

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

### 1. Basic information

**Country:** Republic of the Union of Myanmar (Myanmar)

**Project name:** Agriculture Income Improvement Project

**L/A signing date:** March 29, 2018

### 2. Project background and necessity

#### (1) Current state of and issues in the development of the Myanmar agricultural sector, and the role of this project

In Myanmar, approximately 60% of the population works in the agricultural sector (2011, Food and Agriculture Organization [FAO]), and the agricultural, forestry, and fisheries industries account for 27.9% of GDP (2014, Myanmar Central Statistical Organization [CSO]). In industrial sectors, the food and beverage production industry, most of which are processed agricultural products accounts for 53% of registered manufacturing companies and 64% of the total value of manufacturing output (2015, CSO). Thus the agricultural sector is important for Myanmar's economy. On the other hand, average household income<sup>1</sup> in rural areas where agriculture is the principal industry is approximately 2.50 million kyat per year, which is lower than the national urban average of approximately 4.50 million kyat per year, indicating that there is a gap between urban and rural areas.

In order to achieve development that strikes a balance between urban and rural areas, there is a need to improve incomes through development of the agricultural industry, which is the principal source of income in rural areas. Rice and beans are highly important grains, as they account for around 50% of the value of agricultural production, and they have plenty of possibility for larger production volumes in terms of both cultivated area and yields, and their annual exports have continuously increased.

On the other hand, issues in the promotion of grain production include the lack of rehabilitation of irrigation facilities and other production infrastructure, and farm roads and other infrastructure for distribution. Cropping intensity throughout

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<sup>1</sup> Source: Average household incomes in urban and rural areas in "Household Income and Expenditure Survey 2012," Myanmar Statistical Organization, Ministry of Finance and Planning.

Myanmar is 21% (2014, FAO), which is relatively low compared to surrounding countries,<sup>2</sup> and cropping area tends to diminish dramatically in the summer. As many as 69% of farm roads are unpaved (2015, Ministry of Agriculture, Livestock and Irrigation) because bull-carts are used to transport agricultural produce, so the volume of goods that can be transported at once is limited, which causes high transportation costs including labor wages. Additionally, the spread of agriculture extension system (use of quality seeds, etc.) and agriculture mechanization are slow. In particular rice yield in Myanmar is 3.89 t/ha, which comparison with surrounding countries (4.62 t/ha in Bangladesh, 5.75 t/ha in Vietnam [2014, FAO]) indicates room for improvement.

In the Myanmar government's "Economic Policy" (July 2016), "Establishing an economic model that balances agriculture and industry, and supports the holistic development of the agriculture, livestock and industrial sectors, so as to enable rounded development, food security, and increased exports." is set as one of the government's major policies. Under this policy, the Ministry of Agriculture, Livestock and Irrigation formulated the "Second stage 5-Year Plan for the Agricultural Sector" (2016–2020), which focuses on "enable rural population and agribusiness enterprises earning profit from production and trade of diverse, safe and nutritious foods and agricultural products using innovative and sustainable production, processing, packaging, logistics and marketing technologies to meet the growing domestic and global demands." The improvement of productivity in the food value chain through rehabilitation of infrastructure for production and distribution is considered a way of contributing to the resolution of priority issues facing the Myanmar government's economic policies and development plan.

In order to realize these policies, the Myanmar government decided to choose the Shwebo area in the Sagaing Region as a priority area for rehabilitation of facilities. Shwebo area is one of three areas (Shwebo in the Sagaing Region, Mandalay, Ayeyarwady) identified as having the highest agricultural development potential in JICA's "Preparatory Survey for Intensive Agriculture Promotion". Shwebo was selected because the Shwebo area has the largest irrigable area in the country but the irrigation system in the Shwebo area supplies water to an average of only 58% of the farming land during the dry season. There is high potential for expanding the irrigated area through rehabilitation of facilities in Shwebo area. A popular brand of rice is also

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<sup>2</sup> Bangladesh: 72%; Vietnam: 72%; India: 45%; Thailand: 38%.

produced here and this area has high agricultural development potential. The Agriculture Income Improvement Project (hereinafter “this project”) aims to improve the livelihoods of farmers in Shwebo area, through expansion of agricultural production, by rehabilitating the irrigation facilities and distribution infrastructure.

