Chapter 6
Environmental Pollution Control Measures

While modern societies face growing concern about global environmental issues, developing countries are experiencing complex, serious and fast-growing pollution problems of their own. The potent combination of industrialization, urban development and mass consumption trends is exacerbated by foreign companies operating with little regard for the impact on the local environment. Environmental pollution is more than just a health issue; it is a wider social issue in that pollution has the potential to destroy homes and communities. Pollution problems are also closely tied to the mode of development in developing countries. Despite this, many developing countries either have not developed environmental pollution control measures, or have not provided adequate implementation structures to ensure that policies are effective.

During the period of rapid economic growth after the Second World War, Japan experienced a variety of terrible environmental problems on a scale unprecedented in the world. These environmental problems can be attributed to the prevailing emphasis at the time on economic growth and profits at the expense of public health. For this reason, the government was unwilling to pursue environmental strategies. Worsening environmental problems led to the emergence of numerous victims' groups and turned the tide of public opinion, so that governments at the prefectural and national level were forced to act. Eventually, after much trial and error, effective strategies for dealing with environmental pollution were put in place and as a result the quality of the environment began to improve.

By describing Japan's experiences with respect to the problems caused by the initial reluctance to address environmental issues, as well as the success of subsequent environmental initiatives, it is hoped that we can help to prevent worsening health problems in developing countries and promote sound and healthy social development.

This chapter presents an overview of the

Table 6-1 Seven Categories of Pollution

Category	Major causes	Major symptoms	Examples
Atmospheric pollution	Smoke, dust, exhaust fumes, toxic substances (such as sulfur dioxide and nitrogen dioxide)	Asthma, bronchitis	Photochemical smog, "Yokkaichi Asthma"
Water pollution	Polluted waste water, waste fluids (such as petroleum), sludge, household sewage, sewage discharge, general waste, agricultural chemicals	Noxious odors, poisoning	Minamata Disease, "Itai-Itai" Disease (cadmium poisoning), PCB poisoning
Soil pollution	Arsenic, heavy metals (especially in agricultural chemicals)		Poisoning
Noise	Factories, construction work, road traffic, trains and aircraft, late-night commercial operations, advertising	Headaches, insomnia, depression, hearing loss, impaired development	Osaka Airport noise
Vibration	Factories, construction work, road traffic, trains and aircraft	Dizziness, discomfort, structural damage to homes	Shinkansen (bullet train) vibration
Ground subsidence	Upswelling of groundwater, gravel quarrying, coal mining	Structural damage to buildings	Koto Ward, Tokyo
Noxious odors	Exhaust fumes, river contamination, sanitation facilities, accumulated sewage, livestock farms, etc.	Headaches, discomfort	Sewage in the Sumida River

Source: Based on the Basic Law for Environmental Pollution Control.

Table 6-2 The History of Environmental Pollution Control Measures

The history of environmental pollution control measures (Iijima 1993)	Classifications used in Chapter 6
1. Prior to 1868 (before the Edo Era): First protest actions by victims of pollution	Beginnings of environmental pollution
2. 1869–1914 (Meiji Era to First World War): Emphasis on industrial development	
3. 1914–1945 (First World War through to end of Second World War): Emphasis on nation-building	
4. 1945–1954: Pollution becomes an issue in wider society	Social awareness of environmental pollution
5. 1955–1964: Extensive pollution damage during period of rapid industrial growth	
6. 1965–1974: Pollution problems continue to worsen	Environmental pollution control measures commenced in earnest
7. 1975–1984: Lack of commitment in environmental policy	Pollution control measures lose momentum, increased awareness of environmental problems
8. 1985–present: Mounting concern for global environmental issues	

Source: Based on Iijima, Nobuko (1993) report.

history of pollution problems and countermeasures in Japan. The specific case of Minamata Disease will be discussed in detail, looking at questions such as the difficulties encountered in the implementation of pollution initiatives and the wider social roles of those responsible for, or otherwise related to, the initial problem. This will be followed by an analysis of environmental policy and philosophy in Japan to identify those experiences and initiatives that have relevance for developing countries today.

1. Overview of Environmental Pollution Control Measures

1-1 What is Environmental Pollution?

The Basic Law for Environmental Pollution Control defines environmental pollution as any activity, by corporations or individuals, which compromises the health and/or environment of other persons in a localized area, where the causal link is clearly established. There are seven categories of environmental pollution. (see Table 6-2)

1-2 Change Over Time in Environmental Pollution Control Measures

Table 6-2 shows the history of pollution and pollution control measures in Japan, divided into eight distinct phases from before the Edo Era (1603~1868) up to the present day[1]. For the purposes of this document, the eight phases have been grouped into four main periods to clarify the past experiences of Japan that are of relevance to developing countries today. Below we present an overview of the social background in each period and the development of pollution control measures.

1-3 Trends in Environmental Pollution Control Measures

1-3-1 Beginning of Environmental Pollution (1600s~1945)

The first known instance of pollution damage in Japan involved emissions of wastewater containing heavy metals by mining operations back in the 1600's, before the Edo Era. Affected farmers and fishermen launched bitter protests against the environmental pollution and sought compensation for damages, and their efforts generated widespread public interest.

From the Meiji Era through to the beginning of the First World War (1868~1914), a strong emphasis on national prosperity, military power and industrial growth saw considerable resources devoted to development of the three core industries of mining, cloth spinning, and steel manufacturing. These policies led to environmental problems such as smoke, noise and water pollution. Environmental damage was not confined to the areas surrounding such operations; city dwellers were often affected too. Local governments were the first to take the initiative to address the situation, introducing a

[1] Iijima, Nobuko (1993) *Kankyo Shakaigaku* [Environmental Sociology] Yukikaku.

range of regulations and restrictions. At the national level, however, the government welcomed pollution as evidence of progress and prosperity, and consequently very few of the environmental pollution control measures contained in the Factories Act (1911) and the Mining Law (1905) were actually enforced.

