

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

South Asia Division I, South Asia Department

Japan International Cooperation Agency

### 1. Name of the Project

- ( 1 ) Country : India
- ( 2 ) Project: Assam State Aquaculture Promotion and Livelihood Improvement Project
- ( 3 ) Project Site/Target Area: State of Assam – Districts of Barpeta, Nalbari, Kamrup, Nagaon, Morigaon, Lakhimpur, Cachar, and Karimganj. (Population: approximately 10.84 million) (Census 2011)

Loan Agreement: March 27, 2025

### 2. Background and Necessity of the Project

( 1 ) Current State and Issues of the Fisheries Sector and the Priority of the Project in India

In India, the fisheries sector has recorded an average annual GDP growth of over 10% since 2014. India's fisheries industry (aquaculture and fishery) is the third largest in the world with an annual production of 14.16 million tons (Directorate of Fisheries (2022)), and the inland fisheries industry, which takes place in rivers, ponds, lakes ("beels"), is the second largest in the world with an annual production volume of 8 million tons (Food and Agriculture Organization of the United Nations (2022)). In FY2021, 1.37 million tons of fisheries products were exported overseas, and the fisheries sector contributes to food security in India and abroad (Handbook on Fisheries Statistics (2022)). Of these, the state of Assam is the largest in the North Eastern region of India in terms of both area (78,438 km<sup>2</sup>) and population (approximately 31.2 million people), and is also an important state for promoting social sector development under the Government of India's development policy for the North Eastern region ("Act East Policy"). Although the state is landlocked with limited access to the sea, it is blessed with water resources such as the Brahmaputra and Barak rivers, as well as ponds and lakes, and has a diverse range of aquatic ecosystems. The annual production of the inland fisheries industry is about 420,000 tons, which is the eighth in India (and the highest in the North Eastern region) among the 28 states and 8 union territories, and the inland fisheries industry is thriving in the region. In addition, the per capita fish consumption in Assam is ranked 10th, while the same North Eastern region's Tripura is ranked 2nd and Manipur is ranked 5th (Handbook on Fisheries Statistics (2022)). With a large consumer market for fish nearby, it is

expected to be a hub for production and distribution within the North Eastern region, and there are extremely high expectations for the development of the fisheries industry. In addition, the fisheries industry in Assam generates employment for approximately 2.52 million people (producers and those involved in the value chain) (Handbook on Fisheries Statistics 2022), and it also plays an important role in socio-economic development, such as by supplying essential nutrient.

On the other hand, the productivity of fisheries products (amount of fisheries products produced/number of people engaged) in Assam is ranked 7th in the North Eastern region (Handbook on Fisheries Statistics (2022)), and the production potential is not being fully utilized. As a result, the production volume is only about one-tenth of that of Andhra Pradesh, which is ranked first in the country (annual production of about 4.22 million tons). In addition, the supply within the state is unable to keep up with the increasing demand for fisheries products each year, and imports of fisheries products from other states and overseas are increasing. The average monthly income of producers engaged in the fisheries industry in Assam is approximately 14,000 rupees (Preliminary Project Report prepared by the executing agency (2022)), which is lower than the average monthly income of permanent workers in India, which is approximately 18,840 rupees (as of 2022; Indian Statistical Bureau), and this is also an issue.

The main reasons for this are the lack of materials needed for aquaculture, such as seedlings and feed, as well as the immaturity of aquaculture technology and the lack of sufficient distribution infrastructure, such as post-harvest processing facilities and hygienic fish markets. For example, the immaturity of aquaculture technology can be seen in the fact that the main method of aquaculture is the non-feeding method, and even in the case of feed-based aquaculture, there are many fish farms where there is room for improvement in productivity due to the low quality of materials. As a result, many producers in Assam are unable to secure a stable quantity of fish to sell, and they only sell small quantities to the market. This means that they are unable to benefit from economies of scale. This is one of the reasons why fisheries producers in the state have little bargaining power when it comes to negotiating prices with market participants and are unable to generate sufficient income from sales.

