

Ex-Ante Evaluation

1. Name of the Project

Country: The Democratic Socialist Republic of Sri Lanka

Project: Anuradhapura North Water Supply Project (Phase 2)

Loan Agreement: November 17, 2016

Loan Amount: 23,137 million yen

Borrower: The Government of the Democratic Socialist Republic of Sri Lanka

2. Background and Necessity of the Project

(1) Current Development State and Issues of the Water Supply Sector in Sri Lanka

In Sri Lanka, 85.2% of the total population has access to safe water from piped supply or from wells or rainwater harvesting. However, the piped water supply coverage itself has remained low at a national average of 45.0% (as of 2015). Moreover, there are significant regional gaps in this coverage. In urban areas, where the demand for water is increasing due to economic growth and urbanization, there is a need to extend and repair existing water supply systems as well as to take measures against non-revenue water. Meanwhile, rural areas still face a challenge of developing new water supply facilities.

Anuradhapura North Water Supply Project (Phase 2) (hereinafter referred to as “this Project”) will target the northern part of Anuradhapura District, North Central Province, Sri Lanka. In the project area, residents mainly rely on wells for water, and the piped water supply coverage is 26.9%, much lower than the national average of 45.0% (as of 2015). Moreover, according to the results of water quality tests to evaluate 45 community-based organizations (CBOs) which supply water to approximately 60% of the served population in the project area, 17 CBOs supply drinking water from groundwater sources with a fluoride concentration exceeding the standard value of drinking water quality in Sri Lanka (1.0 mg/L), and the highest value has gone up to 1.9 mg/L. The high concentration of fluoride can cause dental fluorosis. In fact, the disease has become a serious problem in Anuradhapura District; Community Fluorosis Index (CFI; an index that shows the severity and prevalence of the disease) are higher in this district than in any other district in Sri Lanka. North Central Province also has a high incidence of chronic kidney diseases (CKDs), which accounts for 5% of the population, and it is assumed to be partially caused by the use of groundwater contaminated by agricultural chemicals and other pollutants for drinking purposes.

Therefore, it is considered urgent to increase the piped water supply coverage in the above-mentioned area and replace groundwater sources with surface water sources.

(2) Development Policies for the Water Supply Sector in Sri Lanka and the Priority of the Project

The Corporate Plan 2016 - 2020 of National Water Supply and Drainage Board (NWSDB), which is responsible for the development, supply, operation, and management of water and wastewater services in Sri Lanka (except for those provided by local authorities and other entities), has set a target of raising the national piped water supply coverage up to 60% by 2020. This Project, designed to construct new water supply facilities in areas with a low piped water supply

coverage, is consistent with the policy of the plan.

Moreover, the Government of Sri Lanka regards measures for CKDs as a high priority policy issue. President Sirisena, who took office in January 2015, has pledged to take measures for CKDs in his manifest, and the Government of Sri Lanka has intensively allocated budget to areas with a high incidence of CKDs including the project target area.

This Project aims to develop water supply systems, replace groundwater sources, which are not appropriate for drinking purpose, with surface water sources, provide safe drinkable water to residents, and increase the piped water supply coverage in rural areas where water supply facility is underdeveloped. Thus, it is consistent with the development policies of Sri Lanka, which aims to improve the access to safe water and raise the piped water supply coverage in rural and other areas of the nation. Therefore, this Project can be regarded as a high priority project.

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

Japan's Country Assistance Policy to the Democratic Socialist Republic of Sri Lanka (in 2012) identifies the "promotion of economic growth" as a priority area and indicates that Japan should actively support infrastructure development for economic growth in order to further promote the growth and stabilization of Sri Lanka. Moreover, referring to the history of internal conflicts and the current status of development in Sri Lanka, the Country Assistance Policy also suggests that attention should be paid to ensure fair support for underdeveloped areas. Meanwhile, JICA Country Analysis Paper for the Democratic Socialist Republic of Sri Lanka (in 2014) indicates the importance of developing water supply systems in rural areas as well as extending water supply networks and reducing non-revenue water in large cities under Environment Improvement Program.

JICA has supported the water supply sector in Sri Lanka by implementing a total of 10 ODA Loan projects, mainly for the development of urban water supply systems, as well as Grant Aid and Technical Cooperation projects. In recent years, JICA has also contributed to the development of rural water supply systems through the Eastern Province Water Supply Development Project (signed in 2010 with a loan amount of 4,904 million yen) and the Anuradhapura North Water Supply Project Phase 1 (the preceding phase of this Project signed in 2013 with a loan amount of 5,166 million yen; hereinafter referred to as the Phase 1 Project).

