Ex-ante Evaluation Paper (for Japanese ODA Loan)

South Asia Division 1, South Asia Department, JICA

1. Name of the Project

Country: India

Project: Andhra Pradesh Irrigation and Livelihood Improvement Project (Phase 2)

Loan Agreement: December 13, 2017

2. Background and Necessity of the Project

(1) Current State and Issues of Agriculture-Irrigation Sector in India

In India, the agricultural sector accounts for 13.9% of GDP (as of 2013–14) and roughly 46% of land area is dedicated to use as farmland. As for population, nearly 70% of the population live in rural areas with about half the working population engaged in agriculture (Source: Ministry of Agriculture, Department of Agriculture & Cooperation Directorate of Economics & Statistics, 2014). These figures demonstrate the importance of agriculture and rural development in achieving socio-economic balance and reducing poverty in India.

Nevertheless, the productivity of agricultural crops is strongly influenced by seasonal fluctuations in the water available from rivers or rainfall during rainy season. The country has also become susceptible to the effects of climate change in recent years from uneven distribution of rainfall, or oscillating between flood and drought due to weather instability. In light of this, from the viewpoint of food security it is essential to stabilize and boost production of crops through efficient use of available water resources. To achieve this goal, over the years the India government has focused efforts on large-scale irrigation development, achieving a 49% irrigation rate for all arable land (Source: Ministry of Agriculture, Department of Agriculture & Cooperation Directorate of Economics & Statistics, 2014). At the same time, however, issues such as inadequate management of irrigation facilities, inefficient use of irrigation water, and insufficient support for farming have grown more serious. In addition to improving the irrigation rates and efficiency to improve crop productivity, it is also vital to support farmers and increase the added value of agricultural crops.

The Indian state of Andhra Pradesh (hereinafter, "Andhra Pradesh") is a thriving agricultural state situated in the Deccan Plateau in southern India. It has 8.05 million hectare agrarian zone with 62% of its 49.57 million population engaged in agricultural activities (Source: 'Initiative in Irrigation Sector, Water Resource Department, Government of Andhra Pradesh'). A wide variety of crops are grown in this region; it is the top producer of tomatoes, okra, papaya, maize, etc.; second largest producer of mangos; and third largest producer of rice (Source: 'Agricultural Statistics at a Glance 2014, Ministry of Agriculture, Department of

Agriculture & Cooperation Directorate of Economics & Statistics, Government of India', 2015).

The Andhra Pradesh government is also focusing efforts on developing the food processing industry by taking advantage of its superiority in the agricultural sector and geographical advantages in distribution with 5 seaports and 6 airports. Andhra Pradesh now has 5,735 food processing facilities—more than anywhere else in the country. The state enjoys favorable conditions for building a food value chain from the growing of crops to their processing and distribution, thus offering potential for agriculture to be key industry for supporting the state's economic development.

Despite these advantages however, it lacks stability in both the yield and quality of agricultural crops, which form the basis of the value chain process. The main reasons behind this, in addition to water shortages for crops due to inadequate irrigation facilities, are a lack of knowledge concerning post-harvest treatment, processing and sales, combined with inadequate basic infrastructure such as storage facilities for crops and vehicles for their distribution. The percentage of land area still without an irrigation system in the current beneficiary area is 33% in mid-to-large scale irrigation and 29% in small-scale irrigation (Source: Water Resources Department, Government of Andhra Pradesh). As a result, agriculture in its current state is not sufficient enough to provide a livelihood for farmers.

Since 1951, India has been formulating five-year plans aimed at achieving food self-sufficiency, improving citizens' lives, and providing stability. The 12th Five-Year Plan from 2012 forward sets an average real GDP growth rate target of 4% for the agricultural sector. Important challenges pointed out in realizing this are effective utilization of resources; popularizing sustainable technology; responding to climate change; and improving productivity. In particular, emphasis is placed on improving the productivity of irrigation agriculture as a basis to utilize water resources efficiently.

In 2014, the Andhra Pradesh government established a Primary Sector Mission with the aim of development of agriculture and related sectors. Its focus consisted of (1) increasing productivity, (2) mitigating the impact of droughts through water conservation and micro-irrigation, (3) implementing post-harvest management to reduce wastage, and (4) the establishment of processing, value addition capacity and supply chain of the identified crops. It also identified insufficient farm mechanization, insufficient agricultural promotion activities, and low productivity as problems that need to be solved.

Since this project, which addresses items (1) to (4), will contribute to raising farmer income, it is deemed consistent with the needs and policies of national and state governments.

(2) Japan and JICA's Agriculture and Irrigation Sector Policy and the Positioning of this Project

The Development Cooperation Policy for India (March 2016) set "support for sustainable and inclusive growth" as a priority issue and clearly indicated the aim to support poverty

reduction and social sector development, including a program to increase income levels among the impoverished segment of the population (i.e. improving small-scale infrastructure, strengthening farming productivity, building a food value chain).