To address these issues, the State of Assam, in its “Assam 2030”, has set a policy to work towards equalizing the quality of local fisheries resources and stabilizing market prices through fisheries cooperatives composed of people

working in the fisheries industry. The state also aims to increase income through joint resource management, which seeks to maintain and increase fisheries resources while also making use of them, through means such as the release of seedlings by cooperatives and the management of fishing grounds and fish farms, as well as supporting for the construction of a fisheries value chain through measures of strengthening production systems and providing marketing support. These initiatives in the state to improve the income of producers through measures such as improving the productivity of the fisheries industry and promoting sales by improving the efficiency of storage and post-harvest processing are in line with the Government of India's "Blue Revolution" policy, which aims to improve the income of people engaged in the fisheries industry while considering sustainability.

The "Assam State Aquaculture Promotion and Livelihood Improvement Project" (hereafter referred to as "this Project") is an activity that contributes to the achievement of the above vision, and is positioned as an important project by the Government of India and the State Government of Assam.

(2) Japan's and JICA's Cooperation Policy and Operations in the Fisheries Sector (especially in relation to key foreign policies such as the Free and Open Indo-Pacific Partnership (FOIP))

Country Development Cooperation Policy for India (2023) supports the "Act East" policy, which aims to strengthen relations with East and Southeast Asia, and states that it will support the creation of a strong foundation for inclusive and sustainable growth. The importance of developing the North Eastern region of India is frequently mentioned at Japan-India summit meetings, and it is a priority region for both the Japanese and Indian governments. In addition, the policy identifies "clean social and economic development" as a key objective and states that it will support projects related to strengthening and diversifying agricultural productivity and sustainability, strengthening value chains, etc. The JICA Country Analysis Paper on India (2018) also identifies "inclusive rural growth" as one of the development challenges, and analyzes the need to improve farmers' incomes, and this Project is in line with these policies and analyses. This Project will also contribute to the Government of Japan's New Plan for a Free and Open Indo-Pacific (FOIP) (promotion of a Blue Economy in fisheries) from the perspective of addressing sustainable aquaculture, building a value chain for fisheries resources, and developing tourism (Blue Tourism) that utilizes regional aquatic resources and ecosystem services. Furthermore, the JICA Global Agenda's "5. Agriculture

and Rural Development (Sustainable Food Systems)” also emphasizes the importance of working to promote the Blue Economy in fisheries and contributing to the balance between resource management and ensuring economic viability, and this Project is in line with these policies and analyses.

### ( 3 ) Other Donors’ Activities

The World Bank is implementing support for the development of agricultural and fisheries value chains in the state of Assam through the “Assam Agribusiness and Rural Transformation Project (APART)” from 2017 to 2025. The German International Cooperation Society (GIZ) has been implementing the technical cooperation project “Sustainable Aquaculture for Food and Livelihood” in Odisha and Assam since 2021, with the aim of strengthening the capacity of aquaculture farmers. The Asian Development Bank (ADB) is currently formulating the “Sustainable Wetlands and Integrated Fisheries Transformation Project (SWIFT)”, which will provide financial assistance for the development of fishing grounds and infrastructure for fishermen engaged in fishing in the wetlands known as 'beel', which is scheduled to begin in FY2024.

## **3. Project Description**

### ( 1 ) Project Description

#### ① Project Objective

The project aims to increase aquaculture production and improve rural livelihoods of fisheries stakeholders by promoting aquaculture, supporting for enhancing the fish supply chain and institutional strengthening of Directorate of Fisheries, thereby contributing to socio-economic development in Assam.

#### ② Project Components

- (a) Support for improvement of aquaculture productivity: (promotion of feed-based aquaculture (fish seed and feed supply, etc.), support for fish seed production (support for obtaining central government certification and accreditation of fish hatcheries, organization of producer groups, supply of large-size seeds, etc.), introduction of new culture species, research and development, etc.)
- (b) Support for the development of aquaculture supply chain: (development of aquaculture business units that provide equipment and technical support for aquaculture, development of semi-urban fish markets, promotion of cooperation between private companies (holding business seminars, demonstration projects by private companies with the necessary technology), etc.)

