

Ex-ante Evaluation

1. Name of the Project

Country: India

Project: Goa Water Supply and Sewerage Project

(Loan Agreement: 09/14/2007; Loan Amount: 22,806 million yen; Borrower: The President of India)

2. Necessity and Relevance of JBIC's Assistance

In India, water usage is increasing together with the growth in population. Dependence on groundwater is reducing the groundwater level, leading to a serious imbalance in the supply and demand of water. Furthermore, until recently, no city in India had 24-hour water service. As a result of the sudden population influx in urban areas and industrialization, the discharge of wastewater exceeds the disposal capacity, and the raw sewage discharged into rivers far exceed the self purification capacity. As a result, the public health and living conditions of local residents are threatened by diarrhea and hepatitis, etc., that are caused by the polluted water.

The 10th 5-Year Plan (April 2002-March 2007) by the Government of India proposed 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. Based on this, in the National Water Policy (April 2002), Ministry of Water Resources aims to give priority to the allocation of water resources in the order of drinking water, irrigation, and hydroelectric power. 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 constructing sewerage facilities under the National River Conservation Plan and the National Lake Conservation Plan. In the current administration's Common Minimum Programme (May 2004) and Jawaharlal Nehru National Urban Renewal Mission (JNNURM) legislated in 2005, there is a commitment to expand public investment in urban infrastructure development, including water supply and sewerage facilities. Furthermore in JNNURM, large-scale subsidy from the central government is planned for urban infrastructure development, on the condition that state governments and municipalities implement managerial reforms, such as strengthening their financial structure and delivery of basic services to the urban poor.

In JBIC's current Medium-Term Strategy for Overseas Economic Cooperation Operations, the priority sectors for assistance to India are "Economic Infrastructure Development" and "Environmental Improvement." The assistance provided by this project is consistent with the strategy.

Goa State, which is situated close to the central part of the west coast of the Indian subcontinent facing the Arabian Sea, has a population of 1.4 million and is attracting a large number of foreign tourists every year (around 1.8 million in 2005). However, there are not enough water supply facilities (391,000 m³/day at the current level) to meet the rapidly increasing water usage brought about by the growth in population, increase in the number of tourists, and the rising living standard, resulting in a serious imbalance in the supply and demand of water. On the other hand, Goa State has a favorable natural climate condition and is relatively abundant in rainfall (about 3,000 mm/year). Also, it has already installed meters at all end-users that allow water tariff collection based on monthly water consumption. Thus, Goa is considered to have sufficient administrative and institutional capacities to manage water volume properly in each water distribution district and adopt

water saving measures, and thereby, the project is expected to become the model for realizing the first 24 hours x 7 days water supply service in India, having a head start over other states in the country. In addition, with regard to sewerage, since sewerage development has failed to catch up with population growth, only 13% of the urban residents have access to a sewage treatment system in Goa State (the average in India as a whole is 28%), thus resulting in the deterioration of the sanitation condition. Both water supply and sewerage systems have maintenance problems, including aging facilities and water leakages. There is an urgent need to adopt an appropriate management method for operation and maintenance including the prevention of leakages, and thus this project is highly necessary and relevant.

3. Project Objectives

The objective of this project is to provide safe and stable water supply and sewerage services that will meet the rapidly increasing water demand by expanding and rehabilitating water supply facilities in the existing Salaulim Water Supply Scheme and by constructing and expanding sewerage facilities in Margao, Mapusa and North Coastal Belt, thereby contributing to improvement of the living conditions of residents.

4. Project Description

(1) Target Area

Water supply: Mormugao, Salcete, Quepem and part of Sanguem, Goa State,

Sewerage: Margao and Mapusa, and North Coastal Belt, Goa State

(2) Project Outline

- (a) Water supply facilities: Rehabilitation (160,000 m³/day) and expansion (100,000 m³/day) of a water treatment plant in Salaulim, provision of transmission pipelines (construction: 73.65 km; rehabilitation: 13.8 km), construction and rehabilitation of distribution pipelines (construction: 259 km; rehabilitation: 170 km), etc.
- (b) Sewerage facilities: Construction and expansion of sewerage treatment plants in Margao (expansion: 6,700 m³/day), Mapusa (construction: 5,400 m³/day) and North Coastal Belt (construction: 5,600 m³/day); construction of pipelines (trunk sewer: 16.8km, branch sewer: 82.0 km), construction of pumping stations, etc.
- (c) Capacity building (mainly, leak detection), institutional strengthening
- (d) Awareness creation: promotion of water saving and house connection to sewerage facilities
- (e) Consulting services (detailed design, construction supervision, etc.)

