

Overcoming Pollution in Japan and the Lessons Learned

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Abstract

In the 1950s and 1960s, Japan experienced unprecedented environmental pollution and accompanying health damages, or so-called pollution diseases. The four major ones in Japan are Minamata Disease, Niigata-Minamata Disease, Itai-Itai Disease and Yokkaichi Asthma. Other Asian countries are now experiencing, or are going to experience, environmental degradation including pollution as their economies develop, but the distress caused by pollution in Japan should not be repeated by its neighbors. This paper describes the severe water pollution Japan experienced, how Japan overcame it, and the efforts being made by governments and enterprises to alert other countries not to make the same mistakes as Japan made.

Keywords: environmental pollution in Japan, pollution diseases, anti-pollution measures, conflict between prevention of pollution and economic growth, Clean Asia Initiative

Introduction

Pollution problems in Japan occurred as early as the Meiji era (in the late 19th century). The Ashio Copper Mine mineral poison case is recognized as the original pollution problem in Japan. The Ashio Copper Mine opened in 1610 and after its control was transferred to a man named Furukawa in 1877, the extraction of copper increased after the discovery of new veins and the modernization of production technology. It eventually grew into the largest copper mine in Japan. On the other hand, slag flowed into the Watarase River (especially during floods) from around 1890, destroying fish populations and causing damage to crops. The aggrieved farmers made petitions to the prefectural government, submitted written inquiries to the Diet, and resorted to other tactics. As a result, the Ashio Copper Mine mineral poison case was addressed by Japan's Diet in 1891. Even so, the company failed to take any substantial steps to prevent further pollution. It was not until 1974 that the Furukawa mining plant consented to pay ¥1.5 billion in compensation.

Severe pollution Japan has experienced

Background

In 1955, Japan's economy experienced unprecedented growth. In the late 1950s and early 1960s, 8.8 % and 9.3 % annual economic growth figures were attained respectively. Heavy industries and chemical industries grew at high rates due to increased investment in facilities and exports from the private sector, as well as active public investment. Heavy and chemical industries emitted more potential pollutants per unit than other enterprises in general. Processing in Japan of the products to be exported causes emissions of more pollutants in the

country than those commensurate to the end consumption of the products in the country. Also, investment for pollution control measures was less, in contrast to the high speed of growth. The enterprises' investment for anti-pollution was rather small, i.e. only 3% (about ¥30 billion) in 1965, which is the first year for which relevant data is available. This is one of the factors that caused severe industrial pollution in Japan.

Progression of water pollution

As the Japanese economy rapidly grew, water contamination became more serious at a high speed. The Sumida River, for example, had clean water in which many kinds of fish lived in the late 1940s through the 1950s. The river also served as a place of rest and recreation for people and provided a livelihood for fishermen. Since around 1955, however, the river has become a sewage laden canal in which fish could not live any more and emitted a malodorous stench.

In those days, water pollution became serious mainly because of the effluents discharged from factories and business establishments. The effluents discharged by Honshu Paper Co.'s Edogawa plant without any pre-processing caused severe damage to the fishing industry in the Urayasu area in suburban Tokyo in 1958. The aggrieved fishermen entered into negotiations with the company and petitioned the relevant governmental agencies yet failed to attain any resolution. Later, an event occurred where about 700 fishermen broke into the factory and scuffled with police.

Severe damages from pollution

Minamata Disease, Niigata-Minamata Disease, Itai-Itai Disease, and Yokkaichi Asthma are called as the four major diseases caused by pollution in Japan. Yokkaichi Asthma is caused by air pollution, so it will not be referred to in the following pages.

(1) Minamata disease

Nippon Carbide Firm, one of the predecessors of Chisso Corporation, built its Minamata plant in 1908. Soon after, the plant began to discharge effluents into the sea nearby. In the early 1950s, massive fish populations were killed in the Minamata Bay while cats and pigs on land died in madness inducing disorders.

