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Report No: 19466

PERFORMANCE AUDIT REPORT

POLAND

ENVIRONMENT MANAGEMENT PROJECT
(Loan 3190-POL)

June 18, 1999

Sector and Thematic Studies Group
Operations Evaluation Department

Currency Equivalents (annual averages)

Currency Unit = Zloty

1988	US$1.00	$00.00
1989	US$1.00	$00.00
1990	US$1.00	Zloty 9,500
1991	US$1.00	Zloty 11,100
1992	US$1.00	Zloty 13,630
1993	US$1.00	Zloty 17,000
1994	US$1.00	Zloty 22,500
1995	US$1.00	Zloty 2.44
1996	US$1.00	Zloty 2.7
1997	US$1.00	Zloty 2.88

Abbreviations and Acronyms

EU	European Union
GIS	Geographic information system
IPPC	Integrated Pollution Prevention and Control
ISO	International Standards Organization
LIU	Local implementation units
LIU	Local project implementation unit
MoEnv	Ministry of Environment
MoH	Ministry of Health
OED	Operations Evaluation Department
PIU	Project implementation unit
RFP	Request for proposals
SAR	Staff Appraisal Report

Fiscal Year

Government: July 1 - June 30

Director-General, Operations Evaluation	:	Mr. Robert Picciotto
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The World Bank
Washington, D C. 20433
U S A.

Office of the Director-General
Operations Evaluation

June 18, 1999

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Performance Audit Report on Poland
Environment Management Project (Loan 3190-POL)

The Environment Management Project (Loan 3190-POL, US$18 million) was the Bank's first environmental technical assistance project in Poland and the first loan of its kind in the Europe and Central Asia Region. The loan was approved in April 1990 and closed, fully disbursed, on December 31, 1996, after a delay of two years. Cofinancing for the project was provided by the European Union, the United States, and Sweden.

The project established a framework for addressing the highest priority environmental concerns in Poland, and helped to move the country toward a decentralized system of environmental management. The four main project components were: Management Systems Support (which reviewed the structure and functions of the ministry's research institutes, regulatory, incentive and enforcement programs, and technology requirements); Industrial Efficiency and Environmental Reviews (which supported voluntary reviews of economically viable private enterprises through the introduction of environmental auditing); Air Quality Management (which established a modern system of air quality monitoring for two regions); and Water Resources Management (which demonstrated a river basin approach to water resources management).

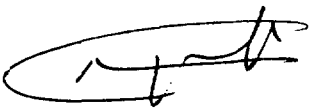
The project-funded activities strengthened environmental management capacity by establishing the institutional, regulatory, and informational basis for immediate corrective actions. Staff at all levels felt part of a reforming mission, with their long-festering frustrations at being unable to report on problems and recommend actions removed. Within the project agencies staff morale was high. Significant environmental improvements took place because of better data gathering and analysis. Some of the most polluted regions in the country have been cleaned up considerably. Government has the information it needs to craft better public policies, and individual manufacturers can know the actual polluting impact of specific industrial activities. Cleaner air and water will reduce health risks, decrease economic costs from environmental degradation, and improve environmental quality. Public awareness of environmental progress and the challenges remaining has been heightened. Project activities catalyzed increased multilateral and bilateral environmental assistance. Professional and technical staff will continue with project-initiated activities because they provide information essential to other public purposes (weather reporting, flight plans, flood warning systems).

The audit rates project outcome as highly satisfactory, institutional development as substantial, and sustainability as likely. Bank performance and borrower performance are rated highly satisfactory. These are the same ratings given by the ICR.

Many of the lessons learned under the project center on environmental consciousness-raising. Public alerts (when air quality conditions are poor) create a demand for further environmental

improvements. In Poland the public made greater use of the Internet than anticipated, in part because computer use in schools and offices is widespread, but also because the Ministry of Environment's website provided information of special as well as general interest. The audit recommends linking the air pollution monitoring network to that of the contiguous Czech industrial areas to facilitate more accurate pollution forecasting, and to allow dangerous smog situations to be anticipated more effectively. About a third of particulate and industrial emissions to the air in the project area come from the Czech Republic on the prevailing winds.

Attachment



Contents

This report was prepared by Mr. Ronald Parker (Task Manager), who audited the project in October 1998. Mr. William Hurlbut edited the report and Ms. Anna Amato provided research support. Ms. Helen Watkins and Ms. Maria Pilar Barquero provided administrative support.

Principal Ratings

	ICR	Audit
Outcome	Highly satisfactory	Highly satisfactory
Sustainability	Likely	Likely
Institutional Development	Substantial	Substantial
Borrower Performance	Highly satisfactory	Highly satisfactory
Bank Performance	Highly satisfactory	Highly satisfactory

Key Staff Responsible

	Task Manager	Division Chief	Country Director
Appraisal			
Midterm			
Completion			

Preface

This is a Performance Audit Report (PAR) on the Environment Management Project in Poland, for which Loan 3190-POL in the amount of US$18 million was approved in April 1990, and made effective in July 1990. The loan was closed on December 31, 1996, after a delay of two years. The final disbursement took place in December 1996. The loan was fully disbursed. Cofinancing for the project was provided by the European Union, the United States, and Sweden.

The PAR was prepared by the Operations Evaluation Department (OED). It is based on the President's Report, sector and economic reports, special studies, Country Strategy and Policy Framework Papers, loan documents, review of the project files, and discussions with Bank staff. An Implementation Completion Report (ICR, Report No. 16640, dated May 30, 1997) was prepared by the Central Europe Department, Europe and Central Asia Region. An OED mission visited Poland in October 1998 and discussed the effectiveness of the Bank's assistance with government officials, other development organizations, beneficiaries, and stakeholders. Their kind cooperation and invaluable assistance in the preparation of this report are gratefully acknowledged.

The ICR provides an account of the project experience and covers project design, the role of the Bank, and achievements. The PAR focuses on the effectiveness of the assistance provided to the Ministry of Environment in the development of new management systems and the review of ministry functions, and documents the environmental progress that has been made in the ecological disaster areas of Katowice, Krakow, and Legnica. Additionally, the audit reviews the use of environmental audits and air quality monitoring. It assesses the quality of the design of the intervention approach, including its consistency with the problems identified. It considers the effectiveness of the Bank and borrower dialogue; reflects on the borrower's ownership, consensus, and commitment; and determines the effectiveness of the project-financed activities.

