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PREVENTIVE ENVIRONMENTAL POLICY -
Concept and Data Requirements

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Zusammenfassung

In diesem Papier wird das Konzept der präventiven Umweltpolitik vorgestellt und im Hinblick auf die zu seiner Ausfüllung benötigten Informationen untersucht. Die Umweltpolitik ist trotz anderslautender Beteuerungen nach wie vor in hohem Maße reaktiv, auf Schadensbehebung, nicht auf Schadensvermeidung ausgerichtet. Deshalb werden die allgemeinen Prinzipien einer an Prävention orientierten Umweltberichterstattung aufgezeigt und Beispiele präventiv-orientierter Indikatorsysteme vorgestellt. Das Papier schließt mit einem Aufriß der im Vergleich zum Präventionskonzept zu konstatierenden Defizite der praktischen Umweltberichterstattung in der Bundesrepublik Deutschland und einer Gegenüberstellung von Pro- und Contra-Argumenten, mit denen die Einführung einer präventiv-orientierten Umweltberichterstattung zu tun hat.

Summary

In this paper an introduction is given into the concept of preventive, anticipatory environmental policy and its data requirements. Environmental policy is still very much ex-post oriented treatment and not prevention of environmental damage is of primary concern. Therefore, the general principles of environmental reporting oriented toward prevention of environmental damage are discussed and examples presented which incorporate the prevention aspect of environmental policy. The paper concludes with a look at the deficiencies of environmental reporting in the Federal Republic of Germany, and a presentation of arguments for and against prevention-oriented environmental reporting.

1. Introduction

"Environmental policy can be defined as the sum of objectives and measures designed to regulate society's interaction with the environment as a natural system; it comprises aspects of environmental restoration, conservation, and management. Since society's existence ultimately depends on the natural environment and its resources, environmental policy in principle involves all societal rules governing the use of nature by human beings."¹⁾ Practice, however, does not conform to such a broad definition. Generally, only selected parts of the set of relations between environment and society become the subject of environmental policy. So far, environmental policy has mostly been understood as a set of media-specific policies concerning the control of air and water quality, noise abatement, and waste disposal, with emphasis on restoration.

For a variety of reasons, this conventional environmental policy was, and is, meaningful and is still necessary. It has a number of weaknesses, however, some of which are cited in the following contribution along with proposals for overcoming them through preventive environmental policy.

2. Preventive Environmental Policy as a Concept

In his essay "The State of Nature in the Nation," Christian Schütze (1981) pointed out a central problem that now confronts environmental policy in Germany--and elsewhere--as it has been practiced so far: "We have started to pay back--from Ried in Hesse to Goslar, from the Bavarian Forest to the fish markets of Cuxhaven."²⁾ If he were writing today, Buschhaus and Georgswerder would be added as further symbols of an ex post environmental policy. Since 1971, when systematic records first began to keep track of the funds appropriated for environmental protection, the sum in the Federal Republic of

Germany has come to the handsome total of 150 billion marks. We thus appear to be paying through the nose--backpayments for the external costs of production and consumption accumulated in the past.

Amounts like these, however, are ambivalent. On one hand, they give cause for proud political statements about the successes of environmental protection. On the other hand, they are--presumably--the absolute minimum of that which is necessary to secure the basis for society's long-term existence. At the same time amounts like these reflect the changing preferences and priorities of society. But they also symbolize the shortcomings of past environmental policies. Expenditures for environmental protection are made when damage to the natural environment is unmistakable and can no longer be denied. They are belated; they are repairs to the process of social development, signs of a reactive environmental policy--a post-operative policy that reacts to damages (and must react to them) but does not, and cannot, prevent them.

Reactive, ex post environmental policy has many shortcomings. First, it is expensive. It usually identifies the problem very late, and the measures it employs occasionally take effect so late that the ecosystems involved can no longer be saved. Besides, it is focused on only a part of the relations between environment and society; it is pursued as a media-specific policy for controlling the air and water quality, for noise abatement, and waste disposal. Thus, it runs the special risk of lacking coordination between its measures, which may result in shifting an environmental problem from one medium to another (from air to water) and, through spatial displacement, from one place to another (long-range pollution). In addition, conventional environmental policies become entangled in a dilemma of principles because the causes of the problems can be reinterpreted at the later stage. If immediate steps simply must be taken, the argument gets shifted in the process of political bargaining from a polluter-pays principle--which is advocated in general--

to the taxpayer-pays principle, thus switching the distribution of the burden of environmental protection from the individual (private) polluter to the community, government, and society at large.

