

Ex-Ante Evaluation

1. Name of the Project

Country: The Republic of the Union of Myanmar

Project: Greater Yangon Water Supply Improvement Project

Loan Agreement: September 5, 2014

Loan Amount: 23,683 million yen

Borrower: The Government of the Republic of the Union of Myanmar

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Supply and Sewage Sector in Myanmar

Yangon City, the former capital of Myanmar, is a central city that accommodates 5.1million residents, accounting for about 10% of the nation's entire population of approx. 60 million. The water supply and sewage system in Yangon City has a long history dating back to 1842 when the development of water supply began. At present, the city has four reservoirs and many wells as water sources. The Yangon City Development Committee (YCDC) controls the development and management of water supply in the city.

Approximately 35% (estimation) of Yangon citizens receive water from the YCDC through its water supply network. While 24-hour water supply is ensured in the center of the city, the average hours of water supply citywide remains at only 9.2 hours. As measures against non-revenue water as well as the renewal of old water pipes have not been properly taken, the ratio of non-revenue water is as high as 65% (estimation). Surface water provides about 90% of the water sources (in reservoirs). The surface water lacks favorable quality, and two-thirds of it is directly supplied without purification. The ratio of installed water meters is relatively high at approx. 70%, and the water fee is about 8 yen/m³ per month for households with a water meter installed, and about 170 yen per month for those without a water meter. The relatively low water fee results in insufficient income derived from it. The YCDC merely deals with frequently occurring failure in facilities and equipment, and takes temporary measures against water stoppages, but cannot sufficiently construct new facilities or renovate old ones.

The Myanmar government also plans to develop a Special Economic Zone (hereafter, "SEZ") in Thilawa, a suburb of Yangon City, in order to realize economic growth by inviting foreign companies, which makes the development of infrastructure around the SEZ (particularly water supply) an urgent task.

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

The master plan for the development of water supply and sewerage, the formation of which JICA supported through the "Preparatory Study for The Project for the Improvement of Water Supply, Sewerage and Drainage System in Yangon City" (FY2012 - FY2013), specifies the following

priority tasks: [1] develop water sources that are indispensable for improving the water supply prevalence rate, [2] establish water distribution zones to ensure stable water supply and reduce non-revenue water, and [3] improve water quality to provide safe water. This project falls under tasks [1] to [3]. Yangon City now faces an urgent situation of tight water demand, and gives high priority to the improvement of water supply service among its urban development tasks. The project is consistent with the policies raised by Yangon City.

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

The project is positioned as “Assistance for improvement of people’s livelihoods” and “Assistance for development of infrastructure and related systems necessary for sustainable economic development” among the three pillars of Japan’s aid policy (established in April 2012) for Myanmar’s economy. For the water supply and sewerage sector, JICA updated the development survey (i.e. “The Study on Improvement of Water Supply System in Yangon City” (2001-2002)), conducted the “Preparatory Study for The Project for the Improvement of Water Supply, Sewerage and Drainage System in Yangon City” based on that update, and formulated the master plan for Yangon City’s water supply and sewerage. JICA also supports Yangon City in its efforts to build water supply facilities and enhance capacity through the “Project for Urgent Improvement of Water Supply System for Yangon City” (grant aid), dispatch of a “Advisor on Water Supply Management in Yangon City” (a expert), and other means.

(4) Other Donors’ Activity

Currently, UNICEF takes the initiative, while the other donors (i.e. World Bank, JICA) and the Myanmar government (i.e. Ministry of Health, Ministry of National Planning and Economic Development, Ministry of Agriculture and Irrigation, Department of Agriculture and Rural Development, Yangon City Development Committee, Mandalay City development committee) review the water/hygiene sector. The sector will then be analyzed for formulating a strategy.

(5) Necessity of the Project

As stated above, the project is consistent with Myanmar’s developmental task and development policies, as well as with Japan’s and JICA’s policies. Accordingly, both the need and relevance for JICA’s support in implementing this project are high.

3 . Project Description

- (1) Project Objectives: The objective of the project is to enhance water supply service by expanding water treatment facilities and improving distribution network, thereby contributing to improvements in the living environment of regional residents in Greater Yangon, Myanmar.
- (2) Project Site/Target Area: Greater Yangon
- (3) Project Components
 - 1) installation of Lagunbyin water treatment plant related facilities (e.g. water distribution pumps, SCADA),
 - 2) installation of water transmission pipes and main water distribution pipes,
 - 3) installation of water distribution pipes,

