

ENVIRONMENTAL LEGISLATION OF POLAND
AND THE UNITED STATES

A THESIS

Presented to
The Faculty of the Graduate Division
by
Victor Marian Orlikowski

In Partial Fulfillment
of the Requirements for the Degree
Master of City Planning

Georgia Institute of Technology

July 1978

ENVIRONMENTAL LEGISLATION OF POLAND
AND THE UNITED STATES

Approved:

B *67-1111*

Chairman

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Date approved by Chairman: *9 Aug 78*

ACKNOWLEDGMENTS

The author extends sincere appreciation to his advisors: Professor Malcolm G. Little, Jr., Dr. Gene Willeke, and Dr. Alan Moghissi of Georgia Institute of Technology. Their guidance has been invaluable. The author is also thankful to Mr. James Grant for his help in editing the thesis draft.

The author extends appreciation to Professor Dr. Wacław Brzezinski of Warsaw's University, Poland, Professor Dr. Odlanicki-Poczobut of the Institute of Mining and Industrial Geodezy, Cracow, Poland and the Library of the Jagiellenian University Cracow, Poland to the Institute of the Natural Environment, Polish Academy of Science, and the Institute of Transportation all Warsaw, Poland.

Special gratefulness is extended to Mr. Z. Gumkowski of the State Institute of Hygiene Warsaw, Poland and to Mr. T. Sadowski, a senior legal assistant in the Library of the U.S. Congress for assistance in obtaining materials for this study.

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SUMMARY

Environmental protection became an established trend in Poland. Considerable improvements have been accomplished in the area of environmental protection during recent years in Poland. The environment in Poland however, has been polluted for many years and some current protecting measures are inadequate for the needs.

The purpose of this study is to describe, examine, evaluate the Polish environmental laws and management methods and compare them with corresponding U.S. environmental laws.

The Polish Ministry of Regional Economy and Environmental Protection is responsible for the entity of environmental policies. Other executive agencies are responsible for certain areas of that entity.

The following essential variations from the U.S. environmental protection system are found in Poland:

- a. the Central Government plays the most important role in the entity of the environmental movement.
- b. the problems in this area are primarily of economic origin.
- c. certain areas of environmental protection have not been adequately regulated (solid waste disposal, municipal pollution control)

The study concludes that some areas of environmental protection in Poland can be significantly improved which could be beneficial for the Polish people and the long range economy.

INTRODUCTION

The objective of this thesis is to examine and evaluate environmental protection in Poland. To attain this objective, Polish environmental legislation and management will be examined, reviewed, and evaluated.

The Polish People's Republic (PPR) may serve as an example of a socialist state with its laws and system, regarding environmental protection. In this thesis a socialist state is defined as a country in which the economy is nationalized by more than 70%. One of basic characteristics of such a system is a planned economy.

Comprehensive planning, in a socialist state, could conceivably serve the nation in an excellent manner including the area of environmental protection and enhancing the quality of deteriorated environment. It is of interest to this writer to determine whether the Polish administration provides adequate measures to protect the Polish natural and man-made environment.

Methodology

Research for this study included a review of pertinent literature as well as correspondence with environmental agencies and public officials in Poland.

The literature used includes environment-related publications in Polish, Polish laws (in Polish, and translated by the World Health Organization) Polish environmental regulations, Polish environmental

journals, and articles in Polish and Western newspapers.

The data used in this thesis were acquired through correspondence with the US Library of Congress, the Library of the Jagiellonian University in Cracow, Poland the library of the US EPA, Polish ministries, the Polish Academy of Science, and private sources.

A considerable amount of descriptive data has been acquired. Numerical statistical data were not available in a sufficient quantity, thus very little of such data is presented. Most of this thesis consists of a narrative description of Polish environmental legislation and environmental management methods, followed by short narrative description of major US environmental legislation.

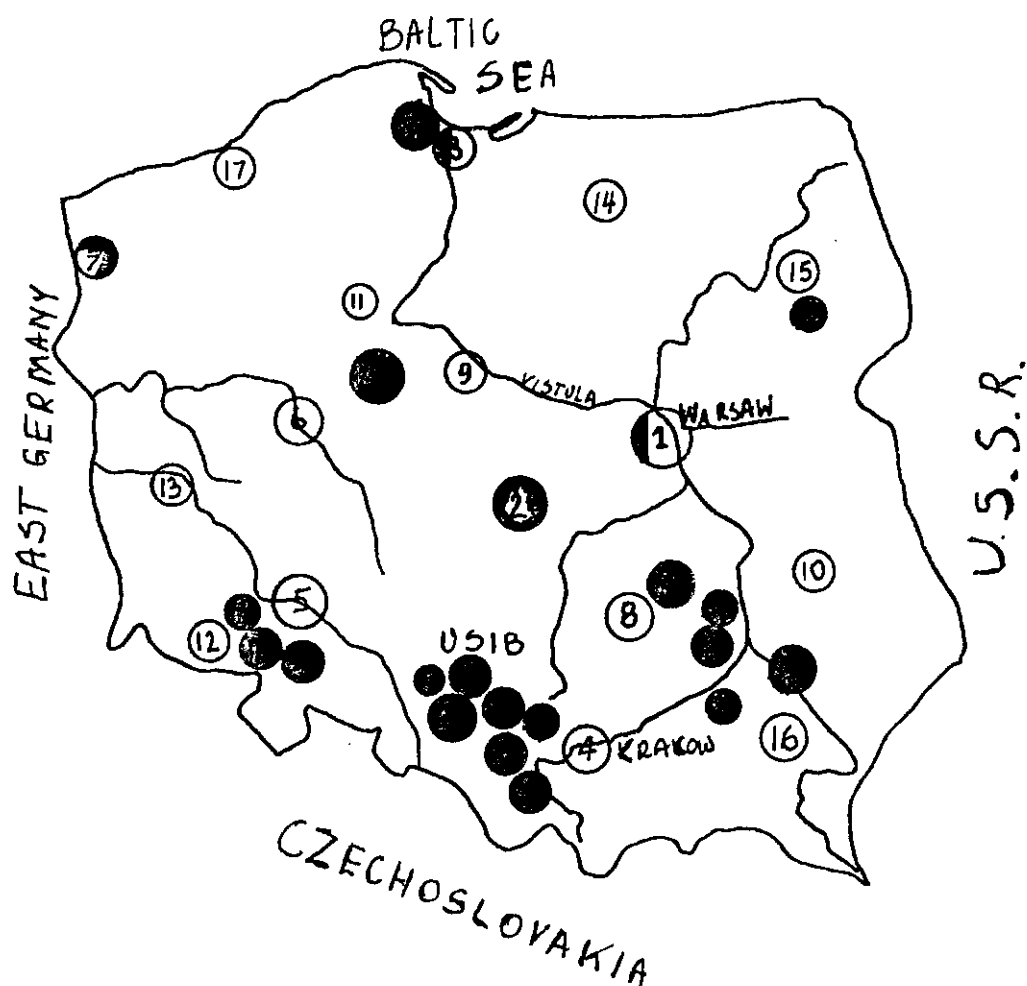
Comparative analysis of Polish and US environmental legislation follows the description of their important characteristics. An evaluation of the Polish environmental protection system concludes this thesis.

Organization of Thesis

The first chapter of this thesis will describe the Polish Government. In chapter II, this writer will review the environmental protection system in Poland. The third chapter will be devoted to a description of Polish environmental legislation and management. Chapter four will briefly review major US environmental legislation. Chapter V will compare Polish and US environmental legislations and identify their similarities and differences. In the final part, the Polish environmental system will be evaluated.

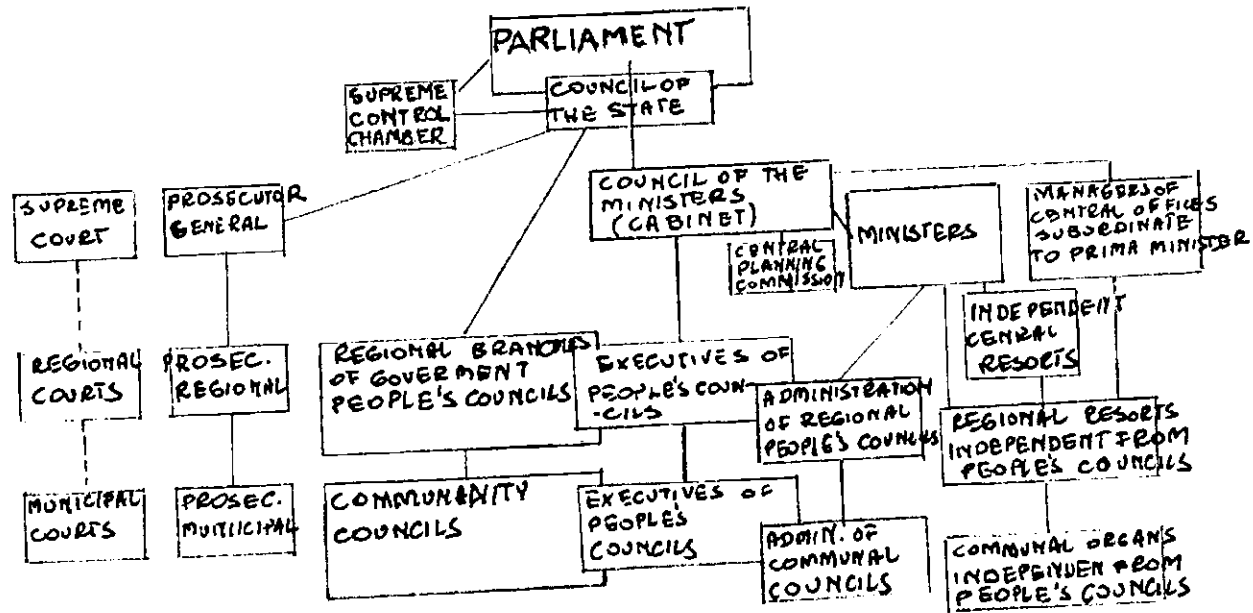
○ - 1-17 the Main Cities,
Regional Centers

● - Industrial Centers



MAP OF POLAND

CHART OF POLISH GOVERNMENT



CHAPTER I

THE POLISH GOVERNMENT

The Polish Government is called a parliamentary democracy. The political system of Poland is regulated by the constitution adopted on July 22, 1952. According to the constitution all power belongs to the people of Poland.

National Unity Front

NUF consists of the three existing political parties: United Polish Workers Party (UPWP) - a Communist party, the United Peasant Party (UPP), and the Democratic Party (DP). The Communist party has always managed to maintain an absolute majority in the parliament since 1945.

Poland is a Communist state wherein the political life, administration, military forces, economics, media and foreign relations are controlled by a single political party (UPWP). Two other political parties recognize the Communist party as the principle power in the task of building true Communism in Poland. " The main objective of the Polish Communist party, as well as other Communist parties in the world, is to promote the unification, coordination and cooperation of all Communist parties in the world" ¹ is a verbatim translation from the UPWP statute.

In internal affairs the UPWP ensures the realization and execution of the national economic plans. National plans are executed through the party administration, which is highly centralized structure

and has a basic unit in every state-owned establishment. Every unit of the party is directly subordinated to the higher unit of administration which may be a secretariate of the party at the locality, city, province, or the central level. In this way, the UPWP is able to control the political and economic life of the Polish People's Republic.

Parliament "Sejm"

Supreme legislative authority rests with the Polish parliament called "Sejm". People elect their deputies to the parliament. This unicameral legislative body consists of 460 deputies elected by universal suffrage for a period of four years. All citizens at least 21 years old are eligible for election to the parliament if they are approved by NUF.

The procedure of formulating laws is quite simple in Poland. The first step of the process is establishing a problem. Then within an appropriate ministry or resort, work is begun on proposals to solve the problem. In the next step a draft is prepared and a review of the draft follows. The proposal for solving the problem is submitted in its final form to the parliament. Finally, the proposal is presented at a hearing of the Council of the State or a session of the Parliament. Once the proposal is approved by the above mentioned bodies it becomes a law or an administrative act, and is announced to the public as such. The announcing is accomplished by publishing the new laws in the government press "Dziennik Ustaw" and "Monitor Polski", as well as through the media (newspapers, radio, tv).

Most legislative work is done at the central level and then spread

to the lower administrative levels. Until lately, local administrative agencies produced hardly any legislative acts. However, with several administrative reorganizations in the seventies, local administrative agencies are adopting Legislative acts.

Cabinet

The Cabinet is appointed by and responsible to the Council of the State or the Parliament. The Cabinet coordinates all activities of the ministries and resorts. The Cabinet submits to the Parliament the projected budget and the gross national production plan. It also ensures execution of the laws and directs activities of the provincial and local councils which coordinate political, economic, social and cultural life in the localities.

Supreme Control Chamber (SCC)

The Supreme Control Chamber controls production. It was created to control the operations of state owned enterprises that are part of the national economy. Control executed by the SCC had a purely economic character in the past, but now the environmental issues are also controlled by the SCC and its regional offices. The SCC reports directly to the Council of the State an annual report of its activities.

Courts

Justice is administered by the Supreme Court, provincial courts, city courts and district-community courts. According to the constitution judges are independent and are elected except for those in the Supreme

Court.

Provincial Governments

After the administrative changes of the seventies, the number of provinces was increased to 49 from seventeen in the sixties. The five largest cities form separate administrative units (Warsaw, Cracow, Lodz, Wroclaw, and Poznan).

One administrative level, the district, was eliminated during these administrative changes. The district was essentially equivalent to the county in the US. As a result, many significant districts became provinces. The smallest units of settlement, communes or localities called "gminy", merged forming large localities. Because of their new size, sometimes as large as 30,000 people, and the resulting increase in their significance, localities were given the same importance formerly associated with the districts. Consequently, there was an immediate and considerable increase in the power and authority of a locality.

Ministry of Regional Economy & Environmental Protection (REEP)

Environmental protection has been an important issue in the world for several years. Poland is no exception to this general trend, and environmental protection has become a nationally important issue during recent years. Once the Polish administration recognized the importance of a clean and protected environment, a special executive agency, the Ministry of Regional Economy and Environmental Protection (REEP), was established. The main task of REEP is hearing, representing, and coordinating efforts, proposals and interests of other

executive agencies, and environment protecting associations and groups of private citizens.

Proposals for solving environmental problems are prepared within the ministry (REEP), as a general rule. When ready, the proposals are submitted to the Council of the State. During the last few years, every proposal aimed at protecting the environment has been unanimously approved.