From the commencement of the First World War until the end of the Second World War (1914~1945), priority was given at the national level to the development of industries to meet the demands of the military—in particular steel production and heavy industries. Increased production levels generated a range of problems including atmospheric pollution, water pollution, noxious odors, noise, and land subsidence of fields and other areas. These in turn prompted efforts to create pollution reduction initiatives such as the world's first ever pollution prevention system, developed by Sumitomo Metal Mining. Given the overriding emphasis on national prosperity, however, public health issues received scant attention and protests by victims of pollution were largely overlooked.

1-3-2 Social Awareness of Environmental Pollution (1946~1964)

The main priority in the aftermath of the Second World War was nation rebuilding; consequently, economic growth was the top priority from the late 1950s onwards. Considerable effort was put into the development of heavy industries and the construction of petrochemical plants. The steel, oil, aluminum and power industries generated huge quantities of a range of pollutants, which in the absence of effective pollution countermeasures led to a rash of health problems on a scale unprecedented in the world at that time, including Minamata Disease, "Itai-Itai" Disease and pollution-related asthma. In the year 1960, the city of Osaka recorded smog on 156 days, and the rivers resembled open sewers.

Post-war environmental pollution control measures were initiated in Japan at the local government level during the 1950s. The first formal measures were the Factory Pollution Control Ordinance, enacted by the Tokyo Metropolitan Government in 1959. Unfortunately, these regulations were largely ineffective, due to the lax criteria and the level of opposition from industry. This experience prompted local governments to take a tougher stance on imposing emission standards, building treatment and processing facilities, monitoring pollution emissions, and providing administrative guidance where necessary. Taxation and other incentives were also introduced to encourage the adoption of environmental pollution control measures by industry.

In response to the increasingly strident protests of pollution victims, the national government also began preparing legislation to control environmental pollution, building on the work of local governments. The process was delayed, however, by difficulties in obtaining consensus among the relevant ministries and agencies, compounded by fierce opposition from industry groups. When it finally arrived, the legislation was largely ineffectual. In 1961, the first national environmental pollution control laws were enacted, in the form of the Two Water Quality Regulation Laws for the regulation of pollution sources. Here again, the legislation lacked teeth, and environmental damage continued to worsen. It should be remembered, though, that the pollution control measures were introduced in the context of the main priority at that time of promoting economic growth, and were therefore designed to avoid conflict with this overriding objective.

1-3-3 Environmental Pollution Control Measures Commenced in Earnest (1965~1974)

The combination of rapid industrial development (particularly in the petrochemical and heavy industries), strong economic growth, and unprecedented urban expansion led to a tremendous increase in pollutant emissions. A succession of new and different pollutants began to appear, and the problems worsened. For example, in 1971 sulfur dioxide emissions in the three major municipal areas in Japan were three times the national average, and nine times the 1955 level of 16 t. On some days it was not possible to go outside at all. Afflictions such as Minamata Disease and "Itai-

Itai" Disease began to appear in other areas of the country. Japan became known as the pollution capital of the world.

Public protests became increasingly vociferous and were taken up by the mass media, which had the effect of raising general public awareness and concern about pollution issues. Scientists and other academics began organizing environmental assessments and resident awareness meetings. Interestingly, residents' groups focused on local governments rather than the national government, a strategy that proved most effective. Mounting public dissatisfaction at the unwillingness of the national government to take proper action on pollution issues impacted on approval ratings, and the government was eventually forced to give priority to public health and lifestyle issues.

The early 1970s saw a steady succession of legal actions against polluters, resulting in victories in the four major pollution trials (Minamata Disease in Niigata, Yokkaichi Asthma, "Itai-Itai" Disease and Minamata Disease in Kumamoto). The findings in favor of the victims prompted a revision of environmental standards and compensation plans, and caused a fundamental shift in thinking on pollution, from being considered acceptable for the overall public good to being considered generally unacceptable.

The combination of rising public opposition and the success of the pollution trials prompted a flurry of activity on the part of the government, resulting in a range of measures such as the Basic Law for Environmental Pollution Control, a special pollution session of the national diet, and the Environment Agency. This period also saw a reversal of the approach adopted in environmental regulation. Instead of imposing emission limits on specific pollutants, regulations now sought to provide target environmental standards as the ultimate objectives to be achieved. Environmental standards for sulfur dioxide emissions were released in 1969, followed by vehicle exhaust and water pollution level limits in 1970, noise pollution limits in 1971 and carbon dioxide and photochemical oxidant emissions limits in 1973. As a result, atmospheric and water pollution levels were improved significantly in a relatively short period of time.

1-3-4 Pollution Control Measures Lose Momentum, Increased Awareness of Environmental Problems (1975 onwards)

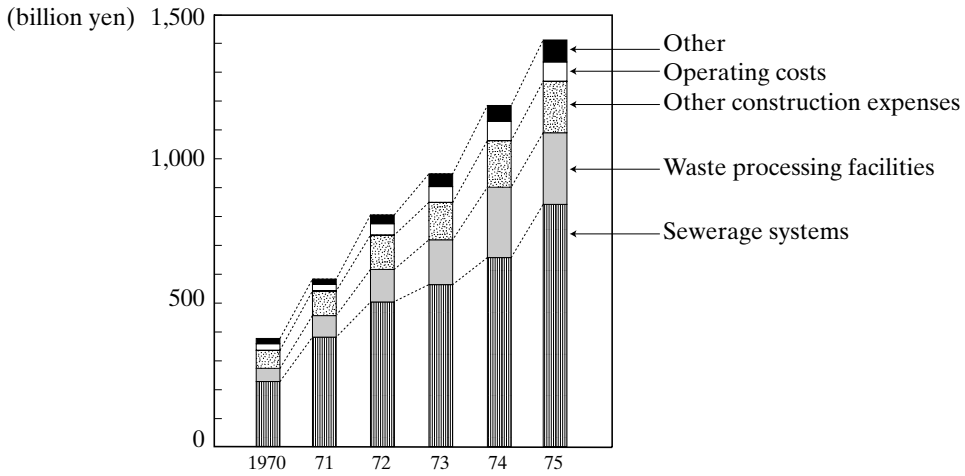
The combined impact of the "oil shock" and an economic downturn in the latter half of the 1970s led to increased criticism of and opposition to pollution controls in business and economic circles, and the government was obliged to modify its stance. The level of public protests had also weakened somewhat. Domestic companies began looking to set up offshore operations, primarily in Asian countries with less stringent pollution controls.

