Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Democratic Socialist Republic of Sri Lanka

Project: Upper Kotmale Hydro Power Project (II)

Loan Agreement: March 26, 2010

Loan Amount: 4,552 million yen

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

2. Background and Necessity of the Project

(1) Current State and Issues of the Power Sector in Sri Lanka

Over the past 20 years, Sri Lanka's electricity generation has increased at an annual rate of approximately 7%, and it is anticipated that it will continue to grow at between 7 and 8% per annum in the future. At the same time, it has become an urgent issue to develop electricity generation and distribution facilities to accommodate rapidly rising electricity demand. It is also required to eliminate the regional disparities in the electrification rates and to promote the power sector reform to enhance the sector's efficiency.

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

In Sri Lanka's "Ten Year Horizon—Development Framework" (2006-2016), the power and energy sector is emphasized as a driving force for the country's economic development, and particular emphasis is put on the diversification of power sources, expansion of electricity generation, and promotion of regional electrification.

In the Long Term Generation Expansion Plan (2002-2016), the Ceylon Electricity Board (CEB) plans to increase the generation capacity and power supply in a phased manner. It is planned that this project (150 MW) and the Kerawalapitiya combined power plant (300 MW) will serve as the important power source prior to the operation of currently planned three coal-fired power stations (total of 1,900 MW) and four hydropower stations (total of 126 MW).

(3) Japan and JICA's Policy and Operation in the Power Sector

In Japan's Country Assistance Program for Sri Lanka (FY2004), development of power sources is emphasized as an urgent issue. JICA also plans to support the formulation of new projects for power sources development in Sri Lanka, while monitoring the progress of the power sector reform. Japan has provided support for projects that contribute to the enhancement of transmission capacity and efficiency based on the Long Term Transmission Development Plan (2000-2010), and other related policies. Such projects include construction of three power plants (Samanalawewa, Kukule, and Kelanitissa;

total of 340 MW) that account for 19% of Sri Lanka's total generation capacity (1,777 MW). Furthermore, Japan has provided an ODA Loan to the "Energy Diversification Enhancement Project (Engineering Services)" (LNG project) in 2008.

(4) Other Donors' Activity

Both Asian Development Bank (ADB) and the World Bank have assisted the power sector in Sri Lanka, while monitoring the progress of the sector reform. ADB has provided technical assistance to promote the sector reform, and commenced studies toward the enhancement of transmission and distribution efficiency. The World Bank has provided funds to renewable energies projects. China, India, and other countries are active in funding large-scale projects for power sources development.

(5) Necessity of the Project

As Sri Lanka's hydropower resources are almost entirely developed, the Upper Kotmale Hydro Power Project (original Japanese ODA Loan for the project), for which the L/A was signed in March 2002, is the country's last large-scale and newly-developed hydropower project. Although thermal power generation is the main energy source in Sri Lanka, as it stably generates electricity regardless of the weather, the country does not possess domestically produced fuels to be used for thermal power generation. Therefore, it is necessary for the country to develop hydropower resources to the maximum extent.

3. Project Description

(1) Project Objectives

The objective of the project is to meet the projected power demand increase by constructing a run-of-the-river hydropower plant (150 MW) on the Kotmale river, a tributary of the Mahaweli River (upstream of the existing Kotmale Dam) with adequate environmental and social impact mitigation, thereby contributing to the economic growth of Sri Lanka.

(2) Project Site/Target Area

Upstream of the existing Kotmale Dam on Kotmale river, a tributary of the Mahaweli River

(3) Project Components

1) Preparatory works: Construction of an access road, development of resettlement sites, and construction of a 22-kV transmission line for construction works, etc.
2) Main civil works: Construction of an intake dam, headrace tunnel, surge tank, penstock tunnel, tailrace tunnel, power house, and switchyard; and civil works for watershed environmental management, etc.
3) Hydromechancial equipment: Construction of a surge tank; installation of a steel penstock and lining, turbines (vertical axis, Francis), etc.
4) Generating equipment: Installation of generators, main transformer, control and

protection equipment, switchyard, etc.