Copies of the draft PAR was sent to the relevant government officials and agencies concerned for their review and comments. Comments from the borrower have been taken into account and are included as Annex B.

1. Background

Coal and the Environment

1.1 Following decades of centrally planned policies that favored output over efficiency, large areas of Poland faced severe ecological problems. Under central planning the economy used 2–3 times as much energy (and materials) per unit of output as more market-oriented economies, and such practices take time to turn around. The project undertook activities to reduce the quantity and impact of enormous pollutant emissions in three "ecological disaster" areas— Katowice, Krakow, and Legnica[1]—environmental damage is heavily concentrated in these densely populated industrialized regions.

1.2 The Polish economy has traditionally been dominated by heavy industry and energy production. Coal accounts for about 75 percent of primary energy consumption—approximately three times Western European and U.S. levels. The country is rich in hard and brown coal, natural gas, copper, zinc, lead ores, and oil. Mineral resources are primarily located in the south where the industrial centers are also concentrated. Approximately 50 percent of the airborne pollution originates in just 15 percent of the total area, namely, in the southern and southeastern part of the country. Defoliation of the region's forests is a serious concern. About one fifth of all soot and dust emitted in Poland emanated from Katowice province where 20 of the 82 most polluting enterprises were located. In the bad old days, three coal mines accounted for 20 percent of the 38 million cubic meters of saline water and brine discharged (a discharge of over 9,000 tons of salt daily) into the Vistula and the Odr, thereby seriously contaminating the province's two main rivers. A heavy concentration of industry and power plants near the source of major rivers and some major cities is responsible for further contamination.

1.3 Water pollution was a particularly serious threat because resources are scarce. Poland ranks twentieth in Europe in per capita amount of water. Groundwater quality assessments indicate high levels of salinity,[2] and the water quality of wells in most households is unsatisfactory. Due to the flatness of its topography, Polish rivers have weak self-purification properties.

1.4 The principal environment-related health threats come from airborne particulates. High ambient levels of suspended particulates lead to chronic respiratory and other health problems for a significant proportion of the Polish population. Soil contamination results in contaminated agricultural products. In Katowice, in the southern part of the country, urban life expectancy for males and females lagged the national average for urban areas by more than one year—a result of increased rates of cardiovascular disease, cancer, and digestive tract disease; and the percentage of anomalous children is also above national averages.

Role of the Bank

1.5 The project was developed during the period of economic transition in Poland, prior to the availability of significant grant support for technical assistance, training, and equipment procurement. The Bank's involvement in the project provided assistance for investments that would create environmental improvements in the short term, and lay the foundation for a longer-

1. Government decrees have established areas of ecological hazard and zones of ecological disaster.

2. As well as pollution by nitrogen compounds resulting from the intensive use of fertilizers.

term sustainable investment and policy program. Activities carried out under the loan provided the institutional and regulatory framework that could support the environmental components that were expected to be a part of future Bank lending. The project reflected the priorities of the Country Brief, and those established by the borrower and the Bank in the Country Assistance Strategy. The project was designed to support Poland's drive to improve the efficiency and productivity of the economy, as well as to support the market-oriented policies the government adopted to achieve them.

The Project

1.6 This was the Bank's first environmental technical assistance project in Poland and the first loan of its kind in the Europe and Central Asia Region. The Government of Poland (GOP) gave high priority to addressing environmental issues.

1.7 According to the Memorandum of the President (no SAR was prepared) the objectives of the project were: to provide and umbrella framework for addressing the highest priority environmental concerns in Poland, and for moving toward a decentralized system of environmental management. The project aims to serve as a catalyst by strengthening environmental management and helping to establish the institutional, regulatory, and informational basis for immediate corrective actions and longer term extensive investments supported through bilateral and multilateral assistance. It also aims to reduce health risks, decrease economic costs from environmental degradation, and improve environmental quality.

1.8 There were four main project components:

1. *Management Systems Support.* Assist the Ministry of Environment in the development of new management systems and preparation of studies. This included a review of the structure and functions of the ministry's research institutes; regulatory, incentive, and enforcement programs; and technology requirements and advisory support for management in critical areas.

2. *Industrial Efficiency and Environmental Reviews.* In cooperation with the Ministry of Industry and Trade, which served as the implementing agency, the project supported voluntary reviews of economically viable private enterprises through the introduction of environmental auditing—a first in Poland. It also provided technical training nationally and abroad for environmental professionals, and hands-on audit training in major industrial and energy facilities.

3. *Air Quality Management.* Establishment of a modern system of air quality monitoring for the Katowice and Krakow regions.

4. *Water Resources Management.* Demonstration of an integrated approach to water resources management for the Upper Vistula River Basin, and establishment of Regional Water Management Boards (RWMBS) in Katowice and Krakow; and development of a geographic information system (GIS) facility.

Institutional Framework

1.9 The project relied heavily on a Project Implementation Unit established under the Ministry of Environment (MoEnv). During the early phases of the project it proved necessary to expand the staff and activities of the PIU. As will be described below, at a critical point during

implementation the unit was transferred to the National Fund for Environmental Protection (National Fund). During the project (and subsequently) it has provided a mechanism for coordination and oversight of multilateral and bilateral support. The PIU was assisted with its activities by a complementary structure at the local level. A set of local implementation units (LIUs) coordinated activities within the three project areas and supported the decentralization of planning and management activities. In addition to the MoEnv and the National Fund, key implementing agencies included the Tarnow and Katowice Laboratories, the Institute of Meteorology and Water Management (especially the Department of Measuring Techniques and Communication Systems), Ministry of Industry and Trade, the Ministry of Health (MoH), and the Center of Environmental Control and Survey. Management of the project was participatory, and representatives of all involved groups met regularly. There were four full-time coordinators within the PIU, one for each component. Meetings were held at each agencies' office in turn. While the PIU had overall responsibility for procurement, it systematically involved all cooperating parties in all phases of the procurement process through periodic technical review meetings.

