

POLITICAL DECISIONS ON ECOLOGICAL PROBLEMS: ANTHROPO-ECOLOGICAL APPROACH

[Dr. Jaroslav Stoklasa](#)

Adviser to the Minister of the Environment
Chairman of the Federal Committee for the Environment
Czechoslovak Academy of Sciences
Czechoslovakia

Introduction

Already in the year 1971 in the Czechoslovak Academy of Sciences, the Institute of Landscape Ecology was founded as an inter-disciplinary institute for the investigation of the methods for solving the environmental problems. The Department of Anthro-ecology was from the beginning oriented on the theoretical and methodological approaches to these questions and for the synthesis of biological and socio-economic scientific results to prepare the background material for the political decision-making on solving the environmental problems. At that time, we formulated a theoretical and methodological model which we called the anthro-ecological system, and which we further developed during the time. This theoretical and methodological approach was used in the last years for the preparation of the inter-disciplinary background papers for the political decision-making on the solution of the environmental problems of Czechoslovakia and was applied in different case studies as an environmental impact assessment.

Decision-making on the solution of ecological problems

Decision-making on the near and long-term goals of socio-economic development is based, on the one hand, on the knowledge of the needs of society and their development and, on the other hand, on the knowledge of the limiting factors. On the general plane, it is possible to speak about the target behavior of a system in a certain environment and adaptation of behavior to changed conditions. The ergo-material and information ties of the system and its environment influence and impose limits upon its behavior. Consequently, it is necessary to obtain information about the limits as well as about the necessary adaptation mechanisms.

From the viewpoint of socio-economic development, these include, on the one hand, the barriers of natural conditions whose laws must be learned so as to prevent their damage, and, on the other hand, the acquisition of new technical solutions for optimizing the relation of needs and techniques for their satisfaction within the framework of a comprehensively conceived anthro-ecological system. The basis therefore is the process of cognition of the natural and social laws and their integration in trajectory variants as the basis for the social decision-making process with a view to determining long-term goals and the stages of their gradual attainment.

Inter-disciplinary anthro-ecological documents for political decision-making

One of the serious problems of the decision-making process in the solution of ecological problems is the quantity and diversity of the relevant data, their excessive specialization and thus the limited utility for decision-making. For a long time, many scientists have already agreed that the study and solution of environmental problems was no longer exclusively the affair of one scientific discipline but that they were essentially the subject of an inter-disciplinary approach. Practically all branches of natural and social sciences intervene in their solution.

This is certainly a generally acceptable view, but in its implementation, one meets with complicated obstacles. Not only for the problem of the specialized terminology of the different scientific disciplines where the same terms sometimes have totally different content, but mainly for the different methods of research, experiment, assessment and interpretation of the results. Even the results of the study of one object, e.g. water reservoir, will be completely different according to the points of view of each scientific discipline. It is most possible that the decision-makers would obtain from the specialists proposals for different, if not contradictory measures, and sometimes mutually exclusive solutions (e.g. such as recreational use of drinking water reservoir).

Here we come to the important task for science in social practice and, at the same time, to the methodological problems arising in the preparation of such an inter-disciplinary document. It is not only a matter of a 'different language' of different scientific methods in individual disciplines, but it sometimes concerns the debate on the fundamental issues of the scientific work. When has an 'exact' scientist the right or the duty to come out of the shell of his narrow and countlessly verified laboratory experiment to take up an attitude to an issue which is only vaguely related to his subject, and therefore only lends itself to a remote analogy? And yet who has the right to derive such an analogy, if not the specialist of the respective field?

