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ECOLOGY AND ECONOMIC POLICY

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I. INTERRELATIONS AND CONFLICTS BETWEEN ECOLOGY AND ECONOMY

Ecology means the necessary and feasible harmony between man and nature (C.F. von Weizsacker). Economy, however, means disharmony with nature. Use is made of nature both directly and indirectly when raw materials are processed for the production of goods, and nature is polluted by the emissions and wastes of this production. There are, then, two processes in which nature remains the loser; she exchanges natural raw materials for produced waste materials. Besides labor and capital, nature is truly an exploited third factor of production. How can nature's position in this "game" be improved, her rights guaranteed and her protection provided?

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

Efforts to hide emissions and wastes - in dumping sites, in intermediate or permanent storage places, in high smokestacks - have proven only temporarily successful because emissions and wastes in general are "mobile poisons" (Peter Mayer-Tasch); they do not stop at borders. One result of this is the "linearization" of ecological cycles: the natural diversity is reduced, the robustness of the ecosystems declines, ecological symbioses and equilibria break down. As a consequence of these processes, the absorption capacity of the natural environment decreases and environmental pollution increases.

Accordingly, the conflict between economy and ecology can be attributed to

two 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 the economic systems; more precisely: the principles of business profitability, of economic growth, and of expansion on world markets.

Given the actual or pending ecological crisis, the question if and how 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 a controversial one in both theory and practice. The answer depends upon the respective (individual and societal) constellation of interest; here the opinions diverge rapidly and usually quite definitely. The answer also depends upon the ability and the willingness for social innovations, and especially ⁽¹⁾ how one uses the possibilities of applying ecological principles for the self-regulation of the economy, and ⁽²⁾ how one judges the possibilities for an ecologically oriented economic policy.

II. ECOLOGICAL SELF-REGULATION OF THE ECONOMY

To start with a general assessment: Only a small fraction of environmental problems would exist if the economic contexts had remained so small and comprehensible that producers and consumers would personally be able to recognize and perceive the consequences of depleting resources and polluting nature, i.e. if business profitability, economic growth, and the expansion on world markets could not be guaranteed or increased by externalising some of the given costs. This is the old but still relevant - because unresolved - problem of the external effects of production.

Scientific-technological development is coupled with negative external effects, i.e., the shifting of costs to third parties, or onto society, future generations, and nature. With respect to environmental problems, all of these components of external effects are interrelated; it is, as Klaus M. Meyer-Abich states, the incarnation of the industrial society problem.

Let us take the pollution of the "ecosystem forest" as a recent example of public environmental discussions:

- First, this example shows the shifting of a part of the costs of production, here in the form of not sufficiently reduced air pollutants, onto nature, which is resistant only to a limited degree: the forests are dying.
- Second, this example shows the shifting of costs onto succeeding generations, a future with less forests, or only a long term regaining of the reproduction capacity of the soil.
- Third, this example shows the shifting of costs onto third parties (i.e. partial expropriation of private forest owners) and onto society in the sense that economic and technical decisions of individual polluters (especially emissions

from power plants, transport, and transboundary pollution) impair the well-being and the physical health of society.

The economic system is thus making incorrect calculations with respect to the "ecosystem forest". Both business accounting and national accounting do not include sufficient signals to prevent pollution that is no longer tolerable for the ecological system or can no longer be coped with. Conventional accounting shows favorable balances for the production of energy, for automobile producers, and for pollutant exporters (the three polluting agents mentioned above), although the "ecosystem forest" is definitely being damaged by the emissions of these economic sectors. Loss here, profit there, compensation does not take place nor is it planned.

One of the pending tasks can therefore easily be described: "Internalize the external effects of production" or, in other words: shift the costs back to the economic units that cause the problems, and include the "ecological component" in all investment decision-making. Undoubtedly, decreasing the external effects of production on society, nature, and future generations would be an important strategic element for regaining harmony between economy and ecology. But, how to proceed in practice?