2. Implementation and Results

2.1 Improved environmental management capacity was expected to catalyze increased multilateral and bilateral environmental assistance. This happened as planned. Many activities undertaken under the loan received support from international donors including the United States, Norway, the Netherlands, and Italy and international organizations such as the World Health Organization (WHO). Two loan extensions[3] were required to allow for implementation of an enhanced program of activities funded with savings realized through competitive procurement procedures and as a result of supplementary grant resources from the EU Assistance Program For Central and Eastern Europe and bilateral donors.

2.2 During project implementation, the transfer of the PIU from the MOEnv to the National Fund solved several ongoing problems: it allowed for the continuity of key staff who could not have been integrated into the ministry, and it allowed salaries to be raised to competitive levels—salaries in the PIU had actually fallen behind public employee levels. Bank staff were concerned that mishandling the transfer could jeopardize project progress, and monitored the transition very carefully. Project staff mentioned that there was a short period during the transfer when some of the implementing agencies felt a bit abandoned.

2.3 The management systems component was modified during implementation to meet the evolving priorities of the MoEnv. Multiple changes at the top, the unanticipated rapidity of environmental improvements (discussed below), and the emergence of new environmental problems (lead dust) all contributed to the changing strategic focus. Changes were more in terms of emphasis rather than focus. Although a major review of the structure and functions of the MoEnv and its research institutes was undertaken (as were a number of special studies), few recommendations have been implemented because of five changes at the ministerial level. Communication and information technology purchased under the project have greatly improved the functioning of MoEnv. The management systems component funded full computerization, a series of electronic mail and Internet networks, and installation of a modern telephone system in the MoEnv. Within the other government dependencies, only the Parliament is similarly well-

3. The closing date for the project was extended to December 31, 1996.

served. Before the project there were only 20 stand-alone PCs in the ministry, none were networked. Now, all staff have computers and email accounts; documents can be interchanged electronically, teams can work together on draft documents over an intranet, and the movement of paper documents is electronically tracked.

2.4 The special studies on management of saline water from coal mines and mineral and petroleum leasing were conducted as planned. Activities were undertaken with the Ministry of Health to upgrade its ability to evaluate environmental health risks and support was provided for health-related studies and policy reviews for municipal and hazardous waste.

2.5 Under the project, the Ministry of Industry and Trade trained local specialists[4] to prepare environmental audits of major industrial facilities.[5] Higher level training was provided abroad in Denmark, Sweden, and the United States.[6]

2.6 An air quality monitoring network was developed for the Katowice and Krakow regions. This network consists of 18 air quality monitoring stations.[7] Its devices are hooked to compatible software that facilitates integrated regional analysis.

2.7 The lack of timely availability of counterpart funds from the national and local governments delayed the acquisition of land and construction of buildings for the air and water monitoring stations. Results were sub-optimal in the Water Resources Management component. For obvious technical reasons, organizations managing water resources are best organized by watershed or river basin. This was the plan under this component, which initially supported water resources management in the Upper Vistula River Basin, and establishment of integrated Regional Water Management Boards (RWMBS) in Katowice and Krakow. Supporting legislation required to formalize the approach and provide sustainable financing was never passed, however, with the result that the organizations have largely reverted to working by political division, which enormously complicates their task and decreases their efficiency.

2.8 The project's benefits interact with each other positively. Monitoring has led to the availability of high-quality environmental information. Industry, aware that the polluting processes of the past are no longer hidden, has strong incentives to use environmental information to clean up operations. The computerization process within MoEnv provides industry with real-time data, regulators and other public agencies can keep better tabs on industry, and the general public is more aware than ever before about the national environmental situation and what government is doing about it. MoEnv also provides network connections for the National Park Service. Materials of public interest are available at the MoEnv's website.[8] Public information supplied includes:

- Press releases
- Environmental publications
- Public Law Database (upgraded monthly)
- Tracking of appeals
- Requests For Proposals (RFPs)

4. About 140 individuals including 8 specialized trainers.

5. About 40 environmental audits were produced.

6. 34 specialists were trained at cooperating institutions.

7. 10 stations in Katowice itself, 2 stations in the Katowice region and 6 stations in the Krakow region. Supplemental funding was provided by the GOP and a bilateral donor.

8. http://www.mos.gov.pl/

- Digital Mapping by the Map Department (1:1,000 scale)
- The Institute of Meteorology's water resources management map (and other data in real time)

MoEnv staff expressed surprise at how effective their website is, how many hits they receive, and how routinely many other groups use it in their daily work. The general public uses more than it would otherwise because it contains information on public parks. Materials of general interest are tapped by teachers in the schools. The law database is used regularly by many businesses in addition to the legal profession. And the appeals tracking service provides stakeholders with ongoing business a way to know how their matters are progressing without endless waiting on hold, and fruitless hours of "telephone tag." Additional project achievements were:

- Three complete GIS facilities were developed in the RWMBs and in the Institute of Meteorology and Water Management.
- Land stations for satellite data and weather radar were provided for the Institute of Meteorology.
- A comprehensive air pollution inventory (by source) was prepared.
- Major environmental risks were identified.
- A data bank of pollution measurements was developed.
- Environmental management plans were developed for major polluters.
- An emergency air pollution warning system was introduced in Krakow.
- Ongoing public information campaigns on environmental topics were set up for Katowice and Krakow.

ICR Findings

2.9 The ICR concluded that the project successfully achieved its overall institutional development and physical objectives. It noted that the loan had helped develop several institutions at the national and regional level, and it predicted that with time these organizations would have the capacity to collect, analyze, and disseminate high-quality environmental data. The ICR also noted that the project was demanding for Poland in that the implementing agency was required to develop completely new procedures for the procurement of goods and services, as well as to adopt a new management structure for the design, coordination, and supervision of new activities.

2.10 The most important problem identified by the ICR was the GOP's difficulty with timely availability of counterpart funds. But it argued that such a situation was to be expected even when the government is highly committed, given the economic transition and the dynamic conditions that prevailed. The ICR highlighted the exceptionally high level of attention paid to procurement and disbursement issues during the appraisal process and in the initial phase of the project. It observed that training for borrower staff in the preparation of procurement plans had a significant positive impact on the quality of implementation and resulted in cost savings that allowed an expansion of the project's scope. Participation of PIU and project agency staff in all phases of procurement resulted in greater ownership of project-supported activities. The self-evaluation concluded that project complexity was considerable with regard to the range of priority environmental management and technical actions it covered and their locations. The ICR is of particularly good quality, and it identifies a number of important lessons and good practices that are not repeated in this document.