CHAPTER II

THE ENVIRONMENTAL SYSTEM IN POLAND

Polish environmental movement may be presented from three points of view: those of the economists, naturalists and lawyers. Economists distinguish three periods of the movement. In the first period man used natural resources to support himself. In the second period man started producing more than he needed to feed himself and started exchanging goods. The third period is characterized by significant changes in the environment due to the magnitude of industrial production, degree of urbanization, and advances in transportation technology. Naturalists also distinguish three periods of the environmental movement. Different means of protection are essentially the reason for this division. The first period is characterized by conservation as a means of protection. The second period is characterized by protecting rare species of animals and plants and is so-called "biocenotic period". The third period is characterized by planning employed in the area of environmental protection.² Lawyers in Poland distinguish four periods in the environmental movement. Their point of departure is linked to administrative law which created environmental agencies. Four chronologic periods are mentioned: the first until 1934, second 1934-49, third 1949-69 and fourth 1969 to present.

Period Until 1934

Very old trees or forests (sometimes more than 1,000 years old) which witnessed the oldest Polish history are preserved in Poland. They were preserved by aborigines, who considered such trees sacred. Thick forests were preserved because of excellent defensive values by the first kings of Poland (966-1364) the Piast Dynasty.³

After 1364, several administrative acts protecting habitat prohibited hunting rare and big game like European buffalo, elk and beaver. They probably were not aimed specifically at environmental protection. Most of these acts were announced during the Jagiellonian Dynasty (1386-1572). The romantic current of the 19th and 20th centuries with the idea of man's unlimited happiness while in the natural environment influenced the environmental movement in Poland. When Poland was partitioned between Russia, Prussia and Austria, environmental associations were often used as a cover for gatherings of militant groups organizing uprisings. Several environmental associations were formed during that time: The Galician Association Protecting Wild Animals, The Polish Association of Tatra Mountains, and the Association of Naturalists named after Copernicus.⁴ All of these associations were active in Cracow which enjoyed autonomy while the other parts did not. The center for such activities was the Jagiellonian University (1364), the third oldest in Europe, and one of the most prominent. In 1869 the Austrian government approved an environmental law which was entirely prepared by Polish Scientists. This law sought protection of a rare species of mountain wildlife.

In 1918 Poland returned to free statehood. One of the first

actions of the new administration was creation of Nature and Environment Protection Commission in the early 1919. This agency acted as an advisory authority and later was responsible for restoration of natural resources, specifically forests which had been destroyed. In 1925 the agency was reorganized and named the State Council of Environmental Protection (SCEP). It was composed of twenty people who served six year terms. The agency had branches at provincial levels. Many prominent scientists were members of SCEP.

In 1928 the League of Environmental Protection, a civic association, was founded. The two above mentioned agencies influenced the Parliament to include the Science of Nature Protection in the elementary and high school curriculum.

Period of 1934-49

The scientific and social activities of this earlier period in the area of environmental protection found expression in a law promulgated on March 10th, 1934. This law established the following concepts:

1. recognition of the institution of Monument of Nature
2. recognition of the institution of National Park
3. protection of rare species of animals and plants
4. protection of rare species of animals under temporary act
5. environmental protection under the law of eminent domain
6. imposing the duty of rehabilitation and recultivation of environment in case of partial or total destruction.

The same law created central and provincial executive agencies aimed at environmental protection. Also, a Fund for Environmental Pro-

tection was created from the fines administered to the violators of the 1934 law. The law provided for citizen participation in the process of environmental protection.

It is maintained by the present administration that the socio-political conditions of Poland at that time (1918-39) vastly limited proper protection of the environment.⁵ This notion, attributed to the idea of the superiority of socialism over capitalism, seems to be exaggerated. Poland was then an agricultural country, with the exception of the southern region, and for this reason not much environmental pollution was present. The dangers of pollution were anticipated as reflected in the 1934 Law. In 1928 Polish scientists postulated creation of an international environmental agency. The proposal was found valid and such an agency was established in Switzerland.⁶ World War II destroyed Polish natural resources to a great degree. Restoration of the environment was one of the first priorities of the new nationalized economy. This concern with restoration was reflected in the Law on Nature Protection of April 7th, 1949, which began a new period of environmental movement in Poland.

Period of 1949-69

The Law on Nature Protection of 1949 established three forms of environmental protection:

1. prevention of total or partial destruction
2. setting a framework for rational use of natural resources
through planning
3. enabling restitution through planned economy, law enforcement

and other means

Normative acts and other laws issued in the period of 1949-69 were developed pursuant to the 1949 Law on Nature Protection or supplements regulating particular areas of pollution. These laws include: the Geologic Law of 1960, the Mining Law of 1961, Water Law of 1962, Law on Prevention of Air Pollution of 1966, Building Code of 1962 and other laws.

Period of 1969 to Present

After U-Thant's report- "Man and His Environment" was released, the quality of environment became a central issue for the Polish government. According to the report's recommendations, laboratories collecting data pertaining to the environment were established in Poland. Many changes in the Polish administrative system were necessary in order to facilitate execution of this new national policy.

In August 1970 the Polish Committee of Environmental Protection was created. In 1972 the Ministry of Regional Economy and Environmental Protection (REEP) was formed. In 1975 the ministry was reorganized to handle its workload. REEP cooperates closely with the Central Planning Commission (CPC) which coordinates land use planning for the entire nation.

Scientific works were immediately promoted to evaluate the condition of the environment in Poland. Several scientific institutes were founded in the early seventies. A substantial amount of legislative work was also done to deal effectively with anticipated problems. Agreements concerning purity of the environment were made with neighboring countries.

Executive Agencies Programs

There are two kinds of environmental protection executive agencies in Poland: central and regional. Two kinds of supervision within these agencies are distinguished: total and partial. According to the Polish legal literature, partial supervision does not include management authority. Some executive agencies have mixed authority in respect to supervisory power. The mix of the authority among the agencies at the central level has no pattern. For this reason, it is necessary to describe their authority by the subject they regulate.

Air

The Law on Prevention of Air Pollution of April 1966 does not explicitly state what executive agency has primary responsibility for enforcing this law. As a result, several executive agencies are responsible for the purity of atmospheric air in Poland. During recent years three executive agencies managed protection of air in Poland: REEP, Polish HEW (through State Sanitary Inspection Stations-SSIS) and the High Office of Mining that controls all industries emitting particulates and poisonous gases. Supervision in this area belongs to the Cabinet and usually concerns emergency cases (danger to human life and health).

Water

Water is considered in Polish law to be one of the most important natural resources, indispensable to maintain life. Several executive agencies manage, control, and supervise the use of Polish waters. The top agency responsible for water supply for cities is REEP. The same agency is also responsible for managing municipal sewage and drainage, and organizing, initiating and reviewing all activities related to

these functions. Polish HEW controls the purity of potable waters and those used for food production. The Ministry of Agriculture is responsible for the entire water economy in Poland. Significant powers and a wide range of responsibilities with respect to water use are exercised by the ministry. It enforces the present Water Law of 1974, as well as ensuring a supply of water for agriculture and other industries.

The Ministry of Transportation is the third top administrative agency dealing with water resources in Poland. It is responsible for building along navigable waters, utilization of inland waterways and their conservation.

Finally, the Ministry of Foreign Trade and Sea Economy is responsible for sea fishery and building sea facilities linked with its activities.

Land Use

Almost all of the above mentioned agencies are responsible to some extent for land use in Poland. The Ministry of Agriculture is again the most responsible, since it deals with the largest acreage. The Ministry of Forestry and Lumber Industry is responsible for forest acreage and National Parks. REEP and CPC are responsible for acreage used for building and enlarging towns and cities. Finally, the Ministry of Transportation is responsible for land used for highways and roads. Responsibility for the coordination of all executive agencies belongs to REEP. Additional responsibilities of REEP include:

1. Programming and forecasting of environmental protection
2. Supervision and control of potential polluters

3. Studying and evaluating environmental quality
4. Initiating, promoting and evaluating production of monitoring equipment used in control of environmental quality and solid waste disposal.
5. Initiating, promoting, reviewing and programming progress of technology preventing environmental pollution
6. Setting standards for maximum concentration of pollutants in the environment and standards for environmental quality.
7. Promoting and directing scientific studies in the field of environmental protection.

Geology

The Central Geologic Agency (CGA) is the executive agency responsible for all geologic works and for the quality of environment arising from the nature of this activity. This agency reports to the Chairman of the Cabinet. The scope of CGA activities includes managing works of all government owned establishments performing geologic works, coordination of all geologic works, and control of all geologic projects and works in progress.

Mining

Several central agencies manage, supervise and control mining activities in Poland, including the Ministry of Mining, the Ministry of Chemical Industry, the Ministry of Energy, the Ministry of Metallurgy, the Ministry of Building Industry, and the Ministry of Transportation. The High Office of Mining has supervisory powers to enforce Mining Law

in all establishments involved in mining activities.

Advisory Agencies

Several advisory agencies operate at the central level. These are: the State Mining Council, the State Water Council, the State Environmental Protection Council, and the State Air Pollution Council. These agencies have no power, but are often used as advisory bodies.

Regional Agencies

Executive agencies operating at the regional level are the boards (praesidia) of the Local Peoples Councils. After the administrative reorganizations of the seventies were accomplished, the heads of the local councils became officially responsible for the local and regional administration. A larger range of authority was given to a single person. The head was authorized to select a group of people in order to accomplish the goals of a locality or a region.

The range of responsibilities of this individual includes: communal economy, spatial planning (land use planning), local geologic works, environmental protection, local transportation, agricultural and forest economy, protection of health and welfare of a locality or region, and coordination of all these activities. An annual report describing such activities is submitted to the appropriate ministry dealing with the subject by the head of a locality or region.

CHAPTER III

POLISH ENVIRONMENTAL LEGISLATION AND MANAGEMENT

The environmental protection program in Poland consists of the national legislation, the management systems to implement that legislation and enforcement activities.

National Legislation

Polish environmental legislation covers many aspects of pollution in the similar manner as does the US legislation. The main concerns of Polish legislation are: water pollution, air pollution, radiation-related pollution, noise pollution and pollution related to increasing traffic volumes. Other areas related to the quality of the environment are also legally regulated. These include: releasing toxic substances, burying solid waste, land recultivation and historic and scenic preservation.

This review of Polish environmental legislation will include water pollution, air pollution, radiation pollution, noise pollution, and nature protection related legislation.

Water Resources

Polish water resources are estimated in relation to the amount of precipitation (about 600mm-24 inches) in an average year. This amounts to about 187 billion cubic meters and puts Poland into 22nd position in Europe in respect to usable water resources.⁷

The long-term policy for the national water economy consists of constructing water reservoirs and canals in order to eliminate losses of water and to ensure an adequate water supply in the periods of water deficit. At present only 4.1% of the total precipitation is captured annually. For this reason, construction of 187 new reservoirs and 330 canals is planned by 1990.⁸

Water is considered by Polish law to be one of the elements absolutely necessary to maintain biological life on earth. Probably to the same degree, water is indispensable in the processing of raw materials. Polish industrial production is constantly growing; therefore, more water is used by Polish industry. During the production process, large quantities of industrial effluents are released, often directly into surface waters. Surface waters are often a natural recipient of such wastes, since treatment facilities are inadequate, or totally lacking.

The problem of water pollution arises when the concentration of industrial or municipal effluents makes water unfit for human consumption and any other use.

The amount of industrial wastes is proportional to the volume of industrial output. The rate at which amounts of wastes increase is a function of the rate of industrial growth. Certain industries use vast quantities of water: the rubber industry, the steel industry, paper and sugar industries and many others.

During the decade 1960-70, the output of Polish industries grew significantly. Production of synthetic rubber increased by about 100%, man-made fibers by about 550%, steel by 100%. The use of water grew

proportionately.⁹

The principles of the 1922 Water Law are similar to those which have been used in many western countries during that time and at present. This law applied to matters of utilizing water power and discharging industrial waste into water. According to that law all waters were public property, unless under the law or special deeds they were private property. Typical of all political systems which promulgated such laws, was that everyone had the right to use public waters in a manner that did not obstruct the use of waters by the other users. Wastes could be discharged into the waters. However, discharges in excess of general usage as well as discharges from municipal sewage systems required prior notification to the established water administration agencies. If the administration decided that the proposed discharges were contrary to policy considerations it would forbid them.

A water administration agency was authorized to enforce these policies. It was authorized to define conditions under which sanctioned establishments could regain authorization to use waters if ever suspended. If the use of waters for waste disposal required water treatment installations, permission could be granted based on technical design of such installations. A permit could be refused if the proposed use of waters would exert a negative influence on the quality of water, and if the pollution could not be prevented by installing a waste treatment plant. The law created an obligation to pay just compensation for damage resulting from such pollution. Assessment of compensation was usually done in the courts. Unfortunately, big business often unduly influenced water administration decisions.

The first postwar legislative action concerning water pollution was introduced on January 31, 1961. The law on Prevention of Water Pollution was designed to prevent or eliminate pollution which could cause water to become unfit for normal use. Pollution is defined as changes in the physical, chemical, and biological characteristics of water due to the introduction of excessive quantities of solid, liquid or gaseous substances, energy radioactive materials in concentrations that may cause unfitness of waters for normal use, as well as for domestic, industrial, agricultural, fishing and other purposes. The Central Bureau for Water Management was designated the administrator of this law. The administrator was given the authority to order industrial plants to discharge wastes at certain places and at certain concentrations. The same agency was responsible for monitoring effectiveness of purification equipment. Finally there was a stipulation that just compensation for damages must be paid by the polluter and that the polluter will be subject to penal liability.

On May 30, 1962 the Water Act was introduced. It reflected the new socio-political conditions and became a guideline for water management for the next twelve years. There are nominal differences in the texts of Water Law of 1922 and that of 1962. The socialist system is regarded as a higher form of evolution of government, therefore superior to the capitalist of free-enterprise system. Consequently, the law is also considered superior to the old one because it carries into practice a national planned economy along with a planned water economy.

The goals of the planned water economy in Poland are:

1. supply of water for public consumption
2. supply of water for the national economy
3. maintaining and enlarging water resources
4. protection of water purity
5. flood management

In 1974, the Water Law of 1962 was amended. The importance of amending the 1962 Water Law lies in regulating the question of water pollution and preserving purity of the Nations's waters. This may be noticed in the section of stipulated penalties. Penalizing harmful pollution of waters is on the top of the list. Again, there are nominal changes in the texts of 1962 and 1974 Water Laws.

