

1. Name of the Project

Country:	India
Project:	Rengali Irrigation Project (Phase 2)
Loan Agreement:	March 30th, 2015
Loan Amount:	339.59 million yen
Borrower:	The President of India

2. Background and Necessity of the Project**(1) Current State and Issues of Agriculture and Irrigation Sector in India**

In India, more than a half of total workforce is engaged in the agriculture sector and around 46% of the total land area is used as farmland. While the percentage of agriculture and allied sector in the Gross Domestic Production (GDP) of India has decreased to 14.1% in 2011-12, the agriculture sector is an important for food security, providing employment and improving livelihood in India. However, rural poverty has been a serious problem and, it is critical to boost agricultural production further and to develop water resources in order to increase the food supply to meet the demand of the rapidly-growing population.

Currently, the agriculture and irrigation sector is facing various challenges, including delays in the development of new irrigation facilities due to insufficient funds of the state government, aging infrastructures, lack of human resources of Department of Water Resources and Water User Associations and decrease in water-catchment capacity due to deforestation. Under such situation, the improvement of agricultural infrastructure, such as irrigation facilities and system for productive agriculture and uplifting rural area is one of the priority issues of this sector.

In the 12th Five Year Plan (April 2012 – March 2018), the Government of India has set the target of the average growth rate of 8% and the growth rate of 4% in the agriculture sector. Since the improvement of agricultural infrastructure contributes to increase farmer's income through growing production, irrigation is one of the key components of this sector in the 12th Five Year Plan and thereby the Project is consistent with this plan.

Odisha is a maritime state along with Bengal bay in the eastern region of India and has a population of approximately 41.97 million (2011) is primarily an agrarian economy. Agriculture is the lifeline of the state's economy. Majority of the rural population of the state depends upon agriculture for its livelihood. It provides employment, both direct and indirect, to more than 70% of the total workforce. The poverty rate (2011) of the state is 32.5%, which is much higher than the national average of 21.9%. It has been assessed that state has about 90% out of total cultivable area. With rich water resources, irrigation has been developed and 62% of potential land is already under irrigation. Nevertheless, agriculture in the state is characterized by low productivity. The yield rate of rice of the state is 1.5t/ha (2008) which is lower than 2.1t/ha of national average and further improvement of agriculture productivity through irrigation is required.

The Project is a part of the Rengali Multipurpose Project, which aims (i) hydro-power generation at Rengali Multipurpose Dam located upstream of the Brahmani River (the construction completed in 1985), (ii) a Samal Barrage located downstream of the Dam (completed in 1994), and (iii) irrigation development utilizing water from the barrage. The Construction works for Left Bank Canal from 0km to RD29km from the barrage was implemented with funding from the World Bank, and for RD29km to RD71km is being funded by JICA as Phase 1 of the Project. The Phase 1 packages of construction of major irrigations have been completed by FY2012 and the irrigation water has been provided to more than 93% of targeted irrigation potential land of 29,176ha. Now, the state Government of Odisha puts high priority on the completion of on-going irrigation projects, which is Phase 2 with targeted area along with the main canal from RD71km to RD141km (this JICA project will target the area up to RD124km).

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

The “Improvement of the Poverty and Environment Issues” is one of the priority areas of Japan’s Country Assistance Program for India (May, 2006). Furthermore, JICA’s Country Analysis Paper for India (March 2012) is emphasizing that it is critical to secure the water for agriculture sector based on efficient use of limited water resources and to improve agricultural productivity based on effective use of the water, in order to increase the food supply to meet the demand of the rapidly-growing population as well as to boost the poverty reduction in rural area. The Project is therefore consistent with above strategies. In the Agriculture and Irrigation sector in India, 11 projects with a total loan of 97,800 million yen have been approved (2.4% of total approved amount). In addition to loan projects, some technical cooperation projects, such as “Study on Development & Management of Land & Water Resources for Sustainable Agriculture in Mizoram”, are on-going.

(3) Other Donor’s Activity

World Bank has been engaged with the reformation of irrigation/water resource sector in Odisha through the programs of rehabilitation of irrigation facilities as well as multipurpose dam. Additionally, Asian Development Bank has been implementing the “Orissa Integrated Irrigated Agriculture and Water Management Project” for rehabilitation and modernization of the existing irrigation facilities.

(4) Necessity of the Project

The State of Odisha is facing high poverty rate and low agricultural productivity. The Project is urgently needed and also in line with both the development plan of the Government of India and the policy of Government of Japan and JICA as well. Therefore, JICA’s assistance with 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 along the Brahmani River in Odisha State, establishing Water Users

Associations, and promoting livelihood support activity through improving farming technique and other related activities; thereby, contributing to improve living standard of farmers and alleviation of poverty.

