

## Ex-ante Evaluation (for Japanese ODA Loan)

**1. Name of the Project**

Country: India

Project: Agra Water Supply Project (II)

Loan Agreement: March 31, 2014

Loan Amount: 16,279 million yen

Borrower: The President of India

**2. Background and Necessity of the Project****(1) Current State and Issues of the Water Supply Sector in India**

In India, 90% of the population in both urban and rural regions has access to safe water (as of 2012), which indicates steady progress toward the goal of establishing sustained access to drinking water throughout India set in the Twelfth Five-Year Plan (April 2012 to March 2017). Nevertheless, development of water sources and water supply systems is being outstripped by increases in drinking water consumption resulting from population increases and economic development. As a result, intermittent, uneven water supply (in India's major cities, the average daily water supply time ranges from one to six hours) and excessive dependence on groundwater have become part of daily life in India. In addition, water supply service providers in India face a number of technical and financial difficulties with respect to facility management and maintenance, including high non-revenue water rates (approximately 40% or higher), low water tariffs, and personnel shortages.

**(2) India's Development Policies for the Water Supply Sector and the Role of the Current Project**

In its Twelfth Five-Year Plan, the Indian government made provision of drinking water to the entire urban population in India a policy goal. In particular, in view of the limitations of water sources in India relative to the water demand increases resulting from population growth, the government has focused on efficient utilization of water by implementing water leak prevention measures as well as use of recycled water. In addition, in order to promote efficient water use among residents and to improve financial sustainability by collecting fair and adequate water fees, the government aims to install water meters in all urban houses. The government's another primary goal is to supply water round-the-clock without interruption. This project aims to augment existing water supply facilities and to install new ones in urban regions where water supply is unstable. In particular, the project intends to expand the water supply system to meet India's growing water needs based on the Indian government's water supply policy.

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

In Japan's Country Assistance Programs for India (May 2006), the Japanese government designated as priority area reducing poverty and environmental problems in India as well as providing support for water supply development as part of its efforts to solve environmental problems. Meanwhile, in its Country Analysis Paper (March 2012), JICA defines the development of industrial and urban infrastructure in India as a priority area, thereby aiming to support water supply development in order to solve urban problems. JICA is also actively considering the possibility of utilizing non-revenue water reduction measures, applying advanced water treatment technologies widely used in Japan and also promoting use of recycled water in order to overcome limitations of surface water intake in response to the needs of the rapidly growing Indian population. Previously, JICA received authorization to provide ODA loans to India in the amount of 403.7 billion yen for 19 projects in the water supply sector (including water supply and sewerage projects). Apart from these ODA loans, JICA is also implementing a number of programs, including technical assistance related to the Delhi water supply improvement project.

**(4) Other Donors' Activities**

In its Country Assistance Strategy for India, the World Bank notes population increases in medium-sized cities and changes resulting from industrialization as high priority issues; the World Bank is working to support water supply development to resolve these issues. The Asian Development Bank is also engaged in supporting India's water supply sector alongside implementing poverty reduction measures; in addition to developing facilities, the bank also focuses on establishing facility management and maintenance systems based on international standards, enhancing organizations and technical skills, and promoting Public-Private Partnerships (PPP) based on lessons learned in other countries.

**(5) Necessity of the Project**

Uttar Pradesh's Agra City and its surrounding areas in Northern India, home of the Taj Mahal and one of India's most popular tourist destinations, need a water supply increase as a result of increased water usage due to the rapidly growing population (from 750,000 in 1981 to 1.57 million in 2011). Moreover, the Yamuna River, a major water source for Agra City and its surrounding areas, is being polluted by untreated sewage inflow from Delhi

and other large cities located upstream. Massive amounts of chlorine is used to purify the river water, thereby increasing purification costs as well as causing people to refrain from using the river water as drinking water due to concerns about health effects. As a result, new water sources need to be developed.

Although started in 2007, this project is likely to run out of funds due to unpredictable and unavoidable circumstances, such as changes in materials used for conduit pipes, which are the major facilities, as well as increases in material prices. In addition to providing its own funds for the project, the Indian government has submitted a request for additional loans from the Japanese government. Construction for water intake facilities and water treatment plant expansion has already started. However, the conduit pipes, distribution network rehabilitation and expansion, and water treatment plants rehabilitation for which the contract awards still under the progress, all construction work for the project is scheduled to start by December 2014. In order for the project to be effectively implemented and to promptly achieve the expected effects, additional funds must be provided via ODA loans. For these reasons, JICA's Assistance for the project is highly necessary and relevant.

### **3. Project Description**

#### **(1) Project Objective**

The Objective of the Project is to construct conduit pipes from the irrigation canal originating in the upper stream of the Ganges River to Uttar Pradesh's Agra City and its surrounding areas in Northern India as well as to improve and expand existing water supply facilities in Agra. Its primary objective is to provide a safe, stable water supply and to contribute to improving the living environment of area residents, including the poor.

#### **(2) Project Site/Target Area**

Agra City and its surrounding areas (Mathura and Vrindavan) in the State of Uttar Pradesh

#### **(3) Project Components**

- 1) Water supply facilities: Construction of water intake facilities, settling tank, and conduit pipes (130 km from an irrigation canal, originating from the upper stream of the Ganges River to Agra City and 12 km to Mathura and Vrindavan Cities); development of roads for laying conduit pipes; rehabilitation (369,000 m<sup>3</sup>/day) and expansion (144,000 m<sup>3</sup>/day) of two existing water treatment plants in Agra; and rehabilitation and expansion of distribution network
- 2) Social development: Awareness-raising campaigns for residents and assistance for house connections for urban poor
- 3) Consulting services (detailed design, bidding assistance, construction management, management improvement, etc.)

