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THE CONDITION OF THE NATURAL ENVIRONMENT IN POLAND AND ITS ASSOCIATED PROBLEMS

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The condition of the natural environment, worsening annually not only in Poland but also on a global scale, leads to a justified anxiety about the future of the biosphere, and within this scope also about the future of men. Therefore, it is easy to understand the outbreak of various prognostic concept, commenced in 1969 by the well-known report of U-Tant. A particularly stimulating role was played by the book written by Meadows, Forrester and others, entitled "Borders of Growth", published in 1972 and translated into almost all languages. From that time the dispute over the future of the world became one of the main topics of discussion, among both scientists and in the circles of society. A large number of prognostic works of a global character were prepared as well as of a regional one, which were both optimistic although — even more frequently — pessimistic ones. In the majority of countries in the world, national programmes for the protection of the environment and nature were elaborated upon. Simultaneously numerous "strategies" of actions appeared, based on the already classical UNEP elaboration, as well as on more or less reliable "reports" concerning the actual condition of the environment.

The significant activity around the environment problems, which took place in the last two decades is fully justified, as it had been proved beyond any doubt that the condition of the environment is one of the basic barriers for the development of mankind, besides the demographic and raw materials barriers.

Also in Poland, the intellectual movement in defence of environmental values, which had its roots at the turn of he 19th century, increased significantly especially

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during the last decade. Moreover, in that decade over 20 various reports about the condition of the environment were elaborated upon. In the last phase of discussion is "The National Programme of Environmental Protection". Multidirectional scientific research is being conducted of the Environment, Natural Resources and Forestry, and the introduction of environmental problems into several decrees was approved of by the Seym created organisational and legal basis for all kinds of pro-ecological activities.

The State of the Natural Environment in Poland at the End of Last Decade

The information below is based on data contained in the "National Programme for Environmental Protection", published in July 1989 by the Ministry for Protection of the Environment and Natural Resources. Thus these are official data. They indicate that Poland — besides East Germany and Czechoslovakia — is the most polluted country in Europe.

The most environmentally dangerous are gaseous pollutions introduced into the atmosphere. The amounts of those pollutions is as follows:

sulphur dioxide	4200	thous. tonnes/year
nitrogen oxides	1530	thous. tonnes/year
carbon oxide	3200	thous. tonnes/year
aromatic hydrocarbons	400	thous. tonnes/year
others	33	thous. tonnes/year

Those types of pollution are mainly emitted by power generating plants /66.2% SO_2 and 40,9% NO_x/. They are characterized by a marked spatial concentration. In nine of the most highly industrialised voivodeships, occupying about 15% of the total area of the country, there are as much as 58 % of the national emission of SO_2 and 51% of NO_x emissions. From the point of view of emissions into the atmosphere of sulphur dioxide and nitrogen oxides Poland occupies one of the leading places in Europe. In absolute alues, in the case of the emission of sulphur dioxide Poland occupies the third place in Europe after the USSR /European part/ and East Germany, while in the case of emissions of nitrogen oxides — the sixth place /after the USSR, West Germany, Great Britain, France and Italy. The share of Poland in the total European emission amounts to about 10% of SO_2 and 8% of NO_x. It ought to be stressed here that the emissions of both those substances in Western Europe gradually decreases, and in our country — increases systematically.

Moreover, Poland constitutes a significant exporter of gaseous pollution. According to data of /UN/ECE the balance of settling of SO_2 in 1987 in relation to the current situation in Poland is a follows: the total "import" of pollution by SO_2 to Poland

amounted to 1398 thous. tonnes/year, and the "export" from Poland — 1734 thous. tonnes/year. It must be added that "import" to Poland contains emissions from East Germany /620 thous. tonnes/year and Czechoslovakia /290 thous. tonnes/year/, and we "export" first of all to the Soviet Union 654 thous. tonnes/year/ and Czechoslovakia /184 thous. tonnes/year/.

Also high in our country is the emission of dusts, amounting to over 3 mln. tonnes/year. However, it has a clearly decreasing tendency /by an average of 3 % annuality/. Unfortunately, there is a lack of reliable statistical data which would enable for the determination of the place occupied by Poland in Europe in this aspect. Very high in our country is pollution of the environment with heavy metals, particularly with lead and chromium. In the 1987 the environment was polluted with about 6 thous. tones. In comparison with other countries of Europe Poland is characterized by a large emission of those metals /in the emission of chromium it occupies the fourth place after France, USSR and West Germany, and in the emission of cadmium — 3rd place, after France and USSR, while in the emission of lead — 9th place, and mercury — 6th place/.

