Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: India
Project Title: Rengali Irrigation Project (III)
Loan Agreement: March 31, 2010
Loan Amount: 3,072 million Yen
Borrower: The President of India

2. Background and Necessity of the Project

(1) Current State and Issues of the Agricultural/Irrigation Sector in India

In India, about 60% of the total workforce is engaged in the agricultural sector, and around 55% of the total land area is used as farmland. Agricultural production accounts for approximately 20% of the GDP, so agriculture is an important industry for ensuring employment and improving livelihood. However, rural poverty has been a serious problem and it is critical to further boost agricultural production and to develop water resources in order to meet the demands of the rapidly-growing population. Currently, the agricultural/irrigation sector is facing various challenges, including delays in the development of new irrigation facilities due to insufficient funds, aging facilities, shortfall in human resources, inactive Water User Associations in each state and decrease in water-retaining capacity due to large scale deforestation. Under such conditions, the improvement of agricultural infrastructure including better irrigation facilities is one of the prioritized issues of this sector in order to invigorate agriculture and upliftnment of rural society.

(2) Development Policies for the Agricultural/Irrigation Sector in India and the Priority of the Project

In its Eleventh Five Year Plan (April 2007–March 2012), the Government of India has set its target for real growth of average GDP at 9%. The growth target for the agricultural sector is 4%. Since the irrigation project contributes to increasing farmers' income through increasing production, it is one of the linchpins of the Plan as a measure to improve agricultural infrastructure thereby contributing to poverty reduction.

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

The "Improvement of Poverty and Environment Issues" is one of the prioritized areas of the Country Assistance Program of Japanese ODA for India. Accordingly, JICA has set the "Aid towards Poverty Reduction" as a major area for assistance, promoting to create and reinforce Water User Associations, recover cost from beneficiaries, improve the ability of government agencies and to construct irrigation facilities, in order to improve livelihoods in rural area. The Project is therefore consistent with the relevant strategies as explained above. Regarding Japanese ODA Loans provided to India, 11 projects with a total loan of 94,700 million yen have been approved in the Sector. Further, concerning Technical Cooperation, experts have been dispatched for several ODA Loan projects in 2002 to Orissa State and in 2008 to Andhra Pradesh State,

implementing activities to ensure the effectiveness of the projects.

(4) Other Donors' Activity

The World Bank has been implementing irrigation programs as well as integrated water resources management programs in the states of Haryana, Tamil Nadu, Orissa, Andhra Pradesh and Maharashtra. The Asian Development Bank (ADB) has also been providing support for rehabilitation and modernization of several irrigation facilities in Orissa State, worth about 188 million USD, since 2008.

(5) Necessity of the Project

The Project site is located in the central area of Orissa State. Since the rainfall is confined to the monsoon season (June to September), it is difficult to cultivate land without any irrigation facilities during the dry season. The poverty ratio in the project area is higher compared to other regions of India, and its agricultural productivity is also relatively low. Therefore, increasing income through efficient use of water and diversification of crops to be cultivated is the critical issue for poverty reduction. In the Rengali Multipurpose Project, which includes this project, the construction of the dam in the upper stream was completed in 1985. In addition, the main canal from the barrage to the 29.177 km point was also completed in September 2004. The priority of the State Government is to increase the effect of the Multipurpose Project by timely completion the Project. However, because the total project cost increased due to the global price escalation of materials and equipment, the Government of India requested an additional loan to cover the shortfall while managing with its own funds as far as possible. Therefore, JICA's additional assistance for the Project is highly necessary and relevant.

3. Project Description

(1) Project Objective(s)

The objective of the project is to increase production of agriculture and crop diversification by constructing irrigation systems and organizing Water User Associations, thereby contributing to improvement of the living standard of farmers in the Project.

(2) Project Site/Target Area

The Left Bank Canal of Brahmani River basin, Orissa State.

(3) Project Component(s)

1) Civil work (Construction of Rengali Left Bank Canal System (Phase1))

2) Technical support

3) Consulting services (detailed design, bidding and procurement assistance, construction management, etc.)

(4) Estimated Project Cost (Loan Amount)

23478 million yen (Loan amount: 3072 million yen)

(5) Schedule

The planned implementation schedule of the project is from December 1997 to June 2012 (175 months in total). The completion of the consulting services which is regarded as the completion date of the project.