Worsening Pollution Problems

Photo 1: Smoke from chimney stacks fills the sky (December 1972; photo by Mainichi Shimbun Co. Ltd)

Photo 2: Children take lessons wearing face masks to block out the smell (Arakawa Ward, Tokyo, December 1967; photo by Mainichi Shimbun Co. Ltd)

Figure 6-1 Expenses Associated with Local Government Environmental Pollution Control Measures



Source: White Paper on the Environment 1977 (Prime Minister's Office)

Table 6-3 Summary of the Four Major Pollution Trials

	"Itai-Itai" Disease	Minamata Disease in Niigata	Yokkaichi Asthma	Minamata Disease in Kumamoto
Cause	Cadmium from mining operations released into the Jinzu River	Organic mercury waste from power production released into the Agano River	Smoke from industrial complexes	Marine life in Minamata Bay contaminated with organic mercury
Symptoms	Bone distortion and fractures	Minamata Disease	Asthma	Disruption to nervous system, speech impairment
No. plaintiffs	33	76	12	138
Year of trial	1968	1967	1967	1969
Year of judgment	1972	1971	1972	1973
Damages awarded	¥148.2 million	¥277.78 million	¥88.21 million	¥937.3 million
Damages sought	¥151.2 million	¥522.67 million	¥200.58 million	¥1,588.25 million

Source: Shibata, Tokue and Murata, Yuko (1976)

Legislation to impose an environmental impact assessment system to prevent environmental pollution at the outset was proposed in 1984 but then shelved; it would not be until 1997 that the Environmental Impact Assessment Law was finally enacted. Environmental standards for NO_2 emissions were relaxed, designation of Type 1 regions for pollution controls and compensation were lifted, and a number of other environmental controls were put on hold; and at the same time the criteria for recognition of pollution-related health damage were tightened. Under 1973 legislation on compensation for health problems caused by environmental pollution, new claims from victims of atmospheric pollution were dismissed, and many victims of Minamata Disease went unrecognized.

From around 1985, mass consumption began to emerge as the root cause of many forms of environmental destruction. Road vehicles, synthetic detergents, chemical fertilizers and insecticides were all identified as pollution sources, which meant that ordinary citizens were no longer the victims, but were in fact the unwitting perpetrators of environmental destruction. At the same time, environmental pollution had become a much more complex problem, as exemplified by chemical substances such as polychlorinated biphenyl (PCB) and dioxins that are not conducive to treatment or processing.

In the 1990s, prompted by rising awareness around the world of the need to protect the global environment, the government returned to environmental policy with renewed vigor, enacting the Waste Management and Public Cleaning Law, the Recycling Law and legislation for the conservation of plant and animal species. In 1993, the Basic Law for Environmental Pollution Control and the Nature Conservation Law were integrated into a single piece of legislation, the Basic Environment Law, detailing basic environmental programs, requirements for environmental impact assessments, and financial penalty systems.

Box 6-1 Promulgation of the Basic Law for Environmental Pollution Control

The Basic Law for Environmental Pollution Control was enacted in 1967 in recognition of the need for coordinated environmental pollution legislation and government policy based on a set of consistent principles. This legislation was prepared by a liaison committee for environmental pollution control measures, with vice-ministerial representatives from the relevant ministries, based on the report of an advisory body to the Ministry of Health and Welfare.

The Basic Law for Environmental Pollution Control was the first legislation in Japan to set out a comprehensive framework for environmental pollution control measures. This law supplies definitions of environmental pollution; delineates the responsibilities of business, government at the national and local levels, and residents; describes the basic features of strategies for preventing environmental pollution; and provides an overall structure for environmental pollution legislation and strategies. In its initial incarnation, the Basic Law for Environmental Pollution Control was designed to complement healthy economic growth and development, and not from the perspective of the residential environment. To this end, the law contained the so-called economic harmonization articles, and did not include any pollution controls with the potential to obstruct economic progress. As a result, environmental damage continued to escalate. The economic harmonization articles were subsequently removed in 1970 in the face of mounting criticism of the Law.

The main features of the Basic Law for Environmental Pollution Control are:

1. Numerical standards for environmental pollution
2. Regulation of emissions of polluting substances
3. Regulation of the manufacturing sector
4. Land use regulations
5. Monitoring and measurement regimes
6. Pollution prevention programs
7. Pollution prevention facilities and systems
8. Subsidy schemes for businesses to reduce pollution levels
9. Compensation for pollution victims
10. Dispute resolution mechanisms

The Basic Law for Environmental Pollution Control served as the basis for a number of other pieces of legislation. Starting with the 1969 Law Concerning Special Measures for the Relief of the Pollution-related Health Damage, the government sought to provide legislation for reconciliation and compensation of victims of pollution. The legislative framework represented an important breakthrough, because many civil compensation cases for pollution damages had foundered due to the difficulty of proving a causative relationship between negligence on the part of the perpetrator and the damages suffered by the victim. Such legislation enabled victims to claim medical expenses and

treatment and nursing care allowances from the public and private sector. Under the 1970 Law for the Settlement of Environmental Pollution Disputes, pollution committees were set up at the national level (reporting to the Prime Minister's Office) and in all prefectures to provide mediation, arbitration and reconciliation services.