The pollution of water is considerable in Poland. In 1987 a total of 12.7 cu.m. of industrial and municipal sewerage was disposed of to surface water. The cleanliness level of the rivers is presented by Table 2. The cleanliness level of the lakes has not been studied lately. Studies conducted in 1979 — 1983 indicated that the 1st class of cleanliness was observed in about 1 % of lakes, 2nd class — 17 % of lakes, 3rd class — 29 %, and over 53 % of lakes had water outside classes. Surface water is continually and increasingly polluted by salt originating mainly from hard coal mines /an average mine water disposes of 7000 — 8000 tones of chlorides and sulfates in a clean form daily to the Wisla and Odra rivers/. In comparison to the situation in Western Europe the pollution of water in the country is 10 times higher.

The data presented above are only partially true. In reality they have been considerably lowered, particularly in the case of air pollution, as well as that of water. This is mainly due to estimated values, based on rather few efforts and the lack of a nation-wide measuring system, i.e. the so-called motoring of the environment. In such a situation information is obtained by an intermediate way, either from reports submitted by managements of selected industrial plants /1362 plants/, which — rather obviously — are interested in the minimalisation of the emission size, or through pilot studies, the result of which are then generalized by the "pars pro toto" method /which takes place for example in evaluating the cleanness of water/, or through intermediate valuations. Those underrated values may be approximately estimated at 20 — 30 % of values given in the "Programme".

The second drawback of the presented data is the almost total exclusion of surface pollution, such as the polluting of water and air by fertilizers and pesticides, radiological contamination, or pollution which is an effect of environmental littering. It is estimated that they increase the summarical amount of air pollution by about 5 — 10 %, and of water — by about 20 — 25 %, and their harmfulness, especially for human health, is considerably higher than that of point pollution from industry and line pollution from transport.

Introducing estimated corrections to the presented data allows for the assumption of the following values as close to reality /1989/:

Table 1: *Air Pollution /in mln. tonnes/year*

Substance	*From national sources*		*From foreign sources*	*Total*
	Acc. to Chief Central Statistical Office	*Corrected estimation*		
dusts	2.8	3.4	0.3	3.7
sulphur compounds	4.3	5.1	1.4	6.5
nitrogen compounds	1.5	2.1	0.4	2.5
carbon oxide	3.1	3.7	0.3	4.0

Table 2: *Pollution of Rivers /in % of river lengths/*

Class	*According to physical and chemical index*		*According to hybrobiological index*
	Chief Central Statistical Office	*Other souces*	
1st class of cleanliness	4.2	3.7	0.9
2nd class of cleanliness	27.6	24.2	1.9
3rd class of cleanliness	28.8	29.8	18.4
water outside classes	39.4	42.3	78.8

Regardless of the fact whether we assume estimations of the Chief Central Statistical Office, or whether we modify them, the pollution in Poland is significant, the highest /beside East Germany/ in European countries. This situation has been presented vividly by the Commission for Environmental Protection of the European Common Market, which wrote in its report: "Poland is an ecological bomb with a retarded ignition, planted in the center of the Europe. It is the duty of all European countries to help in disposing of its charge" /1987, p. 43/. This is a true statement, although it does not take into consideration the role of the Common Market countries in the creation of this bomb. If we assume according to Juda /1986/ that about 40 — 50 % of air pollution with chemical substances comes from outside our country /in accordance with other estimations — a little over 30 %/, then above all substantial assistance would be constituted by limiting the export of pollution to our country, which — at the moment — does not take place.

In preparing forecasts for the developmental possibilities of our country important are first of all, estimations of social, economic and ecological consequences of occurring pollutions. The basic criterion for such estimations is the determination of initial values, i.e. standards of admissible concentrations of harmful substances, taking into consideration the consequences of their cumulation in time.