PAR Findings

2.11 The audit supports the ICR findings in all important particulars and finds it to be an accurate portrayal of a successful project experience. The project completely changed the practice of environmental management in Poland, providing practitioners with equipment and access to state-of-the-art data in air and water pollution, weather and flood monitoring, and laboratory analysis. This report reviews changes in local conditions and practices linked to project activities, identifies additional lessons learned for further in-country work and applicable to other environmental technical assistance projects within the region and beyond.

Pivotal Role of the PIU and the Importance of Modern Equipment

2.12 Although a special Project Management Unit was created in Warsaw, many of the problems traditionally associated with a PIU structure (little staff continuity, diminished institutional development impact, resentments regarding pay and privileges, etc.) were avoided. Staff for the unit were selected by a competitive and transparent process. Each of the short-listed applicants was interviewed personally by the minister—indicative of the priority given to a successful project outcome. One of the key attributes sought in PIU candidates was a strong commitment to decentralization (stated as a willingness to let most of the key decisions be made outside the unit).

2.13 A highly capable cadre of motivated young professionals, who were used to working in foreign languages and who had spent some time abroad, came together to form an unusually cohesive team. It is not an exaggeration to say that they saw themselves as having a mission. The historical moment helped. A sector that had been starved for funds and using outmoded technologies was given hard currency and carte blanche. PIU staff were determined that the opportunity to catch up with European and international peers not be wasted. Ways of doing environmental business changed abruptly. The project supported the purchase of modern scientific equipment to identify the complex chemical composition of industrial pollution[9] and introduced new computer-based quality control systems for the environmental laboratories in Katowice and Tarnow. Transparent procurement, writing terms of reference, and competitive bidding were new activities for many within the government. PIU staff taught these skills to the various implementing agencies. The pre-project condition of most public offices could be characterized as totally deficient in productivity-enhancing technologies. When procurement economies permitted the project to supply full computerization in the MoEnv,[10] it ended the typewriter age.

2.14 The PIU established under the project functioned well. It, together with the LIUs, provided a mechanism for coordination and oversight of project activities. However, most similar organizations do the same. What made it somewhat unique (in addition to its commitment to decentralize decision-making) was the manner in which it involved the appropriate technical experts from the private and public sector at critical moments in the project planning and decision-making activities. At crucial moments the PIU anticipated shortfalls of counterpart funds and adjusted schedules for the acquisition, delivery, and installation of equipment and training of personnel. The problem of local financing was also expeditiously resolved because of the mobilization of supplemental bilateral resources by the PIU. Additional government contributions were provided by the National Fund once the PIU was transferred there.

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9. *Inter alia*, liquid chromatographs, atomic absorption spectographs, spectric photometers, mineralization samplers.

10. With some bilateral support.

2.15 The PIU has come to enjoy an outstanding reputation locally and internationally. The ICR congratulated the PIU for effective management of the loan proceeds and clear accounting procedures. Following the project, targeted donor funds for the environment have continued to flow to Poland, and Fund staff (former PIU coordinators) have facilitated their effective use for environmental improvements.

Environmental Improvements in Katowice During Implementation

2.16 The 1990–96 implementation period of the project coincided with significant environmental improvements generally and a remarkable drop in pollution. This development is a mixed blessing for local residents: some of the reduction comes at the price of closed (value-subtracting) smoke-stack industries and lost jobs tied the loss of markets to the east. On the other hand, competition for markets in the west pressured the private sector to improve the quality of goods produced, which often led to cleaner manufacturing processes and higher salaries for those fortunate enough to stay employed.

2.17 As the most industrialized of Poland's 49 states, Katowice Voivodship provides a good bellwether of industrial pollution levels.[11] Monitoring has been made possible because of the networks and equipment financed under the loan. And improved management has become possible because of electronic record keeping and the sharing of disks between dependencies has eliminated needless duplication.

Air Pollution

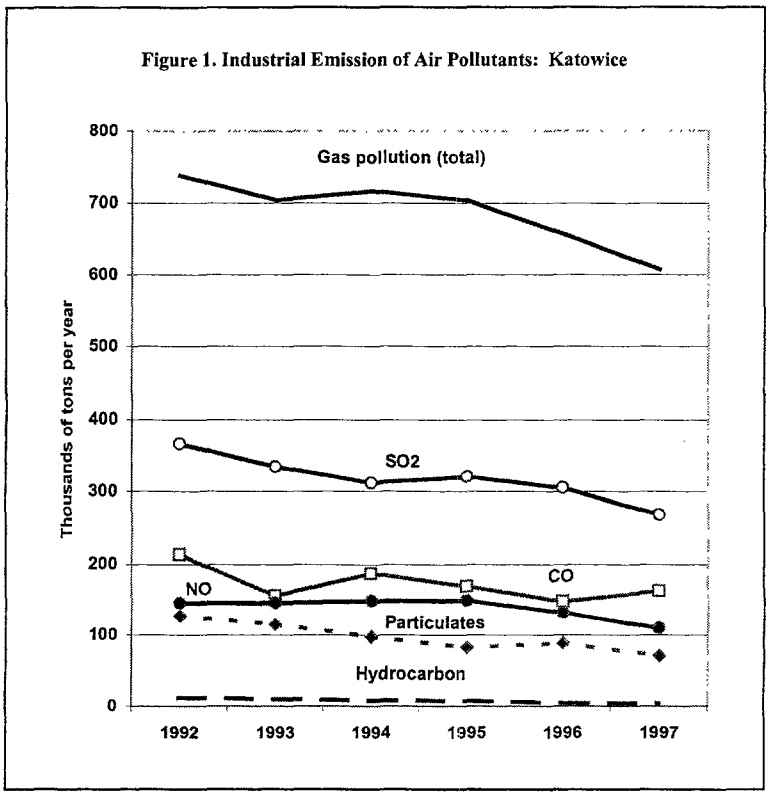
2.18 Monitoring commenced in 1992.[12] The presence of industrial emissions into the air has shown marked improvement for all substances, although this is partially offset by the rapid increase in the number of private and commercial vehicles in circulation during the period (although the emissions per vehicle are also falling). Some air pollution comes from neighboring countries, and important benefits would accrue from networking with monitoring stations over a broader (and international) area. Total gas emissions, which include sulfur dioxide, carbon monoxide, nitrous oxide, and hydrocarbons, have decreased from a 1992 level of 738.1 tons per year to 607.5 tons per year, while suspended particulate levels, perhaps the most immediate threat, have gone from 127.1 to 70.4 tons per year (Figure 1). Of course the state of affairs, though much improved, is not always healthful. Still, the nature of the problem has changed. Before the project the largest polluters were heavy industries. Now the most severe problem is the use of low-grade coal for seasonal home heating—a problem that is only now beginning to receive the attention of public authorities.[13]

