Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Republic of Uzbekistan
Project: Amu-Bukhara Irrigation System Rehabilitation Project
Loan Agreement: January 27, 2015
Loan Amount: 11,872 million yen
Borrower: The Government of the Republic of Uzbekistan

2. Background and Necessity of the Project

(1) Current State and Issues of the Agriculture and Irrigation Sector in Uzbekistan

Agriculture is an important sector in Uzbekistan, as approximately 40% of the population is engaged in this sector, and agriculture accounts for about 20% of the whole country's GDP. Especially, one of the largest exporting items is cotton, of which production quantity is ranked the sixth in the world and export amount is ranked the third in the world (US Department of Agriculture, 2014). Vast majority of the land in Uzbekistan is dry or semi-dry land, and most farmland heavily relies on irrigation water originated from neighbouring major rivers. Agriculture in Uzbekistan and other former Soviet countries in Central Asia may be characterized with policies and activities largely dominated by governments within a transitional period from planned economy into market economy and with large-scale and less efficient irrigation infrastructures constructed by the Soviet government.

Many of the irrigation pumping facilities in Uzbekistan were constructed in the 1960's to the 1980's. Since then, no major rehabilitation work has been implemented, although facility life for irrigation pumping stations is usually 20 years. Therefore, water leakage problems and mechanical faults that frequently take place are causing decrease of the amount of pumped-up water delivered to farms. Moreover, it has been more difficult to procure spare parts that comply with specifications of such outdated facilities, as manufacturers do not produce some of the parts anymore. This creates difficulty for the executing agency to maintain the facilities.

On top of the above, those outdated and less efficient Soviet style pumping facilities are consuming massive amount of electricity for operation, which account for approximately 20% of total electricity consumption of the entire country. Enhancing energy efficiency of the pumping facilities, therefore, is crucially and urgently important.

(2) Development Policies for the Agriculture and Irrigation Sector in Uzbekistan and Priority of the Project

In agricultural sector, the government of Uzbekistan establishes "Welfare Improvement Strategy (II) (2012-2015)," a national development plan of the government, which prioritizes to secure stable and sustainable production of cotton and other agricultural products and to lower the electricity consumption in order to achieve the target of 5.9% of annual growth in agricultural sector by 2015, by rehabilitating outdated pumping facilities that were constructed during the Soviet time. In such circumstances, Amu-Bukhara Irrigation System in central-western part of Uzbekistan, which commenced its operation in the 1970's, is one of the largest irrigation system in Uzbekistan; it uses 4.58 billion m^3 of water, which is about a half of the amount to be able to take from Amudaria based on international agreement, and it consumes roughly 1,300 GWh although the entire consumption for agricultural sector in Uzbekistan is 7,000 GWh (Central Asia Power Sector Regional Master Plan, ADB, 2012). As Amu-Bukhara Irrigation System is such a large scale, its rehabilitation can have drastic impact on particularly saving electricity. Thus, the presidential resolution in 2012 (No. 1668) about investment plan for 2012 prioritizes rehabilitation and replacement of pumping stations for Amu-Bukhara Irrigation System.

(3) Japan and JICA's Policy and Operations in the Agriculture and Irrigation Sector

Country Assistance Policy for Uzbekistan highlights "Support for Reconstructing Social Sector (Agriculture and Regional Development and Health Sector)" as a priority area, and it stresses to strengthen Agricultural sector on which rural communities mainly rely, for mitigating economic and social disparity between urban and rural areas within Uzbekistan. Also, for Uzbekistan, JICA Country Analytical Paper prioritizes income generation, improvement of healthcare, and enhancement of education in rural areas, and as one of the ways to achieve the goal, JICA highlights cooperation on rehabilitation of irrigation facilities and on more efficient water use. For improving a capacity of water users associations in Uzbekistan, The Project for Water Management Improvement was implemented (November, 2009 to December, 2013).

(4) Other Donors' Activities

Asian Development Bank (ADB), co-financer of the Project, has implemented five projects on irrigation sector in Uzbekistan. Also, World Bank has implemented four projects in the similar sphere of cooperation.

