India

Industrial Pollution Control Project and Industrial Pollution Control Program

External Evaluator: Chiaki Nakamura

Field Survey: October 2004

1. Project Profile and Japan's ODA Loan

Region map of project site

One company that received capital investment from this project

1.1 Background

Key industries such as the heavy and chemical industries in India have faced numerous problems heretofore related to environmental conservation. There has been very little progress in capital investment in pollution prevention measures because of the funding difficulties involved, particularly when it comes to small and medium companies. After India's "New Economic Policy" was introduced in 1991, advances were made in modernization and industrialization, but on the other hand, industrial pollution became evident especially in large cities and surrounding areas. In particular, the city of Calcutta faced urban pollution that was as serious as the pollution in Mumbai and Delhi. Calcutta is located in the western part of the state of Bengal and possesses a scale of commerce and industry that rivals Mumbai.

Meanwhile, although there was a systematic framework in place for environmental policies in the form of both central and state pollution control boards, their supervision was far from sufficient due to these agencies' lack of ability to implement environmental studies and lack of ability to enforce laws and regulations.

The World Bank has actively carried out support in the field of industrial-related pollution including (1) strengthening the organization of the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCB) in 8 states[1], (2) stimulation of capital investment by individual companies for environmental improvement through two-step loans offered through development financial institutions, and (3) technical support for improving environmental measures provided to India's Ministry of Environment and Forests and to staff at financial institutions.

[1] The 8 states of Gujarat, Maharashtra, Tamil Nadu, Uttar Pradesh, Rajasthan, Madhya Pradesh, Karnataka, Andhra Pradesh.

Given the current state of industrial pollution in India and the World Bank's support in the field of industrial pollution as stated above, this project was requested as a cooperative loan in the broad sense with the World Bank loan. In order to measure the progress of the project implementation and to measures the effects of the project independent of the World Bank's loan following project completion, it was decided to implement this project primarily in the western part of the state of Bengal.

1.2 Objective

The objective of this project was to promote the improvement of supervisory capacity and the law enforcement capacity of the staff of the West Bengal Pollution Control Board (WBPCB) by providing the necessary equipment for environmental data measuring and by conducting staff training, thereby contributing to the improvement of the environment in the western part of the state of Bengal. The objective was also to promote capital investment by companies for environmental improvement by offering two-step loans through the Industrial Credit and Investment Corporation of India (ICICI) to companies that are sources of pollution, thereby contributing to prevention of pollution caused by companies in India nationwide.

1.3 Borrowers:

(1) Organizational strengthening component and technological cooperation component: President of the Republic of India

(2) Capital investment for pollution measures component: Industrial Credit and Investment Corporation of India (ICICI)[2]

Executing Agencies:

(1) Organizational strengthening component and technological cooperation component: West Bengal Pollution Control Board (WBPCB) and the Central Pollution Control Board (CPCB)

(2) Capital investment for pollution measures component: Industrial Credit and Investment Corporation of India (ICICI)

(Supervisory Agency: Ministry of Environment and Forest)

1.4 Outline of Loan Agreement

	(1) Organizational strengthening component and technological cooperation component	(2) Capital investment for pollution measures component
Loan Amount/Loan Disbursed Amount	1,525 million yen/955 million yen	3,000 million yen/3,000 million yen
Exchange of Notes/Loan Agreement	December 1994/February 1995	
Terms and Conditions -Interest Rate -Repayment Period (Grace Period) -Procurement	2.6% 30 years (10 years) General Untied (Consultant portion partial untied)	

[2] Due to reorganization, the name of ICICI changed on March 31, 2002, from The Industrial Credit and Investment Corporation of India: (ICICI Limited) to ICICI Bank Limited.

Final Disbursement Date	April 2003	October 2002
Main Agreement	Advance Scientific Equipment (India), Omega Instruments (India), other local companies	
Consultant Agreement	National Thermal Electric Power Corporation (India), other local companies	

2. Results and Evaluation

2.1 Relevance

2.1.1 Relevance of the Plan at the Time of the Appraisal

In its Policy Statement for Abatement of Pollution (PSAP, 1992), the Indian Government declared the promotion of introduction of environmental equipment in small and medium companies and prevention of pollution at its source.

In particular, the industrial belt in western Bengal was the worst polluted area in India (Table 1), and in Bengal's environmental policy (1995), a policy of prevention of industrial pollution primarily in large cities was declared.

