

NATURAL ENVIRONMENT PROTECTION INSTRUMENTS AS STIMULATORS OF POSITIVE CHANGES IN THE NATURAL ENVIRONMENT AND LANDSCAPE IN POLAND

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ABSTRACT - The article presents a systematic set of instruments for environment protection as the background to describe major achievements Poland can boast of in the field of environment protection. In the presented group of instruments for environment protection, regulations, institutions and a financing system are concerned as rudimentary since they constitute a legal, institutional, and economic basis for environment protection. The achievements of environment protection in Poland result both from the political transformations that took place after 1989 and from a consistent application of environment protection instruments on all the state managerial levels.

Key words: instruments of environment protection in Poland.

1. INTRODUCTION

The political change from 1989 that took place in Poland has also brought basic economic changes and a different attitude towards the environment and natural resources. The necessity of rational exploitation of natural resources and protection of the environment has become recognized as crucial qualities for the future development of Poland. The new approach was soon reflected in the law on the State ecological policy passed by the lower chamber of Polish Parliament on May 10th, 1991 (Ordinance...1991).

Under Polish circumstances, environmental protection and rational exploitation of natural resources governed by law and supported by right administrative and planistic decisions seem to be the most effective way to harmonise human efforts with nature (Dubel K., 1996).

In the process of transforming the Polish economy into a free market system, environment protection shall be seen as one of the spheres that require state intervention, since it cannot be exposed to bare market instruments. It is the government that is responsible for the development of intervention mechanisms and the scope of state interventionism. It is also important that the Government policy regarding such fields as power engineering, industry, car industry, agriculture, education, science and information were always consistent with basic rules for ecological policy.

Therefore, an effective achievement of the environmental policy of the State requires the existence of instruments that support both implementation of environmental priorities and control of emitted pollution.

The primary objective of the paper is to present a systematic review of instruments for environmental protection that serves as a background for reviewing the major Polish accomplishments in the field of environment protection completed throughout the structural transformation period.

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2. INSTRUMENTS FOR ENVIRONMENT PROTECTION IN POLAND

The unquestioned successes related to environmental protection and attained in the period of structural transformation area result of both political changes and consequent application of the environment protection instruments at numerous state management levels. The natural environment protection instruments in Poland have been divided into the following seven problem groups:

- ◆ legal regulations,
- ◆ institutions,
- ◆ the ecological policy of the State,
- ◆ a system for financing environmental protection, economic instruments,
- ◆ environment protection instruments for spatial planning,
- ◆ ecological education,
- ◆ a supply of information.

The author presents the function of each instrument and gives examples of its application (**table 1**).

Regulations mean laying the foundations of a legal and administrative system for natural environment protection in Poland. The group includes mainly laws related to environment protection, regulations issued either by the Council of Ministers or by the Minister for Environment, and local laws. Local laws are communal regulations concerning natural environment protection for the concerned self-government areas (e.g. local spatial development plans), administrative statements on individual cases issued at the local administration level or by a Voivod.

Table 1. *Instruments of natural environment protection in Poland.*

TYPE	FUNCTION	EXAMPLES
LEGAL REGULATIONS	Creating legal and administrative basis of natural environment protection	<p>- Laws: (e.g. Environmental Protection Act; issued on April 17th, 2001 Official Journal n°62, item 627; and other). (e.g. Law issued on April 16th, 2004 on nature protection. Official Journal n°92, item 880 from 2004)</p> <p>- Ordinances: (e.g. Ordinance of the Minister of Environment issued on June 6th, 2002 on the admissible level of some substances in the air , the alert levels of substances in the air and tolerance margins for the admissible levels of some substances. Official Journal n°87, item 796) (e.g. Ordinance of the Council of Ministers issued on November 9th, 2004 on defining the types of projects which might have a significant impact on the environment and detailed conditions connected with qualifying the project to create a report on environment impact; Official Journal n°257, item 2573 from 2004) and other)</p> <p>- Acts of local law: a) communal legal regulations (e.g.: local spatial development plan) b) administrative acts on the level of local government units c) administrative given acts issued by voivods.</p>