(3) Total Project Cost / Loan Amount

27,766 million yen (Yen loan amount: 22,806 million yen)

(4) Schedule

August 2007 – January 2014 (78 months) The project completion is defined as when the defect liability period expires.

(5) Implementation Structure

- (a) Borrower: The President of India
- (b) Executing Agency: Public Works Department, Goa State
- (c) Operation and Maintenance System: Same as (b)

(6) Environmental and Social Consideration

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: 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 project is not located in a sensitive area, based on the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002).

(iii) Environmental Permit

The EIA report is not required for the project in the country’s legal system.

(iv) Anti-Pollution Measures

Regarding water supply facilities, since water is taken from existing dams, no significant ground subsidence is foreseen. Water treatment plants, pumping stations etc. will be designed by taking noise into consideration. The quality of the water discharged from the sewerage treatment plants to the river shall comply with the country’s effluent standards, and no significant adverse impact is foreseen from the effluents.

(v) Natural Environment

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

(vi) Social Environment

The project requires land acquisition of about 14.6 ha, which will be implemented in accordance with the country’s domestic procedures. The project will not involve any involuntary resettlement.

(vii) Other/ Monitoring

None

(b) Promotion of Poverty Reduction

None

(c) Promotion of Social Development (e.g. gender perspective, countermeasures for HIV/AIDS and other infectious diseases, participatory development, consideration for the disabled)

None

(7) Other Important Issues

- The project aims to be a model for realizing the goal of providing 24 hours x 7 days water supply services, for the first time in India.
- The project aims to carry out capacity building of Public Works Department, the organization in charge of operation and maintenance, including leakage detection, financial management, asset management, and improvement in customer relations.
- Awareness creation on sewerage house connection, water saving, tariff payment etc. are

scheduled to be carried out by experienced experts and NGOs/ special agencies.

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Water Supply

Indicator	Baseline (2006)	Target (2016, 2 years after completion)
Total population served (1,000 persons)	457	612
Amount of served water (m ³ /day)	160,000	260,000
Water supply hours (hrs/day)	8	24

Sewerage

Indicator	Margao		Mapusa		North Coastal Belt	
	Baseline (2006)	Target (2016)	Baseline (2006)	Target (2016)	Baseline (2006)	Target (2016)
Total population served (1,000 persons)	13	81	-	34	-	20
Amount of treated wastewater (m ³ /day)	2,200	13,700	-	5,350	-	5,090
Rate of facility utilization (%)	29%	96%	-	99%	-	91%
Percentage of popula- tion served (%)	15%	81%	0	63%	0	62%
House connections (1,000 houses)	2.6	16	-	6.9	-	4.0

(2) Number of Beneficiaries

666,000 people: Sum of the total population served with water facilities and sewerage facilities. However, since the total population served with sewerage facilities in Margao is included in the total population served with water facilities, it is not included in the calculation.

(3) Internal Rate of Return (Financial and Economic Internal Rate of Return)

Based on the conditions indicated below, the Project's Economic Internal Rate of Return (EIRR) is 10.4% for the water supply facilities and 9.6% for the sewerage facilities.

[EIRR]

(1) Water Supply

- (a) Cost: Project cost (excluding tax), operation and maintenance expenses
- (b) Benefit: Income from tariff, economizing on the cost of purchasing substitute services.
- (c) Project Life: 30 years

(2) Sewerage

- (a) Cost: Project cost (excluding tax), operation and maintenance expenses
- (b) Benefit: Income from tariff, economizing on the cost of purchasing substitute services and the

<p>increased amount in willingness to pay of tourism tax (c) Project Life: 30 years</p>
<p>6. External Risk Factors</p>
<p>None</p>
<p>7. Lessons Learned from Findings of Similar Projects Undertaken in the Past</p>
<p>From ex-post evaluations of similar projects in the past, it has been learned that it is important to improve the existing water distribution network and to conduct public relations and awareness raising campaign for the project targeting the residents in order to boost the projects effects. In this project, in addition to improving and expanding the existing water distribution network, public relations and awareness raising campaign for the residents will be implemented.</p>
<p>8. Plans for Future Evaluation</p>
<p>(1) Indicators for Future Evaluation</p> <ul style="list-style-type: none"> (a) Total population served with water supply facilities(1,000 persons) (b) Amount of served water (m³/day) (c) Water supply hours (hours/day) (d) Total population served with sewerage facilities(1,000 persons) (e) Amount of treated wastewater (m³/day) (f) Rate of facility utilization (%) (g) Percentage of population served with sewerage facilities(%) (h) House connections to sewerage facilities(1,000 houses) (i) Internal rate of return: EIRR (%) <p>(2) Timing of Next Evaluation</p> <p>2 years after project completion</p>