The concept of "preventive (ex ante) environmental policy" can counter these shortcomings of traditional environmental policy, which is primarily reactive, and can show the way toward a gradual transition from reactive to preventive environmental policy.³⁾

Research on preventive environmental policy is difficult but necessary because--

- of growing pressure, given the abundance of tasks to be accomplished (significant reduction in automobile emissions and desulfurization of energy plants, for example), and the necessity to find solutions that are more acceptable economically than those involved in ex post measures;
- the early identification of future environmental problems (such as the impacts of new technologies) is needed;
- priorities for action (forest damage, for instance) must be set in time.

Research on the ways of implementing preventive environmental policy is difficult because--

- preventive environmental policy is confronted with the problems of complexity, uncertainty, and time pressure;
- analytic methods and political procedures are required that are not sufficiently well known or not yet adequately tested;
- institutional precautions and special administrative skills are required in order to make anticipatory action possible (enacting of measures and programs).

For many practical reasons, turning to prevention does not make ex post environmental policy superfluous, for previous damage must be rectified and unforeseen problems dealt with. Pragmatically speaking, ex ante and ex post approaches complement each other in environmental policy (much as they do for instance in medicine).

A second essentially different view of preventive environmental policy is possible, a view that can be paraphrased as "Ecological Modernization of Other Policy Areas." Along with and beyond established environmental policy--control of air and water quality, noise abatement, and waste disposal--the decisions in other established policy areas impinge on environmental quality. This is especially true of those policy areas that have a part in regulating the material cycle and corresponding technical systems: agricultural policy, technology policy, and energy policy in particular. In terms of preventing environmental pollution, it is interesting to ask if and how much ecological considerations, aspects, and approaches have been incorporated into these traditional policy areas and how ecological patterns of thinking can be gradually introduced and practiced in policy areas relevant to the natural environment.

The expectations placed on environmental policies in which the aspect of prevention is more pronounced than in the past should not be placed too high, however. Even future environmental policy will not be geared solely to avoiding damage but, at best, to limiting it more effectively than conventional environmental policy has.

3. The Information Aspect of Preventive Environmental Policy

Environmental policy oriented toward prevention requires better, comparatively sweeping and comprehensive information. Whereas ad hoc environmental protection measures are designed to deal with individual acute and, hence, known problems, preventive environmental policy keys in on environmental damage that might occur. This involves many, often independent influences and complexly interrelated variables.

The information aspect of preventive environmental policy shall be explored below with three main questions:

- What special information does preventive environmental policy require, and how would a corresponding system of environmental reporting ideally look?

- Where do these types of approaches already exist?
- Which factors promote environmental reporting relating to a more preventive approach and which work against it?

3.1 Principles of Environmental Reporting Oriented Toward Prevention

Preventive environmental policy can be understood as active, long-term management policy focused particularly on the ecologically sound development of economic, technical and social structures. Unlike conventional environmental policy, which is organized according to media, preventive environmental policy relates more to the anthropogenic conditions giving rise to environmental pollution. Unlike conventional environmental policy, which is oriented to the management of special dangerous situations, preventive environmental policy centers on the everyday forms of production, consumption, communication, and transportation.

From these characteristic features of preventive environmental policy emerge the goals and areas of concentration constituting the ideal type ("Idealtypus") of continuous environmental reporting: information is required about how the complex conditions at the root of environmental pollution develop. Thus information about environmental pollution at the end of the chain of effects (disposal, resulting damage) must be expanded by more information about causes, especially about--

- the development of polluting emissions and the originating levels of waste;
- the consumption or degree of use of resources (like energy and land);
- the technical processes and the products that pollute the environment; and
- the development of those economic sectors, systems of transportation, types of consumption and ways of life with relatively low environmental impacts.

Environmental reporting oriented toward prevention thus aims primarily at providing a continuous flow of information about the structural development of the economy and society from an environmental point of view. This approach must make it possible to recognize environmentally relevant developments in time to avoid a situation that reduces or eliminates the alternatives for action.

