

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

### 1. Name of the Project

Country:	Kingdom of Cambodia
Project:	Siem Reap Water Supply Expansion Project
Loan Agreement:	March 29, 2012
Loan Amount:	7,161 million yen
Borrower:	The Royal Government of Cambodia

### 2. Background and Necessity of the Project

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

Access to safe water in the Kingdom of Cambodia deteriorated to extreme levels as a result of a civil war that destroyed infrastructure, including water supply facilities, and continued until the start of the 1990s. After the conclusion of the civil war, improvements were made to water supply services primarily in Phnom Penh owing to collaboration among Japan and other donors, but the water supply rate to regional cities remains low. Siem Reap City is Cambodia's third-largest city, with a population of 233,000, and in addition to rapid population growth (11% per year) in recent years, the city is home to the Angkor Wat ruins, which draw over 2.8 million tourists annually. The city is projected to see a rapid increase in water demand going forward, but its only existing water treatment facility is one constructed by Japan in 2006 through grant aid with a capacity of 9,000 cubic meters per day, yielding a water supply rate of approximately 25%, which is the lowest level of any major city in the country, in a situation where safe and stable water supply services are failing to catch up with demand.

#### (2) Development Policies for the Water Supply Sector in Cambodia, and Priority of the Project

Access to safe water is one of the priority development goals in the National Strategic Development Plan (NSDP) (2009 to 2013), and the National Policy on Water Supply and Sanitation (NPWSS) (2003) also spells out a policy to strengthen urban water supplies in each province. The Project is regarded as being consistent with these development policies and contributing to the strengthening of water supply capacity in regional cities.

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

The country assistance program for Cambodia formulated in February 2002 aims to improve lacking social and economic infrastructure with "sustainable economic growth and the realization of a stable society" as an area of focus, and the Project is consistent with this policy in that it is expected to contribute to the improvement of the living environment in Siem Reap City and the development of the tourism industry. Moreover, the project development plan aims to engage in maintenance and improvement of urban water supply facilities within the City Water Environment Program (provisional title), and has recently provided the Niroth Water Supply Project (loan, 3.51 billion yen) in FY2008. Since 2003, the Capacity Building for Water Supply System in Cambodia Phases I and II (technical cooperation project, through 2012) has been being

implemented, with the results of this technical cooperation being utilized in the implementation of the Project.

#### **(4) Other Donors' Activities**

The Asian Development Bank (ADB) is carrying out the following rural water supply improvement project for the water supply sector in Siem Reap Province.

- Second Rural Water Supply and Sanitation Sector Project: 2010 to 2015 (\$21.0 million)

#### **(5) Necessity of the Project**

The Project is in accord with Cambodia's challenges and development policies and with Japan and JICA's areas of aid focus. Consequently, it is highly necessary and relevant that JICA should support implementation of the Project.

### **3. Project Description**

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

The object of the Project is to broaden safe and stable water supply services in Siem Reap City, which has a serious water shortage due to rapid urbanization and an increase in the number of tourists, by expanding water supply facilities, thereby contributing to the improvement of the living environment and the vitalization of the tourism industry in the Project area.

**(2) Project Site / Target Area:** Siem Reap City, Kingdom of Cambodia

#### **(3) Project Components (including Procurement Methods):**

(i) Water diversion facilities, water pipe (approx. 13 kilometers) construction; (ii) water treatment plant construction (60,000 cubic meters per day); (iii) laying of distribution pipes (approx. 217 kilometers); (iv) consulting services (detailed design, bidding assistance, supervision of works, human resource development/organizational strengthening, etc.)

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

7,700 million yen (yen loan amount: 7,161 million yen)

#### **(5) Schedule (Cooperation Period)**

Planned for the period between March 2012 and June 2019 (88 months in total). The Project will be completed at the service opening of the facilities (June 2018).