(5) Necessity of the Project

The Project is to contribute to enhancing stable and sustainable agricultural water supply and improving energy efficiency, and the project is fully consistent with development plan and policies of Uzbekistan and

Japan's assistance policies and analysis. For these reasons, it is highly necessary and appropriate for JICA to assist the Project.

3. Project Description

(1) Project Objectives

The objective of the Project is to provide stable irrigation water to water users of Amu-Bukhara Irrigation System and to reduce electricity consumption of pumping facilities in the system by rehabilitating the two existing obsolete pumping facilities on the main canal in the system, thereby contributing to enhancing agricultural sustainability and energy efficiency in the system.

(2) Project Site/Target Area

Amu-Bukhara Irrigation System (Bukhara Province and Navoi Province)

(3) Project Components

1) Replacement of Pumping Station "Khamza-II" (commenced in 1974) and "Kizil Teppa Auxiliary" (commenced in 1985)
2) Consulting Services (design, bidding assistance, construction supervision)

(4) Estimated Project Cost (Loan Amount)

14,733 million yen (Loan amount: 11,872 million yen)

(5) Schedule

From December 2014 to December 2020 (total: 73 months). The Project completion is defined as the commencement of the service of the facilities (December 2019).

(6) Project Implementation Structure

1) Borrower: The Government of the Republic of Uzbekistan
2) Executing Agency: The Ministry of Agriculture and Water Resources (MAWR)
3) Operation and Maintenance System: Interregional Operation Authority of Amu-Bukhara Machine Canal, which is structured under MAWR, has consistently undertaken operation and maintenance of the facilities in the system since the original commencement in the soviet time. The Authority, therefore, has rich experience in operation and maintenance of the facilities.

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

1) Environmental and Social Considerations
   (i) Category: B
   (ii) Reason for Categorization: The Project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA Guidelines for Environmental and Social

Considerations (April, 2010), and its potential adverse impacts on the environment are not likely to be significant.

(iii) Environmental Permit: No environmental impact assessment report is required under the relevant laws in the Republic of Uzbekistan.

(iv) Anti-Pollution Measures: To fulfill relevant effluent and environmental standards in Uzbekistan, the impacts of the Project on air quality and waste during construction will be mitigated by such measures as watering and appropriate disposal of debris and waste oil. The impact of water and waste after the start of its operation will be mitigated by such measures as installation of oil-water separators and appropriate disposal including reusing and recycling. The impact of noise and vibration from the Project site is not expected, as the site is located at least 150 m away from the nearest residential area.

(v) Natural Environment: The Project site is not located in and around any sensitive areas such as national parks. Although the site of the pumping station "Khamza-II" is 10 km away from Lake Dengizkul, which is listed under Ramsar Convention, the project impact to the lake is not expected.

(vi) Social Environment: The Project is to rehabilitate the existing facilities, and the Project will not involve any land acquisition or involuntary resettlement.

(vii) Other / Monitoring: During the Project's construction phase, the contractor[s] will monitor air quality, water quality, waste and so on. After the start of operation, the Executing Agency will monitor waste and safety issues. Regarding cotton harvesting practices in Uzbekistan, on which non-governmental organizations have shown their concerns, the Uzbek government has accepted ILO's independent monitoring mission and started the Decent Work Programme to enhance labour and employment situation with ILO in 2014. The progress and results of the program will be regularly reported to JICA.

2) Promotion of Poverty Reduction: None

3) Promotion of Social Development: None

(8) Collaboration with Other Donors: Amu-Bukhara Irrigation System has six major pumping stations on the main canal. Out of six, JICA will finance for rehabilitation of the two existing pumping stations, while ADB will finance for rehabilitation of four of them and some technical assistance on water saving techniques and agricultural extension services within the system.

(9) Other Important Issues: The Project can mitigate climate change impact (expected CO_2 emission reduction: 188,189.30 ton per year).