2.19 Once there was monitoring data on air quality, it became possible to use it to increase public awareness of the environment through the use of air quality warnings. Based on political expediency rather than any commonly accepted technical standards, warning levels are set too weakly (for ozone, SO_2, and suspended solids) at a level where they do not occur very often. When conditions deteriorate to that point, public authorities are informed, and they in turn inform

11. Unless noted otherwise, charts and graphs were plotted using data from *Environmental Protection 1996–1997: Katowice Voivodship,* published by Urzad Statystyczny and Osrodek Badan I Kontroli Srodowiska [Katowice] in 1998.

12. Contributing to this analysis were: 30 monitoring points for suspended particulates and gases at the ground-level, 12 automatic air monitoring stations, and six that require manual data recording and reporting. The ground level monitoring points sample at the less-than-10 micron level for suspended particulates.

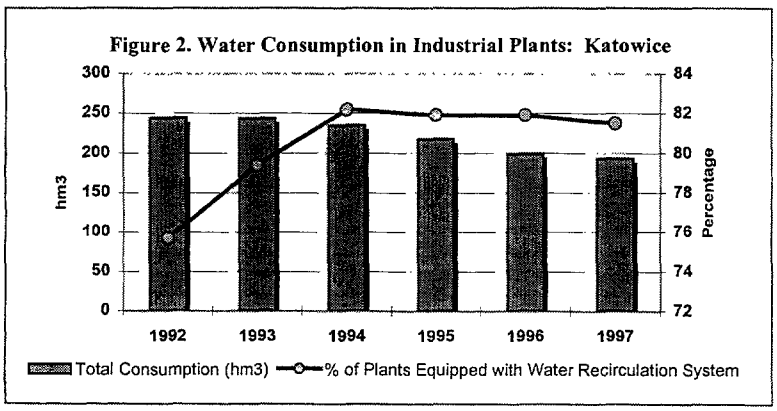
13. Low stack emissions currently account for 80 percent of peak winter particle emissions.



the media. This leads to pleas to keep children and the aged indoors, limit vehicle trips, and refrain from making open fires and the burning of coal. It is anticipated that as air quality improves standards will be toughened. The next step, already under development is to create legislation that permits a second stage of alert. The legislation would require industrial closure and/or cleaner fuel use whenever the air quality reaches truly hazardous levels. Now that manufacturers know that they are being monitored, and that the public has access to this data, there is some incentive to clean up, even though further legislation would provide more motivation.

Industrial Use of Water

2.20 Figure 2 shows the improving trends in industrial use of water. Not only is the total amount of water being used for industrial purposes declining (which could be a mixed blessing if it only reflects the economic downturn) but the percentage of plants relying on water recycling technology has gone up about 6 percent.



2.21 The graph shows the decrease in water consumption, which directly corresponds to the increase in the percentage of industrial plants that are equipped with systems to recirculate previously used water.

Water Pollution and Groundwater

2.22 Of the total liquid waste from industrial plants that should be processed before entering groundwater in Katowice province, the percentage which is actually processed is shown in Figure 3. In 1997, 27 percent more of this waste was processed than in 1992. The amount of liquid waste that was processed averaged 90 percent during the six-year period for which there is monitoring data (Figure 4).

Figure 3. Unprocessed Wastes Entering Groundwater (volume)

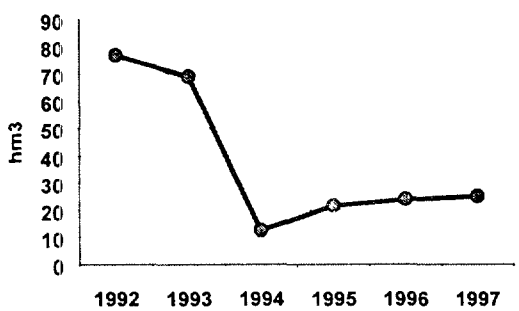
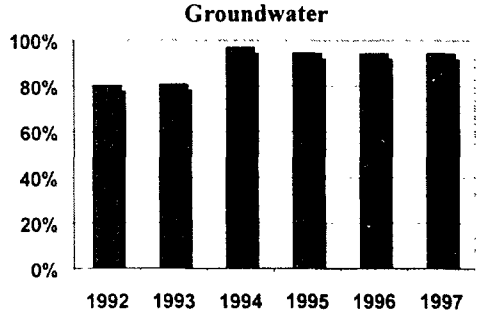


Figure 4. Industrial Liquid Waste: Processed Percentage Entering Groundwater



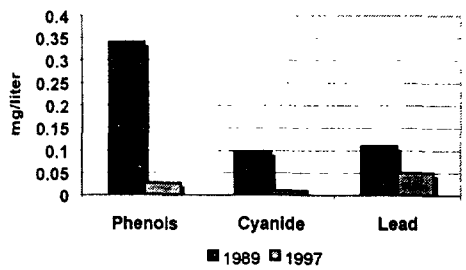
Surface Water Pollution

2.23 Equipment financed by the Bank loan has permitted water monitoring along 60 paramenters including organic compounds. As the Rawa River leaves Katowice province—use of the last monitoring point gives cumulative data for the province—the amount of heavy metals and other pollutants has dropped off significantly since 1992. Figure 5 shows the decline in levels of phenols, cyanide, and lead. The decrease in zinc levels was even more dramatic, going from 2.1 mg./liter to 0.609 mg./liter—a drop of 71 percent. More monitoring stations need to be built downstream so the pollution produced by communities nearer the sea can also be measured.