(4) Other Donors' Activity

The World Bank has contributed to the development of water supply and sanitation facilities mainly in rural areas through projects such as the Water Supply and Sanitation Improvement Project (in 2015). Meanwhile, the Asian Development Bank (ADB) has supported community water projects, for example through the Secondary Towns and Rural Community-Based Water Supply and Sanitation Project (in 2006). The ADB has also implemented the Jaffna and Kilinochchi Water Supply and Sanitation Project (in 2010) to reconstruct and extend water supply systems in Jaffna and other districts affected by internal conflicts. These projects do not overlap with this Project.

(5) Necessity of the Project

This Project is in line with the development issues and policies of Sri Lanka and the assistance

policies of Japan and JICA. Moreover, as it aims to develop new water supply facilities that will use surface water as their source to provide residents with safe water and increase the piped water supply coverage in areas with health hazards, this Project is expected to contribute to the Sustainable Development Goals (SDGs) 6: ensure access to water and sanitation for all. Therefore, it is highly necessary for JICA to implement this Project.

3. Project Description

(1) Project Objective

This project is to construct a water supply system in the northern part of Anuradhapura District to provide safe drinking water and increase the water supply coverage, thereby improving health conditions and the living environment in the project area.

(2) Project Site/Target Area: The northern part of Anuradhapura District

(3) Project Components

This Project consists of the following activities in relation to the water supply systems whose water source is Wahalkada reservoir and the water supply systems whose water source is Mahakanadarawa reservoir being developed through the preceding project: Anuradhapura North Water Supply Project Phase 1.

- 1) Construction of a intake facility (28,800 m³/day), a water treatment plant (15,000 m³/day), ground sumps, and elevated tanks and development of related mechanical and electrical works
- 2) Installation of transmission mains (with a total length of 150.4 km) and distribution mains (with a total length of 326.7 km)
- 3) Installation of distribution sub-mains (with a total length of 720.7 km) and procurement of service pipes (with a total length of 330 km) and water meters (for 20,000 households)
- 4) Procurement of 14 vehicles and 13 construction heavy machines
- 5) Consulting services (construction supervision and public relations / awareness-raising campaigns to residents)

(4) Estimated Project Cost (Loan Amount)

27,370 million yen (Loan Amount: 23,137 million yen)

(5) Schedule

November 2016 to March 2022 (65 months in total). Project completion is defined as when the facility service is commenced (scheduled in March 2021).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Democratic Socialist Republic of Sri Lanka
- 2) Executing Agency: The Ministry of City Planning & Water Supply and the National Water Supply and Drainage Board (NWSDB)
- 3) Operation and Maintenance System: The National Water Supply and Drainage Board will be responsible for the operation and maintenance. The Board has properly operated water supply systems constructed under ODA Loan and other scheme and it has sufficient results and experience to fulfill the responsibility. The maintenance costs are planned to be

allocated by the governmental budget of the country and revenue from water tariff collection. Thus, no specific technical and financial problems are expected.

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

1) Environmental and Social Consideration

- i) Category: B
 - ii) Reason for Categorization: This Project is classified as Category B because it does not fall under the sector likely to have any significant impact on the environment nor have characteristics that are liable to cause adverse impacts or not located in or near sensitive areas as specified in the JICA Guidelines for Environmental and Social Considerations (published in April 2010).
 - iii) Environmental Permit: Preparation of the Environmental Impact Assessment report for this project is not mandated under the laws of Sri Lanka.
 - iv) Anti-Pollution Measures: The construction is likely to cause noise, vibration, dust, and water pollution. These problems, however, can be controlled by measures such as using low-noise equipment, sprinkling water during the construction works, and installing sedimentation tanks. The wastewater, sludge, and noise likely to be generated after the commencement of service can also be controlled to meet the environmental standards of Sri Lanka by undergoing sedimentation and landfill processes within the water treatment plant and by ensuring compliance with maintenance requirements for the facilities.
 - v) Natural Environment: The project site is not located in sensitive areas such as national parks and nature reserves. Although the intake facilities and water treatment plant are located in the vicinity of buffer zones of wildlife sanctuaries, this Project is likely to have no significant adverse impact on the natural environment because of the following reasons: the water will be taken from irrigation canals; measures will be taken to minimize deforestation and transplant big trees; and low-noise, low-vibration equipment will be installed to reduce noise and vibration levels after the commencement of service.
 - vi) Social Environment: In the Phase 1 Project, which entailed the involuntary resettlement of one household, compensation was paid to the household, and all the other necessary procedures were performed in accordance with the laws and regulations of Sri Lanka and the JICA Guidelines. This Project will not involve involuntary resettlement or land acquisition because the construction sites are located within state-owned land including the public right of way along existing roads.
 - vii) Other / Monitoring: NWSDB will be responsible for monitoring of noise, vibration, and dust levels and water quality during the construction as well as water quality, noise levels, and resident resettlement after the commencement of service.
- 2) Promotion of Poverty Reduction: None in particular.
- 3) Promotion of Social Development:
- i) Gender Perspectives: The public relations program to promote access to piped water and raise the awareness of local residents about the importance of using piped water is to mainly target women.

