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Environmental Protection in the Soviet Union: More Smoke Than Fire



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An Intelligence Assessment

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Environmental Protection in the Soviet Union: More Smoke Than Fire



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An Intelligence Assessment

This paper was prepared by 
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**Environmental Protection
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Key Judgments

*Information available
as of 1 May 1985
was used in this report.*

As in the industrial West, neglect and abuse of the environment is a serious problem in the Soviet Union. Official statistics are sparse, but a wealth of anecdotal evidence from official Soviet writings and statements indicates that pollution and other environmentally harmful conditions have created health hazards and placed limits on productive potential. Water pollution appears to constitute the greatest threat to health, while erosion of soil by wind and water probably causes the most economic harm.

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The Soviets have evidently made some progress in cleaning up the environment in the last several years. For instance, they claim to have reduced the discharge of industrial wastes into rivers and lakes since 1977 and to have reduced emissions from fixed sources of air pollution.

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But maintaining this trend is in doubt as environmental protection still appears to have low priority, and investment remains clearly inadequate. The share of both GNP and investment devoted to environmental protection in the United States is roughly double that of the USSR. Indeed, while the post-Brezhnev regimes have given greater attention—at least rhetorically—to environmental problems, under Andropov investment in protection facilities fell.

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Instead, in recent years, Moscow's environmental protection campaign has focused on administrative measures. Under Andropov, the Politburo formally reprimanded five industrial ministers for environmental neglect and ordered the Council of Ministers to draw up tougher protection laws and increase enforcement activities. Under Chernenko, a "vast" program to combat air pollution was announced, though without details as to timing and size. Both Andropov and Chernenko in major speeches to the Central Committee during their tenures blasted the laxity of current efforts to curb economic activity that damages the environment. Since taking office in March 1985, Gorbachev has not addressed the environmental problem. His past experience as party secretary for agriculture, however, suggests he realizes the extent of economic damage from environmental disregard and will continue, if not increase, the level of the leadership attention to pollution problems.

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Because negligence and improper use of equipment are major causes of pollution in both industry and agriculture, the regime's antipollution campaign may be aimed primarily at making industrial and agricultural

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managers more aware of their responsibilities for environmental protection. The best known recent example of negligence occurred in September 1983 when the carelessness of officials at a chemical plant resulted in a spill that seriously polluted the Dnestr River, killing more than 2,200 metric tons of fish and depriving large cities in the Ukraine and Moldavia of drinking water for several weeks. [redacted]

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Progress is difficult, however, because the machinery for enforcing environmental laws and regulations is weak—in part because no central body coordinates the efforts of the variety of agencies responsible for enforcement. Moreover, policing is often left to producing enterprises themselves. But enterprise managers have few incentives (or disincentives) to protect the environment. Bonuses are not given for pollution-control activities, and the modest charges on land and water resources do not impel managers to treat them with greater care. [redacted]

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As the economy continues to grow, the task of controlling an increasing amount of pollutants will become more difficult. To sustain or even to preserve the environmental gains of recent years, the regime must go beyond reliance on exhorting managers to use existing environmental protection tools more effectively. The leadership must step up investment in protection facilities, strengthen mechanisms for enforcing antipollution laws, and provide incentives for economic managers to give higher priority to environmental concerns. But such measures are unlikely in the current period of slow growth where official policies give overriding priority to production goals. The demands of the food, energy, and machine-building programs will leave little room for investment in environmental protection, which contributes little to improving productivity. [redacted]

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**Environmental Protection
In the Soviet Union:
More Smoke Than Fire**



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Introduction

Until the late 1960s the Soviet Union almost totally ignored the effects of economic activity on the environment. So completely did economic output goals dominate that until then, according to one Soviet author, industrial use of water received priority over drinking water in many arid southern cities. By the early 1970s it was becoming increasingly obvious that disregard for environmental issues was jeopardizing the availability of clean water for agriculture, depleting fish reserves, and causing significant health hazards. Moscow reacted by increasing expenditures on environmental control and laying at least an administrative framework to oversee protection efforts. Capital investment in environmental protection, measured in constant prices, rose in the first half of the 1970s, peaking in 1975 at 2 billion rubles—1.8 percent of total investment. Since then, investment in environmental protection has fallen to a fairly steady level of about 1.3 percent of total investment, and the pace of government activity in the area has eased.



The post-Brezhnev regimes have not increased the allocation of resources to environmental protection, although there has been a revival of high-level attention to environmental problems. In December 1983, former General Secretary Andropov's speech to the Communist Party (CPSU) Central Committee forcefully assailed the inadequacy of protection policies. This speech followed an environmental calamity in September when a dam holding chemical wastes burst, seriously polluting the Dnestr River.