Standards in force in Poland are very liberal, frequently two or three times more lenient than in other countries. Usually they are not based on reliable scientific data. Numerous physiological and ecological data indicate, for example, that a concentration of already 8 mg/cu.m./year of SO_2 decreases the growth of coniferous trees stands by about 10 %, and a concentration of over 20 mg/cu.m./year causes a clear degradation of those systems. It is also known that a concentration of all that substance exceeding 50 mg/cu.m./year constitutes a direct danger for the health of man. Meanwhile the current standards in force in Poland consider concentrations of up to 20 mg/cu.m./year as harmless for forests, and concentrations below 64 mg/cu.m./year as harmless for health. Thus, in accordance with our standards, almost two-thirds of forests areas are not endangered. On the other hand — if we are to assume standards in force in West Germany — the whole area of Poland is in an endangered area, and nearly 80 % of the area in a region of average and significant endangerment. This concerns both endangerment to human life and to forests.

Therefore the basic task for science is the elaboration of new fully objective systems of standards, separate for various recipients of influences. This is due to the fact that there is a different reaction to the given stimulus by man, and a different one by fodder plant, and still another one by a determined tree species. The striving for the unification of standards is methodically incorrect and as a consequence brings more damage than profit.

An important aspect in any practical activity for environmental protection is the determination of causes which lead to descripted negative consequences.

Those causes may be of two types: external and internal. We have basically no influence whatsoever on the first type, such as the chemical pollution of air, especially acid rains, or pollutions of the Odra and Wisla rivers and the Baltic originating outside our country. The elimination of consequences of that type of endangerment requires international cooperation, and the hitherto experience in this scope is not too encouraging. The signed conventions and agreements function mainly on paper, as their realization encounters resistance from the majority of signatories, which are interested, above all, in an improvement of the situation in their own countries. Let us hope that in the near future something may change in this scope.

Internal causes, which are the effect of an incorrect social and economic policy realized in our country in the last forty-year period, may be reduced to two basic groups. The first one encompasses all ecologically negative consequences of the preferred economic system, and the second one — similarly negative consequences of systems of value popularised and maintained within the society.

The evaluation of the economic system from the viewpoint of its ecological effiriency is relatively simple. This is aided by, among others, the Kneese index, which defines the relation between the sum of pollution and the size of produce in enterprise, region or country in a determined period of time. This index — as far as I know — has not been used in Poland. Initial estimating calculations conducted by myself indicate that it is in our country six times lower than that in the USA, or West Germany, five times higher than in England and three times higher than in France. This shows an unproportionally high production of pollution by our economy, particularly by the fuel and power industry, which is a consequence of the utilization of out-of-date technologies and the incorrect management of primary and secondary raw materials. Consequently, without a radical rebuilding and modernization of polluting industry branches, the improvement in the state of the environment in Poland is illusory.

The second of the above-mentioned causes is the subject of a separate paper. At this stage we ought to stress the existence of an obvious disproportion between the state of social consciousness and the assumed system of values, which is internally highly complicated. Until rather recently a distinct consistence existed between those variables /i.e. consciousness and system of values/, which was expressed by an exploitative and antiecological relation to nature, and presently while the ecological social consciousness clearly increased, the system of values remained unchanged.

Thus a discrepancy was established between the things said and the things which are really desired.

The natural Environment as a Subject of Prognosis

It is well known that the preparation of any type of scientific prognosis requires the following:

— primarily: knowledge of the initial state of the subject of the prognosis, its real and potential possibilities of reactions to external influences,

— secondly: a maximally full knowledge about external stimuli which determine the directions, intensity and rate of changes in the subject of prognosis,

— thirdly: the ability to select methods and technologies of elaborating prognosis, adequate for the prognosed object and possibilities of the prognosing subject.

Those are absolutely necessary requirements, which distinguish scientific prognosis from all kinds of suppositions, prophesies etc. Those requirements also define the admissible time horizon for presenting future states of prognoses subjects.

Is it possible for us in these situation to prepare a reliable prognosis of the natural environment in our country in twenty years? It seems that it is not. Although our knowledge about the natural environment, its differentiation, resistance, self-regulating and self-controlling properties is — despite numerous shortages — rather satisfactory. The external conditions are practically unknown. This automatically eliminates methods of the so-called simple forecasting, with a clearly defined sequence of causes and consequences of the "if ... then" type, and gives priority to complex technologies /originating for example from the theory of systems or theory of games/, or multi-scenario solutions, in which causative facts are being replaced with a series of hypotheses of potentially real situations. The multi-scenario concepts, although in their assumptions probabilistic, may provide a general view of the future.