To understand the economy as an integrated cycle, or as recycling in the broadest sense, would mean to reduce systematically the use of depletable resources and the generation of polluting wastes - in contradiction to an economy being organised for speed throughout. In practice, recycling is still at an incipient stage (glass and paper wastes, old tyres, and used batteries) as a systematic economic undertaking. The step from simply disposing refuse towards an integrated waste economy has not yet been made. Certainly, this is in part because many waste products cannot be recycled at all or only at high costs. But it is also true because the right price and cost signals have not yet been set. Preventing waste generation and actively conserving energy are not sufficiently being promoted. And lastly, it has to do with the structural deficits of the accounting procedures which do not entail adequate criteria for measuring diminishing stocks. The result may be contradictory: increasing monetary income - decreasing natural stock.

Approaches for "ecological accounting" at the factory level and for the integration of environmental aspects into national accounting procedures are promising and have been sufficiently tested. With ecological accounting at the factory level, the amount of energy, materials, wastes, and land used 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 investment decision-making, but also may provide a public information instrument which can contribute to determining and promoting qualitative economic processes.

In addition to the above-mentioned principle of integrated cycles, a second ecological principle is no longer valid in modern industrial society: the sustainability of resource use. Traditionally, forest owners have followed the principle "do not cut down more wood than can be regrown", but this principle has been under-

mined: externally produced "acid rain" destroys internal resource conservation. Sustaining the yield of private forest capital is being replaced by indirect expropriation in the form of publically experienced "dying of forest". Nature fights back by dying. How should society fight back?

One basic principle to be re-established for the economy is that of responsibility of liability. With respect to environmental problems, the legal system and economic behavior is marked by strict proof of causality. Only when the injured (damaged party) can prove who caused the damages (polluting party) then that party is held liable for compensation. Instead, in some countries - for example in Japan - the statistical probability is sufficient for obligating polluters to compensate for damages. Once this principle was applied, it helped to improve environmental quality through ecological self-regulation of business activities. In addition it strengthened the concept of prevention in environmental policy, and shifted the technical solutions of environmental problems from "ex post" to "ex ante" solution, i.e., from end-of-pipe technology towards integrated technology. The practical implementation of the principle of responsibility and liability can follow different patterns: general environmental liability, cooperative funds, automatic reporting on emissions, etc.

III. ECOLOGICAL ORIENTATION OF ECONOMIC POLICY

Confronted with serious environmental problems, 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. Kenneth Boulding fifteen years ago called this "throughout economy". Instead, he demanded the "spaceship economy". If he were writing today, he probably would speak of an "ecological economy". This paradigm includes a new guiding principle: "increasing efficiency and maintaining substance". Aspects such as environmental compatibility and resource conservation become important, and the structural change of the economy, of products and technologies, according to ecological principles, becomes the task.
- (2) With respect to goals, it is necessary to redefine and supplement the conventional economic policy goals, especially to reassess economic growth targets and to include "environmental stability" in 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 an issue, and since then they have not been readjusted. Economic growth is still measured in terms of goods and income categories (GNP - Gross National Product), the ecological cycle is not included. Economic growth is defined as an increase of

income; the effects of this on the stock and quality of resources (natural capital) are not considered. And, finally, in the conventional concept of growth, all monetary transactions are summed up independent of their function. Increasingly more expenditures are included which cannot be positively assessed but are being spent on the necessary compensation for damages previously caused by the economic process (compensatory expenditures).

More qualified goal indicators for economic policy can be gained in various ways: through computations of compensatory expenditures, i.e. assessment of an environmentally related net product (ENP - Eco National Product); combined growth, employment and distribution indices; integrated system of economic and ecological indicators, 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, taxes and charges are required which, to some extent, can replace traditional taxes. Highly relevant in a situation of unemployment and environmental pollution would be resource taxes (e.g. energy tax) and emission charges (e.g. a charge on sulphur dioxide emissions). Such a combination could help to change the existing incentive structure in the economy towards increasing resource efficiency and employment opportunities.
- (4) Economic policy manifests itself in and works through particular institutions. Therefore, the ecological orientation of economic policy requires establishing new institutions and abolishing or redefining old ones.

As a rule, environmental problems are not confined to the parameters of private ownership nor do they remain within given borderlines. Environmental protection falls within the realm of competence of local, national, and international institutions. Thus neither the existing civil law, nor the national governmental jurisdiction can provide adequate answers to the environmental crisis. A structural reform of institutions is required by which economic institutions would have to incorporate ecological perspectives. Environmental institutions need to improve their competence, so that environmental impact assessments would become part and parcel of all 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.