## **(2) Japan and JICA’s collaborative policies for agricultural sector, and the role of this project**

This project falls under “support for the improvement of the people’s lifestyles” in the Japanese policy on economic cooperation with Myanmar formulated April 2012. Additionally, it also falls under “agricultural and infrastructure development in rural areas,” as established in the “Japan-Myanmar Cooperation Program” announced in November 2016. This project is included in the project list of that program, and this project is in accordance with these policies. Further, this project was given context in the specific policies of the “Food Value Chain Road Map (2016-2020)” created in 2017 by Japan’s Ministry of Agriculture, Forestry and Fisheries and Myanmar’s Ministry of Agriculture, Livestock and Irrigation. Finally, this project also contributes to the achievement of SDGs Goal 2 (“End hunger, achieve food security and improved nutrition and promote sustainable agriculture”). In JICA’s Irrigation Development Project in Western Bago Region (2014), rehabilitation of four irrigation schemes is underway in areas including those targeted by the South Nawin Irrigation Project.

## **(3) Other aid organizations**

The World Bank conducts the Agricultural Development Support Project (2015 to 2022; approx. 10.0 billion JPY), which provides support for rehabilitation of facilities and productivity improvements at multiple mid-sized irrigation facilities throughout Myanmar. Additionally, the Asian Development Bank conducts the Irrigated Agriculture Inclusive Development Project (2017 to 2024; approx. 7.5 billion JPY), which provides rehabilitation of facilities (etc.) for mid-sized irrigation facilities, focusing on the central dry areas of the country. Neither of these projects overlaps with the target areas covered by this project.

### **3. Project overview**

#### **(1) Objective**

The objective of this project is to improve the agriculture income in Shwebo area in Sagaing Region by rehabilitating the irrigation facilities and distribution infrastructure as well as strengthening agriculture extension and mechanization, thereby contributes to the economic growth in rural areas in Myanmar.

#### **(2) Project site / Target area name**

Shwebo area in Sagaing Region

#### **(3) Project overview**

1) Irrigation and Drainage Improvement: Irrigation and drainage rehabilitation (weirs in four locations; canal lining [approx. 400 km], etc.); installation of water management and flood monitoring systems; procurement of construction machinery for maintenance work.

2) Rural road and rural bridge Improvement: Rural roads and canal inspection road (approx. 1,300 km); bridges in 42 locations.

3) Land Consolidation: Approx. 2,000 ha of land consolidation; procurement of construction machinery.

4) Agriculture Mechanization Strengthening: Maintenance workshop improvement (5 locations), establishment of agriculture machineries testing center (1 location).

5) Agriculture Development and Extension Strengthening: Upgrading and diversification of extension modality, improvement of demonstration farms, Improvement of camp & township offices (52 locations), establishment of seed centers (3 locations).

6) Consulting services (detailed design / construction supervision and the support of strengthening capabilities for operation and maintenance, etc.).

#### **(4) Total project costs**

35,339,000,000 JPY (of which 30,469,000,000 JPY is for yen loan)

#### **(5) Project implementation schedule**

Scheduled for March 2018 through November 2025 (total of 93 months). The project will be concluded when the facilities are put into service (scheduled for

November 2024).

## **(6) Project implementation framework**

1) Borrower: The Government of the Republic of the Union of Myanmar

2) Guarantor: None

3) Project-implementing bodies: Primarily Myanmar's Irrigation and Water Utilization Management Department at Ministry of Agriculture, Livestock and Irrigation, followed by the Agricultural Mechanization Department, the Department of Agriculture, Department of Agricultural Land Management and Statistics at Ministry of Agriculture, Livestock and Irrigation, and the Department of Rural Road Development at Ministry of Construction.

4) Operation / Administration / Maintenance / Management: The site offices of the Irrigation and Water Utilization Management Department at the Ministry of Agriculture, Livestock and Irrigation are responsible for maintenance of irrigation facilities and machinery. The Water Users Group, farmer beneficiaries group, is responsible for maintenance of farm roads and water courses of land consolidation site. The township offices of the Department of Rural Road Development is responsible for maintenance of rural roads and bridges.

## **(7) Collaboration and division of roles with other projects, other aid organizations, etc.**

### **1) Japanese support activities**

This project collaborates with the Project for Improvement on Accessibility of Rice Certified Seed (2017 to 2023), a technical cooperation project, to improve the supply of the quality seeds that are essential to increase the per-unit-area yield of rice. It is expected that the Agriculture and Rural Development Two Step Loan Project (2017), will serve to encourage farmers and others to purchase agricultural machinery, and this project can be expected to further promote farmer's investments in agricultural machinery by improving Myanmar's government-run maintenance workshop. The establishment of agriculture machineries testing center will eliminate inferior equipment, which promotes the distribution of superior-quality agricultural machinery. Finally, advisor for irrigation policy has also been dispatched to Ministry of Agriculture, Livestock and Irrigation (since 2016) to provide policy and implementation capacity support such that participatory water management would be fully applied at Myanmar's

irrigation facilities.