- (c) Support for diversification of livelihoods: (support for the promotion of Blue Tourism (infrastructure development in combination with aquaculture, etc.), support for entrepreneurs in the field of aquaculture, etc.)
- (d) Support for capacity building of the Directorate of Fisheries, Department of Fisheries, Government of Assam and aquaculture personnel in the state (development of infrastructure (research facilities, training facilities, etc.), support for promotion of DX in the Directorate of Fisheries, training of aquaculture personnel, etc.)
- (e) Establishment and monitoring/evaluation of project management systems: (establishment of Project Management Unit (PMU) systems, strengthening of PMU capacities (training, provision of equipment, etc.), monitoring/evaluation)
- (f) Consulting services: (detailed design support, bidding assistance, construction monitoring, capacity building support, support for executing agency's DX, support for environmental and social considerations, etc.)

### ③ Project Beneficiaries (Target Group)

Direct beneficiaries (aquaculture farmers and fisheries cooperatives eligible for support under this Project, people involved in the fish supply chain, people eligible for support to diversify their livelihoods, etc.: approx. 15,600 people)

Final beneficiaries (consumers who benefit from the promotion of inland aquaculture in the target districts: approx. 10.84 million people)

### (2) Estimated Project Cost

4,475 million yen (Japanese ODA loan: 3,580 million yen)

### (3) Schedule

March/2025-November/2029 (57 months)

Completion of all activities (November 2029) is considered as the completion of the Project.

### (4) Project Implementation Structure

1) Borrower: President of India

2) Guarantor: N/A

3) Executing Agency: Directorate of Fisheries, Department of Fisheries, Government of Assam (DoF)

4) Operation and Maintenance System:

For above 3. (1) ② (d) and (e), the DoF will operate and maintain the projects with the budget of the State Government after the completion of this Project. For above 3. (1) ② (a), (b), and (c), the relevant aquaculture farmers, fisheries

cooperatives, entrepreneurs, etc. will carry out operation and maintenance using their own funds, and the DoF will provide technical support and monitor the status of activities. In terms of finances, the DoF has already reached an agreement with the Finance Department of the Government of Assam that the state government will allocate a budget for the costs required for operation and maintenance.

#### ( 5 ) Collaboration and Sharing of Roles with Other Donors

1 ) Japan's Activity: Japan is considering dispatching individual experts to provide technical guidance on the production of high-quality seeds, etc., with the aim of utilizing the country's knowledge.

#### 2 ) Other Donors' Activity:

ADB plans to launch the SWIFT project, which targets fisheries in wetlands (beels), in fiscal year 2024, and plans to cooperate with the PMU, which is the main implementing agency for this Project, by holding annual workshops with the main implementing agency for the SWIFT project, and by digitizing the project management system to contribute to the smooth operation of the executing agency.

#### ( 6 ) Environmental and Social Considerations

##### ① Category: FI

##### ② Reason for Categorization

This Project cannot identify sub-projects before JICA's loan approval under the “Japan International Cooperation Agency (JICA) Guidelines for Environmental and Social Considerations” (issued in January 2022), and such subprojects are expected to have environmental impacts.

##### ③ Other/Monitoring

Under this Project, the executing agency will classify sub-projects into categories based on Indian domestic laws and JICA guidelines, with the support of ODA loan consultants employed with ODA loans, and take the necessary measures for the relevant categories. Category A sub-projects are not included in this Project.

#### ( 7 ) Cross-Sectoral Issues

##### ① Climate change

This Project targets aquaculture, which has the advantage of being less vulnerable to the effects of natural disasters than fishing, which relies on natural resources, because it is possible to control the environment in which the fish are raised. In addition, the Project will contribute to climate change adaptation by

reducing the risk of negative impacts from climate change, as it will raise awareness among aquaculture farmers about measures to take in the event of heavy rain or flooding through training and other means. This Project also includes activities to promote the in-state production of seedling, which is expected to reduce CO2 emissions from transportation from other states and reduce the risk of negative impacts from climate change, and thus contribute to climate change mitigation. The climate change mitigation effect (approximate GHG emission reduction) of this Project is equivalent to approximately 58 t/CO2 per year. It is also consistent with the NDC: Nationally Determined Contribution, which aims to achieve net zero GHG emissions by 2070.

## ② Poverty measures and consciousness

This Project also targets small-scale and micro-scale aquaculture farmers, including the poverty-stricken. The specific effects of poverty reduction will be confirmed through the baseline survey and impact survey to be conducted after the start of the Project.