This was a project to promote capital investment by companies for environmental improvements and also to promote improvement of the supervisory capacity and the law enforcement capacity of the WBPCB. So, as a measure in response to the above issues, it was a project of high priority and pressing urgency.

Table 1: Comparison of Suspended Particulate Matter (SPM) Concentration (Unit: μ g/m^3・)

	Industrial Area	Commercial Area	Residential Area	Average
Western Bengal/Calcutta	554[*1]	904[*2]	n.a.	-
Delhi (1985)	488	439	294	407
Maharashtra/Mumbai (1985)	223	175	289	229
Tamil Nadu/Chennai(1985)	130	107	121	119
India's Environmental Standards (1989)	-	-	200	-

Note 1: Average concentration in Calcutta near Howrah Bridge (1989)
Note 2: Median average at B.B.D. Bagh in Calcutta (eastern Calcutta) (1992)

2.1.2 Relevance of the Plan at the Time of Evaluation

In India, environmental policies and environment-related laws have been established in rapid succession, including a solid waste management law (2000) and a noise regulation law (2001), and so prevention of industrial pollution continues to be an important policy.

In western Bengal as well, prevention of industrial pollution particularly in large cities is upheld as an important policy.

Consequently, because this project endeavours to promote capital investment by companies for environmental improvements and also to promote improvement of the WBPCB's supervisory capabilities and law enforcement capacity, it can be said that it continues to be of high importance.

2.2 Efficiency

2.2.1 Output

This project is composed the organizational strengthening component (executing agency: WBPCB)

and the technological cooperation component (executing agency: CPCB) as well as the capital investment for pollution measures component (executing agency: ICICI). The output of this project for the components is as follows

2.2.1.1 Organizational Strengthening Component and Technological Cooperation Component

(1) Construction of Offices Combined with Research Centers

The relocation and new construction of the WBPCB headquarters' offices combined with central research center to replace the facilities that had been spread out around Calcutta was implemented according to plan. Also, the relocation and new construction of regional offices combined with research centers for the two regions of Durgapur and Barrackpur was implemented according to plan.

(2) Purchase of Environmental Data Measuring Devices, etc.

The planning and implementation of the purchase of devices for water quality measurement and air pollution measurement are shown in Table 2.

Table 2: Number of Environmental Data Measuring Devices Purchased

	Planned	Actual
Water Quality Measuring Devices	40	64
Air Pollution Measuring Devices	23	54

Source: WBPCB

In addition to the originally planned measuring devices for the headquarters' offices and central research center, a need was recognized for devices to measure environmental data at the regional offices combined with research centers in the two regions of Durgapur and Barrackpur, and so the devices were added after the implementation of the project began.

(3) Implementation of Environmental Management Plan

1. Reorganization and Staff Increase

   The reorganization of research staff and the establishment of new departments accompanying the increase in equipment was implemented according to plan.

2. Expansion of Computers and Software, etc.

   Purchases were implemented basically according to plan for audio equipment necessary for expansion of public relations activities and for computers and software, etc., necessary for construction of a databank to record and analyze measured pollution levels.

3. Training for WBPCB Staff and Company Managers

   Training was implemented for the WBPCB staff so that they would be able to fully utilize the newly purchased equipment (total participants: 39). Training was also implemented for company managers to promote awareness of environmental problems. (Training held a total of 47 times with a total of 1,160 participants.)

4. Compilation of Basic Environmental Data

   Basic data was collected in 17 locations in Calcutta on air pollution, including suspended particulate matter (SPM), sodium dioxide (SO_2), and nitrogen oxide (NO_X), etc., and basic data was collected in 8 locations on the Hugli River concerning river water quality, including biological oxygen demand (BOD) and dissolved oxygen (DO), etc.

(4) Consultant Services

The consultant undertook preparation, etc., of the training programs for the WBPCB staff and company managers. However, the first consultant company which was first contracted required a large amount of time to procure equipment due to lack of experience. Because this caused delays, etc., the consultant's contract was cancelled, and the work was consigned to a different consultant company.

(5) Technological Cooperation Component

At the time of appraisal, it was planned (1) to have CPCB prepare a pre-investment study concerning the candidate loans for the project's capital investment for pollution measures component and also concerning installation of equipment for joint pollution measures, and (2) to have CPCB implement a study on loan formation similar to this project in other states. Following the start of this project, as stated below (2.2.2 Project Period), progress of the capital investment for pollution measures component was delayed due to economic stagnation in India which lowered the willingness of manufacturers to make environmental investments, and so problems arose such that the pre-investment study never started on borrower companies in the capital investment for pollution measures component. In response, the Japan Bank for International Cooperation (JBIC) undertook various efforts including implementation of the mid-term review study in 1998, but ultimately the technological cooperation component was not implemented.

