

## Ex-Ante Evaluation (for Japanese ODA Loan)

South Asia Division 1, South Asia Department

Japan International Cooperation Agency

### 1. Name of the Project

Country: India

Project: Uttarakhand Integrated Horticulture Development Project

Loan Agreement: March 31, 2022

### 2. Background and Necessity of the Project

#### (1) Current State and Issues of the Agricultural Sector Development in India / the state of Uttarakhand

India has experienced stable economic development in recent years. However, as of 2019, approximately 140 million people, equivalent to 10.7% of the total population, still live in poverty, which is defined as living on less than US\$1.90 per day (Asian Development Bank Poverty Data: India 2019). The average monthly income of farmers is estimated to be 8,931 rupees (about 14,000 Yen), less than 30% of the non-farm income level (NLI Research Institute, 2020). Given this situation, the National Institution for Transforming India (NITI Aayog) formulated a strategy document in the agricultural and allied sector, Doubling Farmer's Income (2017). Aiming to double the farm household income from FY2015 to FY2022, the strategy cites productivity improvement and promotion of diversification of livelihood means through reinforcement of cultivation of value-added crops such as vegetables and fruits, development of irrigation infrastructures, improvement of seeds and fertilizers etc. The strategy sets as its goal income, not output, with its policy focused on efforts to improve farmers' income and the economic and social development of rural areas.

The state of Uttarakhand (hereinafter referred to as "UK state") is located in the Himalayan foothills of northern India and has a population of approximately 10 million (according to the Census 2011). About 20% of the state's land area is occupied by plains with a tropical climate, and about 80% by hills and mountains with a temperate climate. In UK state, 39% of the total population and 55% of the rural population are engaged in the primary sector of industry, including agriculture, and about 90% of farmer households are smallholder farmers with 2 ha or less of cultivated land (UK State Human Development Report 2018). It also focuses on horticulture development that takes advantage of the cool climate characteristic of mountainous regions, and horticulture sector is a major industry in UK state, which is responsible for about 30% of the gross domestic product

(GDP) accounted by agriculture (Horticulture & Floriculture Sector Profile 2019). In addition, UK state emphasizes the cultivation of profitable crops such as fruit trees, vegetables and spices. In terms of fruit trees, temperate fruit such as apples, pears, and peaches are grown in the highlands, while tropical fruit trees such as mangoes are grown in the lowlands where temperatures are relatively high. In India, there are limited number of states in which temperate fruit trees that require relatively cool growing conditions can be produced. UK state has a high potential for horticulture development, including apples (3<sup>rd</sup> highest in the country in terms of production), pears (1<sup>st</sup> in the country), and peaches (1<sup>st</sup> in the country). The major areas of production of these fruits are the four districts for which the Uttarakhand Integrated Horticulture Development Project (hereinafter referred to as “the Project”) was designed, including Uttarkashi district, Tehri Garhwal district, Pithoragarh district, and Nainital district, and it is expected to have a ripple effect as a model project for other districts (Horticulture & Floriculture Sector Profile 2019). As for vegetables, the mountainous areas are major producers of peas and potatoes by making use of the elevation differences of the mountainous region. They are also a major producer of turmeric, ginger and other spice crops.

Horticulture sector in UK state covers a wide variety of products. Considering this fact, if UK state can enhance the added value especially of temperate fruit trees and vegetables, for which they have a comparative advantage, and perform highly profitable transactions in the local markets in the same state as well as in large consumption markets such as Delhi, horticulture sector has the potential to become an leading industry that drives the state's economy and increases farmers' incomes. In addition, in this country where demand for fruits and vegetables is increasing mainly due to the growing urban middle class, if a supply chain for horticultural crops can be established through the Project, it could be a good example for other mountain states in India and other similarly disadvantaged areas. On the other hand, they are not currently able to fully utilize their potential. There are three reasons for this.

First, productivity of high value-added crops such as vegetables and fruit trees is low, which prevents farmers from stably supplying such crops. For example, UK state ranks 22<sup>nd</sup> out of 28 Indian states in the productivity of tomatoes, which are cited as a case example of local vegetables of the state. And the productivity of apples, cited as a case example of the state's fruit tree, is 3<sup>rd</sup> among the 28 Indian states (about 2.3 ton/ha), far below the top-ranking Jammu and Kashmir

states (about 11.4 ton/ha) (Horticulture Statistics, Department of Agriculture & Farmers Welfare, 2017-18). There are multiple factors behind this. In particular, the fact that farmers are not sufficiently versed in horticultural production technologies, and farming extension services, such as technical guidance by extension officers, are not thoroughly provided. In addition, production infrastructures including drip irrigation have not yet been developed, and access to agricultural inputs is limited. Their productivity is still low, which fails to allow farmers to realize enough production to satisfy the market distribution in major consumption areas such as Delhi.