The Dnestr River incident seems to have seized the attention of the leadership. Since then, enterprise managers and workers have been warned in major speeches by Soviet leaders to take their responsibilities in environmental protection more seriously, and a "vast program to fight air pollution" has been announced by the Politburo. The importance of environmental protection was recently emphasized by a high-ranking official of the State Planning Committee (Gosplan), who listed pollution as one of five causes for declining male life expectancy.



In this paper we will first discuss the current environmental situation in the USSR, assessing the extent and consequences of environmental neglect. We will then describe past environmental protection efforts and evaluate their effectiveness. Finally, we will discuss current policies and assess their chances for success.



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The Current Environmental Situation

The extent to which economic activity is harming the Soviet environment is difficult to establish. The USSR publishes few statistics on environmental matters and does not explicitly define what is meant by environmental damage. Published Soviet commentary suggests that the authorities view environmental damage as comprised of two major elements: (a) health hazards caused by pollution of various sorts and (b) reduction of the productive potential of land and water through pollution and other causes.



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Soviet publications indicate that, while air pollution is a serious problem, water pollution probably is the greatest threat to health, and erosion of soil by wind and water accounts for the greatest direct economic losses. Furthermore, although environmental investments have not risen, the leadership statements and other official commentary of the last two years suggest heightened awareness of severe pollution and other environmental problems and of the need to deal with them.



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A Soviet underground (samizdat) report by Boris Komarov suggests that the Soviet economy currently produces more pollutants per unit of output than the United States for any given activity.¹ While not

¹ Boris Komarov is a pseudonym of Vladmir Volfson, who from 1968 to 1978 was the senior lecturer with the Biological and Environmental Department of Educational TV in Moscow. The report was published in 1980 by Sharpe, White Plains, NY, under the title *The Destruction of Nature in the Soviet Union*. Mr. Volfson emigrated to Israel in 1981 and is a senior adviser in Israel's Environmental Protection Service, Ministry of the Interior.



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The Economic Costs of Pollution

According to the samizdat account by Boris Komarov, a special commission was tasked in the mid-1970s to study the state of the environment and forecast conditions in 1980 and 1990. The group of experts projected the annual loss caused by air and water pollution alone to the nation's economy at 20 billion rubles by 1980—nearly 5 percent of the officially measured value for national income. The group also projected that these losses would grow at a rate much faster than national income in the 1980s to a level of 45 billion rubles by 1990, an average annual rate of increase of 8.5 percent. The account claimed that data not included in the commission's forecasts suggest a much higher economic cost for environmental damage—50-60 billion rubles in 1980 and up to 120 billion rubles by 1990. We do not know how these estimates were derived or what is actually being measured.

Most press accounts of economic activities harmful to the environment do not give ruble estimates of the damage but do say that adverse indirect effects can more than offset the benefits such activities may have for specific sectors. For example, increased water consumption by agriculture and industry has reduced the water level of the Caspian Sea and threatened the catch of sturgeon—thus endangering the Soviet hold on the world caviar market, an important hard currency earner. TASS warns that, if the water level of the Caspian, which has stabilized in the last few years, drops by just one more meter, the warm waters of the northern shallows where 85 percent of the world's sturgeon breed will become dry land. In one example in which a ruble value is attached to damage, the press claims that, despite the expenditure of about 40 million rubles yearly to protect the soil from acid rain, harvest losses, in the central and northwest USSR, average 80-120 million rubles annually.

offering any supporting documentation or detailed methodology, he asserts, for example, that the Soviet economy overall produces twice as many air pollutants per unit of output as that produced in the US economy. Komarov also reports that a special Soviet

journal published for a select readership of high-level bureaucrats and natural resource specialists has estimated that the levels of noxious gases in the atmosphere of more than 1,000 Soviet cities are so high that they are a "hazard to health."

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Published commentary suggests that the major sources of air pollution are thermal power stations, the ferrous and nonferrous metallurgy industries, and the petrochemical industry. According to Yuriy Israel', the Chief of the State Committee on Hydrometeorology and Environmental Protection (*Goskomgidromet*), damage from sulfur dioxide emissions is an especially critical problem. He reports that in the northern and northwestern parts of the USSR such emissions, falling in the form of acid rain, have caused great harm to the water, soil, and vegetation. In the Ukraine, for example, acid rain has caused high concentrations of heavy metals to be leached from the ground and find their way into drinking water.

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Water pollution is also extensive. Soviet journals have reported that 40 percent of the water discharged into surrounding bodies of water by industrial enterprises in the following ministries is polluted: Timber, Pulp, Paper, and Wood Processing; Chemical and Petroleum Machinery; Nonferrous Metallurgy; Petroleum Industry; Meat and Dairy Industry; and Mineral Fertilizer Production. Water pollution is especially critical because the USSR is relatively underendowed with freshwater resources. The densely populated western portions of the country account for about 80 percent of industrial output but contain less than 25 percent of freshwater resources. The arid southern regions constitute 27 percent of the Soviet landmass but possess only 2 percent of the fresh water.