2.2.1.2 Capital Investment for Pollution Measures Component.

The condition of implementation of the sub-loans to 11 borrower companies is as shown below (Table 3).

(1) Borrower Companies' Size and Loan Size

At the time of the appraisal, the size and years of existence of the borrower companies was not an issue. The size of the sub-loan borrower companies in terms of employees was 250 to 9,200 employees, with an average of approximately 2,873 employees. The size in terms of total assets was 824.7 million to 28,270 million rupees, with an average of approximately 6,120 million rupees. The total amount loaned was 2,996 million yen, ranging from 15 million yen to 1,029 million yen per company, for an average of 272 million yen per company.

(2) Distribution by Time Period

At the time of the appraisal, the maximum repayment period was set at 15 years, with a grace period of 4 years. However, the actual repayment period was 4 years to 10 years, with an average of 8 years, and so the loans were repaid within the original timeframe.

(3) Distribution by Region

At the time of the appraisal, companies in the western part of the state of Bengal were given priority.

However, loans were extended to borrower companies beyond western Bengal following the start of implementation, and in actuality borrower companies were distributed all over India. (3 out of 11 companies were in western Bengal.)

(4) Distribution by Industry

At the time of the appraisal, the type of industry of the borrower was not an issue. In actual implementation, various industries were selected, including paper manufacturing, textile, metal processing, pharmaceuticals, and cement, etc.

(5) Distribution by Usage

Rules at the time of appraisal concerning the equipment to which the sub-loans could be applied stated that “the corporate capital investment funds are to bring about a large, positive effect on the environment through recycling of discharged material, prevention of pollution, waste treatment, and clean technology, etc.” In actuality, the sub-loans were used for equipment for environmental measures involving end-of-pipe treatment of discharged material at 9 of the 11 companies, equipment repair at 6 companies, equipment for recycling discharged material at 3 companies, and installation of pollution monitoring equipment at 1 company.

(6) Financing Ratio, Sub-loan Interest Rate, Collateral, and Guarantee

As originally planned, the sub-loans were funded 100% by ODA loans. The interest rate level of this project was 12% to 13%, which was lower than ICICI’s lending rate of 15% to 17%. The loans were in the currency (rupees or yen) desired by the borrower companies. Material collateral such as machinery, buildings, and land, etc., and personal guarantees by managers, etc., were collected at the discretion of ICICI.

Table 3: Details of Sub-Loan Borrowers[3]

Classification	Total			
	Approved Loans		ODA Loans	
	Number of Loans	%	Amount	%
(1) Equipment Installed				
End-of-pipe treatment	9	82		
Equipment repair	6	55		
Equipment for recycling discharged material	3	27		
Pollution monitoring devices	1	9		
Total	11	100		
(2) Number of Employees at Borrower Companies				
Under 1,000	1	9		
1,000 - 2,000	2	18		
2,000 – 3,000	2	18		
3,000 – 4,000	4	36		
Over 4,000	1	9		
Unknown	1	9		
Total	11	100		
(3) Fixed Assets of Borrower Companies				
100 million – 1 billion rupees	2	18		
1 billion – 5 billion rupees	5	45		
5 billion – 10 billion rupees	2	18		
Over 10 billion rupees	2	18		
Total	11	100		
(4) Amount of Sub-Loan			million yen	
10 million – 50 million yen	2	18	64	2
50 million – 100 million yen	1	9	53	2
100 million yen – 500 million yen	6	55	1124	38
500 million yen – 1 billion yen	1	9	726	24
Over 1 billion yen	1	9	1029	34
Total	11	100	2996	100
Average			272.4	
(5) Period				
3 to 5 years	1	9		
5 to 7 years	4	36		
7 to 9 years	3	27		
9 to 11 years	3	27		
Total	11	100		
(6) Geographical Distribution of Borrower Companies			million yen	
Western Bengal State	3	27	475	16
Madhya Pradesh	1	9	129	4
Gujarat	2	18	1288	43
Karnataka	1	9	126	4
Andhra Pradesh	2	18	199	7
Rajasthan	1	9	53	2
Tamil Nadu	1	9	726	24
Total	11	100	2996	100
(7) Industry of Borrower Companies			million yen	
Paper manufacturing	3	27	538	18
Textile	2	18	178	6
Metal Processing	1	9	198	7
Pharmaceuticals	3	27	2014	67
Cement	2	18	68	2
Total	11	100	2996	100

[3] Diagonal lines on the table represent items for which data was unobtainable.