- 4) procurement of water meters,
 - 5) installation of a chlorination facility, and
 - 6) consulting service (e.g. detailed design, Tender Assistance, and Construction Supervision etc.)
- (4) Estimated Project Cost (Loan Amount)
31,180 million Yen (Loan Amount: 23,683 million Yen)
- (5) Schedule
From September 2014 to November 2021 (a total of 87 months). Project completion is defined as when the facility is officially provided (scheduled for November 2020).
- (6) Project Implementation Structure
- 1) Borrower: The Government of the Republic of the Union of Myanmar
 - 2) Guarantor: None
 - 3) Executing agency: Yangon City Development Committee (YCDC)
 - 4) Operation/maintenance/management system: YCDC
- (7) Environmental and Social Consideration/Poverty Reduction/Social Development
- 1) Environmental and social consideration
 - (i) Category: B
 - (ii) Reason for Categorization: The project does not fall under the large-scale water supply sector as per the “Japan International Cooperation Agency Guidelines for Environmental and Social Consideration” (issued in April 2010, hereafter, “JICA Guidelines for Environmental and Social Consideration”), and is judged to have minimum undesired impact on the environment. In addition, the project does not include any characteristics likely to cause an impact or areas susceptible to impact as specified by the JICA Guidelines for Environmental and Social Consideration.
 - (iii) Environmental Permit: Myanmar’s domestic laws do not require the preparation of an environmental impact assessment (EIA) report concerning the project.
 - (iv) Anti-Pollution Measures: Taking such measures against poor air quality, noise, etc. during construction work can minimize negative impact and thus satisfy international environmental standards (e.g. sprinkling water, use of low-noise/oscillation construction machines).
 - (v) Natural Environment: The project does not include any national parks or other areas susceptible to impact, and is expected to have minimum undesired impact on the natural environment.
 - (vi) Social Environment: Because the YCDC owns the land concerned, the project does not include the acquisition of land or relocation of residents. Four households engaged in farming at two sites (where water distribution ponds are to be constructed) have been provided with livelihood support as requested by the families affected, based on the JICA Guidelines for Environmental and Social Consideration.
 - (vii) Other/Monitoring: The executing agency will monitor air quality and noise during construction, and water quality upon the provision of water supply.
 - 2) Promotion of Poverty Reduction: None

- 3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Person with Disability etc.): Not in particular
- (8) Collaboration with Other Schemes and Donors: Support through the dispatch of experts for the executing agency to design, procure, and manage construction of the Lagunbyin water treatment plant with its own funding.
- (9) Other Important Issues: In considering concerns about existing water sources drying up due to global warming, and deteriorating water quality, the water supply facilities for expanding the areas provided with safe domestic and commercial water will help adapt to climate change.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)t

Indicator	Baseline (Actual Value in 2011)	Target (2022) [Expected value 2 years after project completion]
Population served within Yangon City (thousand persons)	1,933	3,344
Maximum amount of water supply within Yangon City (thousand m ³ /day)	673	1,096
Rate of facility utilization(maximum) (Lagunbyin Water treatment plant) (%)	-	87.1
Rate of continuous dozing of disinfection facility (%)	-	100
Minimum Amount of remained Chlorination (mg/L)	-	0.05< Compliance rate: more than 85%
Percentage of population served within Yangon City (%)	37.6	54.4
Net water supply per capita for residential use(l/person/day)	95	127 (entire city) 93 (Lagunbyin Covered area)

(2) Internal Rate of Return:

Based on the prerequisite below, the economic internal rate of return (EIRR) of the project is calculated to be 11.5%. The financial internal rate of return (FIRR) has not been calculated.

[EIRR]

Cost: Project cost (tax excluded), cost of administration, maintenance and management

Benefits: Degree of willingness to pay for new water supply, effect of cost reduction (cost for substituting water sources)

Project Life: 40 years

- (3) Qualitative Effects: Improvement of the living environment of Greater Yangon residents, establishment of an environment for investment through water supply for the Thilawa SEZ

5. External Factors and Risk Control

Delays in construction of the Lagunbyin water treatment plant undertaken by the executing agency with its own funding

6. Lessons Learned from Past Projects

- (1) Evaluation of Similar Projects: The result of ex-post evaluation on Jamaica's "Montego Bay Water Supply (Great River) Project" demonstrates that the ratio of non-revenue water must be reduced in order to ensure financial sustainability of the water supply project. We learned that it is necessary for the project to include programs aimed at improving the ratio of non-revenue water.
- (2) Lessons Learned from Past Projects: Through "Advisor on Water Supply Management in Yangon City" (Aid in singular form (Expert)) and technical cooperation projects (to be implemented in 2014), support is scheduled to enhance the executing agency's capacity for management and maintenance, including the maintenance and management of water supply facilities, water quality control, measures against non-revenue water, the collection of fees, and financial management.

7. Plan for Future Evaluation

- (1) Indicators to be Used: Water-supply population (thousand persons), quantity of water supply (thousand m³/day), use ratio of the Lagunbyin water treatment plant (%), ratio of continuous chlorination (%), free chlorine residual concentration (mg/l), piped water prevalence rate (%), water consumption per person (l/person/day)
- (2) Timing
Two years after completion of the project