Contaminated Soils

2.24 Contaminated land is slower to respond to decreased particle emissions. Ongoing soil monitoring conducted by the project-supported laboratories has shown that heavy metals such as lead, zinc, and cadmium falling from iron works' stacks continue to be a problem in prime agricultural areas of the province. Between 20 and 30 percent of cleared land formerly in agricultural use is not safe for the

Figure 5. Rawa River: Last Monitoring Point in Kato Basin



production of food for humans or animals, and the local authorities have declared that it should only be used for forests. The audit was unable to determine the degree to which this decision is actually enforced.

Flood Warnings

2.25 Some of the stations that monitor water quality also monitor river levels. Together with the GIS work that has been done on river contours and capacities, this has permitted accurate flood forecasting for the first time. Predictions have proved quite accurate, and losses of life and property have been avoided following several heavy rainfalls that produced localized and (in one instance) region-wide flooding.

Anticipated Laws Not Passed

2.26 Two legal changes taken as a fait accompli during preparation remain under review by the Polish Parliament:

(a) *Water Law.* Although Parliament asked the MoEnv to prepare and propose amendments to the existing water law and this was done, there has been no action on the proposed changes. The lack of a Water Law reduces the potential significance of the RWMB system. This situation has affected the RWMBs in Katowice and Krakow developed under the project as well as others throughout the country. Under an amended law the RWMBs would actually manage an area that would make technical sense, and annual funding would be assured.

(b) *Mandated Audits.* The MoEnv proposed a legal requirement for routine environmental audits of industrial facilities. If such legislation were enacted by Parliament, the auditors trained under the project would be able to use their new skills as originally anticipated.[14] The cooperation between the Ministry of Industry and the MOEnv, which was established during audit training, has not continued because the volume of such audits is too low, and there are not enough incentives for industries to commission environmental audits at the scale originally anticipated.

Economic Impact

2.27 The Memorandum of the President did not provide indicators that quantified benefits, and given the nature of the project, this was appropriate. As a technical assistance project this loan was not subject to calculation of economic or financial rates of return.

2.28 Water quality monitoring and audits that encouraged water recycling have led to a reduction in regional water use, which clearly has an economic impact in an area where water resources are scarce. Before the project, industrial and household use of water was as high as 30 times European averages. Now it is quite near averages for some European nations.[15]

2.29 The project-supported laboratories have begun to service state-owned companies and the private sector, charging fees 35 percent over costs to monitor their emissions and impact on

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14. In the interim, the (EU) Directive on Integrated Pollution Prevention and Control (IPPC) and requirements of the International Standards Organization for the various ISO ratings lead to a few industrial audits annually, which enables a small number of graduates to keep current.

15. Holland, Britain, and France.

surrounding land. This has proven attractive and generated enough revenues to permit equipment replacement.

3. Assessment of Performance

3.1 The audit rates project outcome as highly satisfactory, institutional development as substantial, and sustainability as likely. These are the same ratings given by the ICR. The project essentially achieved all its objectives. The loan helped to move the country toward a decentralized system of environmental management, and project-funded activities strengthened environmental management capacity by establishing the institutional, regulatory, and informational basis for immediate corrective actions. It was hoped the project activities would lead to investments in pollution control and increased monitoring supported through bilateral and multilateral assistance, and the PIU was able to catalyze increased multilateral and bilateral environmental assistance. The environmental improvements described in the previous chapter, which came about at least partially because of better data gathering and analysis, will reduce health risks, decrease economic costs from environmental degradation, and improve environmental quality. Professional and technical staff will continue with project-initiated activities because they are fully funded[16] and they are essential to other public purposes (weather reporting, flight plans, warning systems, etc.).

Borrower Performance

3.2 Borrower performance is rated highly satisfactory. GOP staff consistently demonstrated great agility, identifying (and approval) minor modifications in project scope and design to reflect the rapid changes occurring in Poland and opportunities stemming from possibilities of supplemental donor funding. PIU staff did not just handle procurement, as happens in most projects, it taught procurement skills to the various implementing agencies. Flexibility and attention to detail also are to be commended. During implementation, the administrative move of the PIU could have placed the project at risk, but it was ultimately handled well. The timely provision of counterpart funds was problematic at times, reflecting the complex changes occurring in the Polish economy and the development of new relationships between the national and local governments. The PIU proved capable at making the required adjustments in the implementation schedules in response to such difficulties, however. It also successfully mobilized financing from the National Fund and EU Assistance Program for Central and Eastern Europe.

Bank Performance

3.3 Bank performance is rated highly satisfactory. Supervision missions worked well with local counterparts, and developed relationships based on understanding and trust. As local capacity increased, the Bank was increasingly willing to rely upon local skills and administrative capacities. The productive role of the PIU, which greatly reduced problems out in the field, is also partially attributable to Bank input and interventions. During the transfer of the PIU to the Fund when PIU and Bank staff suddenly stopped what had been intensive follow-up a bit abruptly, good interpersonal relationships and effective communications—between key borrower and Bank

16. Laboratory activities are partially supported by fees paid for service by private and public concerns, and the RWMBs have to assemble funds from several public budgets each year until the Water Law passes.

personnel—solved this problem, and forced the implementing agencies to rely even more on their own resources, which ultimately led to a highly productive working relationship.

4. Conclusions and Lessons Learned

Conclusions

4.1 The project's success was due, in good part, to its high relevance during this historical moment. Poland was changing the way business was done. The impact of the first wave of modern monitoring technologies and reliable environmental data is bound to be greater than for subsequent interventions. Indeed, a recent audit of a Latin American environmental technical assistance project[17] was unable to detect significant differences between performance levels of departments that had been assisted by a Bank loan and those that had not, because critical equipment was already in place and performing tasks relevant to good outcomes.

4.2 Some of the most polluted regions in the country have been cleaned up considerably. Government has the information it needs to craft better public policies, and individual manufacturers can know the actual polluting impact of specific industrial activities. Lastly, public awareness of environmental progress and the challenges remaining has been heightened. The project has also had an important demonstration effect: Ukraine and the Baltics have studied the environment sector in Poland and taken project experience into account.