**2) Support activities by other aid organizations, etc.**

None.

**(8) Environmental and social considerations / poverty reduction / social development**

**1) Environmental and social considerations**

1. Category: B
2. Basis for categorization: This project does not classify as a large-scale projects in road and agricultural sectors cited in the JICA Guidelines for Environmental and Social Considerations (published April 2010), so its potential adverse impacts on the environment are deemed negligible. The project does not have sensitive characteristics, nor is it located in any sensitive area that might be impacted by influences cited in the Guidelines.
3. Environmental permits: Among the project activities that constitute this project, the Environmental Management Plan (EMP) must be created for irrigation rehabilitation, and the Initial Environmental Examination (IEE) must be created for rural road and bridge improvement. These were created in March 2017. It is planned to receive the approval by Myanmar's Environmental Conservation Department in the future.
4. Pollution countermeasures: Although atmospheric pollution, waste, noise pollution, and vibrations created during construction are expected to have a negative impact on the environment, it is also expected that these negative impact can be minimized by implementing mitigating measures such as regular maintenance for machinery, the use of water sprinkling, the collection of waste material, the prohibition of night-time construction, etc.. It is not expected to have any special impact on the environment in this project once they are put into service.
5. Natural environment: The areas targeted by this project does not correspond with a site easily impacted, such as national parks, nor are they located in the vicinity of such sites, and thus there is expected to be minimal negative impact on the natural environment.
6. Environmental and social: The main activity of this project is to rehabilitate the existing facilities, and this will not entail any land acquisition or resettlement except rural road improvement work. Some

sections of rural roads to be improved (approx. 9.9 km) will require land acquisition (approx. 0.3 ha in total) for road widening (maximum of 30 cm on one side of the road). In this, land acquisition will be conducted as per a Resettlement Action Plan created based on domestic Myanmar procedures as well as the JICA Guidelines for Environmental and Social Considerations. Additionally, land consolidation will only be conducted on plots of land provided voluntarily by farmers in target areas.

7. Other / monitoring: The implementing bodies will monitor air pollution, waste, noise, vibrations, etc. during construction. In addition, the implementing bodies will properly monitor and provide compensation for land acquisition

**2) Cross-sectional items:** Strengthening of agriculture extension, the improved market access, and other outcomes of this project are expected to improve the agricultural productivity of small-scale farmers, and the improvement in their incomes can be expected to contribute to reduction of poverty. Additionally, this project includes rehabilitation of irrigation facilities in regions prone to water shortages due to the effects of climate change, and thus it is considered a “climate change adaptation project.” Moreover, this project also includes plans to establish the Water Users Group, farmer beneficiaries group to improve the durability of irrigation and drainage rehabilitation, promoting participatory water management to maintenance water courses by farmers.

**3) Gender category:** Gender Informed (Significant) – gender activity integration project

<Activity content / categorization reason>

In the areas targeted by this project, married couples make decisions on farm management jointly, and women play an especially large role in farm accounting and financial administration. As a result of this, it is agreed with the implementing bodies to implement accounting training etc. that is corresponded with women’s roles on farms, considering the gender balance among participants in training of agriculture extension system as part of this project.

**(9) Other special notes:** None.

## 4. Project outcomes

### (1) Quantitative outcomes

#### 1) Outcomes (Operational / effectiveness indicators)

Indicator name	Reference numbers (actual 2015 results)	Target numbers (2027) [3 years after project completion <sup>*1</sup> ]
<b>Irrigation and Drainage Improvement:</b>		
Irrigable Area Benefited by The Project (ha; cropping intensity in in parentheses [%])		
Monsoon	196,633 (98)	200,000 (100)
Summer	116,049 (58)	190,000 (95)
Gross Annual Average Farming income (kyat/year/household)	5,148,006	7,469,000
<b>Rural road and Rural Bridge Improvement</b>		
Changes in transport mode during harvest period (percentage change in number of vehicles)		
Bull-Cart (%)	(Set before work is begun)	-84
Trollergyi (vehicle powered by a small engine) (%)		-69
Trucks (%)		+124
<b>Land Consolidation<sup>*3</sup></b>		
Annual Average Farming Cost(kyat/year/household)	3,155,490	2,300,000
<b>Agriculture Mechanization Strengthening</b>		
Average Operation Hours of Major Workshop Machinery per day in Busy Farming Season (hours/day)	0	4
Number of Times of Repairment for private owned machinery in a Year		
Four-wheel tractors (times/year/total 5 locations)	161	190
Combine harvest (times/year/total 5 locations)	32	40
Two-wheel Power Tiler (times/year/total 5 locations)	343	410
Number of Models of Tractors Tested by Agriculture Machineries Testing Center (models/year)	0	15
<b>Agriculture Development and Extension Strengthening</b>		
Total number of farmers who utilize new extension camps in a Year (Farmers/Year/total new extension camps)	0	1,000
Annual Volume of Processed Seed Production at	0	600