Unfortunately, in the case of prognoses of the state of the environment, multi-scenario methods are particularly difficult to apply due to an enormous differentiation both of the prognosis subject and external causative factors. The latter may be of a global character /e.g. ranging of temperatures conditioned by the cosmos, which once led to glaciation; global anthropogenic transformations, which are lately so widely discussed/, as well as regional, or even a local character, also of a natural or

anthropogenic origin. As we can see, we are faced with a significantly complicated system of influences in which various unit types of impulses may stimulate each other or neutralize one another.

External anthropogenic influences — as those are of the greatest importance to us — are a derivative of a series of rather quickly changing factors of a social character /e.g. demographic, culture, etc./, as well as of an economic character /applied technologies, financial and material resources, etc./, the prognosing of which is excceedingly difficult.

It becomes obvious that in the situation where influences are so varied as is the natural environment, all forms of "step-by-step" prognosing are not too useful. Consequently, the question arises, is it possible at all to make prognoses about the state of the natural environment in Poland in twenty years? What will be the social and economic consequences of its degradation? Naturally it is possible to elaborate partial prognoses, concerning more narrow interactions, however, they do not provide sufficient data for answering the above defined question.

There is also a different approach, based on assumptions of the theory of games, in which we assume a priori, a determined state of the prognosed subject and we search for an answer to the question of what conditions ought to be fulfilled in order to achieve that condition and in what period of time would it be possible? In that case we do not act in the classical way, observing step by step how reality changes, but from a defined future towards the present times.

Let us assume the following parameters of the target model:

a/ limiting of the emission of gases /SO_2, N_xO_y, CO and carbohydrates/ by 90 %,

b/ improving of the water cleanliness to the level assumed in the "National Programme", i.e. increasing area of 1st class water to 40 % of water course length and decreasing water outside any class to zero,

c/ improving the health state of forests to the level of their full ecological and productional efficiency,

d/ limiting of large area pollutions, mainly agricultural, municipal and transport ones to the level of ecological and health standards.

In order to achieve the assumed target, the following two requirements must be fulfilled:

— ensuring financial, material, executing and technological means,

— obtaining an active support of the society on all levels of management and organization.

When it comes to the elimination of air and water pollution, the achievement of the assumed target with the present state of science and technology is fully real. This naturally concerns internal pollution produced in our country, as we have no direct influence of external effects /transborder pollution/. This may be obtained in two ways: through limiting pollution without major changes in production technologies or through linking cleaning activities with the change in that technology. In both cases the effect would be similar, but the costs would differ, and the second solution, i.e. the modernization of production technology, maximal utilization of alternate power, the creation of self-cleaning systems of small retention etc./ is socially and economically more profitable. Not going into details of calculations, the financial requirements for the implementation of both alternatives range between 50 — 70 billion dollars. Having at disposal the above-mentioned amount and the necessary material resourses and manpower, the assumed target could be achieved in the period of one investment cycle, i.e. during 3 to 5 years. On the other hand, if the investment processes are prolongated and the activities are distributed over a period of twenty years, the amount ought to be increased by an index of costs of tying up direct inputs /index of Moder and Philips/, which as a consequence would increase the required financial means to 65 — 90 billion dollars.

Taking into consideration various kinds of barriers and the state of our economy and social requirements, it is unrealizable to destine once for environment protection over 50 billion dollars. Thus the realisation of the recommended aim in the model is transferred beyond 1995.

And so is it possible to realize the discussed stipulation up to the year 2010? This would require investing in that period about 3.5 — 4.5 billion dollars annually /excluding the increasing of works front, due to a prolongated functioning of technically inefficient equipment, and simultaneously an increase of environmental degradation/. Thus inputs necessary to the achievement of the stipulated condition exceed the amounts of our debts to other countries, which at that time would have to be repaid. Can the Polish economy cope with that burden? This does not seem possible. And so the achievement of the stipulated aim would have to be transferred beyond the year 2010.

On the other hand the decreasing of pollution until 2010 by 30 % in relation to the year 1987 seems real provided additional financial means could be obtained from

outside, either through an eco-conversion of debts, or from the currently established International Ecological Fund.