4.3 The notion that pollution and the resultant environmental degradation was a direct result of an unresponsive political system also galvanized the GOP's commitment to and ownership of the project. The change in governmental approach to the environment was expected to lead to a more healthful and attractive ambiance. Similarly, staff at all levels—the PIU, the LIUs, the laboratories, and the implementing agencies—felt part of a reforming mission, with their long-festering frustrations at being unable to report on problems and recommend actions removed. High morale was contagious: the PIU saw itself as a "group of eagles," there were wonderful new tools, data from satellites and the Internet, first-rate training opportunities, and scholarships for study abroad. For the first time, systematic monitoring can (and does) take place. New equipment makes it more convenient to analyze samples and easier to take samples in the first place. Now that staff have been trained to operate good quality equipment, they are more willing to receive training. Samples are taken often enough that results are now statistically significant. The cost of monitoring is also known for the first time, and early forays into the commercial market by the (formerly totally public-supported) laboratories have been successful.

4.4 Staff involved in the project stressed repeatedly how the most important legacy of the project has been a change in public officials' mentality, one with broad repercussions for the manner in which the public sector conducts environmental business in Poland. Innovations in public behavior that staff attributed to the project included: the first use of meaningful terms of reference, competitive bidding, the use of bank guarantees, and procurement based on detailed designs (themselves a product of a careful analysis of project requirements). They asserted that Poland's new public procurement law reflects international procedure, which is largely the result of working with the Bank.

17. Bolivia ETAP (Loan 2443-BO).

4.5 Changes in mentality usually do not come in close succession. While subsequent investments in the sector will continue to have a positive impact, the novelty has worn off. Numerous bilateral agencies have built on the project's legacy of improved environmental management. And the government's concerns have evolved: unemployment is again prioritized so that cleaning up the environment has to be balanced with the creation of new jobs or preventing the loss of old ones. That is not to say that further support for the sector is contraindicated, quite the contrary. And the likelihood is that legislative initiatives in water and other areas will open up other fertile areas for cooperation with the Bank.

4.6 Ownership was strong because Bank staff tried to make sure that Polish staff had the necessary elements at hand, but left them to solve their own problems. Another major factor in the success of this project was staff continuity. The PIU Director changed twice during implementation but in both cases was succeeded by an experienced deputy. Careful selection of key staff was also important.

Lessons

4.7 The audit identified the following lessons learned:

Public awareness and the Internet. The use of a website by environment ministries should be encouraged in the region. In Poland the general public made greater use of the Internet than anticipated, in part because computer use is widespread, but also because the website provided information of special *and* general interest.

Public awareness and air quality warnings. Staff involved in air quality monitoring cited the success of public alerts in creating coalitions to pressure for further environmental improvements. While admitting that few parents probably kept their children inside, and few motorists actually reduced automobile use, the fact that the radio stations and newspapers were announcing health dangers probably produce a profound sense of discomfort, and create a strong constituency for change. Next steps include making standards more stringent and creating the legal authority to close major polluters down temporarily when environmental circumstances warrant it.

Use of ISO certification *(see footnote 14)*. Naturally, in all the involved bureaucracies there were many who did not pick up the sense of mission and discovery that characterized many of the key decision-makers in the project. In fact, agency leaders noted that changing the way some of their more bureaucratically inclined colleagues worked (once new equipment created new possibilities) was a big challenge, as was moving their attention from applied research to environmental management. Surprisingly, the solution for many was the ISO process. For example, when the two laboratories sought ISO certification, it opened the eyes of certain recalcitrants that the world's way of doing business had nearly passed them by.

Broadening water and air quality monitoring and networks to include industrial areas across the international border. Although the project area is and has been a major source of pollution, a significant amount of particulate and industrial emissions to the air (about 30 percent) come from the Czech Republic on the prevailing winds. Dangerous smog tends to occur simultaneously in three regions.[18] The cost of expanding the network to take into account the information already being collected in the contiguous industrial areas would not be large, but more accurate pollution forecasting would allow dangerous situations to be anticipated more effectively, and other benefits would accrue from improved cross-border understanding.

18. Krakow, Ostrava (Czech Republic), and Upper Silesia.

The Bank's comparative advantage. Bank support for environmental technical assistance projects and related activities can help borrowers to improve environmental management quite rapidly. Another power of a Bank technical assistance loan is that it supplies the institutional framework for expanded activities and attracts the attention of other multilaterals, bilaterals, and other donors. These bring supporting funds that can be used to multiply project benefits and impacts. During the implementation process, cooperating development agencies also fund supporting activities. Working in the spotlight can be advantageous. Donor funding in support of environmental improvement in Poland was also a response to the excellent reputation of the PIU and its staff.

Identifying the right moment to switch from intensive support to laissez faire is critical to successful implementation. Although intensive support is often required in the early phases of implementation, finding the right time to back away is important in developing ownership and keeping the morale of local staff high. Extensive use of experienced Bank technical and procurement staff to give strong support at start-up worked well in this project. Part of the job of the technical and procurement staff is to establish an exit strategy tied to clear indicators of local competence and desire to take greater responsibility.

PIUs can contribute to successful institutional development. The PIU staff's commitment to participatory management and, especially, to allowing important decisions to be made in the implementing agencies by the people best qualified to make them, strengthened the participating institutions and led to better project outcomes. Similarly, teaching the participating agencies how to manage their own procurement instead of handling all procurement centrally multiplied the impact of the PIU. Continuity is always important: the project's three technical components benefited greatly from retaining the coordinators.

Warning systems need to be disaster-resistant. In some areas rising flood waters destroyed the automatic radio equipment at the monitoring stations. Contingency planning needs to be done to ensure that monitoring systems that provide critical information to emergency response personnel are disaster resistant.

Information flow sometimes problematic. Now that the technical side has been strengthened through the provision of training and equipment, institutional weaknesses become more obvious. Monitoring information still does not make it to the right people at the right time. Although summary data appears regularly on websites, not enough attention was given by project staff to the flow of detailed and time-sensitive information.