In 1956, a report was made to the Minamata Healthcare Center in Kumamoto Prefecture that a hospital took in a patient who was suffering from a brain disease whose cause was unknown. This was the first identified case of Minamata Disease. Minamata Disease is a toxic disease which affects the nervous system and is caused by methyl mercury. The Chisso Minamata plant was using non-organic mercury as a catalyst in the acetaldehyde manufacturing process. The catalyst generated a slight amount of methyl mercury which was discharged into the sea. It accumulated in fish through biological concentration. Heavy consumption of these fish caused Minamata Disease in humans.

Similar symptoms were discovered in patients near the Agano River in Niigata Prefecture in 1960. This disease was called Niigata-Minamata Disease. In this case, the cause of the disease was the methyl mercury disposed of by the Kanose plant of Showa Denko K.K. located upstream on the Agano River.

There were around 3,000 legally-certified victims of both Minamata and Niigata-Minamata Diseases in total and the damages (to the health of the victims due to contamination of bottom sediment, and to fisheries) are estimated to amount to ¥378.9 billion in total.

The Supreme Court decided that such diseases and damages were the responsibility of the national and Kumamoto Prefectural governments because they neglected to enforce regulation (Minamata Kansai lawsuit case, 2003). Today, five damage suits are pending (filed by about 1,500 plaintiffs) demanding the relief of about 20,000 victims.

(2) Itai-Itai Disease

Itai-Itai Disease is a pollution disease that frequently occurred in the watershed of the Jintsugawa River in Toyama Prefecture. It became noticeable in the mid-1950s. The name “Itai-Itai” (Ouch! It hurts!) comes from the fact that patients of this disease suffer severe bone pain and always cry “Itai, itai!” It was found that this disease was caused by ingesting rice or water contaminated by cadmium over an extended period of time. Kamioka mining plant owned by Mitsui Mining & Smelting Co., Ltd. upstream on the Jintsugawa River had been discharging, without pre-processing, effluents containing cadmium after refining zinc, causing the contamination of water and soil.

The Law Concerning Pollution-Related Health Damage Compensation and Other Measures specified Itai-Itai Disease as one of the designated diseases to be awarded compensation for medical treatment expenses, etc., to certified patients. The legally-certified victims amount to 195, and they are still increasing as of 2008. The damages, including those to health and agriculture, are estimated to amount to ¥50.7 billion.

How pollution diseases were addressed

The conflict between fishermen and the paper plant over the fishery damages caused by effluents from the plant in 1958, as mentioned above, led to enactment of the Water Quality Control Law and the Factory Effluent Control Law, which are called the “former two water quality control laws”) in the same year.

These laws ordered the national government to establish water quality standards for public waters designated by it and to impose regulation on factories’ effluent.

However, these laws were enforced in such a way that further problems occurred. First problem is that the water area was designated after polluted. Second problem is that the laws had another purpose: to harmonize the health of citizens and preserve the living environment with industrial development, securing water quality to the point where the benefits of victimizing and victimized industries were in harmony. Accordingly, they were not sufficient from the point of view of pollution regulation.

As a result, degradation of quality in public waters became observed in other cities in various districts as industrial development even after the former two water quality laws were enacted.

Growing momentum of citizens’ movements

Frequent occurrence of environmental problems attracted wide attention from common people, leading to citizen movements.

In 1960, there were widespread protest movements, including citizen rallies and signature campaigns against a petrochemical complex planned for the Numazu area of Mishima City, eventually forcing the plan to be cancelled in 1964.

Efforts in overcoming pollution

Conflict between prevention of pollution and economic growth

When promoting anti-pollution measures, it is important to solve the burden of costs required for mitigating/preventing pollution. In principle, such costs should be paid by the enterprises that generate contaminants. However, it was often stressed that the cost of anti-pollution facilities did not directly contribute to production and would also be a burden to industries. Therefore, anti-pollution measures were believed as a factor obstructing industrial development in Japan where small and medium-scale enterprises accounted for the majority of all enterprises. As a result, the Japan Pollution Control Corporation was established in 1965 as an agency specializing in aiding the cost for prevention of pollution.