(2) Project Site/Target Area

Dhenkanal, Jajpur and Keonjhar District, the State of Odisha

(3) Project Outline

- 1) Civil work (Construction of Main Canal (International Competitive Bidding(ICB)), Construction of Branch Canal (Local Competitive Bidding(LCB)), On-Farm Development, Support Activities (State Own Procedure (SOP))
- 2) Technical Support/Institutional Strengthening (Agricultural Development Program, Capacity Building for Water User Associations, Support for On-Farm Maintenance and Management etc.) (SOP)
- 3) Consulting Services (Detail Design, Support for Bidding and Procurement, Construction Supervision etc.) (Short-List)

(4) Estimated Project Cost (Loan Amount)

42,850 million yen (Loan Amount: 33,959 million)

(5) Schedule

April 2015 - March 2023 (96 months). The Project will complete when facilities are started using (March 2023).

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Executing Agency: Department of Water Resources, Government of Odisha
- 3) Operation and Maintenance System: Department of Water Resources and Water Users Associations (WUAs)

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

- 1) Environmental and Social Consideration

① Category: A

② Reasons for Categorization:

The Project falls into the irrigation sector and is likely to have significant adverse impacts due to its characteristic (large-scale involuntary resettlement, large-scale irrigation, and habitats of rare species that require protection) under the JICA Guidelines for Environmental and Social Considerations (April 2010) (hereinafter referred to as ‘the JICA Environmental Guidelines’).

③ Environmental Permit:

Environmental Impact Assessment Report (hereafter referred to as “the EIA Report”) has already been approved and Environmental Clearance has been obtained on December 1996 and the Stage II Forest Clearance (812 ha) on May 2003. Regarding the EIA Report, since it is not obligated to update the report according to Indian domestic law, the updated EIA

Report approved in May 2014 and Stage-II Forest Clearance for balance 1,295 ha is currently under process and is expected to be obtained by the March 2015.

④ Anti-Pollution Measures:

Regarding environmental damage such as air pollution, water pollution, solid waste disposal, noise pollution & vibration during constructions, it is expected that the negative impacts on natural environment would be less likely to occur through mitigatory actions by the contractors, based on Environmental and Social Management Plan (hereafter referred to as ESMP), including;

- Regular and proper water sprinkling near the site to minimize dust deposition on vegetation
- Construction waste will be disposed off at the identified and approved locations
- All machines to be used in the construction will be kept in good working order, and will be regularly inspected and properly maintained
- Tunneling hours shall be limited (within the day time only)

Additionally, the agriculture extension officers advise the farmers on appropriate use of fertilizers in order to prevent excess use of agrochemicals and prevent discharge residue to local water bodies and groundwater.

⑤ Natural Environment:

The Project requires a total of 773 ha of forest area and 90% of it is located in the project target area. The watercourses are designed to minimize cutting trees and 68,650 trees will be planted. In addition, the Environment Management Committee has been organized at the project level, in which the Forest Department of the state, NGOs and research institutes take part. An action plan for protecting the ecosystem and wild animals in the target area will be formulated and be implemented by the Forest Department in order to minimize impacts on habitat environment of animals and plants (e.g. elephant friendly ramps, elephant overpasses and electric fencing to prevent human-elephant conflict).

⑥ Social Environment:

The Project requires 1,891 ha of private land acquisition and involuntary resettlement of 138 households (90% of them will resettle inside the project area). Therefore, land acquisition and resettlement will be implemented in accordance with Resettlement Action Plan (hereafter referred to as "RAP") which has been made based on both Indian Domestic Laws and the JICA Environmental Guidelines. During stakeholder meetings which were held on the process of formulating RAP, Department of Water Resources (hereafter referred to as "DoWR") explained the project affected people about project outline, compensation and support, Grievance Redress Mechanism and there has not been any complaints from them. The procedures of land acquisition for approximately 6 ha have been completed in accordance with Land Acquisition Act 1894 (by the end of December 2014). The procedures of the rest of required lands, approximately 1,885 ha, shall be done in accordance with the Odisha

Rules under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation Act 2013, which is issued on January 2014, once the regulations of the Rules are approved by the State Assembly. Additionally, the affected households will be compensated in accordance with Odisha Resettlement and Rehabilitation Policy 2006. Moreover, as the Scheduled Tribes included in the affected households of the project, DoWR will provide employment-cum-income generation activities to them in accordance with policies in Odisha.

⑦ Other/Monitoring:

Contractors monitor air quality, water quality, waste disposal, noise and vibration etc. during the construction and DoWR monitors soil and water quality after completion of the construction based on the ESMoP. Furthermore, the Project Level Environmental Monitoring Committee will monitor the compliance of Environmental Clearance Conditions.