According to the 1974 Water Law all inland and territorial waters are the state's property unless the law determines otherwise. Wastes are defined as substances of energies that may pollute waters because of their chemical or biological composition. Establishment (a plant) is defined as a unit of the state-owned national economy. Water works are defined as all water related structures including installations protecting purity of waters.

Heads of communities are defined as heads of administrative units like small towns and quarters of towns constituting counties. Heads of the counties are defined as mayors of towns constituting counties or heads of quarters of big cities. Heads of voivodships (administrative units equivalent to US states) are defined as the top executives of voivodships or mayors of the big cities excluded from voivodships. Administrative officers, as defined, have important

influence on water economy, particularly over the issues related to pollution of waters in their areas.

Special use of waters includes:

1. intake of waters
2. introducing wastes into waters
3. cumulating wastes in a proximity to waters

A water permit is required for these special uses. This permit is usually issued for a prescribed period of time. If a permit concerns introducing or storing wastes, the composition and quantities of wastes must be precisely described. A permit is to be refused if the proposed use of waters is in conflict with:

1. the plan or direction of growth of the national economy
2. environmental protection
3. maintaining level of waters indispensable for biological life.

Determining whether a permit can be issued requires examination by a board of independent experts in hydrology, biology, chemistry, ecology, law, and planning. Civic organizations are also to be admitted to the hearings if the social interest requires it.

The Office of the Prosecutor is entitled to participate in all water related proceedings. The task of this office is to "ascertain that final settlements of all proceedings are in accordance with the law"- Polish Administrative Code of 1960. The prosecutor has the power to reopen a case if he determines that it is necessary. A permit may be revoked or limited if there is evidence that:

1. released wastes endanger human life and health
2. it is necessary to realize national economic plan

3. it is in the interest of preserving quality environment.

The head of a county is authorized to issue a water right permit if the law does not determine otherwise. Water permit can be issued if:

1. the amount of wastes does not exceed 50 cubic meters per hour.
2. intake of waters does not exceed certain quantities.

The cabinet regulates fees for water intake and release of industrial wastes according to the law. All plants using water for production or release of wastes into surface waters are ordered to monitor quantity of intake, and quantity and quality of industrial sludge.

The law also regulates protection of potable waters. Springs and other sources of potable water are protected by establishing protective zones. These areas are subject to special restrictions in regard to land use. The law determines that no building projects, cemeteries, drillings, excavations, solid waste deposits, or any other activity which could pollute waters can be located in the zone.

Additional restrictions may be set by local water administration authorities after consultation with the State Sanitary Inspection Station. Prohibition against certain fertilizers, manure, and other chemical pesticides may be imposed by local water authorities. When the above restrictions make the property unsuitable for its previous use the owner is compensated for his loss.

The law specifically protects waters against harmful pollution. The term "protection" means maintaining purity of waters or bringing back polluted waters to the purity standards required by the law.

The cabinet may issue an administrative order prohibiting the release of wastes into waters which may need particular protection.

All new industrial plants are ordered to build, maintain and properly use waste purification facilities. They may not start production without simultaneous operation of these waste treatment facilities.

Flood management is the responsibility of all levels of administration. Flood management works should not diminish the natural landscape values and cause ecological imbalances.

The responsibility for water supply and sewerage rests with the local governments. All installations related to water supply are the state's property. Releasing wastes into the municipal sewerage system must be authorized by the head of administrative unit.

The Minister of HEW issues ordinance stating standards for:

1. potable waters
2. food production waters
3. waters used for recreation
4. waters used for industrial production.

Control over the quality of water is exercised by State Sanitary Inspection Stations.

Penal sanctions are stipulated for harmful pollution of waters. "Who harmfully pollutes waters is liable to five years of imprisonment and fine penalty" says the law. And later: "who does not maintain, and use installations protecting waters against pollution, despite being entrusted with such duty, will be punished by three years of imprisonment and fined 50,000 ZLP".* Unintentional activity is also punished.

* ZLP- abbreviation for Zloty Polski a unit of Polish currency, 21 ZLP equals about one US dollar.

Special use of waters without authorization is punished by a fine of 5,000 ZLP. The same punishment applies to those who release wastes that have changed in composition or quantity even though no pollution resulted from this action. The same fine applies to those who:

1. do not respect restrictions concerning protection zones
2. do not inform the authorities about withdrawing water and do not monitor the amounts of intake
3. cause malfunctioning of monitoring equipment.

Heads of voivodships levy fines for withdrawing water in quantities higher than specified. The same authority also levy fines for introducing to waters, soil, sewage, or industrial sludge other than specified in the permit.¹⁰

Purity of waters is also protected by a 1975 Administrative Order. This regulation has some significance in municipal water pollution control. This order, an updated pursuant to the 1962 Water Law, defined conditions of effluents which could not be released into municipal sewage, and classified existing inland waters into three purity categories. The first category included waters suitable for:

1. drinking purposes
2. food production
3. culture of Salmonidae

The second category included waters suitable for:

1. culture of fish except for Salmonidae
2. recreational purposes
3. culture of animals

The third category included waters suitable for:

1. industry, food industry excluded
2. agricultural use.

According to this order, municipal sewage can not receive effluents containing:

1. gases, mineral and organic substances in concentration that may endanger human health and life
2. a. rugs, animal waste, ashes, pieces of slaughtered animals
b. metals, glass, dirt, wood
c. other floating bodies causing deterioration of municipal sewage or obstructing its exploitation.
3. flammable and explosive substances at 85°C or above
4. radioactives
5. substances which mixed with effluents produce unpleasant odors.

If there is a special sewage treatment facility for industrial use, all establishments must use it. Maximum permissible concentration standards are provided in appendix.

Irrespective of all standards and described conditions the following can not be discharged into inland waters:

1. suspended matter-readily settleable after standing for two hours in amounts greater than 0.5 ml/l
2. floating materials

The law also prohibits the discharge of pollutants into ground waters except for those properly treated. This order stipulates fine penalty for non-compliance. The fines vary and depend on the quantity and composition of wastes released. A representative of water authorities

determines the violation by examining monitored records and by taking samples. Fines are cumulated for each 24 hours of releasing unimproved wastes.

Air Pollution

Atmospheric pollution is caused by quantitative changes in the proportions of gases in the air, as well as the introduction of harmful gaseous substances into the air. The problem of air purity has also disturbed the public in Poland. For years it was unnoticed by the majority of the people, but in some regions of Poland the atmosphere has been seriously polluted, particularly during the last decade. The problem results from rapid industrial growth which is expected to continue.

According to findings cities of the Upper Sillesian Industrial Basin (USIB) violated all air pollution standards in 1971. This coal mining region (the most urbanized and industrialized in Poland) is also the most polluted one. Standards for maximum permissible particulate matter deposits were exceeded by 110% to 350% and standards for maximum concentration per cubic metre by 600% to 900%. This high level of pollution in the region reflected the fact that about 1,000 plants with no purifying equipment released particulates in 1971.¹¹

Actual emission of harmful gases is estimated at 315 million ton* annually.¹² Seventy percent of this amount contains sulphurs. Sulphur dioxide (SO₂), one of the most dangerous and common air pollutant, is released in the process of burning coal, widely used in Poland. The data indicate that the standards for maximum accepted concentration of

* ton equals 1,000 kg.

SO₂ were exceeded by as much as 600% in the cities of USIB in 1971.¹³

Industry is the main atmospheric polluter. However, urbanization and the motor vehicle also contribute to the magnitude of the problem. It is estimated that 50-70% of total air pollution is attributed to industrial production, 10-20% to urbanization and the motor vehicle and the remaining percentage to kitchen ranges and coal heating which are still widely used in Poland.¹⁴

It is believed that the total amount of air pollution will decrease in the future, due to the impact of air pollution legislation.

The first legislative act concerning air pollution was introduced in 1954. The State Sanitary Inspection Office was given the power of supervision and control over the industrial operations to ensure the purity of the atmosphere. The same agency was also given the task of preparing standards of air quality which would protect human health and life as well as air purity.

In 1961 the Cabinet issued a decree ordering heavy industry to decrease its pollution of atmospheric air. A rapid increase in the rate of pulmonary diseases in the USIB was the immediate cause for issuing this decree, giving the first priority to its enforcement.

In 1966, the Law on Prevention of Air Pollution was adopted. This law has been regulating problems of air pollution. The principle of the law is defined at the very beginning and reads as follows: "the atmospheric air shall be protected against pollution which constitutes a nuisance to man or has unfavorable effect on his health or on climate, growth or plants, the breeding of animals, the economic value of the soil and water, or which causes other losses to the economy of the country".¹⁵

The law further defines pollution of air as "introduction into air of liquid, solid, or gaseous substances in amounts or of a kind such that the standards on maximum permissible concentration may be exceeded."¹⁶

The aim of protection of air against pollution is to ensure that prescribed standards are not exceeded and to bring about progressive reduction of such harmful emissions from all sources. To enforce the law industries were ordered to install purification equipment, and to monitor and record emission levels. Failing to comply may result in closing down a plant or temporarily closing it during periods of heavy pollution concentration in the region.

Control and evaluation of activities resulting in air pollution are to be carried out in two ways: control of pollutant concentration per cubic metre of air and control of amount and composition of substances emitted by individual plants.

According to the law two kinds of standards on maximum permissible concentration were established:

1. the mean daily standard of permissible concentration of pollutants
2. single standard measured over a period of 20 consecutive minutes.¹⁷

Both standards are related to human resistance as the point of departure. For deposits of particulates the mean standard is defined in quantities per sq. kilometre per year (standards are cited in the appendix table 4). Several amendments to the 1966 law were issued. The Order on Measuring Dispersion of Pollution of the Atmosphere was adopted the same year. This order issued by Central Bureau for Water Management (CBWM) concerns forecasting dispersion of pollution in atmosphere. The State Institute of

Hydrology and Meteorology is responsible for preparing such forecasts. Priority is given to highly industrialized areas and regions where newly located industries are likely to pollute. Eventually, every locality will be evaluated in terms of topography, microclimate and their effects on the dispersion of air pollution.¹⁸

Also, in 1966 an Order on Transmitting Air Pollution Information to a responsible agency was introduced. All polluting plants must provide data to the local agency responsible for air pollution on type and quantity of emissions into the atmosphere and information on the type of business. The local agency in cooperation with State Sanitary Inspectorate will determine the level of pollutants a plant may release. In making such determination the following will be taken into account:

1. general level of pollution in the area
2. conditions affecting dispersion of pollution
3. extent of development within ten kilometers of the plant
4. technical and economic feasibility of reducing the level of emissions.¹⁹

On January 31, 1967, an Order on the Measurement of Pollution Concentration in the Air was issued by CBWM and the Ministry of Health and Welfare. The order stated: "every enterprise discharging more than 40,000 cubic metres of atmospheric pollutants per year, must provide facilities for monitoring and recording emission levels."²⁰ Newly installed or repaired purification equipment must be checked within two weeks of becoming operational. Local pollution agencies may adjust pollution monitoring to the local needs. SSI is to establish a network of air pollution monitoring stations to record concentrations of polluting gases

in the air.

In May of 1967, a law establishing atmospheric protection zones against pollution was introduced. This law divided all industrial plants into five classes depending on the kind of production. The radius is determined by taking into account the type of industrial operation. The area within the zone can not contain any development intended for human occupation or use but it can be used for cultivation of all kinds of vegetation.²¹

The motor vehicle is also identified as a serious source of pollution. Leaded gasoline produces tetraethyl lead and other gases recognized as carcinogenic in the process of burning. It is believed that the greater number of lung cancer cases registered in the cities than in the countryside, is caused by the rapidly growing use of motor vehicles. However, Poland has fewer motor vehicles per capita than most countries in Europe and the growth in this area is moderate (See Fig. 6 in Appendix). The importance of automobile caused pollution has been anticipated and some preventive steps have already been taken. Standards for emission of Carbon Monoxide and Nitrogen Oxides were set at 3mg/m^3 and 0.6 mg/m^3 respectively. These standards (usually exceeded) indicate the danger level and represent the target to be met.²²

The Ministry of Transportation takes the issue very seriously as indicated by one of its studies. The recommendations of this study indicate that the following steps should be taken in order to reduce transportation-related air pollution:

1. elimination of steam engines in transportation to be replaced with electrical ones

also due to exposure to excessive noise and in the long run become one of the major causes of nervous and mental complaints. The effects of noise are often irreversible, some speed up gerontological process and exert negative influence upon the entire human body, not only on hearing.²⁴

There are many sources of noise. In the city, motor traffic is the most intensive one. Noise can also be caused by a faulty elevator in multifamily housing (the most common kind in Poland) noisy heating installations, and inconsiderate neighbors. The most powerful noise generators are low flying or taking off modern planes. This problem is especially serious in Warsaw where residential quarters are located in close proximity to Warsaw's international airport.

A separate and serious social problem is noise at work. Machines in motion produce noise which is often a source of occupational diseases.

There is no law "per se" dealing exclusively with protection from noise in Poland. Several laws however, regulate noise producing activities. The Public Offenses Code of 1971 says in Article 41: "who by shouting, raising alarm or other excesses disturbs peace, public order and night rest, or behaves indecently...is liable to punishment...those who participate or encourage such excesses are also liable to the same punishment."²⁵ Sharper sanctions are stipulated if offense is committed under influence.

Penal Code of 1969 does not contain specific provisions relating to noise, but it does stipulate infliction of penalty upon perpetrators of a crime against human health and life. According to Article 155 a person is liable to punishment: "who deprives a person of hearing...

2. increased efficiency level of gasoline burning in piston engines
3. use of more efficient fuels and no lead fuels
4. elimination of widely used two-cycle engines
5. replacement of low compression engines with high compression ones
6. development of electrical car engines, natural gas engines, or hydrogen engines.

With regard to dust pollution caused by transportation, it is proposed to develop pavements that would minimize dust emission.

Noise Pollution

One of the biological hazards to the natural environment in the era of industrial civilization is noise. Noise has always existed and was perceived as a nuisance, but during the last decade it has become dangerous to human health. Urbanization and mechanization of production made noise a major social problem in Poland and other nations.