Seed Center (t /year)		
Yield of Major crops Per Unit Area <sup>*2</sup>		
Shwebo Paw San (rice) (t/ha)	2.88	3.45
Ayeyarmin (rice) (t/ha)	2.86	4.26
Shwe Sae Yin (rice) (t/ha)	3.96	4.50
Sesame (t/ha)	0.33	0.66
Green Gram (t/ha)	0.97	1.54
Approval Ratio of Certified Seeds Produced by Seed Center (%)	45	60

\*1) Target numbers indicate values at three years after the completion of the project, based on the timing at which the effects of the project materialize. Post-project evaluations will take place four years after the project, based on the timing at which actual figures can be acquired.

\*2) Source: Farmer Household Survey.

\*3) For land consolidation, in addition to “Annual Average Farming Cost”, “Cultivated Area by Major Crops” and “Net Annual Average Farming Income / Profit” are also monitored via project status reports.

## 2) Impact

None

**(2) Qualitative outcomes:** Invigoration of economic activity in target areas and, through this, the improvement of standard of living among farmers.

## (3) Internal rate of return

Based on the assumptions below, this project’s Economic Internal Rate of Return (EIRR) is 20.2%. Its Financial Internal Rate of Return (FIRR) is not set because the level of revenue earned by the maintenance workshops etc., which is the benefit of this project, is not at a sufficient level to recover the project cost, operational and maintenance cost.

[EIRR]

Costs: Project cost (excl. tax); operational and maintenance cost

Benefits: Increase of planted area, increase of yields, reduce of transport costs

Project life: 30 years

## **5. Prerequisites / External conditions**

### (1) Prerequisites

None

### (2) External conditions

No occurrence of large-scale natural disaster.

## **6. Lessons from similar past projects and how those are applied to this project**

### **(1) Lessons from similar projects**

Lessons from the post-project evaluation results of the South Nawin Irrigation Project conducted in Myanmar include the lesson that farmer's agricultural methods, management, and logistical knowledge should be improved, even in irrigation rehabilitation projects.

Additionally, from the post-project evaluation results of past irrigation projects, it has been indicated that in order to increase the benefits of the project, it is important to establish and strengthen the capacity of participatory water management systems, especially regarding the maintenance of water courses.

### **(2) Application of those lessons to this project**

Based on these lessons, this project takes agriculture development and extension strengthening as one of component of the project. Through improvement of demonstration farms, upgrading and diversification of extension modality, and improvement of camp & TS offices, the project plans to improve farmer's knowledge of agricultural methods, management, and logistics.

Additionally, this project plans to conduct initiatives which aimed at forming the Water Users Group and other forms of participatory water management by utilizing the Irrigation and Water Utilization Management Department's Irrigation Technology Center (ITC) Bago, which JICA provided support of capacity development for participatory water management through prior technical cooperation projects.

## **7. Evaluation results**

This project promotes the rehabilitation of the irrigation facilities and

distribution infrastructure as well as strengthening agriculture extension and mechanization. In this, it is in accordance with Myanmar's development policies and development issues on the agriculture sector, and it is also in accordance with Japan's policies focused on supporting agricultural and rural community development. Additionally, in the midst of rapid economic development, the improvement of livelihoods in rural areas through strengthening agricultural competitiveness is a urgent issue, and because this project also contributes to the achievement of SDGs Goal 2 ("End hunger, achieve food security and improved nutrition and promote sustainable agriculture"), it is highly necessary for JICA to provide support for the implementation of this project.

## **8. Future evaluation plans**

### **(1) Indicators to be used in future evaluations**

As described in 4 (1) to (3).

### **(2) Timing of future evaluations**

Post-project evaluation: Four years after project completion.