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INSTITUTIONS	Creating subject and organizational activities influencing natural environment protection	<ul style="list-style-type: none"> - Ministry of Environment; - Departments of Environment Protection on the government administration level - Departments of Environment Protection on the level of local government units; - The State Inspection of Environment Protection; - Non-governmental bodies: <ul style="list-style-type: none"> a) foundations (e.g. Partnership for the Environment in Cracow); b) social organizations (e.g. Polish Ecological Club)
STATE ECOLOGICAL POLICY	Defining the rules and priorities of environment protection In Poland	<ul style="list-style-type: none"> - Polityka Ekologiczna Państwa; Uchwała Sejmu Rzeczypospolitej Polskiej z dnia 10 maja 1991 r. pt. "Polityka Ekologiczna Państwa" - Ecological Policy of the State Resolution of the Parliament of Poland issued on May 10th, 1991 "Ecological Policy of the State"
ENVIRONMENT PROTECTION FINANCING SYSTEM AND ECONOMIC INSTRUMENTS	Creating an integrated system of environment protection system in Poland; Controlling environment protection via economic instruments of its protection	<ul style="list-style-type: none"> - Environment protection financing: <ul style="list-style-type: none"> a) ecological funds (e.g.: National Fund for Environment Protection and Water Management); b) subsidies both from the central budget and from local budgets; c) financial foreign aid, realized, among other, in the form of the so-called „eco-conversion”. - Economic instruments of environment protection: <ul style="list-style-type: none"> a) taxes, b) payments, c) fines, d) subsidies.
ENVIRONMENT PROTECTION INSTRUMENTS IN SPATIAL MANAGEMENT	Analysis and assessment of the effects of spatial development decisions for the natural environment.	<ul style="list-style-type: none"> - Prognosis of local spatial planning effects on natural environment (Official Journal n°197, item 1667, 2002). - Decisions on the environmental conditions of granting a permit for realization of a venture (while issuing a building permit) (Official Journal n°257, item 2573 from 2004).
ECOLOGICAL EDUCATION	Making the society aware of how important the problems within the scope of environment protection are.	<ul style="list-style-type: none"> - Taking the problem of environment protection into consideration In the syllabuses of lots of Polish universities and schools; - A broad understanding and considering the ecological problems in the mass media.
INFORMATION FEEDBACK	Information feedback on the decisions concerning environment protection. Gathering, processing and making available the information which is significant for environment protection control.	<ul style="list-style-type: none"> - Monitoring of the natural environment; - Databases in the field of environment protection; - Geographic systems of spatial information (GIS); - Land information systems (LIS).

Source: the author's study

Institutions are the organs that provide both subject and organisational activities influencing the natural environment protection. They are either organs that administer environment protection in

Poland or those that monitor the natural environment condition (e.g. National Inspection for Environment Protection), and non-governmental organisations (Magiera-Braś G., Gawroński K, 1999).

Ecological policy of the State defines the rules and priorities for environment protection in Poland. It is aimed at two strategic targets:

- further improvement of the natural environment with a parallel reaching proper indices related to rational management of national resources, realized by adopting and implementing the EU environmental protection standards;
- increased economic and social benefits due to rational management and exploitation of the existing biodiversity resources (e.g. by developing tourism and a more effective use of the biological potential of Polish soils).

The financial system for environment protection in Poland is based on ecological funds, subsidies from both the central and local budgets, and on foreign financial aid means. There are the following ecological funds: National Fund for Environment Protection and Water Management, sixteen voivodship Funds for Environment Protection and Water Management, as well as county and communal funds.

Natural environment protection can be customised by many economic instruments such as taxes, charges, fines or subsidies. In all market economies taxes are the main source of the national budget income, being the citizens' service to the State and to local government institutions at the same time. However, fees and fines remain the main instruments of shaping the pro-ecological approach. On the one hand, they are aimed at stipulating and stimulating protection-oriented ventures, and on the other at minimising the social cost of natural environment protection. Therefore, economic fees serve both the function of stimulation (motivation) and acquisition of funds for natural environment protection, i.e. a redistributive function (Górka K., 1996). All subjects responsible for emission within the range specified by the legislative standards and regulations are charged.

Financing natural environment protection from the means gathered on the bank accounts of ecological funds consists in subsidising environment protection projects as well. Such subventions cover two groups of instruments:

- single or periodical subsidies to a business made by public institutions or individuals, given due to realisation of a particular goal (e.g. an ecological one);
- preferential credits allowed by bank institutions (proceeds of the ecological fund are then used to compensate the difference between commercial and preferential credit rates offered by banks for environmental protection projects.)

Environment protection instruments also allow analysing and assessing the impact that particular spatial policy decisions have on the natural environment. The legal basis for applying such instruments was established in 2003 by the Polish Parliament in the Spatial Development Act (Law ...2003). The act introduced an important issue from the environment protection point of view concerning an obligation binding urban planners to have their projects evaluated by environmental protection experts. The evaluation considers the impact of the solutions presented in the conceptual spatial plan on the widely understood natural environment (Ordinance...2004).

Another instrument for environmental protection used in spatial management is an obligation put on self-government organs and on voivods of issuing the so-called decision on environmental conditions of granting agreement for investment realisation (while applying for a building permit). The decisions may oblige the investor to prepare the so-called 'environment and landscape impact report'.

Environmental education remains another important instrument for effective environment protection, since it makes people aware how important and significant the problem is for their well-being and the quality of life.