Also in 1967, the Basic Law for Environmental Pollution Control was enacted under the concept that individual and first-aid-type regulations as intended under the former two water quality control laws were insufficient, and that it was important to declare the basic principles of anti-pollution measures and to promote such measures comprehensively and uniformly. The Law declared that the prevention of pollution was very important for securing the healthy and cultural life of citizens, establishing the “polluter-pays” principle and the environmental standards which served as administrative targets. The Law was superseded by the Basic Environment Law enacted in 1993, which took over almost all of the contents of the former Law.

“Pollution session of the Diet” and establishment of Environment Agency

The national government made active efforts in taking measures against pollution since the Basic Pollution Control Law was enacted. Given the fact that the sections in charge of taking the measures covered many ministries, the government established Pollution Control Office headed by the prime minister in July, 1970, to enforce the laws more powerfully. Under the leadership of the Office, new efforts were started in order to develop a legal system for pollution prevention.

In an extraordinary Diet session in 1970, pollution problems were front and center in response to the then public demand for anti-pollution measures and high public interest in the problems. This session of the Diet was called the “Pollution session of the Diet.” The national government submitted fourteen bills, including an amendment to the Basic Pollution Control Law and the Water Pollution Control Law, all of which were approved and enacted by the Diet. Those bills featured: (1) Deletion of a clause providing for harmonization with the economy. This clause was deleted to cast aside the public’s skepticism that the former laws might have put priority on the economic development over pollution control measures; (2) Introduction of national-wide regulations instead of regulations only in designated areas and also strengthening regulations by adding to the number of substances. This was applied to Air pollution and water pollution control; (3) Strengthening the power and authority to local governments. Substantially, all authority over business operators was delegated to local

municipalities, and the provisions for additional regulations were made to reinforce the authority of the local municipalities.

In addition, the Pollution Control Office was resolved developmentally, with the Environment Agency established in July, 1971.

New system of pollution control measures

The Water Pollution Control Law was enacted superseding the former two water quality laws, after they were reflected upon. The Law may be summarized briefly as follows: (1) The Law aimed to prevent contamination of public waters, thus protecting citizens' health and preserving their life environment, by regulating the effluents discharged by factories and business establishments into public waters; (2) The regulation covered the effluents discharged by the factories or business establishments having specific facilities, which might be specified not only in the manufacturing industries but also in any other industries; (3) The standards for effluent regulation covered all the public waters from the viewpoint of the prevention of water contamination in advance, and, if the standards were considered to be insufficient for any public waters, a prefecture might issue an ordinance adding stricter standards; (4) To ensure compliance with regulation, the Law provided requirements for the reporting of the installation, etc., of the specified facilities, the issuance of orders to change the plan reported, the issuance of orders to improve the waste water treatment processing method, and so on. In addition, the Law provided a direct penalty system in which any violation of the effluent standards would result in immediate punishment; (5) The Law provided that a governor of a prefecture could order a factory or business establishment to reduce the volume of effluents discharged into the public waters or to take other measures if contamination increased due to exceptional drought or other reasons; (6) The Law obligated the governors of prefectures to vigilantly monitor the levels of contamination in public waters and to make this information available to the public.

To enhance the anti-pollution system, the staff of municipalities in charge of pollution prevention were increased (from about 300 in 1961 to about 12,000 in 1975, a 40 fold increase) and the budget for pollution prevention was also increased. (¥73.3 billion of the national budget in 1970 to ¥333.1 billion in 1975, that is about five fold increase). In 1972, 1,426 orders for improvement and 6,554 administrative directives were given to persons who violated the Law or regulations. But the direct penalty was imposed on only 13 violators, which was a rather small number. This shows that the administrative measures such as orders and directives, were adopted as final measures to enforce the anti-pollution regulations.