(6) Project Implementation Structure

1) Borrower: The President of India

2) Executing Agency: Department of Water Resources, State Government of Orissa

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

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

1) Environmental and Social Considerations

(i) Reason for Categorization: "OECF Guidelines for Environmental Considerations" (October 1989) was applied to this program, and the environmental categorization is not applied. (Under the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Consideration" (April 2002), the Project falls under the category of a major agricultural sector (irrigation) that is likely to have a significant impact (major-scale deforestation), and thus is classified as Category A.)

(ii) Environmental Permit: The Environment Impact Assessment (EIA) report for the Project is already prepared. Environmental Clearance and Forest Clearance were also obtained from the Central Government in December 1996 and May 2003 respectively.

(iii) Anti-Pollution Measures: Farming guidance will be provided to farmers in the targeted farmland of the Project on the usage of agricultural chemicals and fertilizers.

(iv) Natural Environment: The irrigation program of Rengali Multipurpose Project[1] requires a total of 2,919 ha of forest land for the left and right bank canals including barrage & pond at Samal, of which 456 ha are located in JICA portion of the project. The canal route has been designed and realigned so as to minimize large scale deforestation and also a separate plan in place for replanting trees. Currently, afforestation has been conducted in the area of about 350 ha in total, and the remaining area is scheduled to be afforested by 2012. In addition, the Environment Management Committee has been organized at the project level & state level, in which the Forest Department of the State, NGOs and research institutes will participate. A specific action plan for protecting the ecosystem and wild animals in the target area has been formulated and is being implemented to minimize environmental impact in the surrounding areras. Following the proposal submitted to the State government in December 2007, a budget of 268.5 million rupees was approved for: (i) improvement in the environment of wild animals' habitats, (ii) the protection of wild animals and ensuring their migration pathways, (iii) the implementation measures to prevent contact between the residents and wild elephants, and (iv) the reinforcement of management in the wildlife protection area.

(v) Social Environment: The Project requires 2,919 ha of forestland and 1,161.35 ha of private land. As for forestland, 2,107 ha in 1997 and 812 ha in 2003 were already cleared based on approval by the Ministry of Environment and Forests. As for private land, 1,142.23 ha has already been acquired (as of the end of October, 2009), and the

[1] Rengali Multipurpose Project means the entire program to take water used in the hydroelectric plant (5 generators × 50 MW) of the Rengali Multipurpose Dam (completed in 1985, 70.5m high, 1,040m wide), located upstream of Brahmani River in Orissa State from the Samal Barrage (completed in 1994, 560m wide), which is located about 35 km downstream of the Rengali dam, and use it for irrigation.

remaining 19.12 ha are scheduled to be acquired. The Project does not foresee any resettlement issues. However, if any households are affected by the Project, compensation procedures will be applied pursuant to the resettlement compensation policy of the Government of Orissa.

(vi) Other/Monitoring: In the Project, the Environment Management Committee at the project level as well as at the state level, in which the Forest and Environmental Department of the State and research institutes participate will monitor water quality for irrigation, measures to protect wild animals, etc.

2) Promotion of Poverty Reduction:

The Project is expected to provide aid for poverty reduction through technical support such as the formulation of Water User Associations and the provision of farming guidance.

3) Promotion of Social Development (e.g. Gender Perspective, Participatory Development, Consideration for the Person with Disability, Measure for infectious Diseases including HIV/AIDS):

The Project will promote canal maintenance through a participatory development involving farmers by organizing Water User Associations. In addition, measures for Malaria mitigation were undertaken, including distribution of mosquito nets preferably to pregnant women and infants from the gender perspective.