Box 6-2 Pollution Session of the Diet

July 1970 saw the establishment of the Headquarters for Countermeasures for Environmental Pollution, chaired by the Prime Minister and featuring representatives of all ministries and agencies. The Headquarters was set up in response to public concern over pollution issues, which had reached a level that threatened to bring down the government. Pollution bills were hastily prepared by a ministerial-level conference on pollution control measures over the following month and presented to an extraordinary session of the diet in December convened specifically for the purpose of debating the bills (the so-called pollution session of the diet). All 14 pollution bills were passed successfully. The main features of the bills were as follows:

1. Amendments to the Basic Law for Environmental Pollution Control, including removal of the economic harmonization articles
2. Broader definitions of pollution
3. Nationwide expansion of the scope of the Air Pollution Control Law; recognition of additional regulations at the prefectural level
4. Formal acknowledgement of the national government's responsibilities for environmental conservation, accompanied by stronger regulation
5. Techniques for calculating the costs to businesses of preventing environmental pollution
6. Criminal prosecution for pollution crimes

Box 6-3 Establishment of Environment Agency

Although the late 1960s through to the 1970s saw a succession of new laws on environmental pollution control, most notably the Basic Law for Environmental Pollution Control, responsibility for enforcement of pollution regulations was scattered throughout different arms of the government, compromising the consistency of the government's policy approach. For example, atmospheric pollution came under the jurisdiction of both the Ministry of Health and Welfare and the Ministry of International Trade and Industry; water pollution was the responsibility of the Economic Planning Agency, the Ministry of Health and Welfare, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Construction and the Ministry of International Trade and Industry; and noise pollution was regulated by the Ministry of Health and Welfare, the Ministry of International Trade and Industry, the Ministry of Transport and the Ministry of Construction. The Environment Agency was set up in 1971 to assume responsibility for the implementation and enforcement of all pollution regulations and provide a coordinated focus for environmental policy. The Agency was promoted to the Environment Ministry under the reorganization of government departments in 2001 to provide a more unified approach to environmental policy.

Table 6-4 History of Environmental Pollution

Domestic and global developments	Pollution incidents and legal action in Japan
Beginnings of environmental pollution (up to 1945)	
Smoke emission regulations (UK, USA) Public Health Act (UK) Sino-Japanese and Russo-Japanese Wars First World War	Legal action over copper poisoning from mining operations 1883 Huge increase in smoke pollution in Osaka 1890 Environmental damage throughout Watarase River basin area from Ashio Copper Mine 1932 Osaka Smoke Regulations introduced
Social awareness of environmental pollution (1945~1964)	
End of Second World War 1960 Income-Doubling Program 1962 National Development Program 1963 Development of industrial complexes	1946 Mine pollution and soil devastation at coal mines such as Chikuho 1951 Water pollution from pulp factories becomes a nationwide issue 1956 Mass outbreak of Minamata Disease victims in Kumamoto 1961 First reports of "Itai-Itai" Disease Large-scale outbreak of Yokkaichi Asthma 1964 Worsening environmental problems at Mizushima Industrial Complex
Environmental pollution control measures commenced in earnest (1965~1974)	
	1965 Mass outbreak of Minamata Disease in the Agano River Basin in Niigata Prefecture 1967 Niigata Minamata Disease Trial begins Yokkaichi Pollution Damage Trial begins 1968 "Itai-Itai" Disease Trial begins Judgment released regarding pollution sources in Minamata Disease and Niigata Minamata Disease 1969 Kanemi Yusho Oil Poisoning Trial begins Kumamoto Minamata Disease Trial begins All-day smog warnings in Tokyo Osaka Airport Noise Trial begins
1970 Japan becomes world's biggest steel producer US submits special message on pollution Japan–US Pollution Conference OECD establishes Environment Policy Committee Japan's first nuclear reactor becomes operational 1972 Rebuilding the Japan Archipelago Program Vehicle ownership quadruples in ten years Polluter-pays Principle adopted UN Conference on the Human Environment 1973 First Oil Shock	1970 First citizens against pollution meeting in Tokyo Cadmium contamination of farmland in Toyama Prefecture Non-certified Minamata Disease victims demand review of complaints process Shizuoka Prefecture sludge pollution trial begins Kanemi Yusho Oil Poisoning victims launch class action 1971 SMON Trial begins Victory for plaintiffs in "Itai-Itai" Trial Victory for plaintiffs in Niigata Minamata Trial 1972 National Federation of Lawyers Groups Against Environmental Pollution formed Victory for plaintiffs in Yokkaichi Trial 1973 Morinaga Milk Powder Arsenic Poisoning Trial begins

	Government response
	1953 Liaison Conference for the Prevention of Water Contamination 1955 Guidelines to the Law on Standards for the Prevention of Pollution in the Living Environment 1958 Legislation to maintain the quality of public water resources 1959 Factory pollution regulations introduced in Tokyo 1961 Legislation to regulate smoke emissions 1963 Ministry of Health and Welfare and Ministry of International Trade and Industry set up study group to investigate atmospheric pollution in Yokkaichi 1964 Pollution Department established by Ministry of International Trade and Industry Environmental Pollution Control Measures Committee established by Prime Minister's Office
	1965 Special Committees on Industrial Pollution Control Measures established in Upper and Lower Houses Environmental Pollution Control Service Corporation Law enacted 1967 Basic Law for Environmental Pollution enacted 1968 National Liaison Council for Environmental Pollution Control Measures 1969 Law concerning Special Measures for the Relief of the Pollution-related Health Damage First White Paper on Pollution released Environmental standards for sulfur dioxide
	1970 Law for the Settlement of Environmental Pollution Disputes; Environmental Pollution Control Measures Headquarters; Ministerial-level conference on environmental pollution control measures 14 pollution bills passed by the pollution session of the Diet Environmental standards on carbon monoxide in vehicle exhaust gases Environmental standards on water contamination for conservation of residential environments Environmental standard on noise from sources such as factories and road vehicles Environmental standards on suspended particulate matter (SPM) Environmental standards on carbon dioxide and photochemical oxidants Environmental standards on aircraft noise 1971 Environmental standards on Shinkansen (bullet train) noise Central Conference for Environmental Pollution Control Measures inaugurated Environment Agency founded; White Paper on the Environment becomes Environment White Paper 1972 Nature Conservation Law enacted 1973 Law Concerning Pollution-Related Health Damage Compensation and other Measures enacted

Domestic and global developments	Pollution incidents and legal action in Japan
Pollution control measures lose momentum, increased awareness of environmental problems (1975 onwards)	
1977 Yen appreciation	1977 Osaka Airport pollution trial begins Nagoya Shinkansen pollution trial begins
1978 Structural recession Bankruptcies reach record post-war levels	1978 Widespread concern over chromium pollution
1979 Second Oil Shock 1984 World Commission on Environment and Development	1979 Court case to stop major development at Lake Biwa
	1982 Second Niigata Minamata Disease Trial begins
	1983 Increase in groundwater pollution by toxic chemicals
1987 Bubble economy period; recession caused by yen appreciation	1988 Verdict in Minamata Criminal Trial: company guilty of involuntary manslaughter
1992 Earth Summit	1992 Niigata Minamata victims lose case

