

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: India
Project: Yamuna Action Plan Project (III)
Loan Agreement: February 17, 2011
Loan Amount: 32,571 million yen
Borrower: The President of India

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Supply / Sewerage and Sanitation Sector in India

In India, the rate of the development of water resources utilizing surface water and water supply facilities is not prompt enough to keep up with the demand boosted due to the population/economic growth. The scarce availability of potable water supply has resulted in serious situation, which is further coupled with over extraction of the groundwater. On the other hand, the sewerage system coverage rate is merely 28% even in the urban areas. In particular, the rapid rate of the population influx from rural to the urban areas and the industrialization is accelerating wastewater discharge which is not only causing problems such as contamination of rivers, soil and ground water but also resulting others constraints due to the limited sewage treatment capacity, thereby threatening the public health and living environment.

(2) Development Policies for the Water Supply/Sewerage and Sanitation Sector in India and Priority of the Project

In its Eleventh Five Year Plan (April 2007- March 2012) the Government of India has outlined a goal of providing water supply, sewerage and sanitation facilities to all the urban population by FY2011. Further, the Ministry of Environment and Forests has been carrying out the river conservation projects since 1985 on 34 major rivers, which are severely contamination in 160 cities, by improving the sewer systems based on the National River Conservation Plan (NRCP) so that wastewater in the urban areas can be completely treated before being discharged into rivers.

The Yamuna Action Plan (YAP) on River Yamuna (the river runs through major cities such as Delhi and Agra) has been one of the key projects under the NRCP, which was introduced in the Eighth Five Year Plan and serve as a basis for this project.

(3) Japan and JICA's Policy and Operations in the Water Supply/Sewerage and Sanitation Sector in India

The Country Assistance Program for India by the Government of Japan will consider the rapid growth of urban population and support the supply of adequate and safe drinking water and the remediation of poor public sanitation as part of measures on environmental issues in order to improve living standards and prevent water contamination in the major rivers. Further, in rural areas, water supply development projects are supported as part of the development of basic infrastructure for the living environment of the poor. In Japanese ODA loans for India in the water supply/sewerage and sanitation sector, 23 projects with loans totaling 402.5 billion yen including the Phase I (FY1992, ¥17,773 million) and the Phase II (FY2002, ¥13,333 million) of the project have been approved. JICA Experts have also been dispatched under the technical corporation since 2004 to the National River Conservation Directorate, Ministry of Environment and Forests, which has been in-charge of the NRCP. The training curriculum, teaching materials have also been developed and the trainings have been provided in order to improve capacity of the organizations related to the operation and maintenance of sewerage facilities.

(4) Other Donors' Activity

The World Bank and the ADB have provided assistance to the water supply/sewerage sector as part of their measures to reduce poverty. Focus areas are (a) assistance to states/cities that are proactive in making reform, (b) promotion of competition in service improvements in water supply/sewerage services among local governments, (c) rationalization of water tariff levels, (d)

utilization of private sector resources and (e) consideration of poverty impacts.

(5) Necessity of the Project

The rapid urbanization and more than expected population growth in the recent years have resulted in huge sewage generation. This has caused severe water pollution in River Yamuna and thereby the sanitation and health problems in urban areas in river basin cities. The improvement of sewerage infrastructure is a pressing issue for the better living conditions. In particular, National Capital Territory of Delhi is heavily populated. Delhi's population was 16.2 million in 2006, which is now estimated to be 18.2 million in 2011, the 90% of which live in urban areas. The total waste water generated in the territory is approx 2.91 million m³/day. Though the capacity of the sewage treatment plants is 2.33 million m³/day, only 1.64 million m³/day is being treated. The length of River Yamuna in National Capital Territory of Delhi is only 2% of the total length of the river, however, it is discharging 80% of the pollution load in the entire basin. Therefore, in order to improve water quality of River Yamuna, it is imperative to improve the sewage systems including sewage treatment capacity in this particular territory. The water quality improvement of River Yamuna is very vital, in accordance with the Yamuna Action Plan under the National River Conservation Plan of the Government of India, which is consistent with JICA's assistance policy. Therefore, absolute necessity and relevance of the project justify JICA's support to this project.

3. Project Description

(1) Project Objective(s)

The objective of the project is to improve the water quality of River Yamuna by modernization of sewage treatment plant rehabilitation and replacement of the existing sewerage system and by implementing public outreach activities in National Capital Territory of Delhi, thereby contributing to improvement of public health conditions for inhabitants.