The definition of noise developed by the Polish Academy of Science (PAS) refers to actual sounds and also vibrations and waves penetrating the human body. It is generally accepted that noises up to 34 dBA are not harmful, 34-70 dBA cause deconcentration, above 70 dBA are harmful to human health and above 120 dBA cause permanent partial or total loss of hearing.²³

Noise generates feeling of fatigue by affecting the nervous system, often leading to a nervous breakdown. Excessive noise can produce malfunctions of the circulation system which may result in very serious secondary effects. Physiological changes, like loss of hearing, are

inflicts other bodily harm, incurable illness or prolonged illness, a mental illness or lasting partial or complete incapability to continue work".²⁶ According to this, the object of the penalty is not the activity causing the noise but activities which actually generate effects detrimental to human health and welfare. Generation of noise, when harmful, falls into this category but proof of a cause and effect relationship must be established, which is often difficult to do. Effectiveness of this law depends, in the final resort, on court practice.

Articles 191 and 246 provide adequate noise control regulations concerning the place of work. The first one prescribes a penalty for failure to carry out statutory duties by person responsible for working conditions which include safety and hygiene precautions in an establishment, if the neglect creates a direct threat to life and health.²⁷ Unintentional activity is also liable to punishment. Article 246 is limited in its subject matter to public officers. Transgression by an officer of his rights and failure to fulfill his duties, which are regarded as activities detrimental to the community or an individual, are punishable if resulting in a serious damage. This regulation can be applied in a very wide sphere of administrative and economic activities not limited to noise, yet linked to other phenomena impairing environmental conditions.

The Civil Code also provides for noise protection. Article 140 concerns the right to use property by the owner only in accordance with socio-economic designation of the right. Therefore residential zones are designed for housing which by its nature must provide for rest after work. Because elimination of any disturbance is one of the requirements in residential quarters, article 140 of the Civil Code can be applied in

abating noise.

City traffic is a major noise generator. This constantly growing issue can not be easily resolved. A joint ordinance of the Ministry of Transportation and the Ministry of Internal Affairs issued in 1968 partially regulates vehicular noise. The ordinance states that in order to use the public roads vehicles must be constructed, equipped and maintained in a way that ensures reasonably quiet operation.²⁸ Use of motor vehicles in residential zones is limited to personal cars for which an annual State Motor Vehicle Inspection is mandatory. The ordinance also specifically forbids:

1. excessive use of sound signals (except for danger) during the night in residential zones.
2. running car engines at unnecessary high speeds in residential zones.

Penalties for failing to abide by these rules are stipulated by the law.

Of great importance for protection from noise within industrial establishments is that part of the Government Regulation of 8/21/59 concerning hygiene-sanitary conditions which must be observed in newly erected and reconstructed establishments. The regulation lists conditions that must be met by establishments in respect to work safety and hygiene. Certain provisions of the regulation are aimed at protection of the natural and man-made environment from detrimental effects caused by industrial equipment. All industrial plants must be equipped with noise suppressing devices. Creches, kindergartens, schools, residential dwellings and hospitals can not be located within a certain radius from a plant.²⁹ The widths of such zones are defined in the Building Code of

1964.

Administrative Law defines industrial noise as that category of social problem which frequently is a by-product of a lawful activity, often a duty resulting from realization of the economic plan.³⁰ The relevant provisions of the Administrative Law regulate conditions which must be met by industries in residential zones in order to protect residents from excessive noise.

The Building Law of 1962 also provides for protection from noise. New buildings can be erected only on sites approved by the regional planning agency. Designs of the buildings should be such that it guarantees the safety of the people using the building.

Radiation

Ionizing radiation presents a very serious dangers to human health by producing chemical alterations in human genes, as well as somatic effects. At present, most of these dangers come from medical treatments, since other kinds of ionizing radiation are almost non-existent in Poland. The legislature, however, prepared several laws and regulations in anticipation of the problem.

On February 12th, 1965 the "Instruction on Medical Examination of Applicants for Employment Involving Exposure and Workers Exposed to Ionizing Radiation" was issued. These instructions were prepared in order to protect persons working in establishments where radiation was present. A series of medical examinations must be provided to the workers during employment and for as long as ten years after they have left the job. Dosimetric control should be carried out in establishments where radiation is present.³¹

In June of 1968, a "Decree on Safety and Hygiene of Work with Ionizing Radiation" was adopted. This decree, issued by the Cabinet, establishes technical measures to prevent excessive exposure of individuals to radiation or contamination of the environment by enterprises working with sealed or unsealed sources of ionizing radiation. Dosimetric surveillance must be maintained and records kept by radiation specialists.

Proper monitoring of radioactive wastes disposal must also be maintained.

In December of 1969, the Polish HEW issued an ordinance supplementing the above two laws. According to the ordinance, workers are divided into two categories:

- a. those working with radiation sources directly
- b. those exposed to radiation as a result of working in the vicinity of radiation sources.

The ordinance also distinguishes four classes in the human body according to its vulnerability to ionizing radiation. Maximum radiation dose is established for each kind of worker and for each class of human body. The following formula is employed in calculating total accumulated dose that a worker of the first category should not receive during the period of employment: $D=5(N-18)$ where D is the total accumulated dose in rems and N the age of the worker. Women of child-bearing age are subject to special standards.³²

One of the last administrative orders dealing with the radiation problem was issued on May 25, 1970. Polish HEW issued an amendment to the 1968 decree on safety work with radiation. This order applies to

x-ray apparatus operating at a voltage higher than 8,000 volts. Establishments operating such equipment must not be adjacent to residential quarters. Protective devices are required in such establishments as well as the employment of a radiation protection specialist.³³

Protection of Nature

The notion of nature, as used in Polish legislation, contains the following terms: sunlight, air, waters, fauna, flora, beauty, and man, all in constant flux and interaction.³⁴

Life on earth depends on oxygen produced by the world's flora. Forests perform a vital role in maintaining the proper quality of the atmosphere and Nature's ecological balance. Unfortunately, the world's forests are constantly diminishing in size. Poland is no exception to this rule. Urbanized areas, industry, and agriculture increasingly replace forested areas which may lead to ecological imbalances and in the long run may prove to be detrimental to some species and eventually even man himself.

The Polish Legislative body has noticed the possibility of such dangers. As a result, the Law on Nature Protection was adopted in 1949. This law with the Law of Land Use Planning (spatial planning) of 1961 provide for nature protection. The Law on Recultivation of 1971 also helps to protect the environment in Poland.

In defining the concept of nature protection the legislature included preservation, restoration, and proper utilization of the animate and inanimate resources of the country. Individual and groups of species "whose protection is in the public interest for scientific, esthetic, historic, health and social reasons as well as those of the specific

values of the landscape"³⁵ have been taken under protection.

The law determines the legal foundation for placing certain natural objects and areas under protection by establishing a limited list of such objects and areas, including:

1. recognition of an object as a monument of nature
2. recognition of an area as a nature reserve
3. creation of a natural park
4. placing under protection certain species of plants and animals.

The Law on Land Use Planning defines locating principles in relation to the environment. There are provisions specifically concerning environmental protection.

The Law on Recultivation defines principles of recultivation of agricultural and forested areas, particularly those previously taken for mining. The crucial point of this law is the principle of soil recultivation. The law specifically addresses changes in the original land use resulting from other activities (especially mining). Land whose original use has been changed is subject to recultivation and redevelopment.³⁶

Recultivation is defined as bringing back the utility value of the soil, and redevelopment as bringing the soil back to a condition which permits its exploitation for the original use.³⁷ The responsibility for recultivation rests with that person or instrumentality whose activities directly caused the loss of the soil's utility value, while the responsibility for redevelopment rests with person or instrumentality who undertakes to use the land in accordance with its new designation.

Transportation Pollution

Several laws indirectly protect the environment from excessive traffic generation. These are: the Law on Air Pollution of 1966, the Law on Nature Protection of 1949, the Law on Recultivation of 1971 and some regulations related to noise control. A single law regulating the subject does not exist. The action in this area is up to the citizenry itself and city planners where the law does not apply.

The guidelines on using the public roads and highways are contained in the Joint Ordinance of the Ministry of Transportation and the Ministry of the Interior of July 1968. The ordinance is concerned mainly with the safe use of public roads and the condition of motor vehicles to be operated on public roads and their mandatory annual inspection.

During recent years the issue of traffic generation has become a more serious problem in Poland. Traffic volumes have increased while transportation facilities were only nominally improved in terms of capacity. The Ministry of Transportation takes the issue very seriously and allocates considerable funds for studies concerning the effects of increased traffic volumes. The following areas are concern of the Ministry of Transportation: designing adequate new highways, harmonizing the highways with the environment, and most importantly making these highways safe. Recultivation of land after highways have been abandoned, the influence of increased traffic volumes on air purity in the cities, urban noise and the effects of maintaining roads during winter on adjoining flora are also studied within the ministry.

Management

Management systems to implement national environmental legislation include the following elements:

1. statistical information
2. scientific research
3. public involvement
4. employment of new technologies
5. penalties and economic incentives
6. environmental investments
7. municipal pollution control
8. international agreements

Polish environmental laws, the most important ingredient of the Polish environmental protection system, have the following characteristics:

1. preventive
2. protective
3. regulatory

The first characteristic is regarded as the most important because it is actually put into action before an act of pollution occurs. Providing standards or protective zones around a source of pollution is an example of the first characteristic. Charges for special use of waters is an example of the second characteristics. Prohibition to pollute or to exceed published standards is inherent in the third characteristic. Examples include stipulated penalties (monetary and imprisonment) for violation of the law.

Environmental laws are, as a general rule, an affirmation and reflection of the level of technology, empirical experience in the subject, and actual conditions in the matter. Periodic amending of environmental laws is a necessity resulting from technological changes and changes in social values. Environmental laws are an important part of any resource management system because of the role governmental activities play in determining the most economic use of natural resources.

Statistical Information

Good factual data is necessary to assess the actual condition of the environment and to take necessary protective steps. Only limited information on such phenomena as environmental pollution were published in the fifties and early sixties in Poland. An exception to this rule is the USIB where massive fishkills were widely noticed. A penalty was imposed in such a case and this seemed to settle the matter as far as the general public was concerned.

This attitude changed significantly in the late sixties and seventies. Questions concerning water and air pollution and their impact on humans, ecological systems, and economy were raised, not only by some unorganized citizens, but by the Nature Protection League and other environmental and social organizations as well as by the press.³⁸ As a result, more consideration was given to the question of environmental pollution by the appropriate organs and executive agencies. To deal with these important issues adequately, major changes had to be made in the nature protection system (described earlier) including the area of statistical information.

In 1971, the Central Statistical Office (CSO) was ordered to

create an office dealing with data concerning the environment. Until then, such data was scattered among all responsible ministries and other executive agencies without methodology and order. It is a CSO responsibility to gather all available data concerning water, air, soil, and other kinds of pollution.

Scientific Research

A wide range of scientific research is being conducted in Poland in the area of environmental protection. Besides the research ordered by the Polish agencies, US EPA has several projects now being conducted in Poland.

More environmental specialists are being educated to perform duties in the field of environmental protection. It is expected that Poland will need 1,200 environmental specialists by 1990.³⁹

Public Involvement

There are many legal organizations concerned with preserving quality environment in Poland. Some of them are composed of scientists working primarily in their own fields of interest but also concerned with broader issues. The following are examples of such associations: Polish Geographic Association, Polish Historic Association, Polish Soil Association, Polish Forest Association, Supreme Technical Association and many others.

Organizations composed solely of citizenry and also functioning as legal persons are: Polish Tourist Association, Nature Protection League, Polish Hunters Association, Polish Scouts, Polish Fishermen Association, and the press club "Landscapes". All these organizations have about 2.5 million members. Action aimed at environmental protection

and originated by private citizens must be introduced at meetings of one of the above mentioned organizations or at the local REEP office which, under the law, is responsible for carrying out protective action.

Enforcement

Enforcement of environmental policies in Poland consists of introducing new technologies, imposing penalties for violation of the law, and investments in the area of environmental protection.

New Technologies

Technologies employed in industrial production are often the main cause of environmental pollution. It is the national policy to correct this situation. Individual plants are ordered to focus their efforts in the following directions:

1. replacement of so-called "dirty technologies" by "clean" ones
2. introducing processes eliminating pollution and utilizing wastes
3. installing monitoring apparatus
4. introducing apparatus minimizing spreading of pollution.⁴⁰

Penalties

Figure 1 in Appendix illustrates that more plants were penalized for polluting Polish environment during 1965-71. Total amount collected from fines for polluting waters in the most heavily industrialized voivodship (Katowice) shows a rising trend. This is due to a growing number of fined plants. In 1965, only five plants were fined for the total amount of 1,500 thousand ZLP, in 1966 seven plants were fined for

3,373 thousand ZLP, in 1967 sixteen plants for 4,358 thousand, in 1968 30 cases for 20,600 thousand ZLP in the entire country.⁴¹ Total amount of penalties depends on the court's practice in assessing the impact of water or air pollution in relation to the environment, economic priorities, and social priorities.

Economic incentives are a part of the Polish economic system. Workers at industrial plants receive bonuses at the end of the year. Bonuses depend on the amount of profit made during the year. Penalties reduce the profits and the amount of paid out bonuses which penalizes workers.

Environmental Investments

Appropriation of funds, by the state, for environmental protection has increased substantially. During 1967-72 period, 46 billion ZLP was spent in the area of environmental protection. During the last five years the investments for environmental protection rose to 62 billion ZLP (see Figure-2 in Appendix). This is equivalent to 1% of the total industrial investments during 1972-77 including municipal investments.

Municipal Pollution Control

It is noticable that very few Polish environmental laws provide for municipal pollution control. The following laws deal with controlling municipal pollution:

1. Administrative Order of November 29th 1975
2. Law on Prevention of Air Pollution of 1966 (only emission standards containing sections)
3. Pertinent sections of laws dealing with noise pollution.

Zoning, which is often used in the US cities as a tool to deal

with all sorts of pollution, is very little known and used in Poland. The Law on Spatial Planning (1961) has been the guideline for rational, including environmental considerations, land use. This law is too general to protect adequately city residents from all sorts of municipal pollution and significant adjustments at the local level usually must be done. Under the present administrative system such necessary tailoring can be accomplished.

Disposing of solid wastes has not been legally regulated in Poland. Lack of law regulating this aspect of pollution is caused by relatively small magnitude, in comparison to highly industrialized nations, of the problem. Packaging goods has always been very simple in Poland and not much of trash has to be collected. Merchandise attractively packed is not a very common sight, thus people like to save the container and reuse it. Old books, newspapers, clothing and trash papers have been traditionally salvaged, recycled, and reused, therefore do not enter general refuse but are collected by people and sold by them at certain locations of the city. General refuse consists of, as a general rule, garbage, coal ashes from still used kitchen ranges, and other useless objects.