2.2.2 Project Period

2.2.2.1 Organizational Strengthening Component and Technological Cooperation Component

In the original plan, the consulting service was scheduled for completion by February 1999, but ultimately it was completed approximately 4 years behind schedule, in April 2003.

Construction of the offices combined with research centers was completed as planned, but there was a delay in equipment procurement due to the cancellation of the consultant contract and the contracting of a new consultant.

2.2.2.2 Capital Investment for Pollution Measures Component

In the original plan, the final disbursement date was scheduled for October 2000, but it was actually November 2001.

As the reason for the delay, it may be mentioned that there was a drop in the number of companies who were suitable borrowers in good financial standing because India's economy stagnated from 1996 to 1999 and manufacturers' willingness to make environmental investments declined. In addition, the continued drop in market interest rates on yen made the interest rate offered by this project less attractive.

Table 4: Planned and Actual Sub-Loans (million yen)

FY	Planned	Actual
1994	1,000	–
1995	1,000	–
1996	500	1,001
1997	500	208
1998		376
1999		–
2000		–
2001		1,226
2002		189
Total	**3,000**	**3,000**

Source: ICICI

However, as the Indian economy recovered from the latter half of 1999 and corporate finances improved, the willingness of companies to make environmental capital investments rose once again.

ICICI also prepared a system by establishing an environment contribution fund, etc., and promoting usage of ODA loans. Moreover, the number of borrowers increased due to the expansion of the geographical area to include borrower companies outside of western Bengal. So, the loan implementation schedule was extended two years because a recovery in the need for capital investment was forecast based on the above reasons (Table 4).

2.2.3 Project Cost

2.2.3.1 Organizational Strengthening Component and Technological Cooperation Component

The project cost was 1,192 million yen, which was 66% of the originally planned amount (of 1,795 million yen). The actual total project cost in local currency was 404 million rupees, which was approximately 76% of the original plan (of 534 million rupees). This was due to depreciation of the local currency that exceeded the rate of inflation and the fact the technological cooperation component was not implemented, etc.

2.2.3.2 Capital Investment for Pollution Measures Component

The project cost was as planned (at 3,000 million yen).

From the above, it can be said that there was basically no problem in the efficiency of this project's implementation overall. Delays were evident in the project period, but the output exceeded the planned

level and the project cost was less than originally planned.

2.3 Effectiveness

2.3.1 Organizational Strengthening Component

(1) Usage of Environmental Data Measuring Devices at the WBPCB

Figure 1: AAS (Central Research Center)

For this study, visits were made to the WBPCB's headquarters combined with central research center as well as to two regional offices combined with research centers. An inspection was made on the state of usage of the environmental data measuring devices and interviews were held with staff members. The results of this study show that the usage rate is high for the main equipment provided by this project, including the atomic absorption spectrophotometer (AAS), which was used daily, and the total organic carbon (TOC) meter, which was used 3 times per week. One factor that may be mentioned as promoting the usage of equipment provided by this project is the high proficiency of the staff in using the equipment. In this project, training on how to use the equipment provided by the project is conducted continually, and it may be said that the knowledge and techniques learned during training are being well utilized.

(2) Improvement of the WBPCB's Monitoring Capacity

Table 5 displays the improvement in the WBPCB's monitoring capacity due to the implementation of this project. According to the table, a striking improvement was shown, including large increases in monitoring personnel from 40 persons (FY94) to 118 persons (FY02), in companies monitored by the WBPCB from 5,950 companies (FY97) to 19,500 companies (FY02), and in water quality measurement stations from 21 locations (FY97) to 912 locations (FY02). It may be said that, due to the provision of equipment by this project, monitoring of companies and environmental monitoring was promoted.