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Agriculture also presents a major danger to freshwater resources. It accounts for more than half of the country's total water consumption—mostly for irrigation. So much water is used for irrigation that, in combination with industrial consumption, agricultural use has led to an alarming fall in the water level of the Caspian and Aral Seas. Since the 1960s the level of the Aral Sea has dropped by 7 meters and the

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Evidence of Disregard for the Environment

[redacted] some statistical and abundant anecdotal evidence of the severity of the USSR's environmental problems. For example, according to 1983-84 press reports and emigre interviews:

- A dam holding chemical wastes burst, seriously polluting the Dnestr River, killing more than 2,200 metric tons of fish and depriving large cities in the Ukraine and Moldavia of drinking water for several weeks.
- Only one-third of the harmful emissions from plants under the Ministry of Ferrous Metallurgy are treated.
- Pollution from the processing of phosphate rock on the Kola Peninsula was so severe in the summer of 1983 that "in the city of Apatity for two days the polar day turned into night; small ventilating windows in residential buildings couldn't be opened even a crack; people walking along the streets wrapped their faces in whatever they could, for what they breathed was not air but stinging dust."
- Heavy industrial pollution is killing thousands of acres of forest around the Soviet automaking city of Togliatti.

- Large areas of the Crimean seascape—well known as vacation spots—have been polluted by industrial wastes.
- Environmental problems in the Kuznetsk Basin are "causing increasing deaths and genetic defects among babies."
- In Iskitim, a city in Novosibirsk Oblast, several cement factories and chemical plants polluted the air so badly that a physician responsible for screening the population for lung disorders found that fully 40 percent had some degree of silicosis. He reported this fact to the city party committee, and, when he persisted in calling for action to control industrial emissions, he was transferred to another job.
- Dozens of industries pour poisonous waste products virtually untreated into Lake Ladoga, "severely endangering" the water supply of Leningrad.
- The forests in the north are rapidly receding, not from global changes in climate but from the mass felling of trees and the destruction of the surrounding terrain. [redacted]

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shoreline has retreated by as much as 40 kilometers. The Aral is becoming more and more saline, thus reducing a fisheries potential that had been considered one of the greatest in the USSR. Nor is irrigation itself an unmixed blessing for agriculture. An authoritative Soviet journal reports that half of the fresh water used in irrigation is wasted. The misuse of irrigation water has resulted, [redacted] in severe damage to almost 20 percent of all arable land in Uzbekistan. Additionally, the Soviet Union has lost about 7 million hectares of farmland to the desert through "salinization," a condition resulting when desert soil becomes waterlogged and salt rises to the surface to poison the ground. [redacted]

Agricultural chemicals also represent a growing problem. Fertilizers are a main source of water pollution, but pesticides and other substances such as DDT also contribute. Much of the "chemical pollution" of both water and land is caused by negligence and improper use of material and equipment. Recent reports indicate that residents of several villages in Uzbekistan applied so much fertilizer to their crops that the chemical content of produce sold in open-air markets significantly exceeded toxic levels. Many people developed skin sores and/or serious stomach disorders as a result. [redacted]

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And the source of our city's river is this factory.

Krokodil ©
February 1984

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The consequences of Soviet abuse of the environment spread beyond the USSR's own borders. Eastern Europe already suffers from acid rain that has been carried by the wind from Soviet territory. In addition, the Arctic air, once crystal clear, is now loaded with sulfur and carbon—most of which scientists have concluded comes from Soviet industry in the Southern Urals. The Arctic pollution, some scientists argue, could affect the Northern Hemisphere's weather patterns by causing a partial melting of the polar icecap. Some localized melting could also result if the Soviets go ahead with a leviathan scheme to divert some of the flow of their western Siberian rivers to the more arid southern regions. A decision on whether to proceed with this project is expected in 1987.

Evolving Recognition of Environmental Problems

The theoretical argument that socialist economies have an inherent advantage over capitalist economies in protecting the environment because they are better able to incorporate social costs into planning decisions has inhibited the willingness of Soviet leaders to recognize and discuss ecological difficulties. Until the latter half of the 1960s, Moscow rarely publicly admitted that the USSR had a pollution problem. Despite a fairly substantial body of environmental laws, resource planning was virtually nonexistent. Legislation was often local and did not have general application; it was reactive rather than preventive.