Consequently, conflicts occur among specialists of the natural and social sciences, where each is trying to impose the priorities of his viewpoint as the 'nation-wide' interest. Another problem of such an inter-disciplinary cooperation is the discussion between the analysts and synthetists in each individual scientific discipline of both groups. In social sciences as well there are experts, specialized in some partial problems, who study the most minute details and, on the other hand, there are also natural scientists with a broad ecological orientation and an insight into several scientific disciplines. The analysts reproach these 'encyclopedists' for 'knowing nothing about everything,' while the synthetists laugh at the narrow specialists for 'knowing everything about nothing.' The discussion goes as far as the issue of 'science and non-science,' where only exact experimental work is considered as scientific, while its processing as a basis for decision-making is considered as non-scientific compilation.

In our opinion, this discussion is totally pointless. Evidently, science can only progress through analytical and experimental work in search for fundamental knowledge and laws. Different scientific disciplines have their different methods of analysis, their experiments and their laboratories. Such methods traditionally exist in the natural sciences but they are being continuously expanded by more exact and accurate equipment. The experiment takes place in exactly defined conditions and must be reproducible to be conclusive.

In the social sciences, the experiment, if it is at all feasible, cannot be repeated because a socio-economic process cannot be confined in a laboratory. Very often, in the time between the start of the experiment and its assessment, changes take place which affect the results or the views of the respondents even in the most careful selection, can only partially reflect the authentic opinions of a broader population.

In preparing data for decision-making concerning the environment, we have to realize that the relations between social and economic development and the environment are influenced not only by natural but also by socio-economic processes. The latter is the result of decision-making at the most different levels, from the individual and groups to society as a whole. Furthermore, these decisions are influenced by a hierarchy of values-individual and collective-by various stimuli (economic, legal, ethical, etc.), and the ways to their achievement. It is impossible to test these decisions out in advance or on 'a small scale,' or in a laboratory, because the real conditions at the time of their implementation and of the assessment of their results are mostly quite different than they were at the time they were made.

Consequently, we must consider every decision made in relation to the environment as an experiment for the future, constantly follow up its consequences on the environment and adapt further decision-making accordingly. It is a kind of circular process of cognition and decision-making (Figure 1) which also serves to avoid previous mistakes at each new step. Hence, the need for a close relation between science and social practice. Science is expected to prepare objective inter-disciplinary data based on the most recent scientific knowledge as a basis for the decision-making. But at the same time, science should follow the effect of the decisions in practice and work out the necessary suggestion for adaptation of the further decision-making process.