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicators	Baseline (2013)	Target (2021) (Expected values two years after project completion)
Operation indicators		
Pumping discharge capacity (Khamza-II)	126.0 m^3 /s	135.0 m^3 /s
Pumping discharge capacity (Kizil Teppa)	40.0 m^3 /s	42.0 m^3 /s
Effect indicators		
Annual electric power consumption (Khamza-II)	643.0 GWh	599.0 GWh
Annual electric power consumption (Kizil Teppa)	37.5 GWh	36.0 GWh
Electric power consumption rate (Khamza-II)	133.00 KWh/m^3	124.10 KWh/m^3
Electric power consumption rate (Kizil Teppa)	5.00 KWh/m^3	4.77 KWh/m^3
Total Irrigated Area in the System (Note 1)	315 thousand ha	315 thousand ha
Portion of Total Cotton cultivated area within Total Irrigated Area in the System (Note 2)	38.4 %	35.0 %

Note 1: With and without project, irrigated area of the System will be expected to stay the same.

Note 2: Although it is difficult to verify the Project' direct impact on cotton cultivated area, the cotton cultivated area is expected to be reduced through various approaches such as technical assistance financed by ADB.

2) Internal Rate of Return: based on the conditions indicated below, the economic internal rate of return (EIRR) of the project is 14.78%. The financial internal rate of return (FIRR) will not be calculated considering the nature of the Project.

[EIRR]

Cost: project costs (excluding taxes), operation, maintenance and management costs (energy cost and other)

Benefits: increased power supply, reduced CO_2 emissions

Project life: 20 years

(2) Qualitative Effects: promotion of national and regional economic development, climate change impact (mitigation)

5. External Factors and Risk Control

Destabilization of electricity energy and/or water supply to the pumping stations

6. Lessons Learned from Past Projects

(1) Results of Ex-Post Evaluation on Similar Projects

The result of the ex-post evaluation on Bohol Irrigation Project (phase II) in the Philippines indicates that concrete-lining work on tertiary canals, which was planned to be implemented by the executing agency, was delayed than the original plan. This, according to the evaluation, resulted in delay in achieving project outcome. The evaluation concludes that that the main cause of delay was that it took time to secure budget for this work.

Another ex-post evaluation, on the Project for Improvement of Hygienic Environment of the Reconquista River Basin in Argentina, points out the project was significantly delayed. The evaluation further analyzes that one of the delaying causes was that the executing agency had little experience in project management and particularly stake holder coordination among relevant ministries and agencies within the Argentine government, JICA, and other co-financing agencies. Therefore, the evaluation indicates the necessity of monitoring of the project with close communication with co-financer particularly in case the executing agency has little experience of ODA loan project.

(2) Lessons for the Project

The government of Uzbekistan is fully responsible for rehabilitating tertiary canals of the Amu-Bukhara Irrigation System, as the component will not be covered by the Japanese ODA loan and ADB loan. The government has commenced its rehabilitation program for the tertiary canals since 2013 and it plans to complete it by 2017. As the lessons learnt from the ex-post evaluation result on Bohol Irrigation Project (phase II) suggest, the progress of the construction as well as financial and budget status of the work will be monitored during the Project, in order for the end-users, or farms, to obtain sufficient water.

Also, as the outcome of the ex-post evaluation for the Project for Improvement of Hygienic Environment of the Reconquista River Basin suggests, the implementation work will be fully in line with the progress of the component financed by ADB, the parallel co-financer of the Project. The staff at the project management unit (PMU) and the project implementation unit (PIU) established by the executing agency will be responsible for both components financed by ADB and JICA. Therefore, PMU and PIU will be able to utilize the experience and lessons learnt from/to each component during the implementation of the Project.

7. Plan for Future Evaluation

(1) Indicators to be Used in Future Evaluations

1) Pumping discharge capacity (m^3 /s)
2) Annual electric power consumption (GWh)
3) Electric power consumption rate (KWh/m^3)
   (Annual electric power consumption (KWh) / Annual pumped-up amount (m^3))
4) Total irrigated area in the System (ha)
5) Portion of total cotton cultivated area within total irrigated area in the system (%)
6) Greenhouse gas (CO_2) emission reduction (t)

(2) Timing of Next Evaluation

Two years after project completion