

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: India

Project: Hogenakkal Water Supply and Fluorosis Mitigation Project (Phase 2)

Loan Agreement: March 31, 2009

Loan Amount: 17,095 million Yen

Borrower: The President of India

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Supply and Sanitation Sectors in India

In India, demand for water usage is increasing with its population and economic growth, but, from a lack of infrastructure, the water supply shortage is becoming acute. Further, reliance on groundwater is lowering the groundwater level and leading to higher content of fluorine, arsenic, and other toxic substances. Also, with a sudden population influx in the urban areas along with industrialization, sewage emission is exceeding treatment which threatens the public health and living environment of local residents. In terms of operation and maintenance of water supply services, there are technical and financial issues such as water quality, non-revenue water and level of water tariff, etc.

(2) Development Policies for the Water Supply / Sewage and Sanitation Sectors in India / Tamil Nadu State and the Priority of the Project

In its Eleventh Five Year Plan (April 2007 – March 2012) the Indian Government has outlined a goal of providing water supply, sewage and sanitation facilities to all the urban population by 2011/2012. Further, in the current administration's Common Minimum Programme (May 2004), there is a commitment to expand public investment in water supply facilities, and the supply of drinking water to all levels of society in both urban and rural areas, and increasing drinking water supplies is one of the top-priority issues. In regards to the problem of fluoride in underground water, the Eleventh Five Year Plan incorporates a "National Fluorosis Mitigation Programme", and a framework to deal with the fluoride issue on a national scale for the first time is expected to be developed.

Tamil Nadu in the southern India has an annual rainfall of 958mm, less than the national average in India of 1,250mm. Such condition together with rapid urbanization is leading to use of groundwater contaminated by fluoride as drinking water, and excess use of groundwater is resulting in depletion of groundwater and chronic water shortages.

To address this, the State of Tamil Nadu is attempting to provide safe water supply through construction of water supply facilities, etc.

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

Taking into account the rapidly growing urban population, Japan and JICA have supported the supply of adequate and safe drinking water and the remediation of poor public sanitation conditions in order to improve living standards and to prevent water contamination in major rivers. Further, in rural areas, water infrastructure projects are supported as part of the development of basic infrastructure for improving the living environment of the poor. In Japanese Yen ODA Loans, in the water supply / sewage and sanitation sector, 20 projects with loans totaling over 343.2 billion Yen have been approved. Further, as technical assistance and grants, policy advisors and other experts have been dispatched three times since 2004.

(4) Other Donors' Activity

The World Bank and ADB have provided assistance to the water supply / sewage sectors as part of their measures to reduce poverty in India. Focus areas are (a) assistance to states / cities that are proactive in making reforms, (b) promotion of competition in service improvements in water supply / sewage service among local governments, (c) rationalization of water tariff levels, (d) utilization of private sector resources and (e) consideration of poverty impacts. Note as of 2007, approved assistance of the World Bank totaled \$4,031 million and of the ADB \$543 million.

(5) Necessity of the Project

The Krishnagiri and Dharmapuri Districts, located in the North West of Tamil Nadu, which are the two areas targeted by this project, are less-developed than other areas in Tamil Nadu. Despite the increasing demand for water due to population growth, because of the less annual rainfall in the two districts at 815 mm than the national average (1,250 mm) and the average for Tamil Nadu (977 mm) and no surface water usable all year round, people are forced to use more groundwater than they should, resulting in depletion of groundwater and chronic water shortages. Also, a large amount of fluoride, which is harmful to the human body, is contained in the rock ground that forms the Deccan Plateau and is transferred to the groundwater. This ground water contaminated by fluoride results in diseases such as dental fluorosis and skeletal fluorosis among the local residents. Supplying safe surface water to the two project areas by drawing water from Hogenakkal in Cauvery River, 45 km from Dharmapuri, is urgently needed to solve the problem of water shortage and contamination of drinking water by fluoride. Thus this project is highly necessary and relevant. The second phase of the project targets the

project area including the Hosur area within the Krishnagiri district that was not part of the target of the first phase of this project (Loan Agreement: March 2008).

3. Project Description

(1) Project Objective(s)

The objective of this project is to provide safe and stable water supply service that will meet the surging demands for water by constructing water supply facilities that use water transferred from Cauvery River and by fluorosis mitigation in Dharmapuri and Krishnagiri, the two areas in Tamil Nadu, South India, which are the areas with the most serious cases of water shortage and contamination of groundwater by fluoride within Tamil Nadu; thereby contributing to improvement of the living conditions of local residents.

(2) Project Site / Target Area

Krishnagiri and Dharmapuri Districts, State of Tamil Nadu

(3) Project Component(s)

1) Water supply facilities: Provision of transmission pipelines, construction of distribution network, reservoirs and pumping stations, etc.

2) Fluorosis mitigation: Baseline Survey; training for doctors, teachers, etc.; diet consultation; awareness campaign, etc.