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This situation has slowly changed. Soviet environmental consciousness was raised by the debate over the pollution of Lake Baikal, the world's largest freshwater body and considered by many a national treasure. The government announcement that a large papermill would begin operation on the lake's shores in 1966 touched a raw nerve among scientists and journalists aware of the pollution danger. Environmental protection, rarely a public issue, soon became a cause championed by several Soviet newspapers,

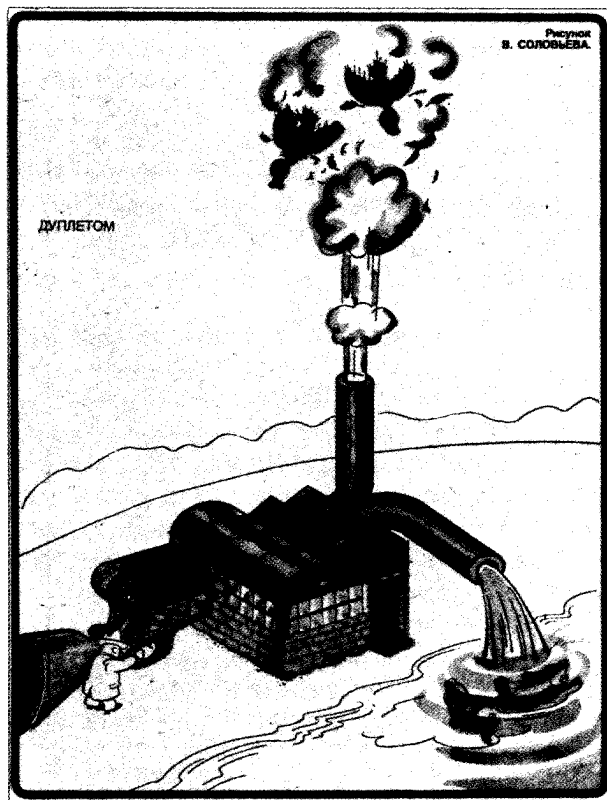
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The Soviet Approach to Environmental Protection

In contrast to capitalist production which plunders nature, the socialist system, based on a planned economy, ensures not only the steady growth of industry but also the protection and improvement of nature.

Ekonomicheskaya gazeta
October 1979

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Krokodil ©
March 1984

notably *Literaturnaya gazeta*—the widely read weekly of the Union of Soviet Writers. Public pressure did not prevent the papermill from opening but did enable a wide airing of the conservationist point of view. Still, by the early 1970s, islands of alkaline sewage were reported to be floating on Lake Baikal's surface. Industrial wastes and logging operations had destroyed important fish breeding grounds and threatened unique species of flora and fauna. *Pravda* reported that the population of plants and animals had decreased by a third to a half in the areas where the plant's sewage was being discharged. In response, the government ordered construction of additional waste purification units and removal from the lake of sunken logs and other wooden debris. The debate on the effectiveness of these measures continues today. [redacted]

The Lake Baikal controversy was not the only impetus for increasing environmental awareness and pressures to protect natural resources. By the early 1970s

pollution had caused the catches of freshwater fish—including those of important foreign exchange earners like sturgeon—to plummet. Cholera and typhus, caused by untreated sewage, had broken out along the lower Volga. [redacted]

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The Kremlin reacted to these developments in 1973 by quadrupling expenditures to protect water resources to over 1 billion rubles a year. Capital investment for all environmental protection almost doubled during 1973-75, reaching a high of over 2 billion rubles in 1975—1.8 percent of total investment. Since then capital investment has decreased, and total capital spending in 1976-80 fell short of the goal of 11 billion rubles given by Brezhnev in his 1976 report to the 25th Party Congress. [redacted]

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Developing an Administrative Structure

While the pace of environmental investment decelerated after 1975, Moscow did take steps to incorporate environmental protection bodies into the formal government structure. A network of environmental protection institutes was developed in various ministries. They operated in an uncoordinated manner, however, often coming into conflict with each other. In 1978 *Goskomgidromet* was formed, in part to provide the Council of Ministers with control over the entire environmental protection structure. But *Goskomgidromet* did not take over existing authorities; rather it was charged with coordinating their activities—a thankless task because it did not have the necessary enforcement powers. In 1981 the Council of Ministers formed the Commission for the Protection of the Environment and the Rational Utilization of Natural Resources. In addition to studying problems of resource protection, the Commission was tasked, like *Goskomgidromet*, to help coordinate the work of government organizations on questions of environmental protection. [redacted]

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The combination of a steady flow of spending, increased state enforcement of environmental laws, and new administrative arrangements appears to have done some good. [redacted] during 1975-82, harmful emissions from fixed sources of air [redacted]

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pollution fell by 12 percent and the monitored discharge of polluted effluents into bodies of water by 28 percent. [redacted]

Andropov's Campaign and Chernenko's Followthrough

After Brezhnev's death in November 1982, the level of leadership attention to the environment picked up. Yuriy Andropov instituted an antipollution campaign that continues to this day:

- In July 1983 the USSR Supreme Court instructed lower courts "to improve their voice in hearing cases involving violations of environmental laws."
- In September 1983 the Council of Ministers Commission on Environmental Protection and the Rational Utilization of Natural Resources ordered banks to stop financing the startup of production facilities with unfinished pollution-control units.
- In November 1983 the State Prizes for Technology were awarded. Of 29 prizes, three went for achievements in a new area—ecology.
- In December 1983 Andropov, in a speech before the Central Committee, used language of unprecedented force in labeling environmental problems "acute" and assailing the "inadequacy of past policies" to deal with them.
- In January 1984 the Politburo ordered the Council of Ministers to draft a comprehensive plan for improving the environmental protection system and publicly reprimanded five industrial ministers for failure to implement protection measures in Kemerovo oblast.
- In January 1984 the State Committee on Nuclear Safety was formed to oversee plant design and siting, reportedly prompting recently replaced Soviet Minister of Power and Electrification, P. S. Neporozhniy, to lament that the "Commission for the Protection of the Environment and Rational Utilization of Natural Resources, which used to be of little importance, is now gaining weight within the Council of Ministers." [redacted]

Andropov's greater attention to safeguarding the environment was in line with his emphasis on candidly identifying the USSR's economic problems. It may also have reflected his greater sophistication in recognizing more clearly than his predecessors the damage

done to the economy by disregard for the environment. Andropov explicitly linked environmental protection with the drive to conserve resources, a major element in his efforts to improve the economy in a time of slowing growth. The shock effect of the spectacular Dnestr River disaster of September 1983 may have further stiffened Andropov's resolve to undertake more vigorous environmental protection programs. [redacted]

Chernenko appeared to follow through on Andropov's activist approach. In his 10 April 1984 speech to the Central Committee, Chernenko criticized government departments for "breaching rules and regulations for environmental protection." This was followed by a series of actions. At the Munich International Conference on Air Pollution, the USSR promised to reduce the level of Soviet transnational emissions of sulfur dioxide by 30 percent by 1993.² Moscow also announced that steps to strengthen environmental protection in the far north and coastal regions adjacent to the northern shore are being considered. In addition, a clean air inspectorate—supposedly empowered to set limits on emissions—was established, and a program to fight industrial air pollution was unveiled. The program includes measures to build new control facilities and improve the efficiency of those already in operation, tighten the enforcement of air-quality laws, convert production facilities that cause particularly severe pollution to cleaner types of fuel, and—when necessary—remove industry from residential areas. No details of how these actions will be implemented were given, but all relevant ministries and departments have been charged with preparing plans for inclusion in the scientific-technical program for the 12th Five-Year Plan (1986-90). [redacted]

Since Gorbachev came to office in March 1985, there has been no additional movement on the environmental front. His past experience as party secretary in charge of agriculture, however, suggests an appreciation of the damage done to the economy by environmental neglect and that the antipollution efforts of Andropov and Chernenko will be continued, if not

² The Soviet Union currently emits nearly 25 million tons of sulfur dioxide yearly but only admits that 1-2 million tons are passed through the air to other countries. It is 30 percent of this 1-2 million tons that the Soviets have promised to reduce by 1993—a feat easily achievable by carrying out current plans to commission nuclear power plants and convert some existing power stations from coal or oil to natural gas. [redacted]

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expanded. Surely, progress will be difficult, because continuing industrial and agricultural expansion will necessarily be accompanied by an increased level of pollutants produced. To sustain or improve upon past performance, Gorbachev will have to do more than rely on the more efficient application of current programs and resources. He will have to deal with several longstanding obstacles that have restrained progress in environmental protection in the past and without changes will inhibit progress even more in the future. These obstacles include a low level of investment, inferior pollution-control equipment, and an incentive system and administrative structure that does little to encourage compliance with environmental protection laws. [redacted]

The Essence of the Problem

State ownership of almost all production facilities would seem to give the Soviet economy an advantage over the industrial West economies in combating pollution. But Moscow has chosen not to devote the necessary resources to deal comprehensively with the problem, and, despite progress since the mid-1970s, continuing environmental difficulties fundamentally reflect the low priority of environmental protection. [redacted]

Perverse Incentives

The Soviet incentive system is oriented primarily toward fulfilling traditional plan targets—preeminently output goals. According to an authoritative Soviet journal, “Enterprises do not have an interest in the realization of environmental protection legislative enactments or assignments.” A recent *Pravda* article observed: “Year after year the environmental projects are the ones where the least amount of work gets done. Such projects are usually avoided because they are unprofitable. They take a lot of work but do very little for the gross output figure.”³ [redacted]

³ Production managers who do employ abatement systems may incur financial losses, since the diverted funds could have been used to help reach or exceed production targets and thus increase bonuses. A recent *Pravda* article quoted the response of a production manager when asked about the status of antipollution measures, “You mean we should get after people over the environment too? We’ve got no time for that, what with the economy cracking at its seams. We’re more concerned with rescuing today’s plans. As I see it, even if we leave nothing after us we’ll only be doing our descendants a service. They’ll be forced to work harder to make good, and they’ll grow up a healthy, gutsy generation.” [redacted]

Table 1 *Percent*
USSR: Gas Purification and Dust Collection Facilities—Percent Not Functioning Efficiently or are Faulty, 1982

Ministry of Power and Electrification	40
Ministry of the Petroleum Refining and Petrochemical Industry	17
Ministry of Ferrous Metallurgy	25
Ministry of Nonferrous Metallurgy	27
Ministry of Mineral Fertilizers	25

Source: *Sovetskaya Rossiya*, 4 May 1984. No definitions for efficiency or faultiness are given.