- ii) Measures to Prevent Infectious Diseases Including AIDS: HIV/AIDS prevention activities for construction workers are to be contained as requirements in the tender documents so as to ensure that the contractors will take such measures.
- (8) Collaboration with Other Donors: None in particular.
- (9) Other Important Issues: None in particular.

4. Targeted Outcomes

(1) Quantitative Effect

1) Outcomes (Operation and Effect Indicator)

Indicators	Baseline (Actual Value in 2012)	Target (2023) [2 years after project completion]
Population served by water supply (persons)	26,589	99,073
Coverage of water supply from surface water sources (%)	0	70
Concentration of fluoride in drinking water (maximum value) (mg/L)	1.9 (*1)	Less than 1.0
Facility utilization rate (%) (*2)	—	85

(Values for the area with water taken from the Wahalkada reservoir)

*1. Referring to the highest value for the concentration of fluoride in drinking water provided by the CBOs evaluated at the time of the preparatory survey. The standard value for drinking water quality requirements of Sri Lanka is 1.0 mg/L.

*2. Average daily water supply (m³/day) / capacity of the water treatment plant (m³/day)

(2) Qualitative Effect

Improvement of public health by prevention of diseases such as water-borne infectious diseases (e.g. diarrhea) and dental fluorosis, improvement of living environment through reduction of burden of the residents such as water fetching activity.

(3) Internal Rate of Return (IRR)

Based on the conditions below, the economic internal rate of return (EIRR) of the project is 2.5%. The financial internal rate of return (FIRR) is not calculated as the project does not aim at acquiring profit while it collects water tariff.

[EIRR]

Cost: project cost (tax excluded), operation and maintenance costs, periodical facility refurbishment costs

Benefit: reductions in costs for using alternative water sources to water supply systems, and benefit from water consumption amount increased after the project implementation

Project Life: 30 years

5. External Factors and Risk Control

In August 2012, NWSDB and Department of Irrigation exchanged a memorandum of understanding to authorize NWSDB to take water from the Wahalkada reservoir for this Project; however, when a drought occurs, both irrigation and drinking water may fall in short supply.

This risk can be reduced by the Yan Oya reservoir, which is now being constructed in the vicinity of the Wahalkada reservoir with support from China and it is planned to complete in 2020 (The water treatment plant is planned to commence service in 2021). Therefore, attention should be paid to the progress of the construction of the Yan Oya reservoir.

6. Lessons Learned from Findings of Similar Projects Undertaken in the Past

(1) Evaluations of similar projects undertaken in the past:

The ex-post evaluation of Kalu Ganga Water Supply Project for Greater Colombo in Sri Lanka drew a lesson that public relations and awareness-raising activities could be effective in encouraging residents to pay water tariff. Meanwhile, the ex-post evaluation of Urban Water Supply Project (Xiamen, Chongqing, Kunming) in People's Republic of China indicated the followings: (i) the project did not attain all of its expected outcomes due to the delay in the development of distribution sub-main pipelines which was outside its scope; (ii) in order to achieve the expected outcomes, the project should have monitored the progress of the construction performed outside its scope and facilitated the local implementing agencies with their construction.

(2) Lessons for this project:

This Project is designed to include public relations and awareness-raising activities targeting residents who have used well water and never paid for water in order to encourage them to pay water tariff. Moreover, the cost or labor of installing service pipes to connect individual households to the water supply system that will be developed through this Project should be borne by individual households and will not be financed by this Project; therefore, based on the above-mentioned lesson learned, this Project is planned to monitor and supervise progress in the installation of the connecting pipes.

7. Plan for Future Evaluation

(1) Indicators for Future Evaluation:

- 1) Population served by water supply (persons)
- 2) Coverage of water supply from surface water sources (%)
- 3) Concentration of fluoride in drinking water (maximum value) (mg/L)
- 4) Facility utilization rate (%)
- 5) EIRR

(2) Timing:

Two years after project completion