

ECOLOGY AND ECONOMIC POLICY

[Professor Dr. Udo E. Simonis](#)

Wissenschaftszentrum Berlin

Federal Republic of Germany

I. Interrelations and Conflicts Between Ecology and Economy

"Ecology in essence means the necessary and feasible harmony between man and nature, society and environment" (C.F. von Weizsacker). Economy, however, in general, means disharmony with nature. Use is made of nature both directly and indirectly when raw materials are processed into products, and nature is polluted by the emissions and wastes generated by industrial production. These are, then, the two processes in which nature remains the loser. She exchanges natural raw materials for produced waste materials. Besides labour and capital, nature is the truly quiescent and exploited third production factor. How, then, can nature's position in the "economy game" be strengthened, her rights guaranteed and her protection provided?

The use of raw materials and the generation of emissions and wastes are of course old issues. Scientific and technological development, however, has made it possible to increasingly exploit the depletable resources, and has led to an ever-increasing accumulation of harmful emissions and non-decomposable wastes. Nature is no longer able to absorb all of these substances, many of which are not only toxic to flora and fauna but to human beings as well.

Efforts to hide harmful emissions and toxic wastes - in dumping-grounds, in intermediate or permanent storage-places, to spread them - through high smokestacks and incinerators, or to dump them - into water bodies and abroad, have at best been temporarily successful because many emissions and wastes are "mobile poisons" or reappear in different forms. These activities lead to what Johan Galtun called "linearisation of ecological cycles", i.e., the natural diversity is reduced, the robustness of ecosystems declines, ecological symbioses and equilibrium break down. As a consequence, environmental degradation increases and the absorption capacity of the natural environment decreases.

Accordingly, the conflict between ecology and economy can be attributed to two (actual or possible) incompatible basic principles: The ecological principle of "stability", as a precondition for the sustainability of ecological systems, and the economic principle of "growth", as the inherent logic of economic systems - more precisely: the principles of business profitability, national economic growth, and world market expansion.

Given the actual and the pending ecological crisis, the question on whether these economic principles can be changed, reshaped and finally brought into harmony with ecological principles, on which level, in what way, and at what time, is, of course, a controversial question in both theory and practice, and a challenge to the social sciences. The answer depends, first of all, upon the respective individual and societal constellation of interests. The answer particularly depends upon the ability of and the willingness for social innovations, i.e., on (a) whether the potential of an ecological self-regulation of the economy is used, and (b) how the possibility of an ecological re-orientation of economic policy is implemented.

II. Ecological Self-Regulation of the Economy

One may start with a general statement: most certainly, only a small fraction of the current environmental problems would exist if the economic contexts would have remained so comprehensible, that producers and consumers would personally be able and liable to recognise and perceive the consequences of their own decisions towards depleting resources and polluting nature. Or, if business profitability, national economic growth, and the expansion on world markets could not be increased by externalising parts of the ensuing costs. This is the old but still relevant - because unresolved - problem of the external effects of production.

Scientific and technological development has been, and still is, coupled with negative external effects, i.e., the shifting of costs to society, future generations, and nature. With respect to the environmental problem, all these components of external effects are relevant. Let us take acid rain and the ensuing damage to the forests as an example of recent public debate in Europe:

- First, this example shows the shifting of a part of the costs of industrial production, i.e., not sufficiently reduced air pollutants, onto nature, which is resistant only up to certain levels: the forests are dying.
- Second, this example shows the shifting of costs onto the succeeding generations, i.e., a future with less or even no forests, and a limited reproduction capacity of the soil.
- Third, this example shows the shifting of costs onto third parties (i.e., partial expropriation of the forest owners) and onto society, in the sense that economic and technical decisions of individual polluters (especially emissions from power plants, cars, trans-boundary pollution) impair the well-being and the physical health of the population.

Thus, the economic system evidently makes incorrect calculations with respect to the "ecosystem forest". Both business accounting and national accounting do not provide sufficient and adequate signals which may prevent pollution levels that are not tolerable for the ecological system. Conventional accounting shows favourable balances for the productions of energy, for the automobile producers, and for the exporters of pollutants (just to stay with the three sources of pollution mentioned above), although the "ecosystem forest" is definitely being damaged by the emissions from these economic sectors. Losses here - profits there, a compensation does not take place nor is it provided for.

One of the pending tasks both for theory and practice can easily be described: internal and external effects of production, shift the costs back to the economic units that cause the environmental problem, and include the "ecological component" into all investment decision-making. Drastically reducing the external effects of production on society, nature, and future generations would be a necessary step towards regaining harmony between economy and ecology. But, how to proceed in practice and where to put the priorities?

To organise the economy as a materially integrated cycle would, first of all, mean to reduce systematically the use of depletable resources and the generation of polluting emissions and wastes - and this is in contradiction to an economy being organised for quick "throughput". In practice, recycling and clean technology is still at an incipient stage and not a systematic economic undertaking. Especially, the step from simply disposing waste towards an integrated waste management has been made only in a few cases.

Certainly, this is, in part, because many waste products cannot be recycled or only at high cost. But it is also true because the right price and cost signals have not been set. Preventing waste generation and conserving depletable resources are not being sufficiently promoted. This state of affairs, however, has also to do with the structural deficits of the economic accounting procedures which do not adequately measure diminishing stocks. The final outcome may thus consist of two contradictory trends: increasing monetary income - decreasing natural stock.