International Agreements

Poland, as a member of the United Nations actively participates in the international environmental protection movement. At present, bilateral agreements have been signed by Poland. These agreements concern water quality of bordering rivers and protection of the Baltic Sea and were signed with the neighboring countries Czechoslovakia, East Germany and USSR.

CHAPTER IV

UNITED STATES ENVIRONMENTAL LEGISLATION

The United States differs considerably from Poland with respect to its age and size as a country, and its political and legislative system. For this reason a different approach will be taken in reviewing the U.S. environmental protection system.

A brief review will analyze each medium of pollution (air, water, land); a description of major federal laws will follow. State and local involvement will also be a part of this section. Finally provisions for public input into environmental protection will be briefly discussed.

Federal Legislation

Early American conservation organizations started in 1876. In that year The Appalachian Mountain Club was founded. Two other organizations were founded by the end of the century: Audobon Society in 1886, and Sierra Club in 1892. These organizations were formed by people interested in a specific use of nature or a cause.

President T. Roosevelt introduced the first official concern for conservation into public policy. The President sponsored the White House Governor's Conference on Conservation in 1908. The purpose of the conference was to bring and possibly focus citizens' attention on natural resources and the importance of preserving them.

During the New Deal era, F.D. Roosevelt created the Civilian Conservation Corps which worked on many projects connected with restora-

tion of natural resources.

Water

The first federal statute prohibiting water pollution was enacted in 1886. This Act prohibited dumping refuse into New York Harbor.⁴³ The 1899 Rivers and Harbor Act prohibited discharge of waste materials into navigable waterways (liquid waste from streets excepted).⁴⁴ The reason for introducing these two laws was to protect waterways against obstructions to navigation. Rivers and Harbors Act stipulates monetary and imprisonment penalties for violation of the law. Removal of erected structures, if obstructing navigation, is also stipulated by the law.

In 1912 the Public Health Services Act was introduced. This federal act was enacted to prevent the spread of water-borne communicable diseases. It authorized the investigation of the public health effects of pollution, in navigable waters. Nationwide standards for potable waters used by interstate carriers were set.

In the twenties oil pollution became a problem. As a result, the Oil Pollution Control Act was passed in 1924. This Act was enacted to protect aquatic life (mainly shellfish) and recreational coastal waters. The Secretary of War was designated as the administrator of the Act. Criminal penalties, including fines and/or imprisonment are stipulated for non-compliance with this Act.

In 1948 President Truman signed into law the first Federal Water Pollution Control Act (FWPCA). The Act resulted from a considerable increase in water pollution problems was meant to be a temporary remedy for the problem. Later the Act was extended for an additional eight years. The law enunciated a policy of cooperation with the states and

local authorities in the field of water pollution control. The states were given primary enforcement responsibilities with the hope that the localities along with the federal government's support would be able to deal with pollution effectively. Federal involvement in enforcing the Act was very limited. The Surgeon General was designated as the administrator of this law. To implement this Act funds were authorized to be appropriated.

Comprehensive and permanent water pollution control legislation was enacted in 1956. It was essentially that Act passed in 1948, permanently extended. Minimal changes were mandated at the federal level; more funds were authorized for research and public works, and more powers were given to the Pollution Control Advisory Board created in 1948. Interstate cooperation was encouraged and funds were authorized to be appropriate to implement the Act.

During the next few years the Congress produced no legislation concerning water pollution control. In 1961 FWPCA was amended to strengthen some administrative aspects of the law and increase grants-in-aids and technical assistance features of the earlier program.⁴⁵ The legislative efforts of the Kennedy administration did not stop deterioration of the Nation's waters.

In 1965, the Water Quality Act (WQA) was passed by the Congress. This Act explicitly stated that it is national policy to protect the US waters from pollution.⁴⁶ As a result, the Federal Water Pollution Control Administration (FWPCA) was created within the HEW. This agency was made responsible for all federally financed programs dealing with water pollution according to the 1956 FWPCA. The states were ordered to

adopt water quality standards for interstate waters. These standards were to be used by the federal agency in enforcing pollution abatement. Under this act, 50% of the appropriated funds were to be used for construction of water treatment plants.

In 1966, the Clean Water Restoration Act (CWRA) was adopted. This Act ensured that establishing water quality standards would rest with the states subject to federal approval.⁴⁷ Each state was given a deadline of July 30th, 1967 to adopt water quality standards applicable to interstate waters. All states met the deadline. The FWCPA was amended several times. The 1972 amendment is the most important water pollution control law in the USA today.

The objective of the Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. The main goal is to eliminate discharging pollutants into waters by 1985 and to achieve water quality fit for wildlife by 1983.

The administrator of the act is Environmental Protection Agency (EPA). EPA will provide for public assistance in development and enforcement of this act. Interstate cooperation is to be encouraged by the administrator. Activities are to be focused on prevention, reduction, and elimination of pollution. It is the duty of EPA to provide grants and scholarships to train people in the field of environmental protection (sec. 109-111). The Administrator is to assist pollution control agencies in every way possible.

An annual report of all activities must be submitted (through the President) to the Congress.

Unnecessary water consumption is one of the subjects of the law.

EPA is charged with the duty of conducting research in this area. Results of such studies must be reported to the Congress annually.

Pollution resulting from agricultural production was also considered in the 1972 law. EPA, the Secretary of Agriculture and other federal agencies were ordered to carry out comprehensive studies aimed at agriculture-related pollution. Funds were appropriated to carry out the provisions of the Act. The following funds were appropriated:

1. grants for pollution control programs,
2. grants for research and development,
3. grants for mine water pollution control demonstrations,
4. training grants and contracts, and
5. scholarships.

Title Two concerns construction of waste water treatment works. The purpose of the title is to achieve the goals of the Act through the treatment of wastes. EPA is mandated to assist the states, municipalities and any interstate agency in every possible and feasible way to build publicly owned treatment works. Funds for constructing treatment works are to be provided by the Administrator.

The 1972 law provides for many forms of citizen participation including civil suits. Any citizen can inniciate a civil action on his own behalf against any person, including the USA, who is believed to be in violation of effluent standards and against EPA if it fails to perform its duties. A citizen can be a group or a single person having an interest adversely affected.

Air

The first federal air pollution control legislation was enacted

in 1955. The Air Pollution Control-Research and Technical Assistance Act of 1955 provided funds for anti-pollution activities at the state and local level. The primary responsibility for preventing air pollution was vested in state and local governments.⁴⁸

In 1963, the Clean Air Act (CAA) was adopted. The primary responsibility for pollution abatement was vested again in the states and localities, but major changes were made in the pattern of the federal-state-local relationship. Under this law the US Public Health Service was given a broader role in handling air pollution problems and the need for regional cooperation was established. Abandonment of the notion that a locality should have the fundamental role in air pollution control was vital in recognizing the need for regional environmental planning. Funds for air pollution control programs were given to the states under the 1963 Act and the states became the focal point in executing air pollution abatement.⁴⁹

In 1965 the CAA was amended. As a result, the federal government involved itself directly in controlling air pollution. The Secretary of HEW was authorized, under the law, to promulgate and enforce the federal emission standards for newly produced automobiles. No participation by the states and localities was stipulated in the 1965 amendments.⁵⁰

In 1967 the Air Quality Act was passed. Under this law, the Federal Government's involvement in air pollution control increased. For the first time the Secretary of HEW was charged with the duty of issuing air quality criteria.⁵¹ The Secretary was also required to issue information about air pollution control techniques, designate broad atmospheric areas, and promulgate air quality criteria. The states were

required to set similar standards and implement them. In 1970 the newly created Environmental Protection Agency (EPA) took over the functions of the Secretary of HEW in this area. In 1974, the Clean Air Act was amended. It is now the most important piece of air pollution legislation.

The primary responsibility for prevention and control of air pollution is vested in the states and localities. The Federal Government's financial assistance and leadership is stipulated by the law in coordination of interstate efforts.

The main purpose of the Act is to enhance air quality of the Nation. The Administrator of EPA is required to encourage cooperative activities of the states and local governments focusing on the prevention and control of air pollution. EPA is to cooperate with all air pollution prevention agencies in the areas of research, investigations, and training. Money for these activities is provided.

Special attention is given to research concerned with reducing air pollution resulting from the combustion of fuels.

Interstate air quality agencies or commissions receive grants from EPA to develop and implement comprehensive plans aimed at air pollution abatement.

Interstate air quality agencies or commissions receive grants from EPA to develop and implement comprehensive plans aimed at air pollution abatement.

States are charged with the duty of assuring air quality within their geographic area by submitting an implementation plan to achieve and maintain national primary and secondary ambient air quality standards.

For this purpose, air quality control regions are designated under the law.

National Ambient Air Quality Standards are established with respect to any pollutant. The following apply to the promulgation of such standard:

1. primary standards
2. secondary standards

An implementation plan for meeting the above standards must be submitted within nine months after promulgation. Deadlines for attainment of plan implementation are given.

Standards for performance for new stationary sources are developed. A standard of performance is defined as: "a standard of emission of pollutants by new and modified construction which means buildings, structures, facilities or installations able to emit any air pollutant"⁵² After a list of categories of such sources is prepared and distributed by EPA, the states must prepare and submit to EPA plans limiting air pollution by stationary sources.

Federal enforcement is stipulated if there is violation of this section. The enforcement may be accomplished by:

1. issuing an order to comply
2. bringing civil suit.

Both penalties: fines and imprisonment are stipulated for infringement.

For the purpose of determining whether a person is in violation of the law, EPA reserves the right to:

1. inspect an establishment
2. order monitoring and maintaining records of emissions
3. enter any premises in which an emission source is located

Title Two of the CAA of 1974 is often cited as the National Emission Standard Act and concerns emission standards for moving sources, particularly motor vehicles and fuel standards. EPA must prescribe standards applicable to any air pollutant released by motor vehicles which may pollute, and therefore, endanger public health.

A 90% reduction of carbon monoxide and hydrocarbons from motor vehicles by 1977 was ordered. Domestic and foreign car manufacturers must comply with the US emission standards. A penalty is stipulated for violating this section.

It is the duty of EPA to test and require to be tested any new motor vehicle emission system. A certificate of compliance is issued only when vehicles can meet the standards.

Vehicles actually in use are also to be tested. EPA is ordered to establish methods and procedures of inspection. Non-conforming vehicles will fail annual inspection and the owners may be denied the use of the vehicles.

The administrator may regulate standards for fuels available on the market in order to prevent air pollution. According to the existing law, manufacturers of fuels must register their products with the administrator. The manufacturers may be required to conduct tests in order to determine whether a fuel may have any negative public health effects. Introduction of potentially harmful fuels may be prohibited.

Low emission engines are to be developed under the law. Low-emission engine is defined as: "a self-propelled vehicle designed for use on the US public roads emitting any air pollutant significantly below new motor vehicle standards."

Investigation of aviation-related air pollution began in 1970. The purpose of this action was to determine to what extent such emission affects air quality. It was determined that aviation contributes to air pollution and aviation fuel standards were prescribed by the administrator.

The 1974 Clean Air Act makes several legal tools available to citizens. According to the law any interested person can bring a civil suit against any other person believed to violate emission standards. A suit can also be filed against EPA if it fails to perform its duties.

Solid Waste

Traditionally, collection of refuse has been a task of local governments. During recent years, the problem of waste disposal has gained considerable attention because of the techniques of disposal (incineration, burial in sanitary landfills, open dumps and sea dumps) which often related to water and air pollution. Considerably increasing volumes also became alarming to the environmentalists.

Three federal statutes deal with the issue: Solid Waste Disposal Act, National Materials Policy Act of 1970 and Resource Recovery Act of 1976. The first act authorizes EPA to conduct research, training and demonstration projects that deal with:

1. the effects on health and welfare - and related to refuse
2. the operation and financing of solid waste disposal programs
3. the reduction of solid waste
4. the improvement of its collection and processing
5. the recovery of materials and potential energy production from solid waste

Financial assistance to all agencies dealing with the issue is strongly

recommended. The Act does not set any standards.

The second Act established the National Material Policy Commission appointed by the President. The commission is to study future material requirements in relation to population size and environmental quality. Recommendations of policies related to recycling of depletable resources are the responsibility of the commission.

The most recent Act gives EPA a broad authority to regulate the disposal of hazardous wastes, and encourages the development of solid waste management plans by the states, localities, and interstate agencies. The Act also prohibits open dumping of wastes and provides for national research, development and demonstration programs. The major objective of the Act is to protect the environment and conserve resources through development of solid waste plans. Open dumps are to be eliminated by October of 1983. To encourage developing plans leading to the objectives, the Act authorizes financial assistance.

Noise

The most important law controlling noise emission is the Noise Control Act of 1972. The findings are that inadequately controlled noise presents growing hazard to the Nation's population particularly in urban areas. Major sources of noise are identified and primary responsibility for noise control is vested in the state and local governments. The Federal government limits its involvement to commerce and labor related noise which often requires nationally uniform treatment.

The policy of the USA is to promote an environment free of unwanted noise. The term "environmental noise" means: intensity, duration and character of sounds from all sources. Certain categories

of equipment were assigned noise emission standards. These are:

1. construction equipment
2. transportation
3. any motor and engine
4. electrical equipment

Abatement of aviation-related noise is also taken into consideration. All products classified as sources of harmful noise are to be labeled in such a manner that a prospective user may know what level of noise the product will emit. Removal of such labels and devices that reduce the noise emission is prohibited. Importing appliances not conforming with US standards is prohibited. A fine and imprisonment penalty is stipulated by the Act if there is infringement. Any person can file a civil suit against:

1. any violator of the Noise Control Act
2. EPA and FAA for failing to perform their duties

In the last part of the Act there are provisions for setting noise emission standards for railroad and motor carriers.

Radiation

The magnitude of effects on humans and environment of bombs used in Hiroshima and Nagasaki was so frightening that the Federal Government decided to have immediate control in the area of ionizing radiation.

In 1954 the Atomic Energy Act was passed. According to the Act, all controls in the area of ionizing radiation (including environmental protection) are exercised by the Federal Government. In 1959, the Federal Government vested considerable powers in the states in the area

of ionizing radiation. Enforcement powers were also given to the states.

The Federal Government is still heavily involved in radiation control in terms of emission control, performance standards, and occupational standards.