It ought to be taken into consideration that in our social and economic situation financial means destined for environmental protection would be minimalised, at least during the next decade. In that period we will not be able to satisfy neither the basic living requirements of the society, nor will we be able to carry out a full technological restructuralisation of our industry. Therefore there are no opportunities for improving the state of the environmental quality by the "large inputs" method. In that situation any less costly effort should be undertaken, and to be more precise the "large input" and "low input" activities remaining in the sphere of the possibilities of the state ought to be linked skilfully, assuming as a target principles of eco-development policy. The establishment of small retention systems, the developing of alternate power sources, creating systems of protected landscape, taking care of the micro-environment for the life of man, rationalizing the chemicalization of agriculture etc. are not costly efforts. However, they require a social acceptance, expressed not in words but in actions, as well as a new economic policy, in which those small local investments would be particularly supported.

A separate problem is constituted by the future of our forests. As we know well, the dominating species in our forests is the simple pine, which is especially sensitive to chemical pollution, both of the air, as well as of water. Pines planted today will in the year 2010 reach a particularly critical age. Consequently, if until that time we are unable to decrease the chemical endangerment by at least 70 — 80%, then the volume of pine tree stands in the fifties of the 21st century is going to be near zero. Either we agree to that, or it is necessary to commence a general rebuilding of the tree stands structure, and thus to eliminate planting both pine and spruce, replacing those species by others, more hardy.

Would the introduction of eco-development principles into social consciousness be possible in such a way that it would become a pro-ecological power? Would the excess of everyday living problems not become a barrier in this case? Would the technocratic vision of the world not cover the ecological vision? I do not know. It seems that hope is in the attitude of the young generation, which is more and more conscious of the fact that its future depends on the state of the environment, which does not want to die prematurely, or give birth to crippled children. If we succeed in convincing them to accept the principles of eco-development, then we will win.

To conclude, it is worth considering in what way the geographical sciences could contribute to the improvement of the prognosed situation? Naturally, science as such is unable to change reality on its own. It may simply indicate directions for the desired changes. It may also — through a profound learning of mutual connec-

tions and dependences — define consequences of interactions for each of the cooperating parties and for the system as a whole. The results of scientific studies, appropriately translated into a language of practice, may only then become a causative power directly able to change reality.

The problem of the environment is from the very nature of things a multi-disciplinary problem, in which none of the scientific fields has priority. Of a similar character is also geography, which is a complex of many scientific disciplines, without a distinct domination of any one of them. For that reason geographical sciences /spatial ones/ are more predestined than any others to a general formulating of the "man — environment" interaction. And so, provided that we can within those disciplines conquer specialization barriers, which particularly separate the economic and social geography from the physical one, then the geographical sciences could become a center for studies on the environment.

LITERATURE

Bericht Ursachen und Verminderung von Wald-, Gewässer- und Bautenschäden durch Luftverschmutzung in der Bundesrepublik Deutschland, 1984, Bundesministerium des Inneren Verl. Bonn.

Białobok S. 1988, The Influence of Air Pollution on Vegetation, LOP Warszawa.

Chemical Endangerments of the Environment in Poland, /Report — Expertise/, 1983, Committee for Chemical Sciences of the Polish Academy of Sciences, Lublin. Typewritten copy.

Ginsbert-Gebert A. /Ed./ 1985, The Economic and Sociological Problems of Environmental Protection. Committee "Man — Environment" at Presidium of the Polish Academy of Sciences. Ossolineum. Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

Górka K., Poskrobko B. 1987, The Economics of Environmental Protection, PWE Warszawa.

Graf D. 1984, Ökonomie und Ökologie der Naturnutzung, VEB G. Fischer Verl. Jena.

Gurman V.I., Moskalenko A.I. 1980, Optimalnoje uprawlenije prirodnoekonomiczeskimi sistiemami, "Nauka", Moscow.

Juda J. /Red./ 1986, Environmental Protection. Synthesis of scientificresearch works conducted in the direction of the 7th Government Research-Development Programme PR8 "Complex Development of Power Engineering, Warszawa.

Kacprzyński B. 1979, Regional Development and The Environment of Mań. Quantitative concept, Studies of KPZK /?/ of the Polish Academy of Sciences, vol. 71. PWN, Warszawa.

Kneese A.V. 1977, Economics and the Environment, Penguin Books, New York.

Kołodziejski J. 1989, A Need for Ecological Safety. Partial expertise no. 7.6. in: For Modern Shape of Poland. Dilemmas of Development of Poland at the Turn of 21st Century, Committee for Prognosing Development of the Country "Poland 2000" at the Presidium of the Polish Academy of Sciences, Ossolineum. Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

Kozłowski S. 1983, Natural Conditions of Spatial Economy in Poland, Ossolineum. Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

Kulikowski R. 1982, Planning of Regional Development in Case of Limited Resources and Protection of Natural Environment /in/: Problems of Modelling of Development in the Country with Particular Regard to Environment. PWN, Warszawa.