	Government response
	1977 Substantial scaling back of environmental standards on nitrous oxide
	1980 Environmental assessment legislation shelved
	1986 Expert committee on dioxins set up
	1986 Designation of Type 1 regions for pollution controls and compensation lifted
	1990 Water Pollution Control Act amended
	1991 Recycling Law
	1992 Implementation guidelines for general control measures for Minamata Disease
	1993 Basic Environment Law
	1997 Environmental Impact Assessment Law

2. Main Responses to Environmental Pollution

2-1 History of the Response to Minamata Disease (Mercury Poisoning) and Discussion

Given the scale of the tragedy and its terrible consequences, Minamata Disease is often considered the first major incident of environmental pollution in the course of Japanese history. The history of the response to Minamata Disease is also that of the struggle by victims for recognition of the problem[2]. The experience of Minamata Disease and its tragic consequences teaches us much about the inadequacy of the initial response and the roles and responsibilities of those involved in preventing pollution—private industry, government and the medical profession.

2-1-1 Overview of Minamata Disease

Minamata Disease was caused by methyl mercury poisoning that gradually accumulated toxic levels of organic mercury as a result of eating fish and shellfish that grew in an environment contaminated by industrial waste water. Typical symptoms includs disorders of the central nervous system and sensory disturbances in the extremities. Minamata Disease was first identified along the coast of Minamata Bay in Kumamoto Prefecture. By around 1955, people in the region already understood that the poisoning came from eating fish. The source was traced to the Minamata Factory of the Shin Nihon Chisso Hiryo Company (now Chisso Corporation). Victims were paid a paltry level of compensation, and the company continued releasing pollutants into the bay while pressuring the government and scientists into delaying studies to evaluate the causal relation[3].

As a result, official government recognition of the disease did not come until 12 years after the first victims were identified, and five years after the final report of the government's own study group, during which time the problem continued to grow.

Table 6-5 History of Minamata Disease

1956	• Minamata Disease formally identified - notification to public health center of Shin Nihon Chisso Hiryo Company (now Chisso Corporation) • Kumamoto University Medical School sets up research team	1965	• Outbreak of Minamata Disease in Niigata
		1968	• Minamata Disease linked to pollution; discharge of wastewater halted
		1969	• Victims group launches compensation action against Chisso
1957	• Kumamoto Prefectural Government application for fishing ban under the Food Sanitation Act rejected by Ministry of Health and Welfare	1971	• Environment Agency takes the position, "If Minamata Disease cannot be ruled out, it is Minamata Disease"
		1973	• Verdict in favor of Minamata victims
1958	• Chisso Corporate changes location of waste outlet; contamination continues and health problems worsen	1974	• Administrative litigation over delays in victim certification by Kumamoto Prefecture
1959	• Kumamoto University Medical School releases findings: organic mercury identified as cause • Food Sanitation Investigation Council notifies the Ministry of Health and Welfare of organic mercury finding and is disbanded on the day	1976	• Victory for victims in administrative litigation
		1980	• Non-certified victims launch legal action for compensation against Chisso, the national government and Kumamoto Prefecture
		1987	• Kumamoto District Court orders the national government, Kumamoto Prefecture and Chisso to pay compensation
1963	• Kumamoto University Medical School identifies link between Minamata Disease and factory wastewater	1995	• National government presents victims with final proposal; accepted by most victims' groups

[2] NHK Archives (2001) *TV no Seishun, Documentary "Waga Uchinaru 'Minamata' - Kokuhakuteki Ishiron* [Minamata Disease - Confessing Doctors' Perspective] Airdate: March 4, 2001.

[3] Ui, Jun (2001) "*Nihon no Kogai Taiken* [Japan's Experience of Environmental Pollution] Yoshida, Fumikazu and Miyamoto, Kenichi, *Iwanami Koza Kankyo Keizaigaku 2 kan, Kankyo to Kaihatsu* [Iwanami Lecture Environmental Economics Vol. 2, Environment and Development].

Furthermore, compensation for Minamata victims who had not been certified, and acceptance of the settlement, did not occur until 1995, some 40 years after the formal announcement of Minamata Disease.

2-1-2 Response to Minamata Disease by those Concerned and Lessons to be Gained

(1) Response by Corporations

Chisso Corporation, the polluter, fearing the negative ramifications of the worsening pollution crisis on its corporate activities and profits, refused to recognize any causal link between the pollutants and the disease. Chisso also withheld information and refused to cooperate

Protest action by victims of Minamata Disease: Sit-in Minamata Disease protesters are forcibly removed by police (March 1978, Mainichi Shimbun Co. Ltd)

Box 6-4 The Public Health Center's Response

On April 21 and 29, 1956, two sisters with serious disorders of the nervous system presented to the hospital attached to the Shin Nihon Chisso Hiryo Factory at Minamata. On May 1, the hospital director, Dr. Hajime Hosokawa, described the disease as "unprecedented" in a report to the Minamata Public Health Center. Following the notification, Dr. Hosokawa and his colleagues joined together with staff from the public health center to conduct a study of the afflicted sisters and other families in the immediate area. They found many others with similar symptoms, as well as evidence of related deaths. On May 4, the doctors submitted a written report to the Director of the Kumamoto Prefectural Health Bureau requesting permission to conduct a study of possible poisoning of well water. The ensuing preliminary study by Dr. Hosokawa's group and the public health center staff generated highly significant findings. The public health center subsequently determined that contaminants had been ingested via consumption of fish and shellfish caught in Minamata Bay, and requested a suspension of fishing activities. This was refused by the Ministry of Health and Welfare on the basis that not all fish and shellfish could be shown to be contaminated. The Chisso Minamata Factory was named as the suspected source of contaminants, but the Food Sanitation Investigation Council, an advisory body to the Ministry of Health and Welfare, refused to grant approval for on-site inspections. The public health center and the prefectural government were therefore unable to identify and eliminate the cause, much less institute preventative measures. The most important reason for this situation was the lack of response from the overseeing body, the Ministry of Health and Welfare. Today in Japan, under the Community Health Law local governments are able to monitor the planning and regulation of private sector operations.