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[redacted]

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Such avoidance is usually accomplished with the consent of local party officials who share the view of the production manager that “overfulfilled plans make more impression on Moscow than clean air and rivers.” Even when pollution-control facilities are built, they often do not serve their function. For example, pollution levels from the Semipalatinsk Cement Plant actually rose for three years after installation of abatement equipment because, in striving to maximize production increases, the plant ignored optimal operating procedures and produced a higher level of pollutants than the equipment could handle. [redacted]

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Furthermore, maintenance of pollution abatement equipment tends to be poor. A Soviet commentator recently complained that, “Even when plants do have pollution-control systems, no one takes a real interest, and they often break down” (see table 1). This is caused, in part, by a lack of trained specialists. About 40,000 specialists are trained a year, a number *Pravda* has labeled inadequate. To make matters worse, according to *Pravda*, “only a small percentage of graduates are assigned to jobs in the field.” A study issued in the 1970s noted, “At the factory level pollution-control work is treated as a low-status occupation, and its workers are generally paid below the scale of productive laborers; consequently the turnover of personnel is high.” In addition, a Soviet

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Table 2
USSR: Capital Investment for Environmental Protection

	Expenditures (<i>million rubles, 1973 prices</i>)	Rate of Growth (<i>percent</i>)	Share of Total Investment (<i>percent</i>)
1973	1,143	NA	1.2
1974	1,528	33.7	1.5
1975	2,084	36.4	1.8
1976	1,887	-9.5	1.6
1977	1,783	-5.5	1.5
1978	1,833	2.8	1.4
1979	1,879	2.5	1.4
1980	1,900	1.1	1.4
1981	1,845	-2.9	1.3
1982	1,854	0.5	1.3
1983	1,764	-4.9	1.2
1984 (planned)	2,000	13.4	1.3

Source: Soviet Central Statistical Administration (CSA).

journal reports that the quality of training for environmental specialists is poor because "geology, climate, and biology are studied separately, leaving blank spots where these areas meet." [redacted]

Inadequate Investment

Pollution control is highly capital intensive, requiring large-scale introduction of new and upgrading of old equipment. But Soviet capital investment in environmental protection seems to remain a low-priority item. It rose sharply in 1973-75 but has trended downward since (see table 2). In 1983 investment for environmental protection was 1.8 billion rubles—almost 5 percent less than in 1982 and more than 100 million rubles below plan. Total outlays associated with environmental protection, however, have been reported to have been as much as 5 billion rubles per year in 1976-80, rising to 9 billion rubles in 1984. A good deal of mystery still surrounds these figures. [redacted]

Capital expenditures on environmental protection are currently only about 1.3 percent of total investment in the USSR—less than half the share in the United States and Japan, but roughly comparable to the share in France in the mid-1970s. The share of GNP

devoted to environmental protection in the United States and West Germany is about 1.8 percent and 1.4 percent, respectively, while the USSR spends about 1.1 percent. Available information concerning the 1986-90 Plan, although scarce, suggests no change in the mix or level of Soviet expenditures that would allow the installation of equipment necessary to substantially improve pollution control.⁴ [redacted]

Indeed, Soviet data on budgetary allocations may overstate expenditures for environmental protection, since many enterprises leave these funds unspent or divert them to other purposes. In the 1976-80 Plan period, enterprises of the Ministry of Power and Electrification spent only 83 percent of the funds allocated for air-pollution control; the Ministry of Tractor and Agricultural Machine Building, 82 percent; Nonferrous Metallurgy, 76 percent; and the Coal Industry, only 48 percent. Similarly, enterprises

⁴ Imports of Western equipment, of course, would help. A trade show for the demonstration of Western environmental-control equipment has been scheduled for Moscow in October 1985. [redacted]

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Total Soviet Outlays for Pollution Control: A Mystery

The Soviet Central Statistical Administration (CSA) did not report total environmental expenditures until 1981, but occasional references in speeches and academic texts put this figure at 5.2 billion rubles annually during 1976-80. Press reports indicated a planned increase in 1981-85 to 6 billion rubles annually. The expenditures were loosely defined as including capital investments, outlays for operation, and expenditures for capital repair. [redacted]