Leszczycki S. /Ed./, Atlas of Resources, Values and Endangerments of Geographical Environment in Poland, PPWK, Warszawa /in press/.

Science Against Dilemmas of Development. Prognostic Works of Science Policy Research Unit, 1988, Poland 2000. Preview of Foreign Prognostic Literature, Ossolineum. Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

National Programme of Natural Environmental Protection, Draft, 1989, Ministry of Environment Protection and Natural Resources. Typewritten copy.

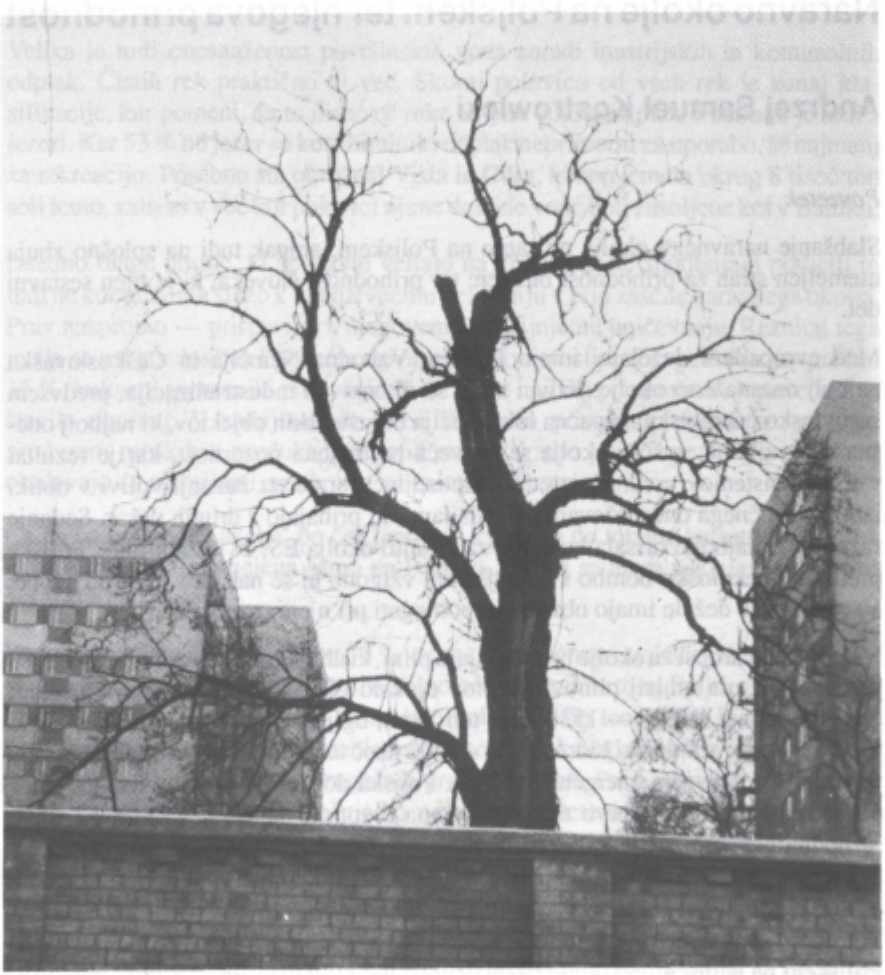
For the Modern Shape of Poland. Development Dilemmas at the Turn of 21st Century. Prognostic Report, 1989, Committee for Prognosing Development of the Country "Poland 2000" at the Presidium of the Polish Academy of Sciences, Ossolineum, Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

Problems of Social and Economic Development with Regard to Natural Resources, 1988, Committee for Environment Engineering of the Polish Academy of Sciences, Brochure 3/1988/, Ossolineum, Wrocław — Warszawa — Kraków — Gdańsk — Łódź.

Strategy for Nature Protection in Poland up to 2010. Draft, 1987, Ministry of Environment Protection and Natural Resources. Typewritten copy.

Wirtschaft und Umwelt. Die Verflechtung von Ökonomie und Ökologie, 1987, OECD und EWG Vorbericht, Berlin, E. Schimdt Verl.