Approaches towards ecological accounting at the factory level and integration of environmental aspects into the national accounts, however, are promising and have sufficiently been tested. With ecological accounting the amount of energy, materials, waste, land use etc. are computed and, by simulating the given shortage, accounting units are determined which then enter the accounts. Thus a measure is developed which not only may guide private investment decision-making, but at the same time provide a public information instrument for determining and promoting qualitative economic processes. Another ecological principle is no longer adhered to, that of the sustainability of resource use. Traditionally, forest owners, for instance, have followed the rule, "Do not cut down more wood than can be regrown." This rule is being undermined: externally produced "acid rain" collides with internal resource conservation; accumulated external debt lead to over-exploitation of internal resources. Sustaining the yield of the forest capital is being replaced by indirect expropriation and direct exportation.

One basic principle to be re-established for the sectors and units of the economy is that of responsibility or liability. With respect to environmental problems, the legal system, and also economic behaviour, in most countries is marked by the strict proof of causality. Only when the injured (damaged party) can prove who caused the damage (polluting party) then the polluter is held liable for compensation. Instead, in some countries and for some cases statistical probability is sufficient for obligating industry to compensate for damages (collective liability). Once this principle is established by the courts and through legislation, it would quickly help to improve environmental quality through ecological self-regulation of business activities. In addition, it would strengthen the anticipate-and-prevent strategy in environmental policy, and shift the technical solutions for environmental problems from ex-post to ex-ante approaches, i.e., from controlling or end-of-pipe technology towards low emission or integrated technology. To implement the principle of responsibility or liability in practice, small steps or big leaps could be taken: from continuous reporting on wastes or automatic monitoring of emissions, to collective funds and strict environmental liability.

III. Ecological Re-orientation of Economic Policy

Confronted with serious environmental damage, conventional economic policy is increasingly being challenged. Its guiding principles, goals, instruments, and institutions are being questioned, and a new concept is emerging: ecological economic policy.

1. Conventional economic policy is based on the guiding principle of maximising flows: volume of production, income, profits, turnover. Fifteen years ago, Kenneth Boulding called this the "throughput economy" and opposed it by proposing the "spaceship economy". Writing today, he probably would speak of the "ecological economy". This paradigm is based on a different guiding principle, i.e., "increasing efficiency and maintaining substance!" Aspects such as environmental compatibility and resource conservation become important, and structural adjustment of products and technologies according to ecological considerations becomes the task.
2. With respect to the goals, it seems necessary to redefine and supplement the conventional economic policy goals, especially to re-assess the growth target and to include "environmental stability" into the catalogue of economic policy goals. The conventional policy goal indicators were developed at a time when environmental pollution was already a problem but not yet a public issue, and since then they have not really been readjusted. Economic growth is still being measured in terms of goods and income categories only (GNP - Gross National Product), while the effects of this on the stock and the quality of the resources (natural capital) are not adequately considered. In the conventional concept of economic growth, all monetary transactions are summed up independent of their specific function; also, increasingly more expenditures are included which are solely being spent for the (necessary) compensation for damage previously caused by the production process ("compensatory or defensive expenditures"). Qualified goal indicators for economic policy can be defined in various ways: through computations of the compensatory expenditure, i.e., assessment of an environmentally-related net product (ENP - Eco National Product); through combined growth and distribution indices (RWG - Redistribution With Growth); through an integrated system of economic and environmental indicators ("Satellite System"), etc..

3. Regarding the instruments, conventional economic policy relies strongly on two main instruments, variations of interest rates and of tax rates. From an ecological point of view, new taxes and charges are required which, to some extent, should replace traditional taxes. Highly relevant in a situation of structural unemployment and environmental pollution is the introduction of resource taxes (as, e.g., an energy tax) and emission charges (as, e.g., a charge on sulphur dioxide emissions), and a definite decrease of wage taxes. Such a structural tax reform would change the existing incentives in the economy towards accelerating resource efficiency and increasing employment opportunities.
4. Economic policy manifests itself in, and works through, particular institutions. Therefore, an ecological orientation of economic policy also requires creating new institutions, and abolishing or redefining old ones.

The current debate on the negative environmental effects of decisions by the World Bank and the IMF, and the call for necessary reforms, are just a case in point. The actual and pending environmental crisis seems to require a structural institutional reform by which economic institutions would have to incorporate ecological perspectives, and environmental institutions would have to improve their competence, and by which environmental impact assessments would become integrated into all major economic decision-making.

IV. Conclusion

A better harmony between economy and ecology is a tremendous task, conceptionally as well as practically. Its implementation requires a restructuring of the economy and a replenishing of economic policy. To "raise a loan with the ecology", i.e. to rely on ecological principles, is what matters. Biological structural change of the economy - and the ecological reorientation of economic policy - ultimately is the only chance to reconcile the interest of human beings and nature.

Professor Udo Simonis is a research professor in environmental policy at the Science Centre Berlin and former member of the German Advisory Council on Global Environment Change. He studied economics at the University of Mainz and the University of Freiburg, and received a Ph.D. from the University of Kiel. His previous positions include Personal Advisor to the President of Zambia, Research Fellow at the University of Tokyo, Professor of Economics at the Technical University of Berlin, Visiting Professor at the Chinese University of Hong Kong and Director of the International Institute for Environment and Society at the Science Centre Berlin. Professor Simonis is the Chairman of the Association of German Scientists and a member of the Advisory Committee of the Development and Peace Foundation.