#### **(4) Estimated Project Cost (Loan Amount)**

55,696 million yen (Loan Amount: 16,279 million yen)

#### **(5) Project Implementation Schedule**

February 2007–July 2018 (138 months). The Project will be completed when the facilities are put into operation (December 2017).

#### **(6) Project Implementation Structure**

- 1) Borrower: The President of India
- 2) Executing Agency: Uttar Pradesh Jal Nigam
- 3) Operation and Maintenance System: Irrigation Department, Government of Uttar Pradesh (water intake facilities) and Agra Jal Kal Vibhag (water supply facilities in Agra City and conduit pipes)

#### **(7) Environmental and Social Considerations/Poverty Reduction/Social Development**

##### **1) Environmental and Social Considerations**

###### **(i) Category: B**

(ii) Reason for Categorization: This project is not associated with sectors, characteristics, or regions defined in the Japan Bank International Cooperation Guidelines for Confirmation of Environmental and Social Considerations (established April 2002) as being likely to produce or suffer from environmental effects, and is therefore assessed as having no serious negative impact on the environment.

(iii) Environmental Permit: Submission of Environmental Impact Assessment (EIA) reports is not required for the project by India's legal system.

(iv) Anti-pollution Measures: Since water is taken from an irrigation canal originating in the upper stream of the Ganges River, no ground subsidence is likely to occur. Sludge generated from water treatment plants is treated at sludge processing facilities constructed on plant premises.

- (v) Natural Environment: The project area is not in or near an area that is susceptible to impact, such as a nature preserve. Therefore, the project is assessed as having a minimal negative impact on the natural environment.
  - (vi) Social Environment: A total of 6.3 ha of land have been acquired for the project in accordance with India's land acquisition procedures. To make temporary use of the 175.4 ha of land required for laying conduit pipe, surveys on the target land and residents have been conducted. The compensation payments for the temporary land use will be made in accordance with India's procedures as and when the construction is carried out. No resettlements will be required during the construction.
  - (vii) Other aspects/monitoring: In this project, water quality and other environmental conditions will be monitored by Agra Jal Sansthan in Agra and by the Nagar Palikas in Mathura and Vrindavan. Thus far, no particular problems have been reported.
- 2) Promotion of Poverty Reduction: As a measure to provide support for the urban poor, water distribution network improvements and assistance for individual house connections have been scheduled in order to improve water supply services for the poor, mainly in urban poor areas. The project will cover costs for assistance for individual house connections.
- 3) Promotion of Social Development (e.g. Gender Perspective, Measures for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for Persons with Disability, etc.): None

(8) Collaboration with Other Schemes or Donors

A survey is being conducted with a view to enhancing the management of India's water supply and sewerage project execution organizations. Based on the survey results, JICA plans to enhance management of this project's execution organization.

(9) Other Important Issues

In the area targeted for this project, JICA is supporting a project to develop urban sewerage systems in cities in the Yamuna River basin for the purpose of the protection of the water of the river, which is an important water source. In awareness-raising campaigns on house connections, water conservation, fee payments, etc., JICA will promote resident participation through group discussions.

**4. Targeted Outcomes**

(1) Quantitative Effects

1) Performance indicators (operation and effect indicators)

Indicators	Baseline (2005)	Target (2020) (two years after project completion)
Total Population Served (thousand persons)	923	1,570
Amount of Water Supply (1,000 m <sup>3</sup> /day)	238	487
Facility Utilization Rate (%)*	64	95
Non-revenue Water Rate (%)	67	35
Percentage of Population Served (%)	65	85
Percentage of Population Using Tap Water for Drinking (%)	20	80

\* The facility utilization rate has been calculated by dividing the amount of water supply by facility capacity.

2) Internal Rate of Return

Based on the following assumptions, the Economic Internal Rate of Return (EIRR) for this project has been calculated to be 6.2%. The Financial Internal Rate of Return (FIRR) was not calculated.

EIRR:

Cost: Project cost (excluding tax), management and maintenance cost

Benefits: Increase in willingness to pay water bills, reduction of medical-related expenses, reduction of operation and maintenance expenses

Project Life: 40 years

(2) Qualitative Effects

Improvements in the living environment in Agra City and its surrounding areas as well as an increase in local residents' awareness with respect to use of the water supply

**5. External Factors and Risk Control**

Deterioration of the political and economic situation and natural disasters in India and the regions surrounding the project area

## **6. Results of Evaluations and Lessons Learned from Past Projects**

### (1) Evaluation Results of Similar Projects

The ex post facto evaluation of the Urban Water Supply and Sanitation Improvement Program in India and other findings show that in order to establish a water tariff system that imposes the maximum possible fees on users and to develop realistic plans for individual house connections, it is necessary to correctly assess demand for water supply services as well as residents' willingness and capability to pay water bills.

### (2) Lessons for the Project

To benefit from the above lesson, water meters were introduced as part of this project and changes were made to convert from a low flat-rate system to a volumetric based multi tariff system based on data on residents' willingness and capability to pay bills. In addition, public relations activities for raising residents' awareness are being conducted as part of social development efforts. With a view to enhancing the water supply service management of the execution organizations, an agreement has been made to develop strategies for non-revenue rate reduction, financial management improvements, personnel development, and promotion of private sector participation.

## **7. Plans for Future Evaluation**

### (1) Indicators for Future Evaluation

- 1) Total population served (thousand persons)
- 2) Amount of water supply (1,000 m<sup>3</sup>/day)
- 3) Facility utilization rate (%)
- 4) Non-revenue water rate (%)
- 5) Percentage of population served (%)
- 6) Percentage of population using tap water for drinking (%)
- 7) Economic Internal Rate of Return (EIRR) (%)

### (2) Timing

Two years after project completion