Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Kingdom of Thailand

Project: Eighth Bangkok Water Supply Improvement Project

Loan Agreement: December 3, 2009

Loan Amount: 4,462 million Yen

Borrower: Metropolitan Waterworks Authority of Thailand

2. Background and Necessity of the Project

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

The Bangkok Metropolitan Area consists of the central city of Bangkok and 5 surrounding provinces, and is the political and economic center of Thailand with the population of over 10 million as of 2008. By 2011, the central city of Bangkok, Nonthaburi Province, and Samut Prakan Province, which are under the jurisdiction of the Metropolitan Waterworks Authority, are assumed to have the maximum water demand reaching to 5.51 million m^3/ day. On the other hand, since the present capacity of water treatment plants is 5.52 million m^3/ day, there are concerns that water supply would be insufficient to meet the future demand.

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

Up to now, MWA has carried out ① Expansion of water treatment plants to improve water supply capacity, ② Extension of the water transmission and distribution pipe network to expand the water distribution area, ③ Rehabilitation of the water transmission and distribution pipe network to reduce leakage, and ④ Ensuring new water transmission channel, etc, based on the MWA Master Plan.

This project is also planned in the MWA Master Plan, and responds to the increasing water demand by expanding Maha Sawat water treatment plant (current supply capacity 1.2 million m^3/day), Bangkhen water treatment plant (current supply capacity 3.6 million m^3/day) and related facilities. The total increased production capacity for each water treatment plant will be 0.4 million m^3/day. As the result of this project, MWA's service area will increase to approximately 2,349km^2 (73.6 percent of the total areas within the jurisdiction) and the service population is expected to be 8.72 million (97.6 percent of the population in the jurisdiction) by project completion in 2014, and it is expected to be able to meet the demand for water until 2017.

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

In Japan's economic cooperation program for Thailand, "Development Issues in Maturing Society" is positioned as a priority area, and support for urban problems and an environmental management system have been raised as development issues. Following such policy, JICA declares its policy for improvement of living environment in urban area, and this project is in line with the policy. The main previous Japanese ODA projects targeted MWA are as follows:

- ODA Loan: "Bangkok Water Supply Improvement Project" (total 11 times of yen loan provision from the 1st Phase 2 (approved in 1979) to the 7th (approved in 1999). Total loan amount 100,819 million Yen)
- Technical Cooperation: "The National Waterworks Technology Training Institute Project" (1985-1991)

- Technical Cooperation: “The National Waterworks Technology Training Institute Project (II)” (1994-1999)

(4) Other Donors’ Activity

In Thailand’s water supply sector, World Bank financed 55 million USDs for “Bangkok Water Supply Improvement Project” (1-1) (1974), and ADB financed 218.6 million USDs for “Bangkok Water Supply Improvement Project” (1-1) (1974), “Bangkok Water Supply Improvement Project” (1-2) (1979), and “Bangkok Water Supply Improvement Project” (2-1) (1984).

(5) Necessity of the Project

This project is to respond to water demand which is increasing with economic growth and population increase in Bangkok Metropolitan Area, by extending the water production facilities, and is consistent with JICA’s priority aid areas. Thus, the necessity and relevance of JICA’s assistance is high.

3. Project Description

(1) Project Objectives

The purpose of this project is to respond to increasing demand for water in Bangkok Metropolitan Area, by expanding the water production facilities, thereby contributing to improve living environment of inhabitants.

(2) Project Site/Target Area

Bangkok, Nonthaburi Province, and Samut Prakan Province

(3) Project Components

①Expansion of water treatment plants (0.4 million m^3/day, Bangkhen, Maha Sawat), reservoir construction (Rat Burana, Phetkasem), pump installation (raw water, transmission, and distribution pumps)

②Construction of pipelines（total extension approximately 1,000km）

③Consultation services（Detailed design (D/D), assistance in bidding, and construction supervision）

(Among these, targets of the yen loan are ① and ③（excluding expansion of the Maha Sawat water treatment plant.）

(4) Estimated Project Cost (Loan Amount)

21,099 million yen (of which the amount targeted for yen loan: 4,462 million yen)

(5) Schedule

December 2009-January 2014 (total 50 months)

The project will be completed at the time of completion of the consulting services related to the test run.