The JICA Country Analysis Paper for India (March 2012) analyzes the need to effectively use limited water resources to ensure agricultural water; efficiently use it to improve agricultural productivity to increase food supply in line with the population increase; and reduce rural poverty.

This project is consistent with the development policy of the Indian government and development cooperation policy of Japan and JICA. It will contribute to achieving sustainable agriculture by improving irrigation facilities to improve crop productivity, and contribute to building a value chain. Supporting the implementation of this project is deemed highly necessary given that it will contribute to SDG Goal 2: “to end hunger, achieve food security and improved nutrition and promote sustainable agriculture.”

As of January 2018, there were 27 ODA loans totaling 271.2 billion yen approved for the agriculture and irrigation sector of India. Previously implemented ODA loan projects in Andhra Pradesh include the 'Kurnool-Cuddapah Canal Modernization Project (I) (II)' (Phase 1, 1995; Phase 2, 2003) as well as 'Andhra Pradesh Irrigation and Livelihood Improvement Project' (2006). Although irrigation rates were improved through these projects, a large gap still exists between the planned and actually irrigated area in the province. This gap now sits at about 25% mid-to-large scale irrigation and 40% in small scale irrigation (Source: Water Resources Department, Government of Andhra Pradesh.

(3) Other Donors' Activity

World Bank has been carrying out activities in Andhra Pradesh since 2007, including a participatory irrigation management project for small scale irrigation and Nagarjuna Sagar modernization project for large scale irrigation. Lessons learned through these projects are also reflected in this project.

Since 2015, World Bank has been implementing the 'Andhra Pradesh State Rural Inclusive Growth Project' as a means to build a value chain and improve access to social protection services. Among other efforts, it has also been engaged in projects dedicated to building an agricultural value chain in Assam, Maharashtra and Rajasthan states, and supporting agribusiness planning, training implementation, business matching.

3. Project Description

(1) Project Objective

This project aims to expand actual irrigated area, boost farming productivity, and strengthen farmers' marketing skills in Andhra Pradesh by upgrading aging irrigation facilities and providing support to farmer's organizations for the development of a comprehensive agricultural structure, thereby contributing to the improvement of livelihoods

of farmers in the project area, and contributing to the establishment of agricultural value chain.

(2) Project Site/Target Area: Andhra Pradesh

(3) Project Components

1) Works included in the Project

① Upgrading of irrigation facilities (upgrades at approximately 470 locations)

② Participatory water management (strengthening the capacity of water users associations and government employees)

③ Promotion of a farmer's organization (outreach worker support and guidance for forming an organization)

④ Livelihood improvement support activities (production support concerning livestock and inland water farming)

⑤ Construction of a value chain and pilot program for promoting widespread use of farm mechanization (support for the growing, processing, and distribution systems of certain crops, establishment of a farm machinery training center, etc.)

⑥ Organizational structure support for project implementation (establishing a framework for the executing agency)

2) Consulting Services (technical guidance on construction supervision, farming, etc.)

(4) Estimated Project Cost

30.028 billion yen (of which, the ODA Loan amount is 21.297 billion yen)

(5) Schedule

December 2017 to December 2024 (85 months total). The project completion is defined as the completion of all activities.

(6) Project Implementation Structure

1) Borrower: President of India

2) Guarantor: None

3) Project executing agency: Water Resources Department, Government of Andhra Pradesh

4) Operation and Maintenance agency: Established based on crop production planning of the Water Users Association, based upon which water distribution management will be carried out. Routine maintenance and management of irrigation facilities will be carried out by the Water Users Association. For repair costs under 500,000 rupees, a water fee may be collected under the responsibility of the same Association. Repair costs over 500,000 rupees will be the responsibility of the WRD (Water Resources Department). In this project, training will be planned to reinforce skills of the Water Users Association to ensure proper operation and maintenance of facilities.

(7) Coordination with Other Schemes and Donors

1) Related aid activities by Japan: None in particular

2) Aid activities of other aid organizations

None in particular

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

1) Environmental and Social Considerations

① Category: B

② Categorization Rationale: This project is not applicable to sectors/characteristics susceptible to the impacts listed in 'JICA Guidelines for Environmental and Social Considerations' (promulgated in April 2010). Thus, the negative impact on the environment from this project is judged negligible.

③ Environmental Permit: This project does not, under domestic law, require an Environmental Impact Assessment (EIA) report concerning the sub-project of upgrading existing irrigation facilities, and no other environmental-related approvals are required.

④ Anti-Pollution Measures: Mitigation measures against air pollution, water pollution, waste, noise, vibration are planned to be taken to meet the emissions and other environment standards set by India. Measures during construction work include water sprinkling to control dust; isolating materials, equipment, and fuel from water flow; and limitations on construction hours. Meanwhile, post-construction measures include ensuring water quality through periodic maintenance of irrigation canals.