Second, the impact of climate change has degraded the quality of horticultural crops in UK state. Among other things, it has been confirmed that global warming are causing changes in suitable cultivation areas for fruit cultivation, quality degradation such as poor coloration, and crop failure. Unlike annual crops such as rice and vegetables, once fruit trees are planted, they remain in production for several decades, making it difficult to carry out short-term measures such as adjusting the seeding timing or changing varieties. Therefore, fruit tree cultivation is understood to be more susceptible to climate change than other agricultural products. Hence, it is necessary to evaluate the impacts of climate change and take measures at an early date to cope with it including development of an appropriate technology or variety improvement.

Third, a horticulture supply chain that can maintain the quality of horticultural crops and allow delivery to the market has not yet been sufficiently developed. Specifically, there is a lack of sufficient infrastructure to maintain freshness, such as warehouses and primary processing facilities, and distribution infrastructure, such as storage facilities and food processing and treatment facilities. Furthermore, the technology for post-harvest management by farmers to prevent quality loss of products before reaching the market is insufficient.

In addition to the above, it is necessary to further realize farming rationalization including negotiation and setting of crop prices and to establish a system to implement marketing strategies that will increase profitability. To be specific, since many farmers do not belong to organizations such as Farmers Producers Organizations (hereinafter referred to as “FPOs”) and are small-scale farmers, they cannot stably produce their agricultural products in quantities sufficient to realize wholesaling to the market on their own and therefore fail to enjoy the benefits of scale of economy. As a result, farmers' bargaining power towards market participants remains poor. In addition, even though farmers have

organized their own FPOs, they have not yet come up with effective brand strategies to enhance the attractiveness of crops. Therefore, even if the above three issues are resolved, it is likely that farmers will not be able to earn sufficient income through sales of horticulture produce to the market. It is therefore necessary to organize FPOs, strengthen the capacity of such association member farmers, organize the implementing organizations that support such farmers, enhance the capacity of such organizations, and develop marketing strategies that will contribute to improving their bargaining power.

The Project is to promote profitable horticulture and improve farmer's income by infrastructure development and capacity development for production, processing and marketing of horticultural crops. In this sense, the Project is therefore positioned as an important scheme in the agricultural sector of India.

#### (2) Japan and JICA's Agriculture Sector/Policy and the Positioning of the Project

The Country Assistance Policy for India (March 2016) formulated by the Government of Japan states "supporting sustainable and inclusive growth" as a priority area. Also, the JICA Country Analysis Paper for India (March 2018) states "Inclusive Growth in rural area" as an issue, which mentions the increase of farmer's income through the enhancement of agricultural productivity. Accordingly, the Project is consistent with these policies and analyses.

Furthermore, the Project will contribute to the achievement of Goal 1 (No Poverty), Goal 2 (Zero Hunger), Goal 8 (Decent Work and Economic Growth), and Goal 13 (Climate Action) of the SDGs.

#### (3) Other Donors' Activities

The World Bank financed the Uttarakhand Decentralized Watershed Development II Project (2014-2021) in the UK state to increase the productivity of rainfed agriculture for food grains and vegetables. The International Fund for Agricultural Development (IFAD) has financed the Integrated Livelihood Support Project (ILSP) (2013-2021), which provides livelihood support to farmers, and plans to promote marketing by small-scale farmers through a new loan project, Rural Enterprise Acceleration Project (REAP). While it is confirmed that there is no overlap with the Project in any of these project schemes, there are various synergistic effects in marketing promotion and others, and so we intend to consult, coordinate and collaborate with them to take advantage of such effects.