Table 5: Improvement of WBPCB's Monitoring Capacity

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Monitoring Personnel (persons)	40	40	53	77	86	92	109	113	118
Companies Monitored (companies)	-	-	-	5,950	6,200	7,100	9,000	12,000	19,500
Water Quality Measurement Stations	-	-	-	21	21	53	67	146	912

Source: WBPCB

(3) Promotion of Environmental Education and Dissemination of Public Information Concerning the Environment by the WBPCB

As pollution prevention measures, the WBPCB is disseminating information concerning the environment and environmental education to the general public, in addition to carrying out the above-mentioned monitoring. Also, a complaint desk has been set up within the WBPCB for complaints about the environment from ordinary residents. Every month, the complaint desk receives between 150 to 200 complaints concerning air and noise pollution, and it takes swift measures in response. (The number of complaints

concerning the environment dropped from 2,330 (FY97) to 1,835 (FY02)). Moreover, public hearings are held regularly (every Saturday) to resolve complaints about the environment from ordinary citizens, and these hearings are proving useful as a countermeasure for environmental problems.

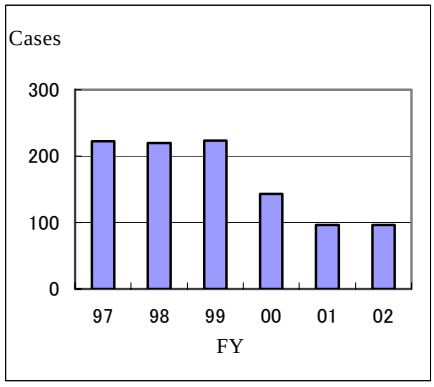
(4) Improvement of the WBPCB's Law Enforcement Capacity

The provision of environmental data by this project is contributing to environmental policy planning by the government for western Bengal (air pollution and noise prevention policies, etc.).

Also, due to the above-mentioned promotion of pollution prevention measures and pollution regulation measures, cases of legal action declined from 222 cases (FY97) to 96 cases (FY02) (Figure 2).

Furthermore, not only is the WBPCB implementing regulations, as stated above, it is also putting effort into training and dissemination of public information, making it a model for pollution control boards in other states. The WBPCB is accepting trainees from other states and is actively advancing efforts to alleviate environmental problems

Figure 2: Changes in Number of Cases of Legal Action (Cases)



Source: WBPCB

2.3.2 Capital Investment for Pollution Measures Component

Verification of the actual effects of pollution prevention, control, and reduction at individual companies was conducted through an impact evaluation[3] funded by the executing agency. Below are the results of the impact evaluation that relate to the effectiveness of the capital investment for pollution prevention component and the results of the beneficiary survey[4] of this study.

(1) Installation and Operation of Environmental Equipment at Borrower Companies

This study was unable to obtain sufficient information on the condition of the installation and operation of environmental equipment at borrower companies. However, according to the results of the impact evaluation, 2 out of the 11 borrower companies were behind schedule in installing their equipment, but it was surmised that the condition of installation and operation of environmental equipment at the remaining 9 companies was

[3] Impact Evaluation Report by Environmental Management Centre Mumbai, August, 2004.
[4] A questionnaire was sent to all 11 companies. Because the borrower companies were spread all over India and because the time period of the field survey was limited, one company in western Bengal (Graphite India) was selected for inspection from among all the companies in the survey.

favorable.

(2) Environmental Effects of Environmental Equipment at Borrower Companies

In this project, 9 out of 11 companies installed environmental equipment related to end-of-pipe processing at the discharge stage. Among those, at companies that installed electrostatic precipitators (West Coast Paper Mill, Graphite India, Tata Chemicals, etc.), it was reported that the effluent load was reduced to less than 50 μ g/m^3, whereas the discharge standard was 150 μ g/m^3 for discharge of particle material.

Also, together with reducing the effluent burden by installing environmental equipment in the borrower companies and improving observance of environmental regulations, this project is contributing to improvements in the health of plant workers and surrounding residents.

Figure 3: ESP* Equipment (Graphite India)

*Equipment for treatment of plant's smoke emissions

(3) Cost Reduction at Borrower Companies

Installation of environmental equipment by this project is contributing to improved resource conservation and recycling of wastes; thus, reducing costs in long-term. Reported examples include a borrower company (Sirpur Industries) that reduced water consumption from 260m^3/ton to 200 m^3/ton by repairing bleaching equipment and coal washing equipment and another borrower company (Sagar Cement Limited) that saved 24 million rupees annually due to more energy-efficient equipment.

