

SYSTEMS RESEARCH INSTITUTE,
POLISH ACADEMY OF SCIENCES, SZCZECIN DEPARTMENT
AGRICULTURAL UNIVERSITY OF SZCZECIN
FACULTY OF ECONOMICS AND ORGANIZATION OF FOOD ECONOMY

MODELLING OF ECONOMY IN SPECIALLY PROTECTED REGIONS

*Proceedings of the international conference
held on 9-11 june 1994 in Drawno, Poland*

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ON THE PROTECTION OF NATURAL ENVIRONMENT IN THE SPECIAL NATURE PROTECTION AREAS

Jerzy Hołubiec

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The strategy

The matters concerning environmental protection are presently in the focus of the majority of societies. Environmental degradation, caused by modern civilisation, starts to threaten this civilisation itself.

Numerous studies, conferences and publications are devoted to these problems on their local, regional, international and even intercontinental scale.

The areas of special nature protection are, as implied by this name, the object of particular care. The hazards to the environment within these regions can be subdivided into two groups:

- hazards resulting from pollutants produced and flowing from

the outside;

- hazards resulting from local activities carried out within the region.

Control and decrease of pollution included into the first of the two groups belongs to a superior scope of competence (of the state or of the international bodies), to whom existence of potential threats can be communicated.

The hazards of the second group are within the competence sphere of local authorities. These authorities have a lot to say here, it seems, and through the conduct of adequate policies they can contribute to the decrease of pollution and to protection of the respective environment, and thereby also to its harmonious development.

When we refer to "adequate policies", we mean not only technical matters, as one could expect at a first glance.

It appears that the care for the special nature protection areas should involve more general, broader criteria than the technical or technological ones.

The search for the solutions which can facilitate the finding of the proper "development path" for these special care regions leads, in the opinion of many scholars nowadays, to the group decision making methods. This domain of science is closely connected with the body of problems referred to as "social choice" problems, which, therefore, have wider implications, reaching also the realm of politics.

It is worthwhile to remind in this place the frequently asked question, which seems to be particularly justified in the case of specially protected areas, namely:

Should fees for the use of environment be introduced?

The tendencies which appeared recently in the world in connection with the special care areas - both in terms of nature protection and economic regional policy - can be reduced to the slogan of *Fitness for social and global environment*". Its application may already involve not only pronouncements of the whole societies of the regions in question in the form of votings (choices) through referenda, but also an active participation in realization of the slogan quoted in the form of *"total participation"*.

Passing from the general to the concrete let us mention that for the kind of regions here considered one should pay attention to two modern tendencies connected with the environmental protection, that is:

- low- or non-waste economy, and
- organization of the eco-tech-parks.

These two tendencies concern mainly the sphere of industrial activity, although it is obvious that in the areas of special nature protection the agricultural policies may also be effective in preventing the degradation of the regional ecosystem.

Low-and non-waste economy

The concept of minimum- or zero-waste economy is derived from the idea of low- and non-waste technologies. Such an idea was coined in 1979 under the auspices of the Economic Commission for Europe (ECE) of the United Nations.

The foundations of this concept are constituted by the wish of preventing that the "dirty" technologies pervade the economy.

Implementation of the concept is carried out through the horizontal connections between the economic structures and thro-

ugh formation of the so called spatial technological chains.

This requires a technology bank or base. An appropriate computer information system blocks the inflow of undesired technologies and simultaneously, in connection with the location policy, enables creation of the effective environmental protection program for the region.

A steady and facile accessibility of information ensures existence of conditions for taking of adequate decisions on the regional level, the accessibility being the key prerequisite for the regional development.

The regional computer information system - in accordance with the concept of minimum waste economy - is useful in integration of the economic, spatial and ecological development of the region.

On the basis of such an approach one may also think of optimization of the eco-development of the region.

For purposes of technology comparison and assessment the following indicators can, in particular, be used:

1. material and energy intensity of production processes,
2. water intensity of production,
3. waste and pollution flows,
4. employment, as well as labour productivity,
5. transport intensity (on the input and output sides).

Particular components of the system can be constituted, for instance, by the distinct computer models for the assessment of quality of surface waters in rivers and for the assessment of the status of aquatic ecosystems of the region.

In the first case we may deal, in particular, with a simulation model of the pollution transport and decomposition in the river network of the region, while in the second case - with, say, a model describing the interactions between the essential components of the aquatic ecosystem (phytoplankton and zooplankton) on the one hand, and the concentration of pollutants causing the development of these components (i.e. nitrogen and phosphorus compounds) on the other.

In general, the adequate utility of the system should ensure, in particular:

- sparing and economic resource use,
- constant decrease in the volume of waste in the region (through the available analyses of waste generation),
- more effective energy economy (through the analysis of energy demand originating from individual technological processes),
- more efficient water economy (through the possibility of performing the analyses of water intensity of the technologies).

Consequently, through implementation of the policy of low- and non-waste economy, the regional authorities have a real possibility of influencing the development of the region, the development of technological and organizational advance, and the conduct of an active policy of environmental protection.

Eco-tech-parks

Eco-tech-parks are an implementation of the general idea of "technological parks", based upon the ecological and economic prerequisites. The concept for such parks is connected with the necessity of changing the nature of approach to environmental questions.

The necessary changes, advised within the framework of the HERMES program (Helping Europe Revitalise Manufacturing: an Education Strategy) accompanying the European program ESPRIT, comprise, in particular, formation of the parks mentioned.

The idea of such a park consists in grouping of industrial production, power generation and waste management within one, common area, organized as a "human friendly" ecosystem. Given such a solution numerous producers are offered the possibility of using common infrastructure, including, in particular:

- common power supply system,
- jointly conducted water economy,
- common waste economy,
- joint maintenance service.

This shared infrastructure ensures the conduct of a more sparing energy and water economy, and a better use of resources. Production costs decrease and the burden to the environment is alleviated. It can altogether be stated that an ecologically oriented technological park should meet the following postulates:

1. sparing use of resources,
2. minimum burden to the environment,

3. improved production economy,
4. enhanced expansion and modernization capacities through shared infrastructure,
5. disappearance of the economy vs. ecology conflict.

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