### **3. Project Description**

#### (1) Project Objective

The project aims to promote profitable horticulture and improve farmer's income by infrastructure development and capacity development for production, processing and marketing of horticulture crops, thereby contributing to economic and social development in Uttarakhand state

(2) Project Site/Target Area

Uttarakashi district (Population: approx. 330,000 (2011)), Tehri Garhwal district (Population: approx. 620,000 (2011)), Pithoragarh district (Population: approx. 480,000 (2011)), Nainital district (Population: approx. 960,000 (2011)), Uttarakhand state, northern India

(3) Project Components

- 1) Support for production of horticultural crops (development of small-scale irrigation facilities (approx. 2,090 ha); formulation and implementation of climate change adaptation measures including assessment of climate change impacts and implementation of measures, development of appropriate technologies and variety improvement; strengthening of farmers' production systems including training for farm management planning; implementation of activities to livelihood improvement activities including provision of equipment and training in mushroom cultivation; etc.)
- 2) Support for building supply chains (support for establishment and capacity enhancement of FPOs including support for business planning by experts, support for building a joint shipping system, etc.; development of collection, storage, and processing facilities, development of sales facilities, and promotion of private sector partnerships including implementation of pilot projects for matching private sector companies and FPOs; etc.)
- 3) Strengthening of the organizational structure of the state government (strengthening of the function of the Project Management Unit ("PMU") including provision of training and equipment; strengthening of the farm management expansion system including training; formulation and implementation of marketing strategies including support by experts in the development of such strategies; etc.)
- 4) Consulting services (detailed design support; bidding assistance; construction supervision; support for organizational structure enhancement; implementation of various surveys such as market research; support for promotion of private-sector collaboration including

support for implementation of pilot projects; support for environmental and social considerations; etc.)

The subprojects to be implemented under components 1) through 3) above will be selected according to the following criteria: whether they contribute to the project objectives (Promote profitable horticulture and improve farmer's income), whether or not they overlap support from the Government of India or other donors, and whether an operation and maintenance management system will be established.

(4) Estimated Project Cost

8,048 million Yen (Japanese ODA loan: 6,401 million Yen)

(5) Schedule

March 2022 to December 2028 (82 months in total). The Project shall be completed with the completion of all activities (December 2028).

(6) Project Implementation Structure

1) Borrower: The President of India

2) Guarantor: None

3) Executing Agency: Department of Horticulture and Food Processing(DHFP), Government of Uttarakhand

4) Operation and Maintenance System: Same as above

(7) Collaboration and Sharing of Roles with Other Donors

1) Japan's Activity:

[1] In the neighboring state of Himachal Pradesh, ODA Loan Project "Himachal Pradesh Crop Diversification Promotion Project" (Loan Agreement signed in FY2011) created a model for shifting from grain to vegetable cultivation. "Himachal Pradesh Crop Diversification Promotion Project (Phase 2)" is currently being implemented (Loan Agreement signed in FY2020), and the good practices and lessons learned from the above projects will be utilized in the Project through the participation of the Project's Executing Agency in the workshops to be held as part of the Project in Himachal Pradesh.

[2] An ODA Loan Project "Uttarakhand Forest Resource Management Project" (Loan Agreement signed in FY2014) provides support for the cultivation and sale of horticultural crops for livelihood improvement. Lessons learned in farmer organizations and marketing support from this project will be used in the Project.

[3] Aiming to improve farmers' income through the formulation of market-oriented farming and marketing plans and the reinforcement of farmers' ownership of farming operations, the above project plans to introduce the Smallholder Horticulture Empowerment & Promotion (SHEP) approach (an initiative aimed at improving farmers' horticultural income by changing the attitudes of farmers from "make crops and sell them" to "make crops to sell them" and improving their farming and cultivation skills) by fostering the executing agency staff through SHEP training.

2) Other Donors' Activity: None in particular

- (8) Environmental and Social Consideration/Cross-Sectoral Issues/Gender Category
- 1) Environmental and Social Consideration
- [1] Category: FI
- [2] Reason for Categorization: Sub-projects cannot be specified prior to JICA's approval for financing, and they may have environmental impacts under the JICA Guidelines for Environmental and Social Considerations (April, 2010).
- [3] Other/Monitoring: Under the Project, the executing agency, with the assistance of a yen loan consultant hired under the yen loan, will categorize the subprojects based on India's domestic legal system and the JICA Guidelines for Environmental and Social Considerations , and necessary measures will be taken for the relevant category. Note that subprojects do not include Category A projects.
- 2) Cross-Sectoral Issues
- [1]Climate Change: The Project will contribute to climate change adaptation measures because it is expected to reduce the risk of negative impacts due to climate change by mainly promoting water-saving agriculture through the introduction of drip irrigation facilities, developing and disseminating appropriate technologies for the impacts of fruit tree cultivation, developing and disseminating adapted varieties, and diversifying to other crops.
- [2]Poverty Measures/Poverty Considerations: The Project targets mainly small and marginal farmers including the poor. Specific effects on poverty reduction will be confirmed through baseline and impact surveys to be conducted after the start of the Project.
- [3]Prevention of AIDS/HIV and Other Infectious Diseases: As part of the effort to prevent the spread of the novel coronavirus infection, a list of measures (36 in total) to be implemented by the executing agency during the formation and implementation of the project was agreed upon at the time of appraisal. This agreement has clarified relevant activities including development of epidemic prevention materials and equipment, improvement of the working environment including the code of conduct, work supervision, and awareness raising. Appropriate monitoring with a constant focus on the impact of the novel coronavirus will be made by receiving quarterly reports on the status of implementation of these items from the executing agency in order to allow the executing agency to take flexible and suitable actions. In

addition, HIV/AIDS measures for construction workers will be implemented by construction contractors during the construction phase.