2) Promotion of Poverty Reduction:

The Project is envisaged to have high impacts on poverty reduction through improving the agricultural productivity of small-marginal farmers as well as employment generation for the landless farmers. The livelihood improvement activities for the Self Help Groups, which mainly consist of women, will be implemented with consideration to benefit the poor as well as marginal and landless farmers.

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

In order to enhance sustainability of the irrigation system, WUAs will be formulated through the Water And Land Management Institution (hereafter referred to as WALMI). This approach will promote the canal maintenance and management through a participatory development by farmers. The project is envisaged to address Gender issues and ensuring that 33% of WUA shall be represented by the women members and the additional contents for Gender Perspective will be considered according to the situation on women's participation in WUA. Moreover, the livelihood improvement activities in the soft components shall be considered the benefits for the marginalized groups such as women and people with disabilities. Additionally, during the civil works, the contractor will ensure highest safety measures are taken and conduct HIV/AIDS prevention program for workers during the implementation stage.

(8) Collaboration with Other Scheme and Other Donors

The upstream canal of the Project in target area was developed by the support from World Bank, and the facilities constructed by World Bank Project will be fully utilized by the Project. Furthermore, technical assistance in the Project will be implemented under collaboration with local NGO in order to supplement the functions of WALMI.

(9) Other Important Issues

After the completion of the canal, Japanese agricultural technologies will be beared to be introduced during Agriculture Development Program with the aim to help farmers to adapt higher more sophisticated agricultural techniques. (e.g. Deployment of Model Construction and Rehabilitation of Irrigation Facilities)

4. Targeted Outcomes

(1) Quantitative Outcomes

1) Operation and Effect Indicator

Indicator	Baseline (2014)	Target year* (2026) (Three years after project completion)
Area benefited by the Project (ha)	-	39,416
Cultivated area by crop (ha)	33,759	74,890
No. of Farm Household benefited by the Project (Number)	-	42,486
Rate of Water Users Group formulated (%)	-	100
Production Volume of Major Crops: Paddy (Ton/Year)	55,562	145,839
Production Volume of Major Crops: Vegetables (Ton/Year)	3,350	165,547
Production Volume of Major Crops: Potato (Ton/Year)	-	118,248
Yield of Major Crops per unit area per season: Paddy – Wet Season (Ton/ha)	2.0	3.5

2) Internal Rate of Return

Based on the following assumption, the Economic Internal Rate of Return (EIRR) for the Project has been calculated to be 9.2%. The Financial Internal Rate of Return (FIRR) was not calculated.

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

Benefit: Proceeds from in agricultural production through irrigation and expansion of land use

Project Life: 50 years

(2) Qualitative Outcomes

Generation farmer's income through expansion of agricultural production and stable production by crop diversification, capacity development of WUAs, Improvement of irrigation effectiveness, etc.

5. External Conditions and Risk Control

Natural disaster, in addition to the deterioration of the political and economic situation of India and the Project's target and neighboring areas.

6. Lessons Learned from Past Projects

In the Rengali Irrigation Project Phase 1, diffusion of responsibilities of Project Management, Finance or Land Acquisition caused delay of decision makings and actions. Thus, in the Project (Phase 2), State-level Project Management Unit (PMU) will be set up in the project site and all officers responsible for each function will work together at the same location. From Ex-post Evaluation of the Upper INDRAVATI Irrigation Project (ODA Loan), a lesson learnt from the project is that social and economic conditions of beneficiaries and roles of stakeholders should be clarified and then an action plan should be formulated prior to the commission of the irrigation system. Additionally, from Ex-Post Monitoring of the Upper KOLAB Irrigation Project (ODA Loan), a certain length of time will be required until the beneficiaries obtain an appropriate knowledge and support the activities of WUA as planned in the design stage. Therefore, appropriate technical assistances at the early stage should be incorporated into the Project scope. In the Project, the sustainability will be ensured by supporting the establishment of WUA and technical assistances for farmers at the early stage of the Project, linking with the progress of the package of civil works.

7. Plans for Future Evaluation

(1) Indicators to be used

- 1) Area benefited by the Project (ha)
- 2) Cultivated area by crop (ha)
- 3) No of Farm Household benefited by the Project (Number)
- 4) Rate of Water Users Group formulated (%)
- 5) Production Volume of Major Crops: Paddy (Ton/Year)
- 6) Production Volume of Major Crops: Vegetable (Ton/Year)
- 7) Production Volume of Major Crops: Potato (Ton/Year)
- 8) Yield of Major Crops per unit area per season: Paddy – Wet Season (Ton / ha)

(2) Timing

Year 2026 (Three years after the project completion)

(End)