Last but not the least, I would like to mention a group of instruments that involves collecting, processing and making the data on natural environment available for management and control of the natural environment protection. Monitoring of the environment, databases covering various natural environment subjects and various spatial information systems are representative for this group to name just a few examples (Gawroński K., 2000).

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**3. GENERAL CHARACTERISTICS OF CHANGES IN POLISH NATURAL
ENVIRONMENT IN THE YEARS 1990-1999**

Polish natural environment has greatly benefited from introducing the instruments described in the previous section into the ecological policy of the state. The progress in that field is a matter of fact. It has affected both the quality of life of the whole society and the international image of Poland significantly.

Since 1990, a systematic growth in the value of environment protection investments has been recorded in Poland. The expenditures on such projects have risen from 0.8 billion US dollars in 1991 (which was 2.4 % of total investment value in the national economy) to 2.3 billion US dollars in 1998 creating ca. 6 % of total national investment value. In 2005, the environment protection investment expenditures amounted to ca. 2.2 billion US dollars that was 0.9 % of the GDP. (Year-book...2006).

Table 2 presents the profile and the dynamics of the funds for pro-ecological investments in Poland for the period 2000-2005.

Table 2. *The structure of environment protection expenditures in Poland and the dynamics of their changes in the years 2000-2005.*

N°	Description	2000			2004			2005		
		[mln PLN]	% of total environment protection expenditures	Dynamics change index in 2000 = 100.0	[mln PLN]	% of total environment protection expenditures	Dynamics change index in 2000 = 100.0	[mln PLN]	% of total environment protection expenditures	Dynamics change index in 2000 = 100.0
1	Atmospheric air and climate protection	2417.8	37.4	100.0	1155.1	22.6	47.8	1149.5	20.0	47.5
2	Waste water management, water protection	3341.2	51.7	100.0	3126.7	61.1	93.6	3615.6	63.1	108.2
3	Waste management, soil protection	650.6	10.1	100.0	736.1	14.4	113.1	847.5	14.8	130.3
4	Protection of biodiversity and landscape	4.0	0.1	100.0	10.1	0.2	252.5	7.6	0.1	190.0
5	Reducing noise and vibrations	47.3	0.7	100.0	88.1	1.7	186.3	113.9	2.0	240.1
	Total	6460.9	100.0	100.0	5116.1	100.0	79.2	5734.1	100.0	88.7

Source: State Statistical Office (GUS) 2006.

As the presented statement shows, the environment protection expenditures are concentrated mainly on investments within sewage management projects together with atmospheric air and climate protection. The analysis of expenditure changes in the years 2000-2005 depicts their considerable growth in the fields of biodiversity and landscape protection, decreasing noise and vibrations and waste management. On the other hand, the dynamics of expenditures connected to air protection has decreased. It is due to the fact that significant financial means were directed at that target in the period 1990-2000, which contributed to a substantial atmospheric emission decrease of all basic pollutants. It is proved by the indices of dynamics change of main air pollutants in Poland in the years 1995-2004 shown in **table 3**. As the list implies, the sulphur dioxide and dusts emission have decreased significantly while the reduction of nitrogen monoxide and carbon dioxide or non-methane volatile organic compounds is not impressive. It is caused mainly by intensive growth of motorisation. A

tendency of local exceeding of nitrogen oxides and tropospheric ozone standards at urbanized areas has appeared.

In the years 2000-2005, a lot of environment protection and water management investments were given into use in Poland (**table 4**). Their greatest increase was observed concerning the household sewage treatment plants and investments connected with regulation and channelling rivers and streams.

Poland falls into the category of water-deficient countries. The annual uptake of water for the national economy needs reaches 12,000 million m³ of water, out of which, the industry uses 71.4 %, utility networks 19.8 %, and 8.8 % remains to be used by agriculture and forestry together. About 85 % of the total consumption of water returns to the surface water as waste. The annual amount of disposed waste water reaches about 10,000 million m³, 17 % of which is attributed to utility networks, whereas 83% is industrial waste water. It is the result of more rational water use in both individual households and for production purposes, which was stipulated by legal and economic instruments. It should be noted here, that a very high rate of reducing the amount of waste water was recorded for utility networks. At the same time, a wide scope of investment activities brought an increased number of waste treatment plants and their improved efficiency. The overall length of contaminated sections of rivers in which the limits permissible by Polish standards are exceeded has been reduced significantly. Simultaneously, the amount of biogenic substances, organic compounds, heavy metal elements, as well as phenols and other toxic substances were found to have fallen systematically. One should mention that the application of biotechnology can contribute greatly to the improved water quality in Poland.