3.2 Two Examples of Preventive Environmental Reporting Approaches

Several countries and international organizations have developed conceptual approaches to environmental reporting that take up the aspect of prevention. Examples are the "Materials/Energy Balances" (MEB) and the "Stress-Response Environmental Statistical System" (STRESS).

The Bureau of Statistics of the United Nations has put forward draft guidelines for MEB as part of a comprehensive concept for environmental statistics.⁴⁾ This statistical system is designed to "reconstruct" the cycle of material and energy from their procurement and conversion from natural resources to final use--and from there back to the natural environment (as waste) or to further use in the production process (through recycling). In a certain sense, MEB can be considered as the input-output method being applied to environmental matters.

This system needs data about:
production, consumption, and the stock of resources; the flow of resources through production and conversion processes and consumption sectors; production, depreciation and inventories of durable goods; and the relationships between economic activities and the generation and distribution of waste.

Considering the statistical capacity of most countries, this system is thus highly demanding. It can also be criticized for its failure to consider the impacts the environmental

situation has on human health. So far only isolated case studies have made practical use of this approach.

The focus of STRESS is on the relationship between production/consumption activity and the change in the state of the environment; it differentiates between "preventive" and "curative" measures.⁵⁾

The use of this system requires data about stress (activities contributing to impacts on the environment), response (the observable effects of stress on the environment), and activity (collective and individual reactions to environmental changes, conservation measures).

The STRESS system was played through in a case study of the lower St. Lawrence River in Canada and in combination with ecological investigations. The Economic Commission for Europe (ECE) has presented a study on the practicability of the system for structuring compendia of national statistics.⁶⁾ STRESS was considered in that publication as an important instrument for recording environmental phenomena and improving the data base relating to the natural environment.

It must be emphasized, of course, that these and similar systems do not exhaust the possibilities and points of departure for supplying the information on which to base preventive environmental policy. In particular, the systematic screening of micro and macroeconomic accounting from an environmental point of view should be mentioned here.⁷⁾ All in all, however, a theoretically founded structure of environmental reporting has met so far with little, if any, success.

3.3 A Look at Environmental Reporting in Germany

In the Federal Republic of Germany, available environmental reports have not yet been systematically examined from the perspective of preventive policy. This work has just entered the project stage. Considering the most important series of

reports on the state of environmental quality and environmental protection, one could say the following:

- Most environmental reporting in the past has consisted of reports focusing on specific media--primarily the quality of air and water--and of reports on the type and development of specific environmental impacts (noise, waste, radiation). This includes especially the media-specific reports prepared by the Laender, the Federal Authority for Environmental Affairs (Umweltbundesamt), and regional institutions (such as the Commission for the Protection of the Rhine River [Rheinschutz-Kommission]), the clean-air plans of individual Laender, relevant passages in reports by the Council of Experts for Environmental Questions (Sachverständigenrat), various sections in the materials relating to the Umweltbundesamt's report on emission control,⁸⁾ and--last but not least--the Umwelt-Atlas by Koch and Vahrenholt.⁹⁾
- Cross-media reports on environmental quality are rare. Among the Laender there has been a trend in recent years, spurred primarily by efforts in Baden-Württemberg, to report more systematically on ecological relationships and to improve the quality of such work. One example of this is the environmental report prepared for Rhineland-Palatinate in 1983¹⁰⁾. That document, too, is organized according to the state of the environment in individual environmental media, but various areas relevant to prevention are included (such as transportation systems and types of farming). The state of this kind of reporting is not at all uniform, however. Some Laender, for example, have merely circulated better political campaign pamphlets highlighting environmental issues; others have prepared no comprehensive report on environmental quality at all. A systematic approach to environmental reporting that combines media-specific and cross-media information has been worked on at the Umweltbundesamt for some time. The "Daten zur Umwelt" (Environmental Data), however, have yet to be published.
- Reports on environmental protection activities have been customary for many years at various levels (local, federation, Land, and federal). Recently, there has been an

increasing number of reports on measures in the energy sector (conversion to district heating, energy conservation, etc.) in which environmental considerations had originally been peripheral at best. As a rule, the reports itemize the measures concerned, their costs, the degree to which the measures have been implemented, or the observable results. Thus these separate bits of information are not yet sufficiently integrated, weighed, or evaluated.