(6) Project Implementation Structure

1) Borrower: Metropolitan Waterworks Authority: MWA

2) Guarantor: The Government of Kingdom of Thailand

3) Executing Agency: same as 1)

4) Operation and Maintenance System: Operations and maintenance of the facilities constructed by this project will be conducted by relevant departments in MWA which operate and manage the current MWA facilities.

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

1) Environmental and Social Consideration

1. Category: B
2. Reason for Categorization: There are no corresponding sectors, characteristics, or districts which are easily affected, as listed in the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002), within this project, and its potential adverse impacts on the environment are not likely to be significant. Therefore, this project corresponds to Classification Category B.
3. Environmental Permit: The domestic law of Thailand does not require the preparation of an Environmental Impact Assessment (EIA) as related to this project.
4. Anti-Pollution Measures: This project complies with the standards of transmittal of the National Environmental Board, Bangkok Metropolitan Administration (BMA), and MWA by the installation of anti-dust sheets and sound insulating walls for air quality, noise, and vibration countermeasures during the construction and in-service period.
5. Natural Environment: The project targeted areas do not correspond to the districts or their surroundings which are easily affected such as national parks, and undesired effects to the natural environment are assumed to be minimal.
6. Social Environment: The construction of facilities and equipment accompanied by this project are carried out within MWA’s existing facilities and premises, and distribution pipes are buried under the public facilities, thus site acquisition or resident relocation is not required to carry out the project.
7. Other / Monitoring: During this project, monitoring for noise, vibration, water quality, and air quality is carried out by MWA.

2) Promotion of Poverty Reduction: None

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 Donors: None

(9) Other Important Issues: None

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual Value in 2008) (*1)		Target (2016) (Expected value 2 years after project completion)	
	Bangkhen Water Treatment Plant	Maha Sawat Water Treatment Plant	Bangkhen Water Treatment Plant	Maha Sawat Water Treatment Plant
① Average Daily Water Production (10,000 m^3 /day)	339	107	366	147
② Maximum Daily Water Production (10,000 m^3 /day)	358	117	388	156
③ Water Production Capacity (10,000 m^3 /day)	360	120	400	160
④Beneficial Population (persons) (*2)	n/a		1,248,829	

(*1) Fiscal year in Thailand (October-September) is applied to these indicators.

(*2) Beneficial Population is the expanded amount of water production capacity from this project (0.8 million m^3/ day) divided by the average daily water production per person.

(2) Internal Rate of Return

Based on the conditions indicated below, Economic Internal Rate of Return（EIRR）of this project is 21.4%, and Financial Internal Rate of Return (FIRR) is 10.2%.

EIRR

Cost: Project expenses (excluding tax), operations and maintenance costs

Benefit: Non-incremental benefit due to full replacement of existing supply, Incremental benefit due to increase of water use

Project Life: 30 years

FIRR

Cost: Project expenses, operations and maintenance management expenses

Benefit: water charges

Project Life: 30 years

5. External Factors and Risk Control

Construction outside the scope of the yen loan target is scheduled to be implemented by MWA with its own capital.

6. Lessons Learned from Past Projects

Ex-post evaluations of previous similar projects demonstrate that it is important to pay attention to the progress of the scopes out of the yen loan target in order to ensure project efficiency. In this project, regarding the construction of pipelines, which is out of the yen loan target, JICA will encourage MWA and the Thai government to proceed as scheduled.

7. Plan for Future Evaluation

(1) Indicators to be used

① Average Daily Water Production (10,000 m^3 /day)

② Maximum Daily Water Production (10,000 m^3 /day)

③ Water Production Capacity (10,000 m^3 /day)

④ Beneficial Population (persons)

⑤ Internal Rate of Return EIRR(%)、FIRR(%)

(2) Timing

Two years after project completion.