⑤ Natural Environment: The negative impact on the environment from the Project is expected to be negligible as the target area is not situated in or around any vulnerable areas such as national parks.

⑥ Social Environment: No new land acquisition or involuntary resettlement will occur as this project consists of a sub-project for upgrading existing irrigation facilities. Nevertheless, there is a possibility of our encountering forest dwellers in the project area. Should their presence become known, appropriate consideration shall be taken by preparing an indigenous people plan based on indigenous peoples framework set in place.

⑦ Other/Monitoring: During construction, the Contractor and Project Management Unit (PMU) will be chiefly responsible for monitoring air quality, water quality, noise and vibration. Once in service, the PMU will be chiefly responsible for monitoring water quality and soil contamination, and impacts on indigenous peoples.

2) Cross-cutting items: Through livelihood improvement support activities, comprehensive support will be provided for not only farmers but also socially vulnerable people by providing benefits to impoverished persons engaged in livestock raising and inland fisheries as their living.

3) Gender Classification: GI (S) Gender Integrated Project

<Activities/Classification Rationale> In the project area, inland water aqua-farming has

been traditionally carried out by impoverished residents while product sale at market is mainly done by women. Marketing support for inland fisheries, being considered as a livelihood improvement support activity, will be implemented as training for women.

(9) Other Important Issues: None in particular.

4. Target Outcomes

(1) Quantitative Effects

Outcomes (Operational and Effect Indicators)

Indicator	Baseline (Actual value in 2017)	Target value (2026) [2 Years after Completion]
Actual irrigation Area (ha)	-Large/medium scale irrigation: 69,000 -Small scale irrigation: 39,000	-Large/medium scale irrigation: 104,000 -Small scale irrigation: 57,000
Gap between planned and actual irrigation areas (%)	Large/medium scale irrigation: 33 -Small scale irrigation: 29	-Large/medium scale irrigation: 0 -Small scale irrigation: 0
Water fee collection rate (%)	-Large/medium scale irrigation: 44 -Small scale irrigation: 8	-Large/medium scale irrigation: 50 -Small scale irrigation: 50
Planted area by staple crop (ha)	Note:	Note:
Unit yield by staple crop (ha) (ton/ha)	Note:	Note:
Agricultural income per household (Rupee/year per household)	Note:	Note:
Number of farming organizations in target area	0	900
Number of commercial farm households covered by project (households/yr)	Note:	5,100

Note: A baseline survey will be conducted on select farmers after project start.

(2) Qualitative Effects

To contribute to improving the capabilities of Water Users Associations and Farmers' Organizations; building an agricultural value chain (i.e. improve the quality and work efficiency of growing, processing, and distribution systems); and addressing climate change (adaptation).

(3) Internal Rate of Return

Based on the following assumptions, the Economic Internal Rate of Return (EIRR) of this project is 21.3%. Since this project is not intended to raise revenue, the Financial Internal Rate of Return (FIRR) is not calculated.

[EIRR]

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

Benefits: An Increase in major crop production due to better yields and an increase in planted land area.

Project life: 30 years

5. External Factors and Risk Control

(1) Preconditions: None in particular.

(2) External Factors: That the political and economic situation in India and areas surrounding project do not deteriorate, and no large-scale natural disaster occurs.

6. Lessons Learned from Past Projects, and Applications to this Project

(1) Results of Evaluating Similar Projects

Farming guidance, livelihood improvement etc. were provided in the 'Kurnool-Cuddapah Canal Modernization Project (I) (II)' through a management system led by Andhra Pradesh's former Irrigation Department, which was the executing agency in the project. However, knowledge from state agricultural and horticultural departments was not utilized.

The lesson learned from this project was that support from the former Irrigation Department's administration had limited effect as not enough technical guidance on farming techniques was received.

(2) Applying Lessons Learned to this Project

The above lessons learned will be applied to this project by assigning staff who are knowledgeable in each field to each relevant department under the State-level Project Management Unit and District-level Project Management Unit, and by establishing a framework to implement and manage the project with the cooperation of related departments. Support personnel will also be assigned after considering the existing capabilities and administrative structure of relevant departments at the outset of the project. This includes personnel support to cover shortfalls, pilot program implementation consultants and others.

7. Evaluation Results

This project is consistent with the Government of India's policies on development as well as Japan and JICA's assistance policy and analysis. Supporting the implementation of this project is considered highly necessary based on the judgment that it will contribute to SDG Goal 2: "to end hunger, achieve food security and improved nutrition and promote sustainable agriculture."

8. Plan for Future Evaluation

(1) Indicators to be Used

As indicated in sections 4. (1)-(3)

(2) Timing of the Next Evaluation

Ex-post evaluation: Two years after the project completion