5) Transmission line: Construction of a transmission line (220 kV, 2 circuits, 17.5 km)

6) Consulting services: Construction supervision and management

(4) Estimated Project Cost

48,460 million yen (Loan Amount: ①Phase I: 33,265 million yen; ②Phase II: 4,552 million yen)

(5) Schedule

March 2002 – March 2013 (total of 133 months). The project will be completed when the facilities begin operation (March 2012).

(6) Project Implementation Structure

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

2) Executing Agency: Ceylon Electricity Board (CEB)

3) Operation and Maintenance System: The same as 2) above

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

1) Environmental and Social Consideration

① Category: A

② Reason for Categorization: The project is classified as Category A because it is a large-scale hydropower project under the "Japan Bank for International Cooperation Environmental Guidelines for ODA Loans" [formulated in October 1999]. (It should be noted that the project is classified as Category A even under the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" [formulated in April 2002] because it falls under the large-scale hydropower sector and sensitive characteristics.)

③ Environmental Permit: The Environmental Impact Assessment (EIA) report for the project was approved by the Central Environmental Authority (CEA) in July 1999.

④ Anti-Pollution Measures: A watershed environmental management plan to prevent soil erosion, etc., was formulated in March 2003.

⑤ Natural Environment: Any adverse environmental impact stemming from this project is expected to be minimal.

⑥ Social Environment: The number of resident households to be resettled by the project is 495. The Resettlement Action Plan was formulated in March 2003, and development of resettlement sites is currently underway. As of December 2009, 424 households have been resettled.

⑦ Others/Monitoring: Construction, environmental measures, progress in resettlement, and other items are being monitored by the Executing Agency. Moreover, an Environmental Monitoring Committee chaired by CEA has been established (generally meets once every two months).

2) Promotion of Poverty Reduction

Under this project, local residents, many of whom are among the low income households, are employed on a priority basis.

3) Promotion of Social Development (e.g. gender perspectives, measures for infectious diseases including HIV/AIDS, participatory development, consideration for the disabled, etc.)

As a part of the Resettlement Action Plan, empowerment programs for female, etc., are implemented.

(8) Cooperation with Other Donors

None

(9) Other Important Issues

None

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual value in 2009)	Target (2014) (Expected value 2 years after project completion)
Hydropower utilization factor (%)	–	97
Planned outage hours for inspection/repair (hours/year)	–	263
Non-scheduled outage hours (hours/years)	–	
Net generation (GWh)	–	407

(2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) for the project is 11.0%, and the Financial Internal Rate of Return (FIRR) is 7.3%.

EIRR

Cost: Project cost (excluding taxes), operation and maintenance cost

Benefit: Cost of constructing and cost of operation and maintenance of alternative thermal power plant (gas turbine)

Project life: 50 years

FIRR

Cost: Project cost, operation and maintenance cost

Benefit: Revenue from power sales

Project life: 50 years

5. External Factors and Risk Control

None

6. Lessons Learned from Past Projects

The mid-term review of the "Upper Kotmale Hydro Power Project" (original Japanese ODA Loan for the project) (February 2007) suggests that 1) follow-up surveys of improvements in the living environments of resettled residents should be conducted regularly even after the project's completion so that not only will the project's good practices in resettlement be documented but the project will have sustainable value as a successful model for social consideration and will contribute to future project formation, and 2) there is a need for collection and monitoring of continuous rainfall data.

For 1), the Executing Agency has expressed understanding that it will conduct follow-up surveys of resettled residents' living conditions even after completion of the project. Furthermore, for 2), the Executing Agency is already monitoring hydrological data, including rainfall data, and it plans to continue gathering and monitoring such data in the future.

7. Plan for Future Evaluation

(1) Indicators to be Used

1) Hydropower utilization factor (%)
2) Planned outage hours for inspection/repair (hours/year)
3) Planned outage hours for inspection/repair (hours/year)
4) Net generation (GWh)
5) Internal rate of return (EIRR, FIRR) (%)

(2) Timing

2 years after project completion