Source: Doi, Rikuo (2003) "*Hoken-jo ha do Ugoitaka* [How the Public Health Center Responsed," Public Health, Vol. 67 No. 3 summarized in part

Box 6-5 Background to the Delayed Response

In 1959, acting on a report from the Kumamoto University Medical School research group, the Minamata Food Poisoning Committee of the Food Sanitation Investigation Council (an advisory body to the Ministry of Health and Welfare) presented the Minister for Health and Welfare with a report identifying organic mercury as the cause of Minamata Disease. The national and prefectural governments, keen to maintain the momentum of strong economic growth and avoid any adverse impact to the chemical industry, did nothing to stop the Minamata Factory wastewater discharge. The report was shelved the day after it was received following a submission by the Minister for International Trade and Industry to the Cabinet. The Minister argued that the disease was not linked to mercury, instead distributing copies of academic papers claiming toxic amine as the culprit. The Director of the Environmental Sanitation Unit at the Ministry of Health and Welfare visited the Minamata Factory to announce the government's stance refuting the organic mercury findings; he proposed that research predicated on factory wastewater as the likely cause should be abandoned and replaced by a fresh study, this time with the full cooperation of the factory. Chisso refused to release details of its production processes and wastewater output, and concealed the results of experiments proving that organic mercury was the cause of the disease. Scientists closely linked to the Japan Chemical Industry Association (JCIA) colluded with the government to propound a range of other theories and stymie genuine research, while the Japanese Association of Medical Science (JAMS) publicly disputed the findings of the Kumamoto University researchers. The government set up its own investigation council, supposedly to determine the cause of Minamata Disease, but no findings were ever delivered, and the council was subsequently disbanded without achieving its stated aim.

Source: Kurihara, Akira ed. (2000) *Shogen Minamata-byo* [Testimony: Minamata Disease] Iwanami Shoten summarized in part

with the Kumamoto University Medical School research team that was trying to determine the cause of the "strange disease," and refuted the findings of the research team upon release. In this way, time dragged on without any relief for the victims of mercury poisoning.

Even after Minamata Disease had been conclusively linked to its factory wastewater, Chisso did not attempt to install wastewater treatment or purification equipment. Instead, the company diverted the wastewater outlet to a new location. On the compensation front, the company used delaying tactics while trying to force victims and fishermen, who were in a significantly weaker position, to accept a paltry settlement.

(2) Response by Local Government

Once Minamata Disease had been identified, the local government recognized the need for countermeasures, but was unable to take effective action for a number of reasons. Firstly, at that time local authorities did not have the power to resolve local issues; environmental pollution control measures required the approval of the national government. Secondly, the local government was keen to maintain cordial relations with the company, a major contributor to the local economy through tax revenue and employment opportunities, and was therefore unwilling to take any action that might be considered a burden on the company. Thirdly, the likelihood of strong opposition from fishing interests deprived of their income source if a fishing ban was imposed was also a factor in the inability to take effective countermeasures.

(3) Response by the National Government

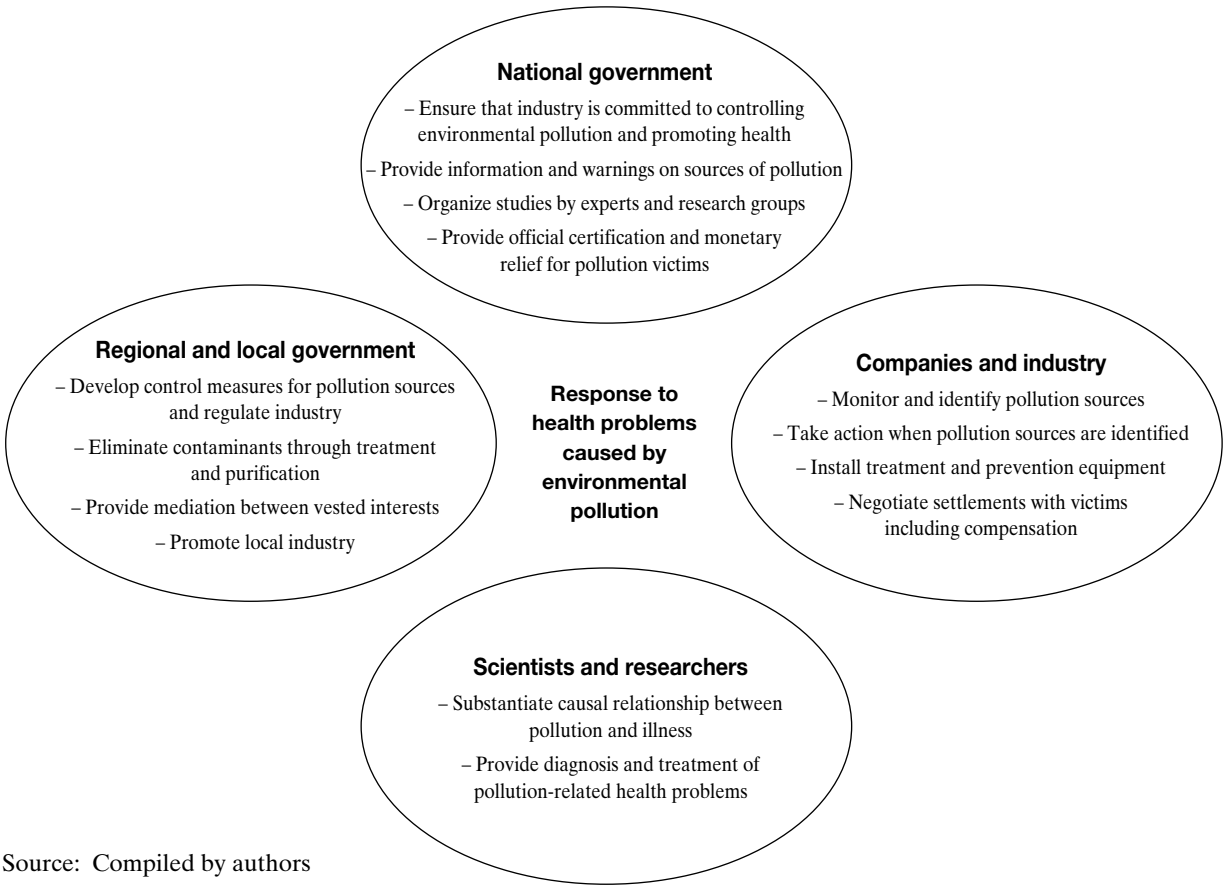
Boosting fertilizer production and promoting the chemical industry in general, was a high priority for the national government and particularly the Ministry of International Trade and Industry. Identifying mercury as the pollutant would strike a blow to the chemical industry, something that the Ministry was keen to avoid. The government did not follow up on the findings of the Kumamoto University research team, but instead sought to delay the response by launching its own study. The government should have moved immediately to provide information and advice and impose regulations, given that there were many other factories around the country producing similar waste discharges; however it did not, and consequently Minamata Disease began to appear in other regions of Japan.