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

- 1) Borrower: Royal Government of Cambodia
- 2) Guarantor: None
- 3) Executing Agency: SRWSA
- 4) Operation and Maintenance System: SRWSA

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

### 1) Environmental and Social Considerations

- (i) Category: B
- (ii) Reason for Categorization: Under the JICA Guidelines for Environmental and Social Considerations, put into effect in April 2010, the Project is deemed not to have major unfavorable impact on the environment in light of the characteristics of the sector, the project, and the region.
- (iii) Environmental Permit: The Environmental Impact Assessment (EIA) report regarding the Project is expected to be approved by Cambodia's Ministry of Environment.
- (iv) Anti-Pollution Measures: Waste products generated during construction will be properly disposed of in accordance with local regulations. Furthermore, regarding contamination measures for after service, the SRWSA is implementing contamination measures such as those provided in manuals and procedures concerning the handling of chlorine, water quality, and sludge at existing water treatment facilities, and plans to take similar measures in the Project.
- (v) Natural Environment: For a portion of the segments in which water pipes are to be laid, the procedures required by regulation are to be carried out under national procedure because they pass through or near protected areas. Since the SRWSA will conduct the work with consideration toward minimizing the impact on the natural environment and take mitigating measures, such as replanting of trees after completion of the work, it is envisioned that unfavorable impact on the natural environment will be minimal.
- (vi) Social Environment: The acquisition of approximately 4.5 hectares of land for the Project will be advanced in accordance with the internal procedures of Cambodia. Note that non-voluntary transfer of residents is not anticipated to occur.
- (vii) Others/Monitoring: SRWSA will monitor effluent water quality, noise/vibration, and the natural environment during the construction period, as well as wastewater quality from the water treatment plant, disposal conditions of waste products (sludge), the natural environment, and other matters during the service period.

2) Promotion of Poverty Reduction: The installation, etc. of common water taps is planned to be implemented in impoverished residential areas.

3) Promotion of Social Development: None in particular.

## **(8) Collaboration with Other Donors**

Through the technical cooperation project, the Capacity Building for Water Supply System in Cambodia Phase III (to be implemented over a five-year periods starting in FY2012), and others, JICA plans to support the strengthening of organizational capacity among through related to water supply projects in Cambodia, including the SRWSA.

## **(9) Other Important Issues**

None in particular.

#### **4. Targeted Outcomes**

##### **(1) Quantitative Effects**

###### 1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (Actual Baseline in 2011)	Target (2020) [2 years after project completion]
No. of households connected to water supply	4,867	18,797
Water supply population	24,876	106,050
Turbidity (NTU)	0	Less than 5
Water treatment plant operating rate (%)	-	52.8

###### 2) Internal Rates of Return

Based on the foregoing assumptions, the economic internal rate of return (EIRR) for the Project will be 21.22%, and the financial internal rate of return (FIRR) will be 3.06%.

- (i) Economic Internal Rate of Return (EIRR): [Costs] Project costs (construction costs, operation, maintenance, and management costs) (excluding tax);  
[Benefits] Reduction of water purchasing costs, reduction of disbursement to medical institutions, tourism-related revenue [Project life] 40 years
- (ii) Financial Internal Rate of Return (FIRR): [Costs] Project costs (construction costs, operation, maintenance, and management costs, material update costs);  
[Benefits] Fee revenue [Project life] 40 years

##### **(2) Qualitative Effects**

Improvement of the living environment for citizens of Siem Reap, preservation of the Angkor Wat ruins by switching the water source from the groundwater flowing under the ruins to surface water, and regional economic development focused on the tourism industry through improvement of the investment environment.

#### **5. External Factors and Risk Control**

None in particular.

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

##### **(1) Results of Evaluations of Similar Past Projects**

Based on ex-post evaluations of past projects in the water supply field, it was learned that it is important to strengthen the capacity of the executing agency in order to realize sustainable effects, because there is a possibility of inadequate realization of effects after project implementation due to a lack of technical capabilities or similar issues at regional water supply authorities.

## **(2) Lessons for the Project**

Viewing the above lesson in light of the technical capabilities, etc. of the executing agency for the Project, JICA plans to support enhancement of technical capabilities through consulting services and the dispatching, etc. of loan aid experts.

## **7. Plan for Future Evaluation**

### **(1) Indicators to be Used**

- 1) Number of households connected to the water supply
- 2) Water supply population
- 3) Turbidity (NTU)
- 4) Water treatment plant operating rate (%)
- 5) The internal rates of return EIRR (%) and FIRR (%)

### **(2) Timing**

Two years after project completion