But the 1981-83 CSA economic yearbooks report total annual environmental expenditures of 8 billion rubles—including, probably for the first time, outlays for the forestry sector. And, in a recent interview, Goskomgidromet Chairman Yuriy Israel' also cited annual expenditures of 8 billion rubles. In January 1985 the CSA reported expenditures of 9 billion rubles in 1984. [redacted]

Even if one assumes that forestry outlays account for most of the difference between the estimate of 6 billion rubles and the higher estimates of 8-9 billion, an annual expenditure of 6 billion rubles for the current 1981-85 Five-Year Plan is still 15 percent greater than the yearly level of 5.2 billion rubles of the 1976-80 Plan period. It is unlikely, however, that Moscow would increase total expenditures to this extent while allowing capital investment—the key to the production of equipment and facilities critically needed for environmental control—to stagnate (see table 2). The Soviets are probably including previously omitted cost items in their estimates of total environmental expenditures—possibly research work and plant renovation costs, as well as new production equipment that pollutes less than the older equipment it replaces. [redacted]

in ministries exhibiting high rates of water pollution spent less than their full allocation: Chemical and Petroleum Machinery, 86 percent; Machine Tool and Tool Industry, 77 percent; and Heavy and Power Machinery, 74 percent. Plants probably will continue to leave some of their allocations unspent as long as Moscow fails to allocate the labor and material resources necessary to construct and run control facilities. [redacted]

Certainly the level of expenditures has not led to the development of adequate supplies of pollution-control equipment. The Chairman of the USSR Commission for the Protection of the Environment and the Rational Utilization of Natural Resources, Z. Nuriyev, recently complained that industry is experiencing a shortage of gas purification and dust-trapping equipment. An industry official has observed that environmental-protection facilities can usually only be obtained when new construction is involved. [redacted]

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Inferior Equipment

Inadequate investment is not the only reason for equipment shortages, however. According to an October 1984 *Izvestiya* article, each ministry tends to develop its own pollution-control equipment, even when such equipment already exists in other ministries. Moreover, the organizations that are tasked to design and manufacture control equipment are usually inefficient, because they have other, higher priority production responsibilities. Even when modern pollution-control equipment is available, compatibility problems make it difficult to install in the many older factories that are still operating. [redacted]

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As a result, according to a recent Soviet journal article, a significant portion of pollution-control equipment is being produced in insufficient quantity and is of poor quality. Some types of badly needed equipment are apparently not available at all. For example, in agriculture the growing use of pesticides and herbicides presents an ever increasing environmental threat, best dealt with by low-volume spraying of crops. Although machine-building ministries have been urged to set up production of the appropriate equipment, it is still not available. [redacted]

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According to the 1980 samizdat report cited above, Soviet design inadequacies sometimes hinder the proper functioning of installed abatement equipment. The multimillion ruble water treatment facilities on the Volga and in the Urals, for example, are designed to treat sewage by converting damaging organic material to nitrates and phosphates before emission. The treatment, however, does not prevent damage, because the nitrates and phosphates interact with algae

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and are transformed once again into damaging organic materials that lead to high levels of water pollution.

[redacted]

Toothless Laws

Soviet law has encouraged environmental neglect by allowing producers to consume natural resources virtually free of charge and to pollute the land while risking only minimal penalties. As a result, in the USSR the environment is subject to even more widespread abuse than in industrial West countries, where owners of mines, agricultural land, and forests have an incentive to prevent wasteful use of these assets. Numerous strong statements favoring the introduction of resource charges have appeared in the Soviet press since the early 1970s, and in 1979 a charge for the use of water was introduced. Although a step in the right direction, this action is likely to have only a marginal impact since it applies just to industrial uses, and exempts agriculture, which accounts for 50 percent of water consumption. Moreover, as indicated above, because of relative success indicators, industrial managers and their ministerial supervisors emphasize gross output at the expense of environmental considerations. [redacted]

Meanwhile, pollution of the land continues virtually unpunished. According to Soviet law, enterprises guilty of spoiling and contaminating agricultural land are subject to fines of up to 100 rubles—regardless of the size and quality of land taken out of service. At the same time the cost of taking agricultural land out of service for industrial use has been set at 6,940 rubles per hectare of arable land. Thus, if an enterprise takes 1 hectare of arable land out of circulation by establishing an illegal dump there, the maximum penalty is a 100-ruble fine, but if the land is withdrawn by the same enterprise to build some capital structure it must pay compensation 70 times that amount. [redacted]

Environmental protection also suffers from the absence of a coordinated administrative mechanism to develop, implement, and enforce environmental laws. Environmental responsibilities in any one region are divided among ministries, agencies, and state committees. For example, responsibilities for monitoring air quality are shared among *Goskomgidromet*, the Ministry of Health, the Ministry of Chemical and Petroleum Machine Building, the Ministry of Internal