To summarize the above, in the organization strengthening component and the capital investment for pollution measures component, this project attained a fairly high level of achievement of its objectives in "improvement of supervisory capacity and the law enforcement capacity of the staff" and "promotion of capital investment by companies for environmental improvement."

2.4 Impact

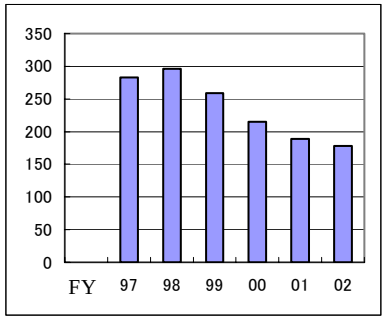
2.4.1 Organizational Strengthening Component

(Western Bengal)

(1) Reduction of Air Pollution

The WBPCB monitors the air pollution year round at 27 measurement stations in western Bengal. Figure 4 shows the trends in the SPM (suspended particulate matter) level in Calcutta during the winter months when air

Figure 4: Trends in Calcutta's SPM Level (μ g/m^3)



Source: WBPCB

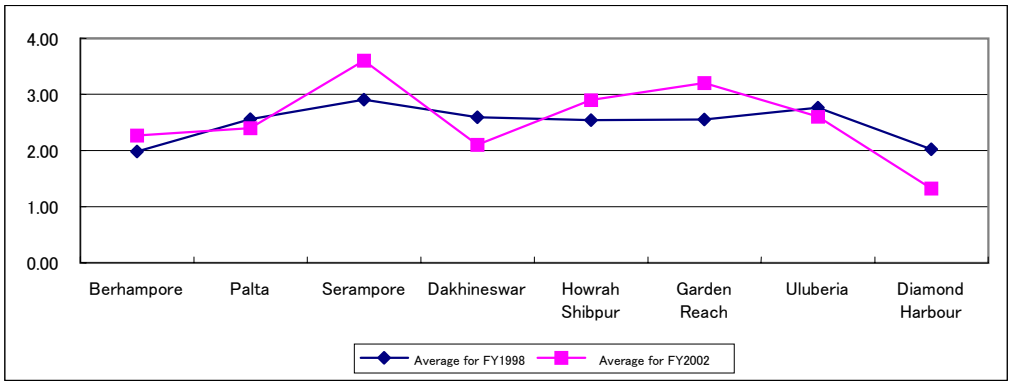
pollution is at its worst. According to the table, SPM dropped from 283 μ g/m^3 in FY1997 to 178 μ g/m^3 in FY2002.

Furthermore, as a part of its regulation of auto emissions, the WBPCB is implementing training for Traffic Department staff and for police officers involved in actual enforcement of the regulations. After receiving training from the WBPCB and recommendations from the study results concerning air pollution, the Traffic Department is implementing programs to alleviate air pollution and noise and is promoting a switch from coal to oil as boiler fuel, etc. Through endeavors such as these, air pollution in Calcutta appears to be headed toward improvement.

(2) Reduction of Water Pollution

The WBPCB is monitoring water quality at eight measurement stations located along the Hugli River from its upper reaches to its lower reaches in western Bengal. Figure 5 shows the results of monitoring of BOD concentration in the Hugli River. According to the table, the average concentration at the measurement station was 2.2 mg/l in FY1998 and 2.54 mg/l in FY2002. Although the BOD concentration has risen slightly, it is still within the environmental standard level (set at 3 mg/l).

Figure 5: Fluctuations in BOD Concentration in the Hugli River (mg/l)



Source: WBPCB

(3) Reduction of Other Environmental Pollution

Other impact that may be mentioned is the strengthening of measures against noise pollution.

The standards prescribed in the noise pollution law for industrial areas (FY2000) sets the daytime level at 75 decibels and the nighttime level at 70 decibels.

To deal with the noise pollution which was serious in urban areas of western Bengal, the WBPCB has endeavored to reinforce noise countermeasures, including training and implementation of a public campaign against indiscriminate usage of loudspeakers and

firecrackers during festivals. Due to these efforts, the noise level has declined, with the road traffic noise at 27 intersections in Calcutta dropping from 83.3 decibels in the summer of 1993 (April through June) to 71.3 decibels during the same period in 1999.

The estimated number of beneficiaries in this project is approximately 80 million persons[5] (i.e. 60% of Japan's population of approximately 130 million persons).