Żylicz T., 1989, The Economy Against Problems of the Natural Environment. PWN, Warszawa.



Urban desert with dead trees.
Urbana puščava z mrtvimi drevesi.
***Foto* J. Solon**

Naravno okolje na Poljskem ter njegova prihodnost

Andrzej Samuel Kostrowicki

Povzetek

Slabšanje naravnega okolja ne samo na Poljskem, ampak tudi na splošno zbuja utemeljen strah za prihodnost biosfere ter prihodnost človeka, ki je njen sestavni del.

Med evropskimi deželami imajo Poljska, Vzhodna Nemčija in Češkoslovaška najbolj onesnaženo okolje. Krivci za to so intenzivna industrializacija, predvsem surovinsko energetska; napačna lokalizacija industrijskih objektov, ki najbolj onesnažujejo okolje; zaščiti okolja se posveča premajhna pozornost, kar je rezultat vsiljenih sistemov vrednot; izredno popustljive norme ter zunanji vplivi v obliki izredno močnega onesnaževanja z emisijami, ki prihajajo z drugih držav. Sedanje razmere je najbolje orisala komisija za zaščito okolja ES, ki je zapisala: "Poljska predstavlja ekološko bombo s podaljšanim vžigom, ki se nahaja v centru Evrope. Vse evropske dežele imajo obveznost pomagati pri njeni razorožitvi."

Največjo nevarnost za okolje predstavljajo plini, ki uhajajo v atmosfero. V letu 1988 je bila struktura emisij plinov: žveplov dioksid (SO_2) — 4200 tisoč ton letno; dušikovi oksidi (NO_x) — 1530 tisoč ton letno; ogljikov monoksid (CO) — 3200 tisoč ton letno; aromatski hidroogljiki — 400 tisoč ton letno. Tak tip onesnaževanja povzročajo predvsem energetski objekti. Poljska dosega 3. mesto v Evropi glede onesnaževanja z SO_2 (prvo mesto zavzema evropski del Sovjetske zveze, sledi Vzhodna Nemčija). Glede onesnaževanja z NO_x Poljska zavzema 6. mesto, za Sovjetsko Zvezo, Zahodno Nemčijo, Veliko Britanijo, Francijo in Italijo. V skupni evropski seštevek onesnaževanja Poljska daje okrog 10 % SO_2 in 8 % NO_x. Potrebno je poudariti, da se v Zahodni Evropi količina emisij zmanjšuje, na Poljskem pa narašča.

Poljska je tudi pomemben "uvoznik" onesnaženosti. V obravnavanem obdobju je Poljska "uvozila" 1398 tisoč ton SO_2 letno: "izvozila" pa 1.734 tisoč ton letno. Emisije dobivajo v glavnem iz Vzhodne Nemčije, Češkoslovaške, Zahodne Nemčije in Švedske, "izvažajo" pa jo v Sovjetsko Zvezo in na Češkoslovaško.

Na Poljskem je tudi veliko onesnaževanja z raznimi vrstami prahu — več kot 3 milijone ton — kar je v glavnem posledica zastarelih tehnologij. Resna je tudi onesnaženost s težkimi kovinami — svincem in kromom. Poljska je na 4. mestu v Evropi glede emisije kroma, na 3. mestu glede emisije kadmija, devetem glede emisije svinca in šestem glede živega srebra.

Velika je tudi onesnaženost površinskih voda zaradi inustrijskih in komunalnih odplak. Čistih rek praktično ni več. Skoraj polovico od vseh rek je zunaj klasifikacije, kar pomeni, da to niso več reke ampak odtoki odplak. Podobno je tudi z jezeri. Kar 53 % od jezer so kot zbiralniki odplak neprimerni za uporabo, še najmanj za rekreacijo. Posebno sta ogroženi Visla in Odra, ki sprejemata okrog 8 tisoč ton soli letno, zato so v več kot polovici njune dolžine vode bolj zasoljene kot v Baltiku.

Izredno blage norme, ki še vedno veljajo na Poljskem, ne spodbujajo podjetij in tudi ne komunalnih služb k intenzivnemu delovanju v prid zaščite naravnega okolja. Prav nasprotno — prispevajo k njegovemu nadaljnjemu uničevanju. Rezultat tega je, da so vsi gozdovi na Poljskem ogroženi, rodovitnost prsti je padla za povprečno 15 %, kulturni spomeniki propadajo in — kar je najbolj pomembno — povečuje se število obolenj. V zadnjih letih je na Poljskem prisotna prezgodnja smrtnost, predvsem moških v produktivnih letih ter večkratno povečanje števila otrok, ki obolevajo za alergijami, predvsem pa za otroško astmo.