(4) Response by Doctors and Scientists

In science and medicine, one cannot make a definitive conclusion without sufficient corroborating evidence. Due to the lack of evidence, doctors and scientists were unable to properly substantiate a causal relationship between the contaminants (and their sources) and Minamata Disease, much less to develop countermeasures and counter the growing health problem. Scientists are expected to be neutral, impartial and scientific; however some of those involved in investigating Minamata Disease underrated the role of environmental pollution and openly disputed the causal relationship.

Figure 6-2 summarizes the proper roles of industry, local and national governments, and scientists and researchers, as exemplified by the experience of Minamata Disease.

Figure 6-2 Roles and Responsibilities for Relevant Parties from Consideration of Minamata Disease Countermeasures



Source: Compiled by authors

2-2 Environmental Pollution Control Measures

Following the tragic mistakes of Minamata Disease, in which a delayed response enabled the disease to continue to develop, a concerted effort has been made to address pollution problems through a raft of environmental pollution control measures. Here we will describe some of the successful pollution control initiatives undertaken in Japan.

2-2-1 Environmental Pollution Legislation and Upgrading Administrative Organization

The Basic Law for Environmental Pollution Control was enacted to provide a proper basis for environmental pollution policy and for the development of other regulations and initiatives. Similarly, the Environment Agency was established to promote unified and coordinate policy initiatives, along with environmental pollution bureaus at the local government level.

Environmental pollution has many different causes and affects us in a number of different ways. For this reason, it is important to have a comprehensive legal framework in place to enable the development of effective policy initiatives, backed by a single organization with jurisdiction over environmental pollution control measures and the attendant governmental structures.

2-2-2 Environmental Standards and Waste and Emission Standards

In Japan, improvements in the state of the environment were brought about by direct regulation based on standards for pollution and the environment. Regulations in many areas - emission restrictions, emission levels and emission volumes - were used to ensure adherence to environmental standards, making it possible to reduce emission volumes at minimal cost.

2-2-3 Environmental Pollution Control Measures and Regional and Local Authorities

The strong stance of regional and local governments provided the impetus for the development of environmental pollution control measures in Japan. Since environmental pollution is generally a localized phenomenon, pollution strategies at the local level are most important. In practice, however, controlling pollution proved difficult, because regional and local governments did not have the power to enforce pollution controls and because harsh penalties for exceeding the national government's lax regulation criteria was considered unlawful.

The Basic Law for Environmental Pollution Control allowed local government to take the initiative in pursuing pollution controls. The combination of environmental pollution bylaws and pollution reduction agreements with industry proved spectacularly successful.

By 1972, every prefectural government in Japan was regulating environmental pollution in accordance with environmental pollution bylaws and had set up a dedicated pollution bureau responsible for regulation, monitoring, measurement, guidance and prosecution. On average, each pollution bureau had 48 staff, with each staff member overseeing 36 facilities.

The pollution reduction agreements represented a form of gentleman's agreement between local government and local companies, where both parties agreed to abide by stricter regulations than those imposed by the national government. Local governments sought to improve environmental conditions through monitoring and supervision of local industry. The first such agreement was signed in 1964 between the City of Yokohama and the power company Electric Power Development Company (now J Power). Under the terms of the agreement, the city of Yokohama was given the right to inspect company facilities and provide advice on environmental pollution control measures, and to impose stricter emission standards than those set down by the national government. The company was also required to submit regular survey reports.

2-2-4 Police Prosecutions and Fines for Polluters

In 1970, the National Police Agency set up a Pollution Control Measures Council and began

prosecuting environmental pollution offenses. Pollution inspectors and pollution prosecutors were appointed to the task of arresting environmental polluters. The arrest rate rose consistently at a rate of 25% - 65% per year.

Once companies understood the potential financial costs of environmental pollution, they began taking genuine steps to reduce pollution output. The police prosecutions and fines were therefore an effective means of forcing polluters to comply with the pollution regulations.

2-2-5 Financial Assistance for Prevention of Environmental Damage

Investment in equipment and technology designed to reduce pollution output can pose a significant financial burden in difficult economic circumstances, without providing any direct boost to company revenue. To encourage investment in pollution reduction initiatives, government financial institutions provided preferential taxation and financial measures, low-interest loans for plant and equipment investment, tax exemptions and special depreciation allowances. The Environment Pollution Control Service Corporation, meanwhile, promoted pollution reduction initiatives in industry by setting up green buffer zones and joint facilities for reducing environmental pollution, building joint-use production facilities and carrying out land reclamation projects.

2-2-6 Introduction of Regional Industrial Planning Policie

Regional industrial planning policies helped to reduce pollution levels by limiting the density of pollution sources (particularly factories) in a given area and encouraging the use of joint pollution control facilities.

2-2-7 Environmental Assessments

In terms of cost, effort and efficacy, it is much better to incorporate pollution controls, based on studies of anticipated environmental effects at the initial planning stage, rather than attempting to devise containment strategies after the event. To this end, the environmental impact assessment is an important part of the preparatory process. Environmental impact assessments have been used in Japan since 1965, mainly for large factory construction projects. Preliminary studies are carried out to determine the expected pollutant emission levels, and the project plans are modified accordingly, for instance by providing additional processing and treatment facilities to reduce emission levels.