2.4.2 Capital Investment for Pollution Measures Component

(1) Contribution to Pollution Prevention by Companies in Western Bengal

After receiving the recommendations of JBIC's mid-term review study, the WBPCB and the western Bengal office of the Ministry of Environment and Forest acted cooperatively to implement publicity activities, including seminars for companies concerning the usage of loans for capital investment in environmental measures. The environmental investment that was financed by this project in western Bengal was smaller than initially planned. However, progress is being made in pollution prevention by companies in western Bengal as shown in the reduction of air pollution in Calcutta, the legal countermeasures for pollution, and the decline in the number of complaints. Thanks to these publicity activities, more effects from pollution prevention can be expected in the future.

(2) Contribution to Pollution Prevention by Companies Across India

Through seminars held by ICICI concerning this project, other companies are learning about the companies that have already implemented capital investment in pollution measures, and the other companies are beginning the same type of investment. So, pollution prevention measures are beginning to spread to other companies. (See examples in box below.)

-Impact Evaluation Result-

-Contribution to Pollution Prevention by Companies across India-

Triggered by the example of a borrower company (Shree Cements) in this project that succeeded in using coke as a substitute for coal, cement companies in Gujarat, Rajasthan, Jammu Kashmir, and Tamil Nadu are promoting usage of coke as a substitute for coal.

Also, the example of a borrower company (Orchid Chemicals and Pharmaceuticals) in this project that recycled collected solvent was featured in many seminars and journals, etc., and as a result, recycling of collected solvent spread to pharmaceutical companies, etc., in Hyderabad.

[5] Population of western Bengal (2001 National Census data).

2.5 Sustainability

2.5.1 Organizational Strengthening Component

(1) Operation and Maintenance System and Technical Capacity

The WBPCB is an agency that was established in 1974 based on the water pollution regulation law, and it is in charge of promoting improvements in water and air quality in western Bengal. Headquartered in Calcutta, the WBPCB has regional offices combined with research centers in Durgapur, Barrackpur and Haldia [6].

According to the executing agency's interview study, cooperation is being promoted and no problems have been reported among the headquarters combined with the central research center and the two regional offices combined with the research centers in Durgapur and Barrackpur.

There were also no technical problems visible following the conclusion of this project in the operation and maintenance of the machinery, materials, and equipment because various forms of training for staff are continually implemented concerning air quality management, industrial waste management, and environmental data bases, etc.

(2) Financial Status

According to the financial statements of the WBPCB, there is income from inspection fees and sales of publications to the agencies concerned, but the amount is inconsequential. Consequently, the majority of the WBPCB's financial needs are met with state budget allocations. Henceforth, operation and maintenance costs are forecast to increase, but the stable apportionment of the operation and maintenance budget from the government is expected.

(3) Operation and Maintenance Status

In the operation and maintenance sector, operation and maintenance of the machinery and materials is being implemented appropriately, in accordance with the operation and maintenance manual. Also, no problems have occurred with replenishment of spare parts.

2.5.2 Capital Investment for Pollution Measures Component

2.5.2.1 Sustainability of Two-Step Loans

Table 6 displays the condition of cash collection from the 11 borrower companies. According to this table, the collection rate (collected amount/amount of principle and interest due) is high[7], at 87% to 100%.

[6]This project relocated and built the regional offices combined with research centers in Durgapur and Barrackpur.

[7] Because the collection rate is low for FY2000, at 34%, but high for FY2001, at 134%, it is surmised that amounts due in FY2000 were collected in FY2001.

Table 6: Condition of Cash Collection (million rupees)

	1997	1998	1999	2000	2001	2002	2003
Amount of Principle and Interest Due (a)	7.2	23.6	38.5	90.0	63.0	745.2	253.3
Amount Collected (b)	7.2	20.6	34.1	30.6	84.3	97.0	226.5
Cash Collection Rate (b)/(a)	100.0	87.0	89.0	34.0	134.0	97.0	89.0

Source: ICIC

Table 7 displays the condition of sub-loan collection for non-performing loans (number and amount) (hereinafter referred to as "NPL"). The percentage of NPLs is 38% and the amount of NPLs is 14% in the most recent figures, for 2003. The cause of the gap in the figures for the number and amount of NPLs is that two of the borrower companies went into default on financial obligations, and during the latter half of the project, loans were made to these companies. ICICI has already reached a settlement with these companies concerning collection of the said financial obligations.