Affairs, and republic environmental-protection committees. This situation has led to what Andropov termed a “narrow departmental approach that sharply lowers the effectiveness of the use of capital investments, hampers the pursuit of a single policy in carrying out environmental-protection measures, engenders irresponsibility for the ecological consequences of the decisions taken, and is conducive to illusory economy, which in the final stages results in great losses.” [redacted]

Environmental-protection authorities such as *Goskomgidromet* and the Ministry of Land Reclamation and Water Resources are clearly at the lower end of the governmental pecking order. They have little control over the research and development institutes that design pollution-control equipment, the enterprises that manufacture it, or the construction trusts that install it. Moreover, the primary responsibility for protecting a resource is not entrusted to environmental-protection authorities but instead to the production ministry that exploits the resource. Since the number-one priority of a production ministry is meeting annual output targets—a goal to which pollution control contributes nothing—this is like putting the fox in charge of the henhouse. Although each production ministry seems to have its own environmental-protection department, these departments are largely ineffectual because they are subordinate to those they are supposed to monitor. [redacted]

Goskomgidromet and the other environmental-protection organizations are mainly advisory bodies with limited policing authority. Government inspection teams had twice ordered the managers of the fertilizer plant on the Dnestr River to shore up the dam holding industrial wastes in the months before the dam burst causing serious ecological damage. Similarly, repairs have been recommended for an industrial waste dam near the Crimean Resort of Lake Saki, but, as *Pravda* recently reported, “The dam can be reinforced properly only by allocating more than 1.5 million rubles . . . and the Ministry of the Chemical Industry isn’t about to come up with the money.” [redacted]

In the past such defiance on the part of ministry and enterprise officials has generally gone unpunished. In

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large measure this is because of the lack of personnel and the limited authority of the existing enforcement bodies. For example, while water resources are technically protected by the USSR Ministry of Land Reclamation and Water Resources, local inspectorates are understaffed, can only impose a maximum 100 ruble fine, and therefore have no authority to shut a plant down. Some reports indicate that fines are paid out of a portion of enterprise profits that go to the State Budget and therefore have no impact on the enterprise's financial position. *Pravda* recently stated that, "As a rule people who are found responsible for environmental violations get off with slaps on the wrist every time." Still, the cases that qualify as exceptions to this general rule seem to be increasing. *Goskomgidromet* has recently been able to exercise greater enforcement powers. For example, in 1983 it actually closed 71 production lines for an average of one week each for pollution violations. The plants closed were undoubtedly carefully chosen to allow a clear message to be sent to industry that "greater environmental vigilance is required" while sacrificing the least amount of production possible. [redacted]

Prospects

Despite some successes in reducing emissions of air and water pollutants from monitored sources, the Soviet record in environmental protection over the last decade is one of struggling to stay abreast of mounting problems. While slowing the march of environmental damage, Soviet programs have by no means reversed the tide. They have failed to supply the number, quality, and variety of abatement equipment that the United States and some countries of the industrial West have relied on to fight pollution. Instead, Soviet gains have been made primarily by improving the efficiency of use of the scarce equipment that is available domestically and by exhorting managers to take their environmental responsibilities more seriously. Efficiency and discipline, however, cannot be expected to improve continuously. And the tasks of environmental protection will become more difficult as the economy grows and the level of pollutants increases. [redacted]

Sustained progress will require substantial increases in investment to produce needed equipment as well as

major changes in the incentive system to raise the priority of environmental targets relative to output goals in industry and agriculture. But capital investment for environmental protection actually fell in 1983, and the characteristics of the incentive system that discourage environmental concerns are associated with the basic economic structure and resistant to change. Industrial and agricultural enterprises are rarely resource owners and thus have little concern for conservation or long-term resource management practices. In the cases where there is significant concern, central planning denies the enterprise manager the flexibility to develop uses or customers for potentially valuable byproducts of environmental-control operations, such as sulfur. Additionally, the Moscow-based ministerial structure often allows decisions concerning industrial sitings to be made with little regard for, or knowledge of, environmental conditions. [redacted]

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Increased investment and structural economic changes to promote environmental protection are unlikely in the current period of slow growth. The demands of the food and energy programs will leave little room for investment in nonproductive sectors like environmental protection that contribute little to improving productivity, which is key to increasing output in the Soviet economic strategy. [redacted]

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The "antipollution campaign" of the post-Brezhnev regimes is probably aimed primarily at increasing the vigilance of industrial and agricultural production managers. Such a campaign could result in shortrun benefits since negligence and improper use of equipment continue to be major causes of pollution in both industry and agriculture. [redacted]

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But the benefits will be small, because as environmental problems mount with economic growth, the effectiveness of an antipollution campaign based on increasing discipline is bound to diminish. Without large infusions of capital and major modifications to the incentive system, the leadership will be ill prepared to stem the growing incidence of environmental disruption in the next decade. [redacted]

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