

Ex-ante Evaluation

1. Name of the Project
Country: India Project: Bangalore Water Supply and Sewerage Project (II-2) (Loan Agreement: 03/31/2006; Loan Amount: 28,358 million yen; Borrower: The President of India)
2. Necessity and Relevance of JBIC's Assistance
<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 10th 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. Based on this, in the National Water Policy (April 2002), Ministry of Water Resources aims to give priority to the allocation of water resources for drinking water, irrigation, and hydroelectric power, in that order. Ministry of Environment and Forests also has been working on cleaning up of rivers and lakes, starting with the River Ganga in 1985 and is in the process of construction of sewerage facilities under the National River Conservation Plan and the National Lake Conservation Plan. In the current Programme called as Common Minimum Programme as well, there is a 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>Bangalore, with a population of 5.7 million (2001), is an important city as it is the state capital of Karnataka in southern India and it has been undergoing rapid development recently as the center of India's software industry. To provide a stable water supply to cope with the large increase in water demand, development of additional water supply facilities and the corresponding sewerage treatment facilities is indispensable, and so JBIC's assistance is highly necessary and highly relevant. Furthermore, this project is the second phase of the fourth development plan for the water supply system that uses the Cauvery River as a water source, and this project will install the corresponding sewerage facilities to meet water demand in 2011, in conjunction with the increase in water supply capacity implemented through the first phase of the fourth development plan (in the previous JBIC projects, Bangalore City Water and Sewerage Development Project (approved FY1995) and the Bangalore Water Supply and Sewerage Development Project (II-1) (approved FY2004)).</p>
3. Project Objectives
The objective of this project is to provide reliable supply and sewerage services by augmenting the water supply from River Cauvery and sewerage system, thereby improving living conditions and developing the industry in the Bangalore metropolitan area, the capital of the State of Karnataka.
4. Project Description

(1) Target Area

Bangalore metropolitan area, State of Karnataka

(2) Project Outline (The target of this yen loan is (a) construction of reservoirs and improvement of distribution network and (b) construction of sewerage facilities)

(a) Water supply facilities: Raw water transmission pipelines, water treatment plant (500,000 m³/day), clear water transmission pipelines, pumping stations, construction of reservoirs, and improvement of distribution network

(b) Sewerage facilities: Sewer lines, pumping stations, construction of sewerage treatment plants (11 plants/total capacity of 403,000 m³/day)

(c) Management improvement: Training, public relations and awareness activities, installation of a supervisory control and data acquisition system (SCADA), improvement of the tariff collection system

(d) Slum development: Development of distribution pipes and lateral sewerage pipes

(e) Consulting services

(3) Total Project Cost/Loan Amount

84,172 million yen (Yen Loan Amount: 70,355 million yen)

(4) Schedule

May 2005 – March 2013 (95 months)

(5) Implementation Structure

(a) Borrower: The President of India

(b) Executing Agency: Bangalore Water Supply and Sewerage Board (BWSSB)

(c) Operation and Maintenance System: Same as (b)

(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 it was determined that the project will not have any significant undesirable impact on the environment given that the characteristics of the sector is not likely to exert impact, and the characteristics of the region make it unsusceptible to impact, based on the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002). (Furthermore, this project is a loan that was requested when these guidelines were under development, and in the “JBIC Guidelines for Environmental Considerations in Yen Loans” (established October 1999) which were applied, this project is classified as Category B.)

(iii) Environmental Permit

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

(iv) Anti-Pollution Measures

No ground subsidence is foreseen due to intake of surface water from the Cauvery River for the water supply facilities, and the facilities such as the water treatment plant and pumping stations are designed with consideration for noise. Effluent from the sewerage facilities is treated to meet India's wastewater effluent standards and is to be discharged into rivers; no particular impact due to the discharging of the treated water is foreseen.

(v) Natural Environment

The project area is not in or near an area that is susceptible to impact, such as a nature preserve, and it is likely to have minimal adverse impact on the natural environment.

(vi) Social Environment

The project requires land acquisition of about 123 ha (47ha for water supply facilities, 76 ha for sewerage facilities), which will be implemented in accordance with the India's procedures. The project does not involve any involuntary resettlement.

(vii) Other/Monitoring

BWSSB will monitor the water quality, etc., of influent and effluent at the water supply and sewerage facilities of this project.

(b) Promotion of Poverty Reduction

Water and sewerage facilities are constructed in slum areas as a support for urban poor.

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

In the above-mentioned slum development component, the poor are participating as members of the water and sewage management committee and are in charge of operation and maintenance with the support of NGOs, and the participation by women as members is ensured. Public awareness activities that include gender issues are also being implemented for beneficiary groups.

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

(a) Water Supply

Indicator	Baseline (2003)	Target (2015, 2 years after completion)
Total population served (million persons)	4.016	7.42
Amount of water supply (m ³ /day)	810,000	1,310,000
Rate of facility utilization (%)	-	100
Non-revenue water rate (%)	36	16
Leakage rate (%)	31	13
Percentage of population served (%)	66.5	95

(b) Sewerage

Indicator	Baseline (2003)	Target (2015, 2 years after completion)
Total population served (million persons)	3.19	7.02
Amount of wastewater treated (m ³ /day)	408,000	1,111,000

Rate of facility utilization (%)	-	90
BOD concentration for each sewerage treatment plant (mg/l)	< 20	< 20
Percentage of population served (%)	53	90

(2) Internal Rate of Return

Financial Internal Rate of Return: 7.2%

- (a) Cost: Project cost, operation and maintenance expense
- (b) Benefit: Revenue from water supply and sewerage services
- (c) Project Life: 30 years

Economic Internal Rate of Return: 13.1%

- (a) Cost: Project cost (excluding tax), operation and maintenance expense
- (b) Benefit: Revenue from water supply and sewerage services, cost saving by switching from non-BWSSB water to BWSSB water
- (c) Project Life: 30 years

6. External Risk Factors

- (1) Economic stagnation/deterioration in India and the surrounding area of the project as well as natural disasters
- (2) Delay in implementation of water distribution and sewer network development for the 8 municipalities in the Bangalore metropolitan area

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 important to conduct rehabilitation of the existing water supply network and to conduct public relations and awareness activities concerning the project in order to enhance the effects of the project. In this project, rehabilitation of the existing water supply network is included in the water supply facilities development, and public relations and awareness activities for the residents are to be implemented.

It is also noted that it is necessary to study measures to strengthen management of the water services from the project formation and appraisal stage. In this project, it has been decided to take measures including those for reduction of non-revenue water rate, improvement of financial condition, human resources development, reinforcement of public relations and awareness activities, and participation of the private sector, etc.

Moreover, in the sewerage projects, it is considered necessary to confirm the financial status for the operation and maintenance costs after completion of the project as well as the availability of new investment funds. In this project, it was decided with the executing agency to raise water tariff to cover the operation and maintenance costs and a part of new investment costs. (Tariff raise implemented in March 2005.)

8. Plans for Future Evaluation

- (1) Indicators for Future Evaluation
 - (a) Total population served for water supply(million persons)
 - (b) Amount of water supply (m³/day)
 - (c) Rate of facility utilization (%)

(d) Non-revenue water rate (%)

(e) Leakage rate (%)

(f) Percentage of population served for water supply (%)

(g) Total population served for sewerage (million persons)

(h) Amount of wastewater treated (m³/day)

(i) Rate of facility utilization (%)

(j) BOD concentration for each sewerage treatment plant (mg/l)

(k) Percentage of population served for sewerage (%)

(l) Internal rate of return: EIRR (%), FIRR (%)

(2) Timing of Next Evaluation

After project completion