Table 7: Condition of Sub-Loan Collection (million rupees)

	1997	1998	1999	2000	2001	2002	2003
Number of claims (a)	1	4	4	4	9	9	8
Claims in Arrears	0	2	2	3	2	3	3
NPL (number) (%) (b)/(a)	-	50	50	75	22	33	38
Claim Balance (c)	0.0	0.0	14.5	68.5	28.3	542.3	132.9
Balance of Claims in Arrears (d)	0.0	3.0	4.4	59.6	40.2	21.9	22.2
NPL (amount) (%) (d)/(c+d)	-	-	23	47	59	4	14

Source: ICIC

Furthermore, ICICI is planning to establish a special account (revolving fund (R/F)) that uses as capital the funds repaid from the end users. With this special account, ICICI plans to extend new loans under schemes similar to this project. Preparations are currently underway for the establishment of this revolving fund.

2.5.2.2 ICICI

(1) Operation and Maintenance System and Technical Capacity

ICICI has 452 branches across India, in addition to its headquarters in Mumbai, and it is the second largest bank in India. There are no problems with its staff or its technical expertise.

Also, ICICI implements numerous appraisals for the World Bank and the Asian Development Bank (ADB). There are no problems as its appraisal capabilities and project activities are highly evaluated.

(2) Financial Status

ICICI mainly handles medium- and long-term financing for project finance. Among the financial institutions in India where the ratio of bad loans is high, ICICI’s management is extremely sound and there are no problems.

2.5.2.3 Borrower Companies

(1) Operation and Maintenance System and Technical Capacity

There is basically no problem in the operation and maintenance system and technical capacity. In this study, a visit was made to only one of the borrower companies, but borrower company's facilities that were visited for this study were operating smoothly. No technical problems were visible.

(2) Financial Status

Two of the 11 companies are in behind in their repayment schedules, but there are no problems with the other companies.

(3) Operation and Maintenance Status

Since borrowing the sub-loans, the operation of the companies is satisfactory as seen in the application of some to acquire ISO certification and cases of independent implementation of monitoring, etc. No problems have occurred in operation and maintenance.

3. Feedback

3.1 Lessons Learned

None

3.2 Recommendations

None

Comparison of Original and Actual Scope

1) Organizational Strengthening Component and Technological Cooperation Component

Item	Planned	Actual Performance
1. Output		
1) Construction of offices combined with research centers	Headquarters combined with central research center and regional offices combined with research centers in Durgapur and Barrackpur	As planned
2) Purchase of environmental data measuring equipment, etc.	40 water quality measurement devices; 23 air quality measurement devices	64 water quality measurement devices; 54 air quality measurement devices
3) Implementation of Environmental Management Plan		
1. Reorganization and increase in staff	1. Reorganization of staff; creation of new departments	1. As planned
2. Expansion of computers, etc.	2. Increase in computers, etc.	2. Basically as planned
3. Training for WBPCB staff and corporate managers	3. No plan	3. 47 training session for staff and corporate managers
4. Collection of basic environmental data	4. No plan	4. Collection of basic environmental data on SPM、SO_2、NO_X, etc.
4) Consulting Service	Design of training program, etc.	Basically as planned
5) Technological Cooperation Component (CPCB)	No Plan	Not Implemented
1. Preparation of a pre-investment study on candidate loans for the capital investment for pollution measures component, etc.		
2. Study on formation of loans similar to this project in other states		
2. Project Period		
1) Construction of offices combined with research centers	July 1994- September 1998	July 1994 – April 2000
2) Purchase of environmental data measuring equipment, etc.	July 1996 – February 1999	July 1997 – April 2003
3) Implementation of Environmental Management Plan	January 1996 – February 1999	July 1997 – March 2003
4) Consulting Service	July 1995 – February 1999	July 1995 – April 2003
5) Technological Cooperation Component (CPCB)	July 1994 – March 1998	-
3. Project Cost		
Foreign Currency	1,052 million yen	526 million yen
Local Currency	743 million yen (221 million rupees)	666 million yen (226 million rupees)
Total	1,795 million yen	1,192 million yen
ODA Loan Portion	1,525 million yen	955 million yen
Exchange Rate	1 rupee ＝3.36 yen	1 rupees ＝2.95 yen

2) Capital Investment for Pollution Measures Component

Item	Planned	Actual Performance
1. Output (sub-loans)	3,000 million yen	3,000 million yen
2. Project Period	February 1995 – October 2000	February 1995 – November 2001
3. Project Cost	3,000 million yen	3,000 million yen