### ( 8 ) Gender Category: ■ GI(S) Gender Informed (Significant)

#### <Details of Activities/ Reason for Categorization>

The gender analysis confirmed that there are gender issues that limit women's participation in livelihood activities, such as loss of work opportunities due to restrictions on movement (few women drive cars), time constraints due to housework and child care, and the effects of gender role division of labor, such as taking on unskilled work in production. On the other hand, the participation of women in production activities is essential to increase aquaculture production, and it is important to support women as key actors in production work. With this background, this Project has drawn up a Gender Action Plan, and is planning to increase the participation of women in fisheries cooperatives, provide gender training for aquaculture farmers and seedling producers, and set indicators such as the number of aquaculture-related employees (increase by 5%, collect data separately for men and women). For these reasons, the Project is classified as a “gender activity integration project”.

### ( 9 ) Other Important Issues:

The products and technologies of aquaculture-related companies (including Japanese companies) that have participated in the business seminars of this project will be examined by the executing agency, and then displayed and used on a trial basis in aquaculture ponds to explore ways of promoting them.

<b>4. Targeted Outcomes</b>
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( 1 ) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2024)	Target (2031) [2years after project completion]
Aquaculture production per unit area in aquaculture ponds (tons/ha)	2.9	5.0
Production (quantity) of large seedlings (100g or more per fish) in intermediate aquaculture ponds	(Note 1)	20% increase from the baseline survey
Certified seedling producers	0	20
Number of farmers farming new fish species (Pangasius, Scampi, Sarana)	10 (estimate)	50
Number of aquaculture management systems	1	4
Total production from aquaculture industry (tons/year)	149,756	250,000
Number of aquaculture-related employees (data collected by gender)	(Note 1)	5% increase from the baseline survey
Income of aquaculture farmers (rupees/year)	437,130	780,000

(Note 1) The baseline and targets are based on the results of a baseline survey conducted at the start of the Project.

( 2 ) Qualitative Effects

Encouraging the creation of new businesses by supporting entrepreneurs, improving and developing aquaculture methods by supporting aquaculture research and development, social participation of women, the poor and vulnerable groups, and promoting Blue Tourism.

( 3 ) Internal Rate of Return

Based on the assumptions listed below, the economic internal rate of return (EIRR) for this Project is 12.5%. The Project is not intended to generate business income, and the financial internal rate of return (FIRR) is not calculated.

**【EIRR】**

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

Benefit: Effect of increasing profits by promoting high-quality seedlings and



feed-based aquaculture, and reduced GHG emissions.

Project Life: 30 years

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

- ( 1 ) Preconditions: None
- ( 2 ) External Factors: The security in the Project area shall not deteriorate significantly.

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

The ex-post evaluation results of the technical cooperation project for Laos, “Aquaculture Improvement and Extension Project Phase 2” (evaluation year: 2013), showed that the executing agency was suffering from a chronic shortage of funds, which was causing problems with the dissemination activities for technology transfer to people working in the fisheries industry. In order to improve this situation, the project adopted a Farmer to Farmer (FTF) approach to develop core aquaculture farmers and share technology and knowledge among aquaculture farmers, and the results showed that this approach was effective. In this Project, due to the limited human resources available for dissemination activities related to improving the productivity of inland aquaculture in Assam, we plan to use the FTF approach, among other methods, to disseminate the production technology to more farmers.

## **7. Evaluation Results**

This Project is in line with India's development issues and policies, as well as Japan's and JICA's cooperation policies and analysis, and will contribute to increasing the production of the aquaculture industry and improving the incomes of those involved in the fisheries industry. It is also thought to contribute to SDG Goals 1 (poverty reduction), 2 (food security and improved nutrition), and 8 (economic growth and employment), so there is a high need to support the implementation of this Project.