Če ne bo energične akcije, bo čez petdeset let prišlo do totalne katastrofe. Takšna akcija ne sme biti omejena samo na Poljsko, pač pa se mora usklajevati z vsemi evropskimi deželami.

Zadostuje pojasnilo, da je okrog 50 % vsega onesnaženega zraka uvoženega. Enako je, čeprav v manjši meri, z rekami. Kakšno bodočnost ima torej Poljska? Na to temo je bilo izdelanih veliko študij, ki so bile bolj ali manj teoretične in faktografsko podkrepljene, vendar vse k problemu pristopajo ekstrapolacijsko, na način tipa "if ...then", ali pa slonijo na drugačnih predpostavkah. Pri poskusih predvidenega stanja naravnega okolja se srečujemo z izredno zapletenim sistemom, kjer postanejo preproste metode, uspešne npr. v demografiji, popolnoma nezanesljive, medtem ko bolj zapletene metode, sloneče na predpostavkah teorije sistemov ali teorije iger, zahtevajo širšo bazo informacij od tistih, ki je na razpolago. Očitno je, da je ob tako veliki raznovrstnosti antropogenih interakcij zelo nehvaležno napovedovati po metodi "step by step". Ali torej sploh lahko predvidimo stanje okolja na Poljskem čez 20 ali 50 let? Zdi se, da moramo k problemu pristopiti na obraten način — od predpostavke kakšna bo bodočnost, gremo nazaj k sedanjosti. Vzamemo npr. določeno stanje okolja (emisija plinov se bo zmanjšala za 90 %, v 40 % rek se bodo pretakale vode I razreda, makropovršinsko, predvsem kmetijsko onesnaževanje bo zmanjšano na nivo neškodljivosti) in ugotavljamo, katere pogoje moramo izpolniti,

da bi prišli do željenega stanja. V našem primeru je potrebna ekratna finančna (in materialna) infuzija v višini 60 — 70 miliard dolarjev. Denar in primerna materialna in kadrovska osnova bi v času enega investicijskega ciklusa (4 — 5 let) omogočila doseči zastavljeni cilj. V primeru podaljševanja investicijskega ciklusa za nadaljnjih 15 let, bi morali denarni znesek zvišati za "indeks zamrznjenih direktnih vlaganj", nakar bi se nujni stroški zvišali na 100 mld dolarjev. Upanje, da bi takšen znesek dejansko dobili, je nerealno, če upoštevamo veliko zadolženost Poljske. Torej vsaj do leta 2010 ne bomo uspeli odtsraniti večine onesnaženja.

Realno se zdi, da bi do leta 2010 zmanjšali onesnaževanje znotraj dežele za 30 %, vendar le ob mednarodnem sodelovanju, ki bi omogočilo zmanjšanje dolgov, ali pa dodelitev različnih posojil in dotacij.

V današnjem družbenem in ekonomskem položaju Poljske, vse akcije, ki zahtevajo veliko denarja, nimajo prioritetnega pomena in tudi stanje družbene zavesti jim ni naklonjeno. V takšnih ramzerah moramo posebno pozornost posvetiti lokalnim izboljšavam, ki ne zahtevajo veliko vloženih sredstav. Graditev sistemov "majhne retencije" vode, razvoj alternativne energetike, oblikovanje sistemov zaščitenega okolja, skrb za mikrookolje, v katerem človek živi, smotrna uporaba kemičnih sredstev v kmetijstvu, graditev malih čistilnih naprav za prečiščevanje vode — vse to ne zahteva veliko denarja. Potrebna pa je družbena naklonjenost, izražena ne z besedami, ampak z dejanji.

Potrebna je tudi nova ekonomska politika, ki bo spodbujala drobne, lokalne investicije. Ali ekorazvoj lahko pride v zavest družbe in postane močno gibanje? Ali lokalna ekološka zavest lahko premaga tehnokratsko vizijo sveta? Upanje je generacija mladih, ki ne bo želela prezgodaj umirati ali rojevati pohabljenih otrok. Če bomo mladim uspeli vcepiti ekozavest, bo problem zagotovo rešen.