Efforts made by pollution generating enterprises

(1) Anti-pollution managerial system

Many of the factories obligated to comply with effluent regulations had no satisfactory system to prevent pollution. Accordingly, the Law Concerning the Improvement of Pollution Prevention Systems in Specific Factories was enacted in 1971, obligating those factories to establish a committee with experts in prevention of pollution.

(2) Pollution Control Agreement

These days, more and more enterprises, municipalities and citizens' organizations are entering into Pollution Control Agreements, which provide stricter regulation standards than the

government's, on-the-spot investigation, liability without fault, etc. The conclusion of such agreements is encouraged partly by the fact that an enterprise experiences difficulty in operating its factory without getting consent from the community as to location, and it can avoid unwanted protests by entering into such agreements.

(3) Increase in investment for anti-pollution measures

The enterprises' investment for anti-pollution measures increased substantially between 1967 and 1975 due to the long-term and low-interest fund that was made available by the Pollution Control Corporation or other related institutions, and that favorable tax policies were put into practice, including reduction of the fixed asset tax on anti-pollution facilities, reduction of the depreciation period, etc. (Table 1).

Table 1 Amount and ratio of investment for anti-pollution measures by the private sector
(on an actual payment basis)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Investment amount (in ¥100 million)	297	268	462	624	1067	1833	3057	3311	5147	9238
Investment ratio (in %)	3.1	2.9	3.5	3.7	5.0	5.8	7.6	8.6	10.6	15.7
	1975	1976	1977	1978	1979	1980				
Investment amount (in ¥100 million)	11783	9368	6277	4171	2960	3169				
Investment ratio (in %)	18.6	15.3	9.1	6.1	4.7	3.9				

Among the investments in facilities made by enterprises, the revision of production processes and reuse of industrial water to reduce effluent, made radically substantial contributions to cleaner water, more so than the contribution made by improved effluent processing technology at the so-called "end of the pipe."

Both anti-pollution investment and the ratio have declined since 1976. The reasons may include the fact that the measures taken by enterprises to comply with anti-pollution regulations have advanced, reaching a plateau. This fact shows that anti-pollution investment is not necessarily required infinitely.

Environmental restoration

The Sumida River flowing through central Tokyo had 60 ppm of BOD at one time because of increased effluents from factories and houses as mentioned earlier. It was said that the recovery of the original state of the river before the contamination might be impossible. Yet today, the river has been returned to life and became the "Face of Tokyo" by means of the regulation on effluents from factories, improved sewage systems, dredging of bottom sediment, and the introduction of cleaning water. In other districts as well, water quality has been improved substantially, achieving environmental standards at high achievement rates with the exception of some lakes, swamps and closed sea waters.

Conclusion

One of the lessons Japan has learned is that the earlier the anti-pollution measures are taken, the better the result (Table 2). Once damages are incurred, they require costs for compensation, etc. Taking preventive measures is much more economical as shown in the table below.

Table 2 Comparison of damages from pollution and costs for anti-pollution measures

Pollution cases	Damages (yearly)	Cost of measures (yearly)
Minamata Disease	About ¥12.6 billion	About ¥100 million
Itai-Itai Disease	About ¥2.5 billion	About ¥600 million
Yokkaichi Asthma	About ¥1.3 billion * About ¥21 billion if assumed that no measures were taken with damages increased.	About ¥14.7 billion

* The yearly figures shown above were calculated by the actual amounts of damages and costs of measures equalized (redemption in 15 – 30 years assumed) in 1989 yen.

Today, Asian countries are achieving noticeable economical growth. It is desired that they may not go through the same experience as Japan has, but overcome the problem of environmental degradation, and take measures against global warming, a new issue as well. For that purpose, Japan has set up the “Clean Asia Initiative,” and also will continue to promote the WEPA which is included in the initiative.

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