Responsibility for setting the standards is dispersed among: Environmental Protection Agency, Nuclear Regulatory Commission, Bureau of Mines, Department of Health and Education, and Department of Transportation. The standards concern the maximum amount of ionizing radiation an employee may receive during the total employment, regulations regarding how and where radioactive wastes can be buried and regulations pertaining to man made radiation resulting from diagnostic x-raying and other treatment devices in the medical fields.

The Department of Transportation regulates the methods of transporting and handling of radioactive materials.

National Environmental Policy Act (NEPA)

On January 1, 1970 President Nixon signed NEPA into law. This action was a result of the intensity of environmental problems which could no longer be satisfactorily regulated by individual states. This Act was the first to provide a comprehensive environmental policy guideline for the future.

The statement of purpose of the Act says: "the purposes of this Act are: to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to produce efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation".

The Act declares that it is the continuing responsibility of the Federal Government to use all practicable means to improve and coordinate federal plans, functions, programs. The final goal is to preserve a quality environment for all Americans and succeeding generations and also preserve important historic, cultural and natural aspects of our national heritage. NEPA does not specifically prohibit anyone from polluting, but it does stipulate that there must be public consideration before any man-caused environmental changes occur. NEPA itself seems to be designed only as a decision making tool which in conjunction with other environmental laws concerning water, air, noise, etc. form a very powerful set of weapons against pollution.

Two major provisions besides a statement of environmental policy are contained in the Act:

1. NEPA requires the preparation and publication of an Environmental Impact Statement on major projects (Federal, State, Private) where the Federal government has fiscal or regulatory involvement.
2. NEPA created the Council on Environmental Quality (in the Office of the President) which advises the President and the Congress on policies, review EIS studies, pursue studies in the environment related disciplines, gather environmental data and report annually to the President on the state and conditions of the environment.

An EIS is to contain the following:

1. positive environmental impacts
2. adverse impacts
3. alternatives to the project

4. comparison of short-term versus long-term use of resources
5. any potential irreversible commitment of resources.

No penalty is stipulated for failing to prepare an EIS, and no statement is made, in the act, that the project cannot be pursued if harmful to the environment, yet the citizens were given the right to stop a project if an adequate environmental impact statement is not prepared and circulated.

About five hundred suits concerning environmental protection were filed by February of 1975. One of the very significant suits was the delay of the Alaska Oil Pipe Line for about four years. The law stipulates that the EIS draft has to be made available for review by Federal agencies and the Public 90 days before beginning of the project. The final version containing all comments should be available for circulation 30 days before approval.

The results of EIS requirements have been extensive. The US Army Corps of Engineers in 1973 had to alter extensively 197 projects, drop 24 and suspend 44.

The Council on Environmental Quality is appropriated money annually to implement a significant portion of NEPA provisions but it does not receive money to prepare Environmental Impact Statements.

State & Local Legislation

Many states and municipalities have adopted laws and regulations to protect the health, safety and welfare of the people against the adverse effects of environmental pollution. Such laws and regulations dealt primarily with air pollution, water pollution, solid waste and noise.

Air Pollution

In response to the 1967 Federal Air Quality Act, all states enacted air pollution control legislation. As a general rule, a state agency was created to promulgate standards and codes. In most cases the State Health Department was given the responsibility of creating such an agency or assumed this responsibility. Most of the states allow their local governments to enact their own codes. Air pollution standards set by a locality must be consistent with those enacted by the state. Some states require a review of local standards before they become effective. Some state governments set standards if a locality fails to set local anti-pollution standards. In such cases a charge may be set by the state. Finally the state agency may determine that a particular class of air pollutants should be regulated at the state level and it may assume exclusive jurisdiction. Generally, state and local air pollution control programs are structurally independent from each other. Once a locality acts according to the state's government directives, a supervisory role is assumed by the state.

Water Pollution

Water pollution control is also based on the police power concept at the local and state level. At the beginning no realistic

protection was available against water pollution except for a court suit against an upstream polluter.

Initial steps leading to governmental control came in the form of laws to protect potable water supplies. Municipalities were granted extraterritorial powers to deal with pollution contaminating potable waters. Local boards of health were given power to monitor the quality of such waters. Since releasing wastes into rivers frequently harmed other localities, it became apparent that state-wide, coordinated action was needed.

At present, a single state agency responsible for formulating water quality control policies is a general practice. State agencies differ considerable implications as to the kinds of standards and the reach of regulations they impose. In some states, only certain waters are subject to the control of the agency.

Solid Waste Pollution

Solid waste disposal has been handled by local regulations subject to state enabling legislation. The manner of getting refuse ready for collection and the collection itself are usually described in local codes (sanitary, health, housing) and ordinances. The enforcement of the ordinances and local codes is totally vested in a given municipality. Violations of these regulations are treated as misdemeanors.

Noise Pollution

Similar to solid waste disposal, protection from noise has been largely a local responsibility. State regulation of the problem is limited to reducing automobile noise by requiring the installation of mufflers. Miscellaneous prohibitions function at the local level, and

are classified, as "police ordinances".

Energetic action against noise pollution is characteristic of large urban areas like New York and Los Angeles. New York's administrative code specifically prohibits: "the creation of noise of such character, intensity and duration as to be detrimental to health and life of any individual". Local zoning also serves as a powerful tool in protecting people from excessive noise. Noise limiting standards are often set for particular zones like residential, hospital and school.

Public Involvement in Environmental Protection

Public involvement has its basis in the US constitution that guarantees the right to petition the government for a redress of grievances. On this basis people have a right, under law, to be a part of the apparatus shaping the environment according to present societal values.

All major laws described earlier provide for citizen participation in environmental protection. Citizens can commence a civil suit against any polluter for non-compliance with set standards or any infringement of the law. United States as well as US EPA can also be sued if it fails to perform its duties.

At the local level (county and municipality) meetings are held to get citizens' input on any proposed changes affecting environmental conditions. Such meetings are opened to the public and a neighborhood input is often a very important factor in making local decisions. As often seen at Atlanta zoning hearings, citizens' influence on local planning decisions depends to a large degree on the strength of their involvement.

CHAPTER V

COMPARATIVE ANALYSIS OF THE TWO ENVIRONMENTAL SYSTEMS

The following analysis describe the differences and similarities between the US environmental system and Polish environmental system.

Legislation

Several areas of environmental protection are similar in the Polish and the American system, these are:

1. principle of protection and similarities found in construction of law
2. legal regulating of environmental problems related to: air pollution, water pollution, noise pollution, radiation pollution and also matters related to recultivation of land, historic preservation, and protection of scenic values etc.
3. management practices.

Principle of Protection

The most important similarity found between the two environmental protection systems lies in the very principle of protection. In the section describing air pollution it is stated in the Polish law that pollution is a nuisance to man, his health, climate, growth of plants, and breeding of animals and therefore should be eliminated. It is apparent that the purpose for eliminating pollution of the natural environment is to protect human health and welfare which is the same purpose stated by the US Congress. Legislation protects: waters, air, soil, land, fauna and flora from pollution.

Environmental laws are similar in their construction in Poland and USA. First sections usually provide pertinent definitions followed by precise regulations. The laws of both countries designate administrators of the laws. A very important section stipulates penalties for violations of the laws.

Sections controlling sources of pollution are an important part of environmental laws in both countries. Representatives of the administrator have the right to enter the premises where the source of pollution is located. The representatives have the right to take samples and examine required records.

American laws also contain sections authorizing funds to implement the law. Polish laws do not contain such a section.

Water Pollution

Use of public waters and their pollution are regulated by the water laws in Poland and USA.

The 1972 FWPCA sets definitive goals for water purity and the deadlines to achieve these goals. The Polish Water Law of 1974 which prohibits polluting waters, is aimed at enhancing the quality of waters in Poland. However, it does not set definite goals or set deadlines for compliance.

An interesting aspect of Polish Water related laws is their correlation with other laws like the Law on Land Use Planning of 1961. In this case the correlation pertains to protection of potable waters by setting protective zones around places of withdrawal. Such correlations are not included in the 1972 FWPCA.

Only industrial wastes require waste treatment plants under the

Polish Water Law of 1974. Again, no goals are set but the law requires completion of a waste treatment facility in every newly built or renewed industrial plant before production can be initiated.

Violations of both Polish water-protection related laws and the 1972 FWCPA (USA) are punished by fines, imprisonment or both. However, civil suits are permitted under 1972 FWCPA against a polluter either by the administrator of the law or by any US citizen.

The right to initiate a civil suit can serve as a very powerful tool in solving environmental questions. The lack of this option limits considerably the environmental protective actions of the Polish citizenry.

Question of financing pollution prevention and control programs is explicitly regulated in 1972 FWCPA by providing funds to carry out the Act. Polish law does not explicitly define how construction of treatment facilities should be financed. However, it requires that a waste treatment facility must go into operation simultaneously with a reconstructed or a new industrial facility. In case an industrial facility fails to operate treatment plant, it is fined for every 24 hours of releasing untreated wastes.

The laws of USA and Poland are perhaps differently constructed but it is apparent that their final goal is to limit and eventually eliminate water pollution.

Municipal water pollution is only partially regulated in Polish Law. An administrative order of 1975 regulates this matter and is limited to prohibition of discharging certain substances and floating bodies into the municipal sewerage. In the USA, localities must meet state legislatures water pollution control standards.

Air Pollution

In comparing Polish Air Pollution Control Act of 1966 with the US Clean Air Act of 1974 it was noticed that the main goal of both was to protect human health and welfare and enhance quality of air for the nation. However, the American Act is wider in scope. It provides for control of aviation-related air pollution in addition to the stationary and moving sources (automobiles). Stationary and moving sources of pollution in Poland and USA must meet similar emission control standards.

Clean Air Act (USA) regulates the fuels used by all motor vehicles including aircrafts. All newly manufactured motor vehicles are required to use non-leaded fuels. Polish law does not provide for such regulations. The superiority of the American law reflects a higher level of need for air pollution control. The need results from a higher degree of organization, motor vehicle use and industrialization that contributes to high levels of pollution in the USA.

The laws of both countries designate administrators of the laws.

Radiation Pollution

There is not much radiation pollution present in Poland but several laws regulate the matter. The laws regulating the question of protection from radioactive pollution are limited to those dealing with occupational safety.

Because the problem of radioactive pollution is relatively new, and the USA has more experience in this area, many countries have accepted American standards and formulas. Poland is no exception to this rule. Polish standards, like the American standards, are based on average human resistance to ionizing radiation and to the age of a person. The Polish

laws are, in general, less comprehensive than the American laws dealing with radioactive pollution. American laws define how and where radioactive wastes should be buried. This question is one of the most important in dealing with radioactive pollution, yet it is not mentioned in the Polish laws in any way.

Noise Pollution

Noise pollution is perceived in Poland, as well as in USA, dangerous to human health. Poland does not have a single Noise Pollution Act as does the USA. A number of laws aim at protection from noise including: Administrative Law, Building Code, Penal Offenses Code, and occupational safety related laws.

The Polish Penal Offenses Code regulates the raising of alarms that would disturb night rest. Such regulation is necessary because most of the Polish urban population lives in apartment houses where the densities are very high.

Industrial noise is included in the law. Unfortunately, the laws in Poland are weak because no standards are established.

Punishment for violation of the provisions contained in the Penal Offenses Code is stipulated by law, but actual execution of the law is more often done by the people themselves rather than by the courts.

Building Code of 1964 and the new Building Law of 1974 and the Law on Spatial Planning (land use planning) of 1961 also provide for noise protection. According to these laws residential quarters, hospitals, creches, schools, and housing for senior residents must be located at least a certain distance from industrial plants. This concept is very similar to zoning concept in USA.

It has been noticed that the Noise Control Act in the USA deals with the matter in a more comprehensive manner than do the Polish laws. Seemingly insignificant sources of noise pollution like home and office machines that are taken into consideration in the American Act are not mentioned in Polish Laws.

Other laws dealing with pollution and preservation exist in both countries. Examples of such laws, not discussed in this thesis, are laws concerning recultivation of land, toxic substances, and historic preservation.

Environmental Management

US EPA is designated the administrator of most of the US environmental acts. It assumes the responsibility for the entirety of environmental management.

In Poland REEP is responsible for coordinating and managing all environment protection aimed efforts. This central agency is seldom named the administrator of the law, the representatives of the agency however, have the right to examine the records and take the samples at the source of pollution. The laws of both countries control the sources of pollution. Representatives of the US administrator, of the Polish administrator and of REEP have the right to enter the premises where the source of pollution is present and take the samples as well as examine the records which are to be kept under the law.

An essential aspect of environmental management is collecting statistical data on environmental conditions. The necessity to keep data in this area is indispensable to assess properly the quality of

environment in the country as well as plan necessary adjustments and preventive actions. Both countries collect such data.

Increasing funds are appropriated for environmental management and pollution control in Poland and USA. This is a reflection of more interest in the field resulting from changes in the values of the Polish and American societies. It was determined that pollution can be very costly, in the long run, in both countries. This fact became apparent to Polish authorities because Poland depends on a limited water supply. This supply has been polluted for many decades and at present most of Polish inland waters need to be treated in order to satisfy industrial production requirements.

Funds appropriated for improving the quality of environment grew considerably in Poland during the shown period of time. (See fig. 10 in Appendix). These funds are used for building water treatment facilities, employment of new technologies, scientific research, and educating environmental scientists.

Poland, similar to USA, entered into international agreements concerning purity of environment. Such agreements are signed with the neighboring countries similar to these signed by USA and Canada.

Differences Found Between Two Environmental Systems

Differences between the two systems of environmental protection emerge from the following aspects:

1. different socio-political conditions:

- a. administrative
- b. economic

c. managerial

2. geographic conditions:

a. climatic differences

b. different fauna and flora

Political

The most important differences emerge from different political conditions. In Poland, the central government (first the kingdom and now the parliamentary system) adopts all policies. In USA, the states and localities are the focal points of attention. Different states regulate the same matters differently if there are no federal guidelines. Polish voivodships regulate legal matters in almost an identical fashion because all of them must follow centrally developed guidelines.

Economic

Differences in regulating environmental problems also result from differences in the economic systems. The main difference, is in ownership of the means of production.

In the socialist economy, as of Poland the means of production belong to the state. Environmental protection is regulated by the state. As a result, two conflicting activities (production and environmental protection) are carried out by the same central government. In such a situation, activities with higher priority dominate. Preserving a quality environment is important, however, industrial production has the first priority in Poland.