- Data on sectors of the economy relevant to prevention, like environmentally demanding production, consumption, transportation and energy systems, so far appear for the most part outside official and unofficial environmental reporting.

Summing up one can say that environmental reporting in the Federal Republic of Germany--much as in other countries--is still underdeveloped as far as preventive policy is concerned. Whereas there is a preponderance of media-specific reports (which focus on damages rather than causes), environmental reporting that deals with prevention (and causes) is just beginning. Much of the information needed for such reporting, however, is contained in report series outside the environmental reporting practice. To conclude, some of the factors promoting or detracting from environmental reporting that is oriented to prevention shall be presented as theses.

4. Factors For and Against Prevention-oriented Environmental Reporting

The following factors would seem to favor environmental reporting oriented to prevention:

- Triggered by environmental damage that can no longer be overlooked (such as forest damage), environmental awareness in general and, hence, the political pressure for an effective environmental policy has grown in recent years.

In addition, the concept of preventive environmental policy has found increasing support. Information on developments in areas causing environmental pollution and on measures that can deal with the causes effectively is gaining political importance.

- Since structural data relevant to prevention are linked through intermediary channels to the acute environmental damage only, institutions and federations depending on public legitimacy, find such data less intimidating than environmental information dealing with damage itself. Furthermore, for the individual, areas relevant to prevention are often even regarded in a positive vein, energy conservation being a case in point, because of the economic advantages it involves.
- Much of the structural data relevant to prevention that are not only ecologically but economically, socially and technologically important are already available. Unlike data related to damage, data related to prevention need not be gathered totally anew. The costs of developing such information is thus more acceptable.

There are also a number of problems that make rapid development of preventive environmental reporting difficult:

- Observing certain sectors of the economy, transportation, and technology systematically from an environmental point of view and gathering and publishing the resulting data will provide an information gain for environmental institutions and the public at large, but will simultaneously mean a relative information loss for other institutions; information determines the range of political power and social impact.
- Besides an institution's interest for hegemony, there are the interests of those individuals, firms, federations, and authorities whose actions are to be reported on from an environmental perspective. As happens with an actual or alleged threat of "information autonomy," environmental information oriented to prevention will therefore encounter resistance that--paired with basic political and ideological positions--can systematically frustrate efforts for improving environmental reporting.

- Finally, practical environmental policy in most countries is patterned according to specific and well known environmental media (air, water, noise) and not according to a systemic ecological pattern. For that reason, too, it may be possible to accomplish only a partial, very gradual transition to environmental policy that is oriented more toward prevention and to a corresponding type of environmental reporting.

Footnotes

- 1) Research Program 1983-1987, International Institute for Environment and Society (IIES), Berlin, October 1982, p. 6.
- 2) In: Scheidewege, vol. 11, 1, 1981, p. 139.
- 3) Cf. Research Program 1983-1987, op. cit., p. 7 ff.
- 4) Cf. Report of the Secretary-General on Environment Statistics: Draft Guidelines on Materials/Energy Balances, New York 1976.
- 5) Cf. Survey of Environment Statistics: Frameworks, Approaches and Statistical Publication, Statistical Papers, Series M, No. 73, United Nations, Department of International Economic and Social Affairs, Statistical Office, New York 1982, pp. 34 ff.
- 6) Cf. CES/SAEP: Comparative Survey of National Compilations of Environmental Statistics, Working Paper, Geneva 1982.
- 7) See H.M. Peskin: National Income Accounts and the Environment. In: Environmental Regulation and the U.S. Economy, edited by H.M. Peskin et al., Baltimore, London 1981, pp. 77 ff.
- 8) Cf. Umweltbundesamt (Ed.): Materialien zum Immissionsschutzbericht der Bundesregierung 1977, 1981, Berlin: 1977, 1981.
- 9) E.R. Koch/F. Vahrenholt: Die Lage der Nation. Umwelt-Atlas der Bundesrepublik, Hamburg 1983.
- 10) Cf. Ministerium für Soziales, Gesundheit und Umwelt des Landes Rheinland-Pfalz: Umweltqualitätsbericht 1983, Mainz 1983.