(2) Project Site/Target Area

National Capital Territory of Delhi

(3) Project Component(s)

This project will improve the operational efficiency of the existing sewage facilities in National Capital Territory of Delhi through improvement and construction of new facilities for treated sewage recycle, to provide recycled water and improve the quality of management and maintenance.

- 1) Modernization, rehabilitation and replacement of sewerage facilities (sewage treatment plants, trunk sewer, etc.)
- 2) Construction of facilities for treated sewage recycle
- 3) Public outreach program
- 4) Consulting services (assistance for bidding, construction management, etc.)

(4) Estimated Project Cost (Loan Amount)

40,663 million yen (Loan Amount: 32,571 million yen)

(5) Schedule

February 2011 - April 2018 (total 87 months). Project completion is defined as the commencement of the service of the facilities (April 2017).

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Executing Agency: Delhi Jal Board (DJB)
- 3) Operation and Maintenance System: Same as in 2)

(7) Environmental and Social Consideration / Poverty Reduction/Social Development

- 1) Environmental and Social Considerations
 - (i) Category: B
 - (ii) Reason for Categorization

This project is not considered to have significant undesirable impact on the environment, given the characteristics of the sector and the characteristics of the project area, under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Consideration” (established in April 2002). For this reason, this project is classified as Category B.

(iii) Environmental Permit

The Environmental Impact Assessment (EIA) report is not required for this project under the country’s legal system.

(iv) Anti-Pollution Measures

Wastewater from the sewage facilities will be treated to meet the local wastewater criteria before being discharged to river, and no particular impact is expected. Each of the sewerage facilities will be reconstructed and renewed, sustaining a certain treatment capacity and taking anti-pollution measures fully into consideration.

(v) Natural Environment

The target sites of the project and peripheral areas are not in the vicinity of any of the nature reserves, etc. No negative impact on natural environment expected.

(vi) Social Environment

The project consists of reconstruction and renewal of the existing facilities, and involves neither land acquisition nor involuntary resettlement.

(vii) Other/Monitoring

In this project, the DJB will monitor quality of the wastewater discharged from treatment plants, and the Central Pollution Control Board will monitor the water quality of River Yamuna.

2) Promotion of Poverty Reduction : The project will implement awareness activities and public relations among residents including those in the slum areas.

3) Promotion of Social Development: The aspect of gender will be taken into consideration in the activities of awareness and public relations.

(8) Collaboration with Other Donors : The project will collaborate with local NGOs in public awareness, public relations, and provide trainings for the DJB staff using the teaching materials developed in the above-mentioned technical cooperation project.

(9) Other Important Issues: None

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (Actual Value in 2009)	Target (2019) 【Expected value 2 years after project completion】
Amount of Wastewater Treated (m ³ /day)	887,400	1,546,000
Rate of Facility Utilization (%)	82.2	100
Effluent BOD Concentration (mg/L) (Annual Average)	After secondary treatment <20.9	After secondary treatment <20 After advanced treatment <10
Amount of Recycled Water Supply (m ³ /day)	—	190,000

(2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) for the Project is 8.11%.

【EIRR】

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

Benefit: Sewage fees, sales of recycled water, water saved by recycled water

Project Life: 30 years

5. External Risk Factors and Risk Control

Population growth significantly exceeding the projections

6. Lessons Learned from Past Projects

From ex-post evaluations of the phase I of the project, a certain effect of sewerage facilities has been observed in improving the sanitary environment, but the water quality of River Yamuna has been improved only in a limited manner, because, in addition to the upstream intake for drinking water, the rate of contamination caused by the population growth is faster than estimated. Therefore, it is considered necessary to develop an approach to cope with the current level of contamination. Considering such situation as well as the sewage facilities to be reconstructed through this project, designs are under way so that untreated wastewater can be collected more thoroughly and the capacities of transportation and treatment can keep up with the level of wastewater discharge.

7. Plans for Future Evaluation

(1) Indicators to be Used

- 1) Amount of Wastewater Treated (m³/day)
- 2) Rate of Facility Utilization (%)
- 3) Effluent BOD Concentration (mg/L) (Annual Average)
- 4) Amount of Recycled Water Supply (m³/day)
- 5) Economic Internal Rate of Return (EIRR) (%)

(2) Timing

Two years after project completion