In USA, the government is given the task of enhancing environmental quality. It does not engage in industrial production. However, conflicts arise between the government's energy and environmental programs.

Managerial

The following aspects are found different in the area of environmental protection in Poland from the same in USA:

1. principle of law (not the principle of protection)
2. funding of environmental investments
3. public involvement

The principle of regulating all matters in Poland, not only environmental pollution, is different from the same in USA. It is maintained by the Polish Legislature that the socialist society has superior methods of regulating the legal problems than the capitalist society whose values are focused on profits and individual interests. This notion is a disputable one especially in the area of environmental protection. The only evidence of such superiority may exist in the area of environmental protection planning which is outlined to some degree in the Law on Nature Protection and in the Law on Spatial Planning. This aspect of planning is outlined in an extremely general way and in no fashion can it be used to prepare detailed plans for environmental protection.

Funds for carrying out environment protecting laws are appropriated by the Federal Government in USA, and is included in the pertinent sections of the US environmental laws.

Funding of environmental protection is a government's responsibility, in Poland yet there is no adequate method of determining how much money is spent for environmental protection in a given year. The total amount invested is the total of investment by all state owned plants and depends on their executives. Environment conscientious managers of plants

tend to spend a higher percentage of the plant's budget for purifying equipment. Another plant with a very similar budget may spend much less for the same, since there is no set percentage to be spent for this sort of investment. Nevertheless, the total amount spent is growing as the interest in the subject gains more attention.

Financing environmental investments is quite different in the USA. Definite funds are appropriated to carry out precisely defined control programs, preventive programs, construction of environment protecting facilities, and education of environmental specialists.

It is apparent that the USA is ready to commit considerable funds to attain the goal of quality environment. Poland, at the same time, is neither ready nor able to commit adequate funds to clean its environment.

Public Involvement

Public involvement in Poland differs considerably from public involvement in USA. In Poland, it is considered an environment protecting method. The public has a right to voice its opinions in an organized manner-through an environmental organization. A person or a group of people seeking some environmental goal must follow legal procedures in order to attain such goals. These procedures often lead to delays that may be detrimental to the environment.

In USA environment protecting actions are often created "ad hoc" and frequently prevent irreversible changes in the environment.

Different social values in both countries also contribute to differences in public's attitude in preserving quality environment. Society in a socialist state is taught non-polluting ideas through the

centralized school system. As an example, all schools can be required to hold competition among students as to the cleanest part of the schoolyard (each class has an assigned part). In fact, this sort of action was remembered by this writer when he lived in Poland. As a result of such action, it is possible to raise a society disapproving of littering. The Polish society is an example of a society where littering is met with strong disapproval and often the "litter-bug" is forced to clean up his mess.

Geographic Conditions

Certain geographic conditions create differences in the two environmental systems. USA has several climates within its borders. As a result, different environmental protection measures suited to regional conditions must be taken. Some regions or a state may have laws and regulations to Poland but not the whole country.

Government's Involvement into Environmental Protection

It has been observed that government's involvement into environmental protection has changed significantly in both countries. US Federal Government's involvement differs considerably from the involvement of the Polish Government.

Historically, environment related matters were regulated at the local and state level in USA. With time, the Federal Government became deeply involved itself in the control of environmental pollution and protection. This involvement has been constantly growing and the Federal Government plays an important role in regulating environment related matters today.

The Polish Government traditionally, regulated all questions,

environmental protection included, at the central level. Because increasingly centralized government has not accomplished its goals and promises to the Poles, anti-government riots broke out in the seventies. Consequently, series of administrative reorganizations have been made. These reorganizations influenced the work of the administration and of many ministries including REEP. As a result, more authority was given to the localities by giving their heads more decision-making power in the area of adjusting centrally developed guidelines to suit local conditions. In no other area is this power utilized as often as in the area of environmental protection because of its political neutrality.

It is evident that the environmental protection movement in Poland has travelled a reversed road from that in the US environmental movement.

Evaluation of Poland's Environmental System

Several aspects of Polish environmental protection system need to be evaluated. These are as follows: law aspect, management aspect, and trends of the environmental movement during the last few years.

Legal Aspect

The practical application of the existing laws and regulations reveal a significant gap between what is desired and what is achieved in regulating water and air purity related problems. The particular area lacking clarity concerns the effectiveness of the regulations as well as their assessment.

The first question that must be raised is the question of penal sanctions. The 1974 Water Law stipulates both a fine and an imprison-

ment as penalties for violation of this law. Stipulated fines are extremely high for a "physical person" in relation to an average annual earnings, (3,500 ZLP). Therefore, only a "legal person" (in this case state owned plants) are fined.

On the other hand, the imprisonment penalty is rare, because of the great difficulty in proving guilt.⁵⁴

Because sizable plants are owned by the state, the state must punish itself, which may often be in conflict with other priorities. A fine penalty was stipulated in the 1922 Water Law but the penalty did not prove to be valid under new socialist conditions.

To correct this situation, an economic incentives method was introduced. As mentioned earlier, this method is based on the system of bonuses given away each year. The size of the profits determines the size of the bonuses. A treatment plant involves a considerable investment and for this reason are executive of a plant often decides to pollute and pay the fines. Because the fines are an insignificant portion of plant's budget, polluting by plants is common.

Water Law of 1974 corrects these shortcomings to some degree by introducing payments for use of water and for releasing used water. The payment for using water for purpose other than generating electricity is five times as high as that for generating electricity.

The amount assessed for releasing industrial sludge depends on the kind, composition, and the class of waters receiving the sludge. A fund is created from these payments to be used for financing water protection related projects.

Immediate operation of the waste treatment plant with the main

plant is mandatory under the 1974 Water Law.

Problems of air pollution control are also inadequately regulated by the Polish legislation. Many similarities are found in water and air pollution related laws, but the most important shortcoming of Polish environmental laws is the lack of provision for a civil suit against either the polluter or the administrator of the law by private citizens whose properties (and often themselves) are directly affected by environmental pollution. This situation, if corrected, could have a very positive effect on improvement of environmental quality in Poland.

Management Aspect

The second most important aspect to be evaluated is environmental management in Poland. Court practice is the controversial issue in the question of environmental pollution management. Too often the "state of exceptionally important conditions" was the reason for dismissing the charges against the plant in water and air pollution cases. Such exceptionally important conditions may be described as realizing the national plan or increased demand by foreign clients which brings foreign currencies so badly needed to pay off foreign credits.

When the Water Law of 1962 was amended, many plants were granted a dispensation from the new regulations because it was impossible to correct the matter immediately. Some plants used this dispensation until 1973. As a result, 275 plants released industrial sludge without treatment or permit in Cracow voivodship in 1973.

Too often water treatment plants are inadequately to meet future needs of an industrial park. Sometimes treatment plants are shut down to achieve better economic results. Cases of building treatment plants

unsuitable for various kinds of industrial sludge are not uncommon.

The area of air protection experiences similar problems. A report of SCC stated that in 1971-72, out of 57 surveyed plants, 49 did not have adequate records of monitoring air pollution. Further, the report states that the average time of operation of air pollution devices was 40% shorter than the time of operation of the emitters. Unfortunately, the courts often find excuses favoring such plants, which is quite understandable in the socio-political conditions.

Trends of Environmental Protection in Poland

It has been documented that interest in environmental protection has considerably grown in Poland in comparison to the sixties. Laws and regulations pertaining to environmental protection are constantly amended and improved. The public's concern has also grown and it seems to gain more power and support from many scientific organizations. This is a reflection of changes in societal values. For these reasons as well as economic reasons the government must be more alert to the problem of environmental pollution and act accordingly.

More polluting plants have been controlled and fined for violating laws during recent years. Higher total amount of fines were paid in 1971 than in 1965 (penalties stipulated by law were the same in both years).

It is felt that the amount of penalty, in a socialized economy, is not important. However, the environmental policy set by the government and its place on the list of national priorities is of paramount importance.

Conclusions

It has been noticed that law has the major role in environmental protection in Poland. Under favorable economic conditions a government of a state, like Poland, could assign the first priority to preserving quality environment. Consequently, the law and its administrator, could adequately protect the environment from deterioration and provide for enhancement of its quality whenever necessary. Poland has not achieved such economic conditions thus many cases of environmental pollution still occur and often are excused by the administration.

As mentioned earlier, unfortunate cases of water pollution are still present. Considerable work has been done in the field of abating water pollution, but numerous improvements are needed in the area of water pollution control.

The same applies to air pollution control. Very significant improvements have been made especially during the last seven years. This trend must be continued because increasing industrialization, motorization, and urbanization of the country will contribute to deterioration of air quality.

In the area of protection from noise pollution a comprehensive, easy to comprehend act, consolidating all noise protection laws and containing necessary standards should be drawn. The existing laws can protect from noise intrusion, but a skillful lawyer is needed, to accomplish such a task.

Protection from ionizing radiation appears to be well organized for the present needs in Poland. The laws adequately cover the problem and necessary standards are provided. The only unaddressed matter is

disposal of radioactive wastes. It is conceivable that this question is not mentioned in Polish legislation for security purposes.

As mentioned earlier no solid waste legislation has been adopted in Poland. Despite relatively small amounts of wastes, some preparatory regulations should be drawn. At the present, state-owned establishments take care of solid waste disposal. With time, a part of the operation may be turned over to private contractors and then regulations will come desirable.

In USA combination of the law, its enforcement and public involvement as the most important ingredient play the key role in preserving quality environment.

US environmental laws are found to be comprehensive and for the most part superior to the Polish environmental laws. This superiority has its roots in the very principle of the American legislation which gives the right to an individual to protect himself and his property. This constitutional right enables the American society to determine in what kind of environment it wants to live and function.

The Polish constitution provides for protection and rational use of the national natural resources and the environment which constitutes a considerable part of national wealth. The constitution also assures that all citizens have right to use the natural environment and charges all citizens with the duty of its protection.

In fulfillment of the constitutional provisions a considerable job has been accomplished in area of improving environmental quality in Poland during the last decade. All environmentally related problems can not be immediately eliminated in Poland, but cooperation of the Polish

administration, government, and society in the area of protecting the environment is expected to continue, and result in achieving a high quality environment in the years to come.

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APPENDIX

Indicator of pollution or nature of pollutants	Unit of concentration	Purity class		
		I	II	III
I	2	3	4	5
Dissolved oxygen	mg O ₂ /l	>6	>5	>4
5-day biochemical oxygen demand (BOD ₅)	mg O ₂ /l	<4	<8	<12
Oxidizability (permanganate)	mg O ₂ /l	<10	<20	<30
Oxidizability (COD estimated by the dichromate method)	mg O ₂ /l	<40	<60	<100
Saprobity system		oligo- to betameso-saprobic	betameso- to alphameso-saprobic	alphameso-saprobic
Chlorides	mg Cl/l	<250	<300	<400
Sulfates	mg SO ₄ /l	<150	<200	<250
Total hardness	mEq/l	<7.0	<11	<14
Dissolved substances	mg/l	<500	<1000	<1200
Total suspended matter (except for sudden rises in water level)	mg/l	<20	<30	<50
Ammonium salts	mg N NH ₄ /l	<1.0	<3	<6
Nitrates	mg N NO ₃ /l	<1.5	<7	<15
pH		6.5-8.0	6.5-9.0	6.0-9.0
Organic nitrogen	mg/l N _{org}	<1	<2	<10
Total iron	mg/l Fe	<1.0	<1.5	<2.0
Manganese	mg/l Mn	<0.1	<0.3	<0.8
Phosphates	mg/l PO ₄	<0.2	<0.5	<1.0
Thiocyanates	mg/l CNS	<0.02	<0.1	<2.0
Cyanides except for compound (complex) cyanides	mg/l CN	<0.01	<0.02	<0.05
Compound (complex) cyanides	mg Me/CN/x/l	<1.0	<2.0	<3.0
Phenols volatile in water vapour	mg/l	<0.005	<0.02	<0.05
Detergents (surface-active agents)	mg/l	<1	<2	<3

* See Int. Dig. Hlth Leg., 1965, 16, 376.—Ed.

TABLE 1 - Standards for permissible pollutants in inland surface waters.

See Int. Dig. Hlth Leg., 1965, 16, 376.—Ed. (Translation from Polish)

POLAND

Indicator of pollution or nature of pollutant	Unit of concentration	Purity class		
		I	II	III
1	2	3	4	5
Temperature *	°C	<22	<26	<26
Odour		<3R	natural	specific
Colour **	mg Pt/l		natural	
Number of coliform organisms of the faecal type		>1	>0.1	>0.01
Pathogenic bacteria		undetectable	undetectable	undetectable
Oil		no visible traces on surface of water		
Ether extract	mg/l	<5	<15	<40
Lead	mg/l Pb	<0.1	<0.1	<0.1
Mercury	mg/l Hg	<0.005	<0.005	<0.01
Copper	mg/l Cu	<0.01	<0.1	<0.2
Zinc	mg/l Zn	<0.01	<0.1	<0.2
Cadmium	mg/l Cd	<0.005	<0.03	<0.1
Trivalent chromium	mg/l Cr	<0.5	<0.5	<0.5
Total heavy metals	mg/l	<1.0	<1.0	<1.0
Nickel	mg/l Ni	<1.0	<1.0	<1.0
Hexavalent chromium	mg/l Cr	<0.05	<0.1	<0.1
Silver	mg/l Ag	<0.01	<0.01	<0.01
Vanadium	mg/l V	<1.0	<1.0	<1.0
Boron	mg/l B	<1.0	<1.0	<1.0
Anticic	mg/l As	<0.05	<0.05	<0.2
Free chlorine	mg/l Cl	undetectable	undetectable	undetectable
Fluoride	mg/l F	<1.2	<1.2	<2
Sulphides	mg/l S	undetectable	undetectable	undetectable
Free ammonia	mg/l NH ₃	<0.1	<0.1	<0.1
Acrylonitrile	mg/l	<2.0	<2.0	<2.0
Caprolactam	mg/l	<1.0	<1.0	<1.0
Radioactive substances		in quantities prescribed by special provisions		
Biological fish test	24 hours	positive — the water must not cause the death of fish within a period of 24 hours		

* If the natural temperature of the water is equal to or higher than the value specified for the respective water purity class, a temperature increase of 2° C is permitted.

** Where specially justified, an increase is permitted in the natural colour, as determined by the platinum-cobalt scale, of not more than 15 mg/l Pt for Classes I and II and not more than 30 mg/l Pt for Class III.