Table 3. *The change dynamics of the main air pollutants emission in Poland in the years 1995-2004.*

N°	The main air pollutants	1995		2000		2003		2004	
		[thousand tonnes]	Dynamics change index in 1995 = 100.0	[thousand tonnes]	Dynamics change index in 1995 = 100.0	[thousand tonnes]	Dynamics change index in 1995 = 100.0	[thousand tonnes]	Dynamics change index in 1995 = 100.0
1	Sulphur dioxide	2376	100.0	1511	63.6	1375	57.9	1241	52.2
2	Nitrogen monoxides	1120	100.0	838	74.8	808	72.1	804	71.8
3	Carbon dioxide	348926	100.0	314812	90.2	319082	91.4	316700	90.8
4	Carbon monoxide	4547	100.0	3463	76.1	3318	73.0	3426	75.3
5	Non-methane Volatile organic compounds	1076	100.0	904	84.0	892	82.9	896	83.3
6	Ammonia	380	100.0	322	84.7	323	85.0	317	83.4
7	Dusts	1308	100.0	464	35.5	476	36.4	443	33.9
	Air pollutants - Total	359733	100.0	322314	89.6	326274	90.7	323827	90.0

Source: State Statistical Office (GUS) 2006.

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Table 4. *Environment protection and water management investments given to use in Poland in the years 2000-2005.*

N°	Description	Total in the years 2000-2005	Investments given to use in the year:					
			2000		2004		2005	
			[number]	Dynamics change index in 2000 = 100.0	[number]	Dynamics change index in 2000 = 100.0	[number]	Dynamics change index in 2000 = 100.0
1	Big waste water treatment plants	593	324	100.0	151	46.6	118	36.4
2	Household waste water treatment plants	4442	578	100.0	2082	360.2	1782	308.3
			[km]	Dynamics change index in 2000 = 100.0	[km]	Dynamics change index in 2000 = 100.0	[km]	Dynamics change index in 2000 = 100.0
3	Sewage pipeline system [km]	16091	4758	100.0	5916	124.3	5417	113.9
4	Water pipeline system [km]	20884	7837	100.0	7471	95.3	5576	71.1
5	Regulation and channelling rivers and creeks [km]	1082	205	100.0	597	291.2	280	136.6
6	Flood control embankments [km]	525	204	100.0	243	119.1	78	38.2

Source: State Statistical Office (GUS) 2006

Poland is included in a group of European countries of the highest biological diversity index. Six of Polish national parks, namely: Słowiński, Białowiecki, Babiogórski, Bieszczadzki, Tatrzański and Karkonoski are listed on the UNESCO World List of Reserved Biosphere. Poland undertakes projects that produce a rise in the overall area of legally protected areas of nature. Such areas contributed to 19.4 % and 32 % (which corresponds to over 10 million ha) of the total area of the country in the year 1990 and 2000, respectively. In 2005, the area of legally protected land was 32.5 % of the country area.

One of the factors shaping cultural landscapes in Poland is spatial planning. The significance of spatial planning as an instrument of shaping and protecting landscape consists in shaping the space according to the requirements of the so-called spatial order, i.e. limiting introduction of development elements creating disharmony in the landscape. Furthermore, the acts of spatial planning of various levels provide for actions protecting and limiting the use of valuable elements of natural and cultural landscapes (Law...2003). In addition, other legal regulations, such as nature protection law, add to preserve characteristic features for particular landscapes. The items of the Law introduce solutions controlling planning activity on areas of valuable landscape qualities (Law...2004).

4. CONCLUSIONS

Natural environment protection instruments applied broadly at all the levels of natural environment management reviewed in the presented study, undoubtedly gave ground to a positive change in the state of the natural environment in Poland.

Regulations, institutions, and the system for financing the natural environment protection are of special significance to the problem since they lay the legal, institutional, and economic basis for protecting the natural environment. The instruments were applied at all the managerial levels of the natural environment protection in Poland.

General characteristics of the change that the natural environment in Poland has undergone illustrate the society's willingness to change the state of the natural environment. From the presented considerations, it can be concluded that since 1990 the expenditures on environment protection have been growing steadily. Within the last decade, the air quality has improved significantly, with special reference to sulphur dioxide and dust emission. Moreover, the amount of communal utilities and industrial waste has been falling constantly for the last ten years, and numerous investments into waste treatment plants with regards both to their number and efficiency have been made. The overall length of rivers that exceeded the admissible Polish quality standards has been reduced. Poland belongs to a group of European countries of the highest biological diversity index.

Protection and shaping of landscape are realised through a system of spatial development plans and other legal regulations connected to nature protection.

The presented considerations allow us to draw the final conclusion that in the period of system transformation numerous effective instruments, methods, and legal procedures, together with economic, financial and planistic instruments were introduced, which brought increased ecological awareness of the society on the one hand, and significantly limited pollution of the natural environment in Poland, on the other hand.

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