different values.

### **The Concept of Sustainable Development**

Traditional neoclassical economics analyses the process of price formation by considering the economy as a *closed system*. While classical economists like Malthus, Ricardo, Mill, and Marx saw economic activity as bounded by the environment, neoclassical theory essentially ignored this reality until the 1970s, when a debate began on the social and environmental limits to growth. At this point, some economists such as Ayres and Kneese argued that the economy must be seen as an *open system* which must extract resources from the environment and dispose of wastes back into the environment. The extraction of resources and disposal of wastes causes stress in the life-supporting ecosystem. The growing awareness of actual and potential conflicts between the two systems led to the concept of *sustainable development*.

In standard economic theory, "development" implies both a quantitative change (growth in GDP) and a qualitative change (transformation from a pre-capitalist economy based on agriculture to a capitalistic industrial economy). Theories of sustainable development involve both a critique of the quantitative GDP measure<sup>1</sup> and a different view of qualitative transformation. The goals of sustainable development include a harmonization of economic and environmental goals. Since it is difficult to conceive of Western-style economic consumption goals being realized on a planetary scale without massive resource depletion and pollution, this view necessarily entails issues of *distributional equity*. Distribution in this context refers not only to distribution of income and consumption levels, but also to the distribution of environmental burdens such as polluted air and water or toxic waste.

### **Neoclassical Environmental Economics**

Environmental economics focuses on:

- (1) The problem of environmental externalities;

## (2) The efficient management and intergenerational allocation of natural resources.

Neoclassical economists take their inspiration from Newtonian mechanics, generally believing that economics can be value-neutral, objective, and scientific. Rational decisions regarding "optimal" solutions in neoclassical environmental economics depend on calculations in monetary terms. Natural resources are not seen as imposing binding constraints on economic activity, since *technological progress* and *reproducible human-made capital* can substitute for natural resources. This view underlies the concept of *weak sustainability*, according to which an economy can be considered sustainable if it saves more than the combined depreciation of natural and human-made capital.

While some neoclassical economists deny any special standing to natural capital, others recognize an obligation to keep the value (though not necessarily the physical quantity) of natural capital at a constant level.<sup>2</sup> One obvious problem with this approach is the difficulty of assigning prices to all natural resource functions. To achieve sustainability in this analytical framework, *complete monetary commensurability* is required.

### **Ecological Economics**

Ecological economics focuses on environment-economy interactions, but recognizes the existence of *incommensurability* between economic and environmental aspects. Rather than the Newtonian scientific paradigm, it adopts a paradigm of *post-normal science*. This involves a recognition that in the area of global environmental issues 'facts are uncertain, values in dispute, stakes high, and decisions urgent.'<sup>3</sup> Uncertainties and values conflicts, generally pushed to the sideline in neoclassical economics, are crucial to ecological economics, which does not claim values neutrality nor an indifference to policy consequences.

In this respect ecological economics is similar to institutional economics: both recognize the importance of different values held by various interested parties, which are reflected in institutional arrangements. No single value-neutral perspective is possible, nor can problems be reduced to a single monetary measure. The distribution of property rights is of fundamental importance, and the interests of stakeholders will shape decision-making. It will not generally be possible to identify an "optimal" outcome, but the process of decision-making can at least be transparent.

From this point of view, development is not the straight-line process towards a Western industrialized society envisioned in neoclassical economics. Rather, it can be seen as a process of *coevolution* whereby human society adapts to a changing environment, while being itself a cause of environmental change. Cultures, values, beliefs, and economic systems coevolve with ecosystems.<sup>4</sup> The apparent temporary independence of modern productive systems from environmental constraints is an illusion, masking a breakdown of sustainable human/environment relationships. There is no unique or optimal development path; both cultural and ecological diversity are of fundamental importance, and their coevolution moves in unpredictable ways.

### **Economy-Environment Interaction**

Taking the broader ecological economics perspective, we must consider the relationship between three systems:

- **The economic system** including production, exchange, and consumption;
- **The human system** including biological life processes, culture, aesthetics, and morality;
- **The natural system**, within which both the economic and human systems are included.

The expansion of the economic subsystem is limited by the size of the global ecosystem. The idea that there are limits to the *scale* of the economic systems leads to a concept of *strong sustainability*, according to which some elements of natural capital are considered *critical*, and not readily substitutable by human-made capital. These critical elements of natural capital must be sustained over time in physical, not economic, terms. This is the theoretical basis for *satellite accounts*, which record physical stock or flow indices of important resources and environmental functions.

According to the thermodynamic law of entropy, resources are degraded and energy used up in all physical and life processes. Complete recycling of materials is impossible, and economic systems are dependent on adequate availability of energy. At the same time, the large-scale use of energy causes increased disposal of wastes into the ecosystem. All theories of development must therefore respect these natural limits on planetary economic scale.

### **Pluralism and Interdisciplinarity**

Traditional monetary evaluation methods such as cost-benefit analysis are based on a partial view of reality connected with only one institution: markets. A more inclusive approach should consider actors and institutions different from the narrow class of consumers. The existence of different perspectives and values should be acknowledged, and a conscious pluralism should be adopted as an approach to decision-making. Attempts to use a single-dimensional measure of value can lead to strange and morally questionable results. For example, the economics research team for the Intergovernmental Panel on Climate Change (IPCC) valued the lives of people in rich countries at up to fifteen times higher than those of people in poor countries.<sup>5</sup>

Rather than pursuing the chimera of "value-free science", analysts and policy-makers should seek to integrate a variety of disciplinary insights. "The impossibility of eliminating value conflicts in environmental policy and the call for a plurality of approaches creates a clear need for environmental philosophers and ethicists to play an important role in ecological economics."  
(229)

### **Notes**

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1. See El Serafy, this volume.
2. See e.g Pearce, D.W. and K.R. Turner (1990).
3. Funtowicz, S.O. and J.R. Ravetz (1994).
4. See Norgaard, R.B. (1994)..
5. See Bruce, James P. ed. (1996).