TABLE 2 - Standards for permissible pollutants in inland surface waters.

See Int. Dig. Hlth Leg., 1965, 16, 376.-Ed. (Translation from Polish)

Lp.	Nazwa związku	Wzór chemiczny	Stężenie wyrażone w mg/l powietrza
1	Amoniak	NH ₃	0,02
2	Siarkowodor (H ₂ S)	H ₂ S	0,01
3	Cjanowodor	HCN	0,0003
4	Chlor i Jod	Cl i J	0,001
5	Brom	Br	0,002
6	Czterochlorek węgla	CCl ₄	0,05
7	Benzen	C ₆ H ₆	0,1
8	Benzyna (C ₆ H ₆)	mieszanina węglowodorów	0,3
9	Fenol	C ₆ H ₅ OH	0,005
10	Eter dwuetylowy	(C ₂ H ₅) ₂ O	0,3
11	Arsenowodor	AsH ₃	0,0003
12	Dwusiarczek węgla	CS ₂	0,01
13	Tlenek węgla (CARBON MONOXIDE)	CO	0,03
14	Dwutlenek węgla (CARBON DIOXIDE)	CO ₂	1,97
15	Metan	CH ₄	14,4
16	Dwutlenek siarki (SULFUR DIOXIDE)	SO ₂	0,02

TABLE 3 - Polish Standards for maximum concentration of gaseous substances frequently found in municipal sewage Order of February 11, 1963.

1. All zones

Lp.	Nazwa substancji	Średnie w ciągu doby	Jednorazowe w ciągu 20 minut
1	Dwutlenek siarki (SO ₂)	0,075	0,25
2	Kwas siarkowy (H ₂ SO ₄)	0,05	0,15
3	Tlenki azotu (w przeliczeniu na NO ₂)	0,05	0,15
4	Siarkowodor (H ₂ S)	0,008	0,008
5	Tlenek węgla (CO)	0,5	3,0
6	Benzyzna (GASOLINE)	0,75	2,5
7	Pył niesiekający o wielkości ziarn poniżej 20 mikronów (PARTICULATES) LESS THAN 20 μ	0,075	0,2

2) dla obszarów chronionych (specially protected zones)

Lp.	Nazwa substancji	Średnie w ciągu doby	Jednorazowe w ciągu 20 minut
1	Dwutlenek siarki (SO ₂)	0,35	0,9
2	Kwas siarkowy (H ₂ SO ₄)	0,1	0,3
3	Tlenki azotu (w przeliczeniu na NO ₂)	0,2	0,6
4	Siarkowodor (H ₂ S)	0,02	0,06
5	Dwusiarczek węgla (CS ₂)	0,013	0,05
6	Pył niesiekający o wielkości ziarn poniżej 20 mikronów	0,2	0,6

TABLE 4 - Polish Standards for Maximum Permissible Concentrations in Air

The maximum permissible doses of ionizing radiation, in relation to workers employed under Category A exposure conditions and for the organs in Groups II-IV, shall be as follows:

Group of organs	Dose per quarter (in rads)	Dose per year (in rads)
II	4	15
III	8	30
IV	20	75

The maximum permissible doses of ionizing radiation for workers employed under Category B exposure conditions shall be as follows:

Group of organs	Dose per year (in rads)
I	1.5
II	5
III	10
IV	25

TABLE 5 - Polish Radiation Standards

Year	Sweden	France	FRG	Italy	Finland	Yugoslavia	Poland
1962	188	141	119	59	58,2	14,5	5,3
1966	240	198	177	118	108,8	21,1	9,1

State	Number of cars per 1000 inhab.	Growth index during 1960-1970
Poland	13	360,3
Czechoslovakia	52	441,2
GDR	60	658,1
Hungary	19	830,4
Rumania	5	1000,0
Yugoslavia	28	1032,2
Bulgaria	9	817,2

¹ *Tourist Statistics 1950—1966*, Central Statistical Office, pp. 57—58.

TABLE 6 - Number of cars per 1,000 inhabitants

TABLE 7 - National Ambient Air Quality Standards (USA)

Pollutant	Period of Measurement (a)	Primary Standard		Secondary Standard	
		$\mu\text{g}/\text{m}^3$ (b)	ppm (b)	$\mu\text{g}/\text{m}^3$ (b)	ppm (b)
1. Carbon Monoxide (CO)	8 Hours	10,000	9	Same	Same
	1 Hour	40,000	35	Same	Same
2. Hydrocarbons (HC) (non-methane)	3 Hours	160	0.24	Same	Same
3. Nitrogen Oxides (NO_2)	Year	100	0.05	Same	Same
4. Photochemical Oxidants (O_x)	1 Hour	160	0.08	Same	Same
5. Sulfur Oxides (SO_x)	Year	80	0.03	None	None
	24 Hours	365	0.14	None	None
	3 Hours	None	None	1,300	0.5
6. Total Suspended Particulates (TSP)	Year	75	-	60	-
	24 Hours	260	-	150	-

(a) Concentrations are averaged over each period of measurement. The annual TSP concentration is a geometric mean of 24-hour samples; all other concentrations are arithmetic mean values. Standards for periods of 24 hours or less may not be exceeded more than once per year.

(b) Units of measurement are micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and parts per million (ppm).

SULFUR OXIDES—Sulfur oxides come primarily from the combustion of sulfur-containing fossil fuels. Their presence has been associated with the increased incidence of respiratory diseases, increased death rates and property damage.

Primary Standard

- 80 micrograms per cubic meter (0.03 ppm) annual arithmetic mean.

- 365 micrograms per cubic meter (0.14 ppm) as a maximum 24-hour concentration not to be exceeded more than once a year.

Secondary Standard

- 60 micrograms per cubic meter (0.02 ppm) annual arithmetic mean.

- 260 micrograms per cubic meter (0.1 ppm) maximum 24-hour concentration not to be exceeded more than once a year.

- 1,300 micrograms per cubic meter (0.5 ppm) as a maximum three-hour concentration not to be exceeded more than once a year.

PARTICULATE MATTER—Particulate matter, either solid or liquid, may originate in nature or result from industrial processes and other human activities. By itself or in association with other pollutants, particulate matter may injure the lungs or cause adverse effects elsewhere in the body. Particulates also reduce visibility and contribute to property damage and soiling.

Primary Standard

- 75 micrograms per cubic meter annual geometric mean.

- 260 micrograms per cubic meter as a maximum 24-hour concentration not to be exceeded more than once a year.

Secondary Standard

- 60 micrograms per cubic meter annual geometric mean.

- 150 micrograms per cubic meter as a maximum 24-hour concentration not to be exceeded more than once a year.

CARBON MONOXIDE—Carbon monoxide is a byproduct of the incomplete burning of carbon-containing fuels and of some industrial processes. It decreases the oxygen-carrying ability of the blood and, at levels often found in city air, may impair mental processes.

Primary and Secondary Standards

- 10 milligrams per cubic meter (9 ppm) as a maximum eight-hour concentration not to be exceeded more than once a year.

- 40 milligrams per cubic meter (35 ppm) as a maximum one-hour concentration not to be exceeded more than once a year.

Both the one-hour limit and the eight-hour standard afford protection against the occurrence of carboxy-hemoglobin levels in the blood of 2 per cent. Carboxy-hemoglobin levels above 5 per cent have been associated with physiological stress in patients with heart disease. Blood carboxy-hemoglobin levels approaching 2 per cent have been associated by some researchers with impaired psychomotor responses.

PHOTOCHEMICAL OXIDANTS—Photochemical oxidants are produced in the atmosphere when reactive organic substances, chiefly hydrocarbons, and nitrogen oxides are exposed to sunlight. Photochemical oxidants irritate mucous membranes, reduce resistance to respiratory infection, damage plants and contribute to the deterioration of materials.

Primary and Secondary Standards

- 160 micrograms per cubic meter (0.08 ppm) as a maximum one-hour concentration not to be exceeded more than once a year.

HYDROCARBONS—Hydrocarbons in the air come mainly from the processing, marketing and use of petroleum products. Some of the hydrocarbons combine with nitrogen oxides in the air to form photochemical oxidants. The hydrocarbons standards, therefore, are for use as a guide in devising implementation plans to achieve the oxidant standards.

Primary and Secondary Standards

- 160 micrograms per cubic meter (0.24 ppm) as a maximum three-hour concentration (6 to 9 a.m.) not to be exceeded more than once a year.

NITROGEN OXIDES—Nitrogen oxides usually originate in high-temperature combustion processes. The presence of nitrogen dioxide in the air has been associated with a variety of respiratory diseases. Nitrogen dioxide is essential in the natural production of photochemical oxidant.

Primary and Secondary Standards

- 100 micrograms per cubic meter (0.05 ppm) annual arithmetic mean.

The U.S. Environmental Protection Agency is examining other pollutants to determine whether any may be covered by future air quality standards.

TABLE 8 - National Air Quality Standards (USA)

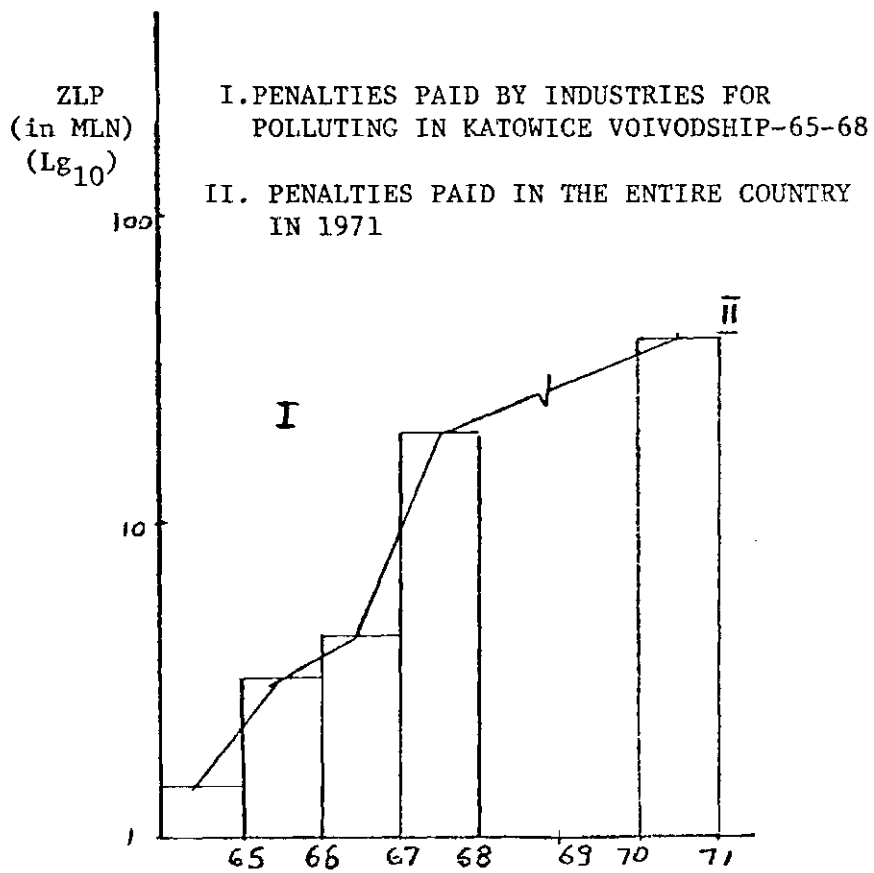


FIGURE 1 - Penalties Paid for Polluting in Poland.

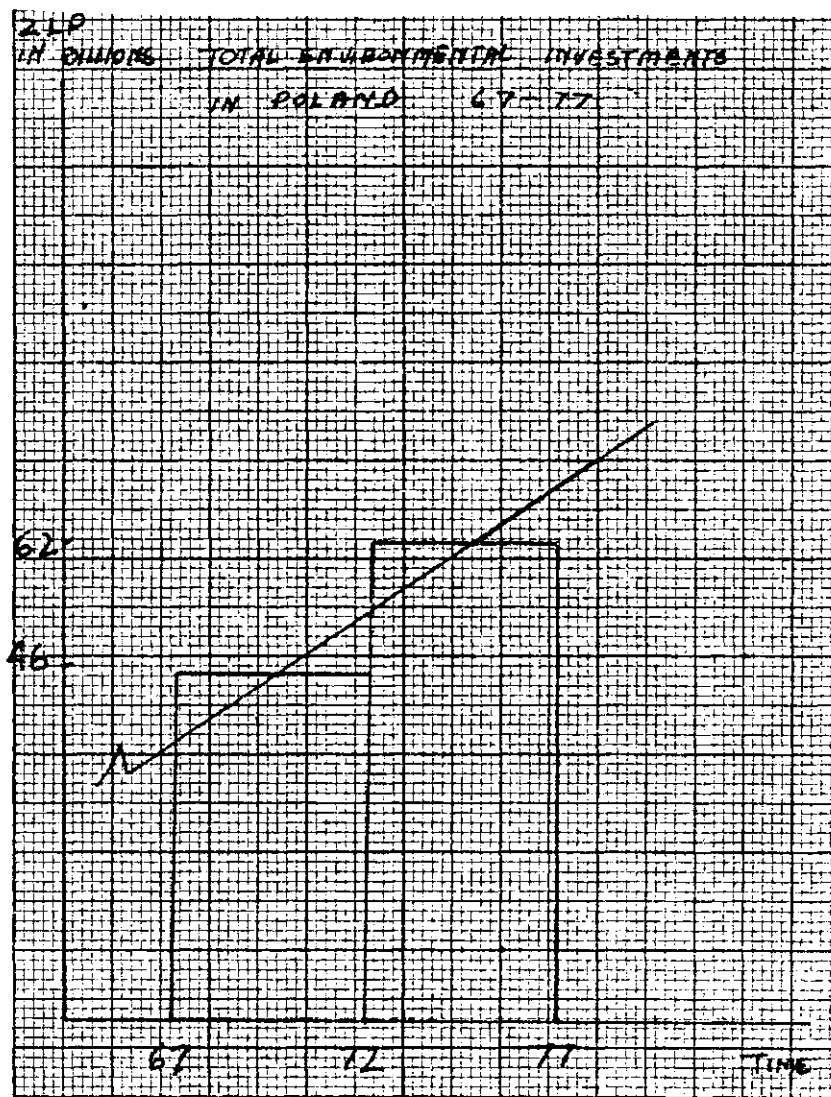


FIGURE 2 - Environmental Investments in Billions of ZLP 67-77