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

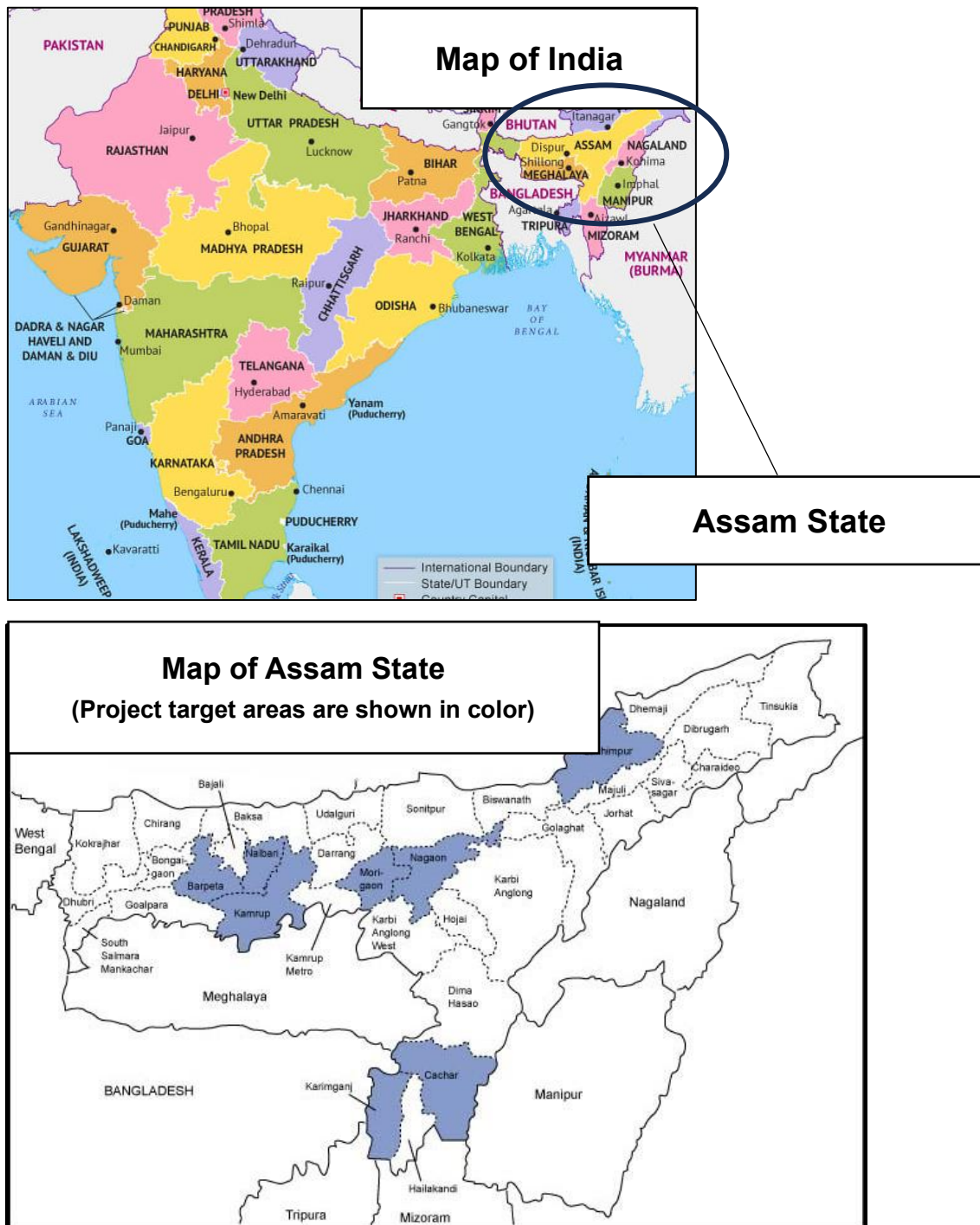
- ( 1 ) Indicators to be Used  
As indicated in Section 4.
- ( 2 ) Future Evaluation Schedule  
Ex-post evaluation: 2 years after the Project completion

END

Appendix: Map of the Assam State Aquaculture Promotion and Livelihood Improvement Project



## Map of the Assam State Aquaculture Promotion and Livelihood Improvement Project



Source: Maps of India (<https://www.mapsofindia.com/>)

Source: Created based on d-maps.com ([https://d-maps.com/carte.php?num\\_car=31175&lang=en%20Maps](https://d-maps.com/carte.php?num_car=31175&lang=en%20Maps)) using Preparatory Survey data.