3) Capacity building of local bodies: Capacity Building for the member of Village Water and Sanitation Committee (VWSC), Operation and Maintenance (O&M), tariff collection and financial management; functional extension of training facilities, etc.

4) Consulting services: Construction monitoring and supervision, capacity building of leak measures for the executing agency, etc.

(4) Estimated Project Cost (loan Amount)

48,026 million yen (ODA loan amount: 39,482 million yen)

(5) Schedule

March 2008–July 2013 (65 months). The project completion is defined as completion of the consulting service.

(6) Project Implementation Structure

1) Borrower: The President of India

2) Executing Agency: Tamil Nadu Water Supply and Drainage Board (TWAD)

3) Operation and Maintenance System: TWAD, local bodies

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

1) Environmental and Social Consideration

a) Category: B

b) Reasons 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).

c) Environmental Permit: The EIA report has been accepted in September 2001 by the Tamil Nadu State Pollution Control Board, though it is not required for the project in the country's legal system.

d) Anti-Pollution Measures: Regarding water supply facilities, since water is taken from surface water, no ground subsidence is foreseen. Water treatment plants, pumping stations and other facilities will be designed and constructed by taking noise into consideration. Additionally, sludge generated at the water treatment plant will be dried under the sun, after which, based on the direction of the State Pollution Control Board, it will either be provided to local farmers as compost or be buried in a prescribed repository site.

e) 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.

f) Social Environment: The project requires 20.83ha of land acquisition of public and private land and deforestation, which will be implemented in accordance with the country's domestic procedures (18.03 ha has already been acquired). The project will not involve any involuntary resettlement. In addition, the clearance for deforestation has been approved, and the necessary procedures are expected to complete in FY2008.

g) Other/Monitoring: In this project, TWAD will monitor the quality of water inflow to and outflow from the water supply facilities, while each local body will monitor the water quality etc. in reservoirs.

2) Promotion of Poverty Reduction: The incidence of poverty in the project areas is about 36.7%, which is higher than the national average, and this project will contribute to the alleviation of poverty by improving health condition of the poor residents and upgrading their living environment.

3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for Persons with Disabilities, etc.): From the planning stage, participation of local residents including

women will be promoted by preparing a distribution plan for each village, building the capacity of VWSC, and by carrying out O&M of water supply facilities and awareness campaign etc.

(8) Collaboration with Other Donors:

Experts or NGOs with knowledge and experience are scheduled to be involved in awareness campaigns concerning fluorosis mitigation, preparation of a distribution plan for each village, capacity building of tariff collection etc.

(9) Other Important Issues:

This project, in conjunction with the Phase 1 project (Loan Agreement: March 2008) is expected to be a model project, the first to comprehensively combat the fluorosis problem with India's groundwater.

4. Outcome Targets

(Quantitative effect of the whole project including Phase 1 and this phase loans)

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual value in 2007)	Target (2015) [Expected value 2 years after completion]
Population served (1000 persons)	910	3,238
Amount of water supply (m ³ /day)	40,875	152,799
Available water per capita per day (L)	Urban area: 29-37 Rural area: 10	Urban area: 70 -90 Rural area: 40
Water supply hours (hr/day)	1 hour on average	4 hours on average
Number of women who participated in capacity building training (%)	-	More than 30% of participants

Impact indicators:

- a) Difference in the ratio of patients afflicted with non-skeletal fluorosis (effects as stomach discomfort, extreme weakness, effects on fetuses, etc.) (Difference in the ratio of non-skeletal fluorosis patients to general population in the project areas before and after the project)
- b) Difference in the ratio of dental fluorosis among students (the ratio of students suffering from dental fluorosis to the total number of students in the project areas before and after the project)

(2) Internal Rate of Return

Based on the conditions indicated below, the project's Economic Internal Rate of Return (EIRR) is 9.05%

[EIRR]

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

Benefit: Reduction in the number of hours for drawing water, increase in the number of workable hours, decrease in healthcare related expenditure

Project Life: 30 years

5. External Factors and Risk Control

Water rights for the Cauvery River.

6. Lessons Learned from Past Projects

From ex-post evaluations of similar projects in the past, it has been learned that for project facilities to be utilized adequately, financial sustainability must also be ensured. While project costs are covered by the government, operation and maintenance costs and upgrade investment costs in the local bodies must be covered by operating income, and it is important that as a part of this project that the necessary subsidies from the state government are gradually removed so that the recovered water payments cover the maintenance costs. Accordingly, in order to ensure the sustainability and stand-alone expansion of this project, JICA will monitor the executing agency in its price setting, payment recovery and subsidy reduction.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Population served (1000 persons)
- 2) Amount of water supply (m³/day)
- 3) Available water per capita per day (L)
- 4) Water supply hours (hr/day)
- 5) Number of women who participated in capacity building training (%)
- 6) Difference in the ratio of patients afflicted with non-skeletal fluorosis
- 7) Difference in the ratio of dental fluorosis among students
- 8) Internal rate of return: EIRR (%)

(2) Timing

Two years after project completion.

End