(8) Collaboration with Other Donors:

None

(9) Other Important Issues:

None

4. Targeted Outcomes

(1) Performance Indicators **(Operation and Effect Indicator)**

Operation Indicator

Indicator	**Unit**	**Baseline (Actual Value in 2003) The original**	**Target[2] (2016) [Expected value 4 years after completion]**
Area Benefited by the Project	Ha.	-	29,176
Cultivated area by crops	Ha.	29,287	55,438
Collection rate of irrigation Water Rate (= Collection Amount / Tax Charged Amount)	%	-	40
Sufficiency Rate of Operation and Maintenance Cost (O & M Budget Allocated / O & M Cost Needed)	%	-	80
No. of Farm Household benefited by the project	Number	-	39,588

[2] According to the provisions stipulated by Orissa State, it will be three years after the start of operation when the water charge collection rate reaches 100%. Because the Project is scheduled to be completed in June 2012, it is reasonable to assume that the water charge collection rate will become measurable in 2016, which is four years after the completion and one year after the collection rate is assumed to reach 100%. Taking into account that it will take time to achieve effects, such as the production volume of major crops, the target year was set at 2016.

Rate of Water Users group formulated (No or area or WUA / No. of area of original schedule)	%	-	100
Production Volume of Major Crops			
Wet Season	ton/season	**Baseline (Actual Value in 2003)**	**Target (2016) [Expected value 4 years after completion]**
Paddy (average of Early, Middle and Late)		53,102	71,481
Pulses		1,634	2,334
Ground Nut		-	2,531
Vegetable		2,920	29,200
Dry Season	ton/season		
Paddy		-	35,742
Pulses		1,167	23,344
Ground Nut		-	12,655
Potato		2,180	43,770
Vegetable		-	70,016
Summer	ton/season		
Pulses		-	584
Vegetable		-	4,745
All Year	ton/season		
Sugarcane		23,360	204,300
Banana		-	17,500
Year wise	ton/year		
Paddy		53,102	107,223
Pulses		2,801	26,262
Ground Nut		-	15,186
Vegetable		2,920	103,961
Potato		2,180	43,770
Sugarcane		23,360	204,300
Banana		-	17,500
Yield of Major Crops per unit area per season			
Wet Season	ton/ha		
Paddy (average of Early, Middle and Late)		2.4	3.5
Pulses		0.4	0.8
Ground Nut		0.9	1.7
Vegetable		5.0	20.0
Dry Season	ton/ha		
Paddy		-	3.5

Pulses		0.4	16.0
Ground Nut		-	1.7
Potato		20.0	30.0
Vegetable		-	16.0
Summer	ton/ha		
Pulses		-	0.8
Vegetable		4.0	6.5
All Year	ton/ha		
Sugarcane		80.0	100.0
Banana		-	20.0
Gross Annual Average Farm Income (= Production volume by crop X unit price = farmers revenue) Rs./ household			
Paddy		11,401.6	23,022.0
Pulses		1,132.1	10,614.1
Ground Nut		-	1,994.7
Vegetable		442.6	15,756.4
Potato		242.3	4,864.8
Sugarcane		129.8	1,135.3
Banana		-	2,652.3
Total		**13,348.4**	**60,039.8**

(2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) is 10.4%.

[EIRR]

Cost: Project cost (excluding tax), operation and maintenance expenses

Benefit: Expansion of land use and increase in agricultural production to be achieved by creating a better irrigation facilities and by adopting good irrigation management practices.

Project life: 50 years

5. External Conditions and Risk Control

Natural disaster, in addition to the deterioration of the political and economic situation of India and the program's targeted and neighboring areas

6. Lessons Learned from Past Projects

From Ex-post evaluations of similar previous projects, it has been learnt that post-completion

operation and maintenance strongly affect the realization of the project's effects. Therefore, it is necessary to supervise the project formation and implementation, with consideration for the establishment of the operation and maintenance system. Based on such an understanding, the Project aims to ensure sustainability while incorporating components to support strengthening the capacities of water users' associations for operation and maintenance of the irrigation facilities to be created under the project.

7. Plans for Future Evaluation

(1) Indicators to be Used

1) Area Benefited by the Project (ha)
2) Cultivated area by crops (ha)
3) Collection rate of irrigation Water Rate (%)
4) Sufficiency Rate of Operation and Maintenance Cost (%)
5) No. of Farm Household benefited by the project (households)
6) Rate of Water Users group formulated (%)
7) Production Volume of Major Crops (ton/year)
8) Yield of Major Crops per unit area for each season (ton/ha)
9) Gross Annual Average Farm Income (rupees/household)
10) Economic Internal Rate of Return, (EIRR) (%)

(2) Timing

Four years after the project completion

(End)