Annex A

Basic Data Sheet

POLAND ENVIRONMENT MANAGEMENT PROJECT (LOAN 3190-POL)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	*Actual or current estimate*	*Actual as % of Appraisal estimate*
Total project costs	27.3	25.3	93
Loan amount	18.0	18.0	100

Cumulative Estimated and Actual Disbursements

	FY90	*FY91*	*FY92*	*FY93*	*FY94*	*FY95*	*FY96*
Appraisal estimate	.8	9.6	25.6	33.8	18.0		
Actual	.64	1.6	10.9	20.1	21.8	22.6	33.5
Actual as % of estimate	3.5	9.0	60.7	111.8	121.1	125.3	186.3

Project Dates

	Original	*Actual*
Identification (Executive Project Summary)	9/89	9/89
Appraisal	11/89	11/89
Negotiations	3/90	3/90
Board approval	4/90	4/90
Signing	5/90	5/90
Effectiveness	7/90	7/90
Closing date	12/94	12/96

Staff Inputs (staff weeks)

Stage of project cycle	*Planned Weeks*	*Planned US$'000*	*Actual Weeks*	*Actual US$'000*
Preparation to Appraisal	*	*		114.2
Appraisal				53.8
Negotiations through Board Approval				13.3
FY90	N/A	N/A	5.3	
FY91	N/A	N/A	22.1	67.9
FY92	N/A	N/A	23.7	71.9
FY93	N/A	N/A	11.0	37.2
FY94	N/A	N/A	10.9	36.5
FY95	10.0		5.7	25.6
FY96	11.0		4.8	15.3
FY97	13.5		10.9	36.6
Completion	18.0		6.4	20.0
Total			100.8	492.3

ANNEX A

Mission Data

Stage of project cycle	*(month/ year)*	*No. of persons*	*Specializations represented*
Supervision	6/30/90		
Supervision	8/21/90	3	Envir., Procurement
Supervision	10/9/90	4	Envir., Procurement
Supervision	6/30/91	4	Envir., Procurement
Supervision	6/30/92	3	Envir., Procurement
Supervision	2/16/93	3	Envir., Procurement
Supervision	6/30/93	1	Envir.
Supervision	6/30/94	3	Sr. Env., Econ., Proc Anal., Prin. Econ. Spec.
Supervision	5/31/95		
Supervision	6/1/95		
Supervision	6/28/96		
Supervision	6/25/97	6	Proc. Spec., Envir. Spec., Env., Econ.,

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

Operation	*Loan no.*	*Amount (US$ million)*	*Board date*
Polish Oil and Gas Company	32150	52.1	1990
District Heating Entity	33820	100.0	1991
District Heating Entity	33790	25.0	1991
District Heating Entity	33780	40.0	1991
Republic of Poland	34660	86.6	1992
Government of Poland	36410	144.0	1994
Republic of Poland	38090	45.0	1995
Bielsko-Biala Aqua SA	40321	95.0	1996
Bielsko-Biala Aqua SA	40320	12.0	1996
Polish Power Grid	39590	0	1996

ANNEX B

Comments from the Borrower

MINISTRY OF ENVIRONMENTAL PROTECTION,
NATURAL RESOURCES AND FORESTRY
DEPARTMENT OF FOREIGN RELATIONS
ul. Wawelska 52/54, WARSZAWA, POLAND
Ph. (48+22) 825 44.67 Fax (48 22) 825.39.72.

Warsaw, June 16, 1999
WZ.wb.cw/1235/99

Mr. Gregory Ingram
M A N A G E R
Sector and Thematic Evaluations Group
Operations Evaluation Department
The World Bank
1818 H Street N.W.
Washington, D.C. 20433
U.S.A.

Ref.: Poland Environmental Management Project (Loan 3190-POL). Draft Performance Audit Report.

Dear Mr. Ingram,

Thank you for your letter of June 01, 1999, and attached draft Performance Audit Report as prepared by the OED. I wish to express my thanks for your positive evaluation of our project implementation and our performance. We are proud receiving this OED rating.

I would like to emphasize the role of the World Bank officers from Washington, D.C and from the World Bank office in Warsaw, who assisted us during the project implementation. Their professionalism, ability to transfer their skills, patience in correcting our mistakes were really indispensable during the project performance.

Commenting this draft report I would like to underline an element of capacity building, which was outside of mainstream of the project, however has became, in consequance, the most sustainable, in my opinion, effect of implementation process. Yes, we all treated our job as a mission (page 6, 2.13). I can also take the risk to say that the World Bank officers also treated their respective jobs in Poland as the mission. But the former „eagles" (page 12, 4.3.) have became the normal people, taking over the responsible positions in central and local administrations, in financing institutions, in private sector, and in the international fora, where they have efficiently used experiences from former PIU.

In concluding I wish to inform you that the World Bank project has received the highest rate among the other international assistance projects in Poland and to express my personal thanks for everything I could withdraw from the co-operation with the World Bank officers.

Sincerely yours

Czeslaw Wieckowski

c/c: Mr. Basil G. Kavalsky
Country Director for Poland
and the Baltics

Annex B

MINISTRY OF FINANCE
UNDERSECRETARY OF STATE
KRZYSZTOF J. NERS
OF/MIF/PWU/332/99

Warsaw, 1999.06.15

Mr. Basil G. Kavalsky
Country Director for
Poland and Baltic States
World Bank

Re: Poland Environment Management Project (Loan 3190-Pol), Draft Performance Audit Report

Dear Mr. Kavalsky,

I would like to thank you for Audit Report on Poland Environmental Management Project (Loan 3190-POL) we had received from The World Bank Operations Evaluation Department. We appreciate Bank interest on efficient management of the mentioned project even though we have some concerns according to the above report.

Ministry of Finance stands on the position that loan disbursement should be finished earlier and in our opinion it was possible to meet this requirement. After having analysed the above report we claimed that your ratings included in point 2, page 3 of the report are not satisfied and we cannot agree with the conclusion of those ratings. We also noticed that there is a lack of analysis of the usage of equipment purchased under the project. We think that further usage of the purchased equipment and its location should be a part of the mentioned report.

Sincerely Yours,

Cc: Mr Gregory Ingram, Manager
Sector and Thematic Evaluation Group
Operations Evaluation Department