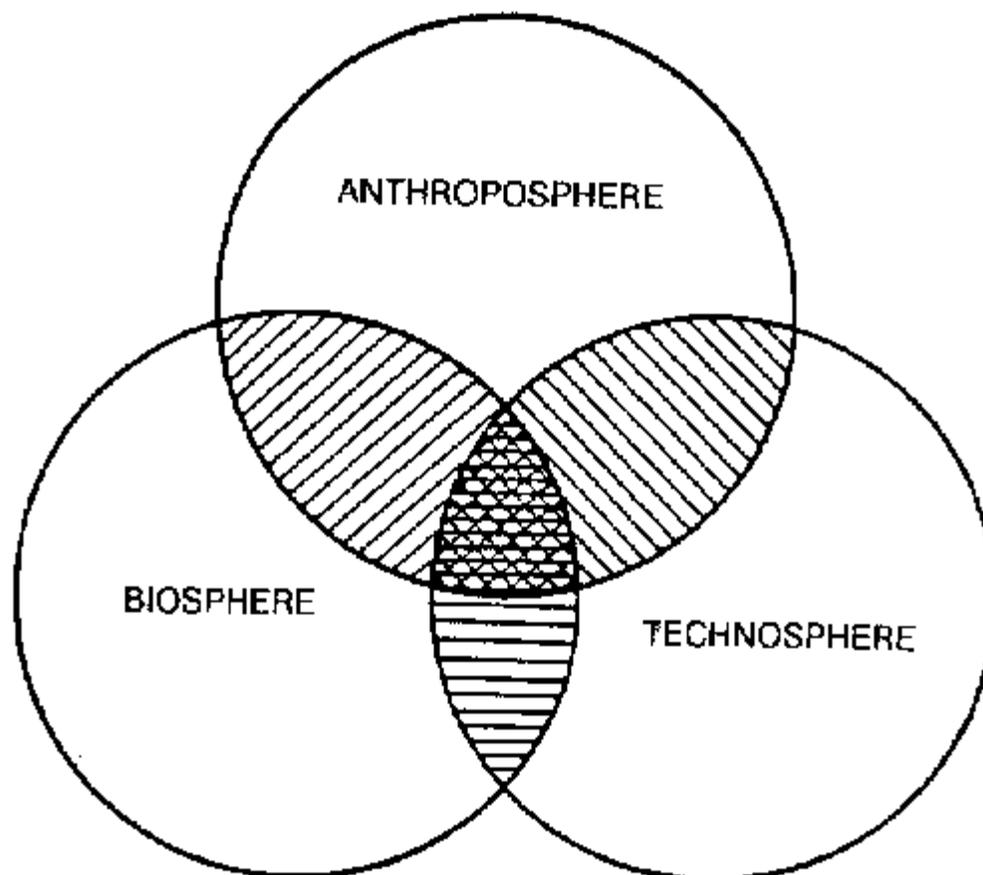


Figure 1: Anthropoecological System

The scientific background document for political decision-making must essentially be processed on the basis of basic research work, the study of the laws of phenomena and processes. This knowledge must serve as the starting point for the given task and be completed by studies in the respective territory. These studies must be carried out in the individual branches of natural and social sciences but directly oriented on the issue to be dealt with and the future synthesis of data and material. The choice of scientific disciplines and of the specialists who will work on the project depends on the nature of the problem and the aims of its solution. This condition is often difficult to fulfil and often one must make do with specialists who happen to be available or are ready to devote their time and work to the problem.

The individual branches should process the studies and proposed measures according to their professional viewpoints into a first synthesis (1. Level see Figure 2). This synthesized material must be incorporated into a second level of synthesis where the given task is assessed from the point of view of the biosphere synthesis of natural science), the technosphere (technical and economic synthesis) and the anthroposphere (social and economic synthesis). In the event of less extensive tasks or for lack of time and specialists, the first and second levels of synthesis can be carried out in a single phase.

All these materials must then be processed into the third level of anthropo-ecological synthesis, which should combine all three viewpoints and respect all the complicated relations within the systems. (Figure 3) Only such a complex, scientifically founded material, has the necessary value for the decision-making bodies. It should have the following structure:

1. Description of the problem: A description of the present state, possibly its causes and development, the description of the ecological, economic and social circumstances. It is not enough to state that certain kinds of plants or animals are threatened, but it is necessary to show what impact this threat can have on the health of the population or on the landscape's ecological balance as well as on further socio-economic development. It is necessary to present also an economic quantification of those impacts which could be economically calculated and to enumerate all other unquantifiables, at least as a supplementary argument.
2. Proposals of solution, which should be based on the combined anthropo-ecological synthesis and be presented in the form of several alternatives, one of which should show the situation which would develop if no measures were to be taken at all. Each alternative should indicate its possible ecological, economic and social negative consequences. It must also indicate resulting needs and measures, such as changes in technologies, capacities of production, manpower, investment, legal and economic measures and costs, etc. (Figure 4)

As explained above, the first level of synthesis is processed by specialists on the basis of studies and partial assessments by individual scientific disciplines. The second level of synthesis is carried out by more broadly-oriented specialists of the natural and social sciences, who have a clear view of the relations among the individual disciplines. The anthropo-ecological synthesis should be performed by experienced specialists who fulfil the following conditions:

1. To have a broad overview and knowledge of the laws of natural and social processes and their relations. They should 'know a great deal about many things.'
2. To be able to read and understand papers of different scientific branches in their respective specialized 'language' or terminology. They should be in a position to raise questions and discuss with experts.
3. The capability of selecting realistic alternatives from the partial synthesis not only from the ecological, but also from the technical, economic and social points of view, assess their economic and ecological impacts and derive a prognosis of development.
4. To formulate selected results and proposals at a high professional level but in a simple language understandable to non-specialists, with brief and well-founded arguments. The politicians have no time to read extensive scientific studies!
5. To have the courage to propose solutions in cases where science has not yet provided sufficient exact and experimentally verified results and it is therefore necessary to make a decision on the basis of analogies and incomplete scientific information. To postpone a decision until the assessment of long-term experiments could cause far greater damage than solutions adopted on the basis of contemporary, though incomplete knowledge.
6. To risk expressing the objective scientific truth, though it may be unpopular and some politicians do not like to hear it. Correct decision-making is only possible on the basis of objective and realistic information.

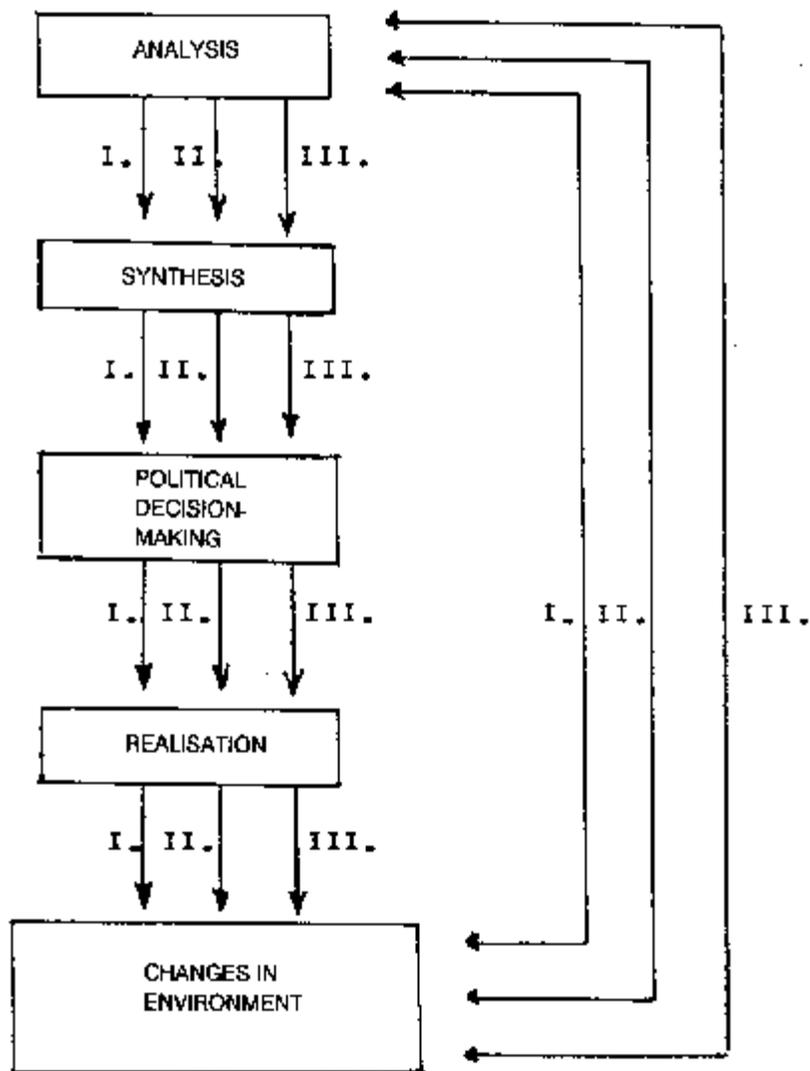


Figure 2: Circular Process of Cognition and Decision-Making

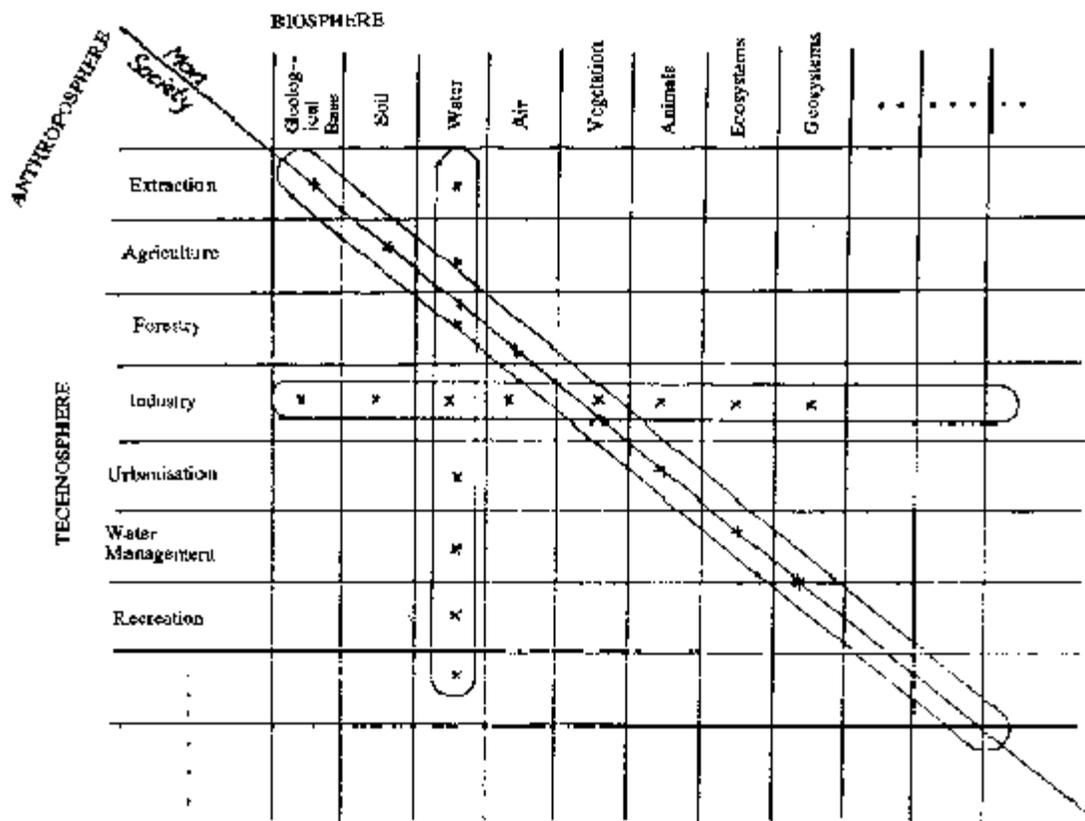


Figure 3

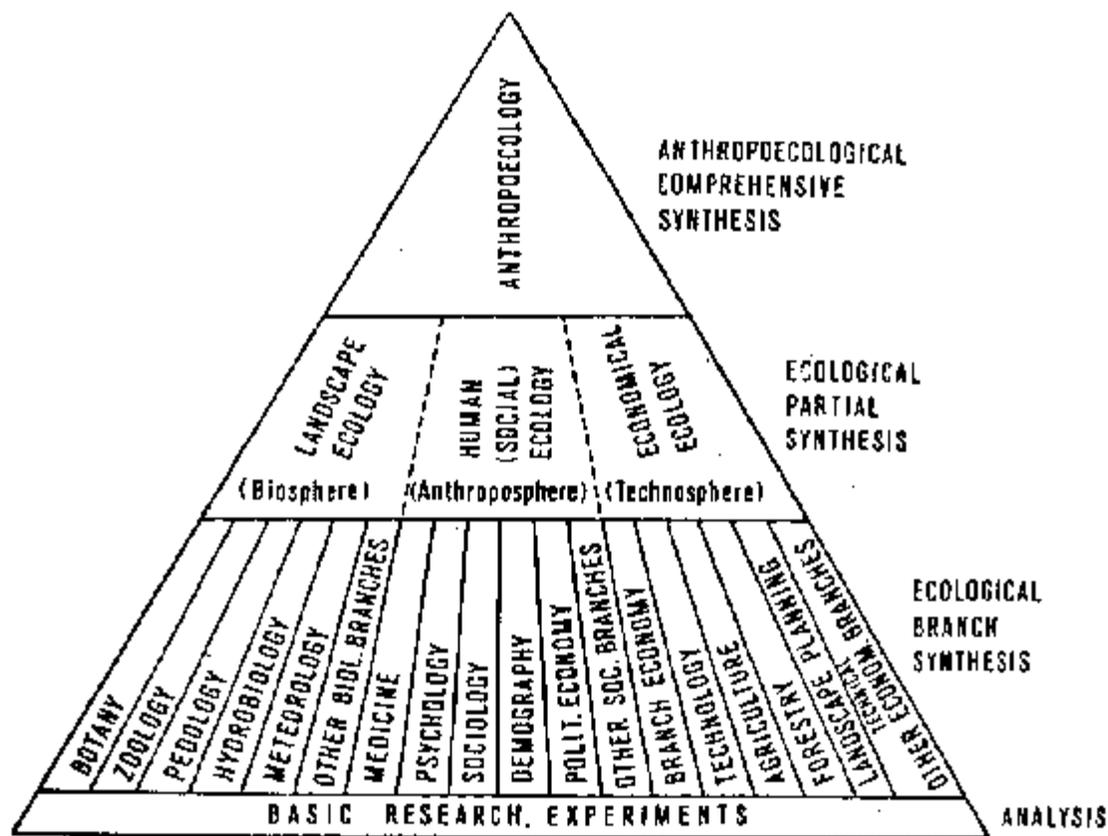


Figure 4: Approach of the Anthropoecological Synthesis

References

1. Petz, J., Stoklasa, J., (1972) "Natural and Artificial Systems in Man's Living Environment", Swedish-Czechoslovak Symposium on Ecology, Liblice. Institute of Landscape Ecology CSAS, Praha.
2. Stoklasa, J., (1979) "Anthropo-Ecological Approach as a Possible Method of Integration between Biological and Economic Development" in Methods and Strategies for Integrated Development. FOL, ONB/Mab UNESCO, Arlon, Belgium.
3. Stoklasa, J., Duinker, P., (1988) "Social and Economic Consequences of Forest Decline in Czechoslovakia". Working Paper, International Institute for Applied Systems Analysis. Laxenburg, Austria.
4. Blazek, B., Petz, J., Stoklasa, J. (1974) "Anthropo-Ecological Decision-Making: On the Analysis of Implicit Assumptions Intervening Between Biological and Economic Approaches in Anthropo-Ecological Decision-Making" in (1) Svensk Begrafisk Arsbok, Lund 49, 1973, pp. 7-13; (2) Lund Studies in Geography, Ser B., Human Geography, The Royal University of Lund, 1974, 40.

Dr. Jaroslav Stoklasa, member of the Czech Academy of Sciences, Honorary Advisor to the Czech Minister of Environment and member of the Steering Committee of the Society for Sustainable Living, has also held the post of Vice-Director for Economy and Management at the Czech Institute for Biology and Genetics and was involved in research at the Institute for Architecture, Human Environment and Landscape Ecology. During his tenure at the latter institute, he developed the principle of "anthropoecology" and later became head of the Department of Anthropoecology. Dr. Stoklasa has been very active in non-governmental environmental movements, prior to the velvet revolution, and published classified information on the state of the environment. A working member of the ECO Group at the Vienna Centre, he has also co-operated with the IIASA in Laxenberg, Austria, and served as Advisor to the Minister of Environment and Member of the Czech Commission for Co-operation with the IIASA. Author of over 150 papers and articles and guest lecturer of many European Universities, Dr. Stoklasa is currently retired and works as a private environmental consultant.