

## Ex-ante Evaluation

<b>1. Name of the Project</b>
Country: India Project: Kolkata Solid Waste Management Improvement Project (Loan Agreement: 03/31/2006; Loan Amount: 3,584 million yen; Borrower: The President of India)
<b>2. Necessity and Relevance of JBIC's Assistance</b>
<p>In India, water usage is increasing together with the growth in population. Reliance on groundwater is lowering the groundwater level, leading to a serious imbalance in the supply and demand of water. As a result of the sudden population influx in urban areas and industrialization, the discharge of waste exceeds disposal capacity, and raw sewage is discharged into rivers in amounts that far exceed the self purification capacity. As a result, the public health and living environment of local residents are threatened by diarrhea and hepatitis, etc., that are caused by the polluted water.</p> <p>The 10<sup>th</sup> 5-Year Plan (April 2002-March 2007) by the Government of India proposes to supply adequate and safe drinking water to the entire population, to clean up the major polluted rivers and to improve the river catchment area environment, and to immediately establish sanitary landfills. Moreover, India's Ministry of Environment and Forests issued an order in October 2000 that makes obligatory the construction of appropriate waste disposal facilities by urban local bodies for waste management for the improvement of the public health environment. In the current Programme called as Common Minimum Programme as well, there is a public commitment to expansion of public investment in this sector.</p> <p>In JBIC's current Medium-Term Strategy for Overseas Economic Cooperation Operations, a priority sector in assistance to India is "Environmental Improvement." The assistance provided by this project is consistent with the strategy.</p> <p>Located in eastern India, metropolitan Kolkata has a population of 15 million and includes the City of Kolkata, the capital of the State of West Bengal, and it also contains the Kolkata Port, one of India's major ports. A former British colony, it has developed into an economic and industrial hub of the state. However, appropriate measures have not been taken for the rapidly increasing volume of solid waste generation, and the living environment of local residents is threatened by bad odors and unsanitary conditions. In contrast to the direct landfill disposal practiced hitherto, this project will establish sanitary solid waste management facilities and boost the 3R (reduce, reuse, recycle) principle through introduction of segregation of types of waste and composting, and therefore JBIC's assistance is highly necessary and highly relevant.</p>
<b>3. Project Objectives</b>
The objective of this project is to promote appropriate solid waste management by developing sustainable regional solid waste management system including sanitary landfill site in the selected municipalities of Kolkata Metropolitan Area, thereby improving living environment and hygienic conditions of the people in the region and safeguarding natural environment.
<b>4. Project Description</b>

(1) Target Area

Kolkata metropolitan area State of Western Bengal

(2) Project Outline

(a) Municipal solid waste Construction of management facilities: transfer stations, compost plants, and regional landfill site, improvement of collection system, introduction of collection system for slum areas, and improvement of access roads

(b) Consulting services (including educational activities related to the environment)

(3) Total Project Cost/Loan Amount

4,239 million yen (Yen Loan Amount: 3,584 million yen)

(4) Schedule

February 2006 – November 2010 (58 months)

(5) Implementation Structure

(a) Borrower: The President of India

(b) Executing Agency: Kolkata Metropolitan Development Authority (KMDA)

(c) Operation and Maintenance System: KMDA will be in charge of regional landfill site, transfer stations, and compost plants. Each municipality will be in charge of its own collection system.

(6) Environmental and Social Consideration

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category B

(ii) Reason for Categorization

This project is classified as Category B because, as a project in the waste treatment and disposal sector, the project is not large scale based on the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002), and so it has been determined that the project will not have significant adverse environmental impact. Moreover, the project does not have characteristics likely to exert impact nor is it located in a sensitive region as determined by the above-mentioned guidelines.

(iii) Environmental Permit

The EIA report is not required for the project in India’s relevant regulation.

(iv) Anti-Pollution Measures

Bad odors will be prevented at the regional landfill site by covering waste with soil, and leachate will be appropriately collected and treated. So, no significant adverse impact is foreseen.

(v) Natural Environment

The project site is not located in or around any sensitive areas such as nature preserves, and it is likely to have a minimal adverse impact on the natural environment.

(vi) Social Environment

The project requires land acquisition of about 21.9 ha, which will be implemented in accordance with the India's procedures. The project will involve the resettlement of one household, and a resettlement site has been provided in the vicinity. With regard to existing scavengers, appropriate measures will be examined following an additional study by the project's consulting service.

(vii) Other/Monitoring

KMDA will monitor the quality of the groundwater around the regional landfill site of the project.

(b) Promotion of Poverty Reduction

A waste collection system will be introduced in slum areas that have no collection system, to support improvements in the living environment of the urban poor.

(c) Promotion of Social Development (e.g. Gender Perspective)

-The project will promote the hiring of scavengers in the solid waste management system developed by the project. Also, with the cooperation of local NGOs and community groups, support will be provided to systematically subcontract the solid waste collection from private apartments to scavengers.

-In cooperation with local NGOs, community groups, and educational institutions, reduction of solid waste and efficiency in the management system will be promoted by raising public awareness on the environment through environment-related education program incorporating the 3R principle.

(7) Other Important Issues

None

**5. Outcome Targets**

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2004)	Target (2011, 1 years after completion)
Compost plant input (tons/year)	-	20,000
Waste disposal volume (tons/year)	94,000	64,000
BOD concentration of effluent (mg/l) (leachate treatment plant)	-	<100
BOD concentration of effluent (mg/l) (septic tank sludge treatment system)	-	<30
Percentage of waste collected (% of households collected)	-	75

(2) Economic Internal Rate of Return: 13.6%

(a) Cost: Project cost (excluding tax), operation and maintenance expense

(b) Benefit: Cost saving from difference of construction between one integrated system and six different facilities for six cities, reduction of drainage cleaning cost as a result of the project,

reduction of waste thrown into the excavated drainage, increased willingness to pay for the improved solid waste collection and management services, income from compost sales, reduction of CO<sub>2</sub> emissions.

(c) Project Life: 16 years

#### **6. External Risk Factors**

Economic stagnation/deterioration in India and the surrounding area of the project as well as natural disasters

#### **7. Lessons Learned from Findings of Similar Projects Undertaken in the Past**

In the ex-post evaluation of similar projects in the past, it has been learned that it is necessary to recognize the issues involved as a part of comprehensive urban development, without becoming biased toward technological schemes for waste management, and to coordinate the interests of related organizations at every level from the initial stages. In this project, because it is a project for regional waste management, detailed discussions have been held with the state government and the six municipalities. A plan for improvement has been proposed premised on the existing waste collection system, and waste transportation routes have been decided.

Moreover, just as in sewerage projects, it has been learned that it is necessary to confirm the financial status to ensure that operation and maintenance cost can be met following completion of the project. In this project, to cover part of the operation and maintenance cost, it has been decided with the executing agency to introduce service charge for solid waste management and to raise them progressively.

#### **8. Plans for Future Evaluation**

##### (1) Indicators for Future Evaluation

- (a) Compost plant input (tons/year)
- (b) Waste disposal volume (tons/year)
- (c) BOD concentration of effluent (mg/l) (leachate treatment plant)
- (d) BOD concentration of effluent (mg/l) (septic tank sludge treatment system)
- (e) Economic internal rate of return (EIRR) (%)

##### (2) Timing of Next Evaluation

After project completion