2-2-8 Pollution Prevention Research

Reducing environmental pollution requires specialized research, firstly to identify the types of pollution and how they are being generated, and secondly to identify the most effective method for dealing with them. In Japan, government pollution research institutes at the local and national level are staffed with dedicated researchers engaged in medical and environmental studies on pollution. Examples include a long-term epidemiological tracking study on the effects of environmental pollution on the human body, launched in 1970, and studies of community health management systems for anticipated health problems.

2-2-9 Use of the Court

The standard procedure for grievances and requests for mediation over pollution issues is to apply to the relevant government agency. Mediation by a government agency does not always provide satisfaction for the affected parties, who are generally in a weaker position than both government and industry. In such cases, recourse to legal action may be taken. Victims of pollution in Japan have often taken legal action against governments and corporations over acts of pollution. The four major pollution trials, for instance, all resulted in comprehensive victories for the plaintiffs. The basic health and welfare rights of the public were recognized, compensation was paid to pollution victims, and the legitimacy of their demands for an end to pollution was accepted.

In general, however, legal action over pollution issues is both complex and time-consuming, in light

of the difficulty of demonstrating the causal relationship between the pollution act and the illness or affliction, and the need for specialist skills and knowledge.

2-2-10 Pollution-related Health Damage Compensation

Japan has many precedents for payment of compensation for health damage suffered as a result of pollution, based on the polluter-pays principle. The Law Concerning Pollution-related Health Damage Compensation and other Measures, enacted in 1973, provides for payments to cover medical expenses, compensation for disabilities, bereavement payments, child allowances and funeral related expenses. This was followed by other measures for paying the medical expenses of victims of pollution who remained uncertified for prolonged periods while trying to establish a causal relationship. Rehabilitation programs, support for relocation for the purpose of recovery and recuperation, subsidized medical equipment for the home, and facilities to provide these services, are also made available to certified victims.

2-2-11 Education of Environmental Pollution Control Personnel for Industry and Local Government

Controlling environmental pollution requires not just legislation but people capable of effectively implementing the legislation. Companies, as the most common polluters, need staffs who understand pollution issues, while local governments need employees to monitor pollution in industry. Since 1971, all major enterprises in Japan have been required to appoint a pollution prevention officer, and local government employees are required to obtain accreditation through certified pollution prevention training courses. Local governments also provide pollution enquiry centers that provide advice on pollution control.

2-2-12 Pollution Awareness Campaigns

The level of commitment to pollution controls and effective outcomes is very much subject to public opinion. The Japanese media, particularly television and radio, are constantly working to raise public awareness of pollution and environmental issues.

3. Environmental Pollution Control Measures in Developing Countries in the Light of Japan's Experience

Developing countries today tend to focus on economic growth and development at the expense of environmental pollution controls, in much the same way as Japan acted not so long ago. As we have seen, however, this situation can lead to major public health problems.

In Japan, pollution problems were allowed to escalate by the lethargic response of government and industry. Since then, however, pollution has been tackled successfully through a range of initiatives. The poor response to pollution controls can be attributed to a lack of consensus within government on the relative priorities of public health and the value of life versus the importance of economic progress and corporate profits. This debate had the effect of delaying the preparation of legislation and regulatory systems and the implementation and enforcement of pollution reduction initiatives. Other contributing factors included the unwillingness of the private sector, motivated primarily by the quest for profits, to make a genuine effort to implement voluntary controls and resolve pollution problems. This was exacerbated by the shortage of doctors trained to identify symptoms of environmental pollution as well as researchers capable of linking such symptoms to specific pollution sources. Given the potential for similar circumstances to arise in developing countries, it is worth reflecting on Japan's experience to prevent delays in the introduction of environmental pollution control measures.

Japan subsequently enjoyed spectacular success in reducing pollution levels through a range of initiatives by industry and government, but it is

Table 6-6 Prerequisites and Considerations Regarding the Application of Japanese Pollution Strategies in Developing Countries

Japanese approach	Prerequisites/considerations for application in developing countries
Pollution control legislation and establishment of administrative bodies	Separation of executive, legislative and judicial powers, what level of authority to be afforded to local government
Environmental standards and emission limits	Nature of government intervention International involvement in environmental and pollution fields
Pollution control by local government	Separation of executive, legislative and judicial powers, what level of authority to be afforded to local government
Police prosecution and penalties for pollution offences	Nature of government intervention
Financial assistance for pollution reduction	Level of industrial development
Introduction of regional industrial development planning	Level of industrial development Regional structures
Environmental assessments	Level of expertise in pollution technology
Pollution control research and surveys	Level of expertise in pollution technology
Recourse to legal action	Separation of executive, legislative and judicial powers, what level of authority to be afforded to local government
Compensation plans for pollution victims	Public opinion and social movements
Training of environmental pollution control personnel	Level of expertise in pollution technology
Public awareness of pollution issues	Public opinion and social movements

Source: Compiled by authors

important to note that these were driven by public opposition to pollution and associated protest activities. Public opinion was in turn driven by advocacy movements for pollution victims and media reporting. At the same time, legal verdicts holding governments and industry responsible for pollution also helped to force a change of approach in government. Environmental pollution gradually came under control as local governments faced with local pollution problems began introducing their own initiatives, and increasing numbers of those in government began to appreciate public sentiment on pollution. In the same way, public opinion and media pressure should provide effective forces for action on pollution in developing countries.

At the same time, we must remember that conditions in developing countries today are not the same as those in post-war Japan. In applying the lessons of Japan, it is important to take into account the political systems and functions of the country and region, as well as differences between peoples and cultures. The following seven differences between Japan and developing countries have been identified as potential influences on the outcomes.

1. Level of industrial development
2. Regional structures
3. Nature of government intervention
4. Public opinion formation and social movements

5. Separation of executive, legislative and judicial powers and level of authority afforded to local government
6. Level of expertise in pollution technology
7. International involvement in environmental and pollution fields

Table 6-6 summarizes the main prerequisites and considerations to bear in mind when applying the Japanese approaches that were effective in pollution control to today's developing countries.