3) Gender Category

■ Gender Informed (Significant) (Gender activity integration project)

[Details of Activities/Reason for Categorization] Based on the results of information collection and issue analysis on gender, which will be conducted as part of the baseline survey during the project implementation phase, the Project plans to establish self-help groups led by women to improve the social status of women so as to allow easy incorporation of women's opinions into the plan. The Project also plans to increase the added value of horticultural crops through processing and other activities to improve livelihoods.

(9) Other Important Issues: None in particular

**4. Target Outcomes**

(1) Quantitative Effects

Outcomes (Operational and Effect Indicators)

Indicator	Baseline (Actual value in 2021)	Target (2033) [5 years after project completion] (Note 1)
Farm income in the Project area	(Note 2)	(Note 3)
Newly irrigated area (ha)	(Note 2)	2,090
No. of target farm households belonging to FPOs	N/A	3,200
Yield per planted area (apple) (ton/ha)	2.0	8.2
Yield per planted area (peach) (ton/ha)	9.6	14.4
Yield per planted area (pea) (ton/ha)	7.1	12.0
Yield per planted area (potato) (ton/ha)	15.2	22.3
Yield per planted area (tomato) (ton/ha)	8.5	25.0
Horticultural crop sales results	(Note 2)	(Note 3)

(Note 1) The fruit trees require a certain amount of time from sowing to harvesting. Therefore, the target year is set at five years after Project completion, and an ex-post evaluation will be conducted in that same year.

(Note 2) The baseline values will be based on the results of a baseline study to

be conducted after the project starts.

(Note 3) Target values will be set and reviewed through detailed activity plans and baseline studies conducted by the PMU in the early phases of the Project.

(2) Qualitative Effects

Adaptation to climate change, diversification of livelihoods, improvement of women's social and economic status, transportation efficiency of horticultural crops, etc.

(3) Internal Rate of Return

Based on the following assumptions, the economic internal rate of return (EIRR) for the Project is 10.5%. Since the Project does not aim to generate business income, the financial internal rate of return (FIRR) is not calculated.

[EIRR]

Cost: Project costs, operation and maintenance costs (both excluding taxes)

Benefit: Benefits from the promotion of horticultural crops (difference in revenue between the case of implementation and no implementation of the project)

Project Life: 30 years

## **5. External Factors and Risk Control**

(1) Preconditions: N/A

(2) External Factors: No extreme deterioration of the security in the project target area

## **6. Lessons Learned from Past Projects**

The lessons learned from the agricultural sector projects in ODA Loan Projects to India are that in some cases, due to limited staffing for agricultural expansion, the target farmers were not given sufficient extension services.

This Project plans to use extension officers under the management of the DHFP to provide technical guidance on the production of horticultural crops to farmers. It is already agreed with the UK state government through the appraisal that a sufficient number of extension officers be made available and that they be appropriately deployed. In addition, the status of farming guidance will be monitored at the project implementation stage. Furthermore, in order to supplement extension activities in the areas expected to be covered by the Project, the Project will provide opportunities for training to share techniques and knowledge among farmers. The Project will also plan to utilize farming guidance services provided by instructors hired at private agritech companies under contract farming.

## **7. Evaluation Results**

Consistent with India's development issues and policies as well as the cooperation policy and analysis of Japan and JICA, the Project will contribute to promote profitable horticulture and improve farmer's income by infrastructure development and capacity development for production, processing and marketing of horticultural crops in the four target districts assumed to be covered by the Project. In addition, the Project is considered to contribute to achievement of Goal 1 (No Poverty), Goal 2 (Zero Hunger), Goal 8 (Decent Work and Economic Growth), and Goal 13 (Climate Action) of the SDGs. Considering these benefits of the Project, there is a strong need to support the implementation of the Project.

## **8. Plan for Future Evaluation**

### (1) Indicators to be Used

As described in 4.

### (2) Future Evaluation Schedule

Ex-post evaluation: five years after project completion

End