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Republic of Uganda

FY2022 Ex-Post Evaluation Report of Technical Cooperation Project

"Promotion of Rice Development Project"

External Evaluator: Isao Dojun, Chuo Kaihatsu Corporation

0. Summary

The project aimed to increase rice production in the target districts through promoting recommended rice cultivation techniques to the trained farmers by (i) strengthening the research and development capacity of rice-related research institutes, (ii) strengthening the extension capacity of rice-related service providers (agricultural officers[1]), and (iii) strengthening the extension capacity of stakeholders (rice millers) in the rice value chain to improve the quality of rice in the market.

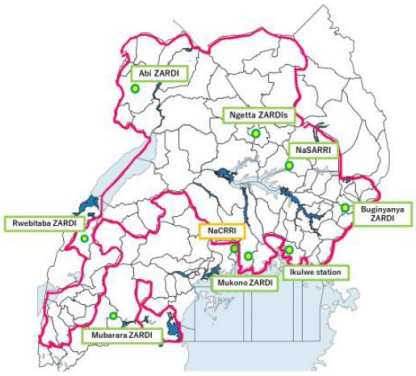
The targeted increase in rice production in the target districts in this project was consistent with Uganda's development plan and development needs both during the planning of the project and at project completion. This project was also consistent with Japan's ODA[2] policy for Uganda during the planning stages (in which one of the priority areas was "agricultural development: rice promotion, value addition of agricultural products, etc.). Further, the project was implemented in collaboration with the Office of the United Nations High Commissioner for Refugees (UNHCR) (an international organisation responsible for refugee assistance), which brought synergy effects. As the project was consistent with international initiatives in these respects, the relevance and coherence of the project were very high. The implementation of the project led to an increase in rice production through the development of recommended rice cultivation technologies, capacity-building of agricultural officers and other actors, and the adoption and expansion of rice cultivation techniques by the farmers who participated in the training in the project's target districts. The effectiveness and impact of the project were very high, as the project brought about more effects and impacts than planned, such as a greater-than-expected increase in rice production among the trained farmers after project completion, an expansion of rice production areas through the dissemination of technologies from farmer to farmer, expanded rice production among refugee and host community farmers[3], and improved roles for women within households. The project cost and period were higher than planned, but these were due to factors beyond the control of the project implementer. The outcomes and project purpose were achieved to a very high degree. The efficiency of the project was moderately low, even when accounting for the fact that the invested human resources and expenses efficiently contributed to the achievement of the project targets. Although some aspects of the project's sustainability are

[1] Persons in charge of agricultural extension works
[2] Official Development Assistance
[3] Farmers living in communities with refugee settlements

ensured by the current implementation of the successor project (Phase 2 project), there are still financial challenges, particularly in terms of the budgets for research, training, and agricultural extension. Thus, the sustainability of the project is evaluated as moderately low.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Locations
(Source: *Project Completion Report*, March 2019)

Rice Cultivation in a Rainfed Lowland
(Source: Photograph taken by the external evaluator)

1.1 Background

Agriculture is a key industry in Uganda, accounting for about 20% of GDP, 48% of exports, and 73% of employment. The average farm size of farmer households is small, less than 1 ha, and subsistence farming by small-scale farmers is the main form of farming practiced. Plantain, sweet potato, cassava, maize, and sorghum are widely grown as staple food crops, while coffee, sesame, sugarcane and tea are grown as commodity crops.

Paddy rice has long been practiced in the wetland-intensive eastern region, while the spread of upland NERICA rice has been promoted in recent years in other areas through JICA assistance. Remarkable growth in NERICA production has been driven by rising demand for rice, especially in urban areas, thanks largely to the good taste of rice and the ease with which it can be prepared. Before the start of the project, however, the levels of rice produced fell significantly short of the levels consumed. Uganda was heavily dependent on rice imports from Asian countries, and increasing domestic production was a major challenge.

As rice production was just getting started in Uganda, research institutes were pressed to develop appropriate technologies for rice cultivation and disseminate them to rice farmers through agricultural officers in order to increase production. In doing so, it was important to develop and disseminate appropriate technologies for each of the three different rice-growing environments in Uganda (rainfed upland, rainfed lowland and irrigated lowland). And for farmers to continue rice cultivation, they needed to secure income from selling rice,

which required the production of high-quality, marketable rice.

This project was initiated in November 2011 with a scheduled period of five years and was implemented based on the results of three JICA-supported projects that had been carried out earlier (i.e., (1) Sustainable Irrigated Agriculture Development Project in Eastern Uganda (2008-2011), (2) NERICA Rice Promotion Project in Uganda (2008-2011), and (3) the Project for Construction of Rice Research and Training Centre (March 2009[4])). The project period was extended twice, and ended in March 2019. Subsequently, the Rice Promotion Project Phase 2 (April 2019 - March 2024) was launched as a successor project.

1.2 Project Outline

Overall Goal		Income of the participating households in training is increased.
Project Purpose		Rice production is increased in the target districts of the Project.
Output(s)	Output 1	Research and development capacity of rice-related institutes is strengthened.
	Output 2	Extension capacity of rice-related service providers is strengthened.
	Output 3	Capacity of the stakeholders involved in the rice value chain is strengthened to improve the quality of rice in the market.
Total cost (Japanese Side)		1,083 million yen
Period of Cooperation		November 2011 – March 2019 (Extended period: November 2016 – March 2019)
Target Area		About 40 districts were selected at the start of the project. (The number of districts was finally increased to 58 following the division of the local administration. The total number of districts was 136 in the year 2020.)
Implementing Agency		Responsible Agency: Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) Implementing Agencies: MAAIF, National Agricultural Research Organisation (NARO) and National Agriculture Advisory Services (NAADS)
Other Relevant Agencies/ Organisations		(None in particular)
Organisation in Japan		Ministry of Agriculture, Forestry and Fisheries
Related Projects		<Technical Cooperation> - Sustainable Irrigated Agriculture Development Project in Eastern

[4] Grant agreement date

	Uganda" (2008-2011) - NERICA Rice Promotion Project in Uganda (2008-2011) <Grant Aid> - the Project for Construction of Rice Research and Training Centre (March 2009) <Other Development Partners> -World Bank: 1) Agriculture Cluster Development Project (2015-2022), 2) Agricultural Technology and Agribusiness Advisory Services Project (ATTAS) (2010-2017), 3) Irrigation for Climate Resilience Project (2020-2026) -Netherlands: Integrated Seed Sector Development (2012-2016)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

The report of the second terminal evaluation (conducted in September-October 2017 during the project extension period) states that two of the indicators, namely, the "rice-growing areas increase" (target value: 15,000 ha) and the "amount of rice production increases" (target value: 45,000 tons), were achieved, and that the rice cultivation technology extension activities in the pilot areas were well implemented. Therefore, the project purpose was well achieved.

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation

The above terminal report states that it is unclear whether the overall goal will be achieved. It also states that it is necessary to collect rice production data from the beneficiary farmers in order to determine whether the targets have been achieved. As for impact, the report states that the adoption of recommended rice cultivation techniques has increased rice income.

1.3.3 Recommendations from the Terminal Evaluation

The above terminal evaluation report describes the status of responses to the recommendations made at the first terminal evaluation (April-May 2016). The following table describes the main recommendations and the status of the responses (including reactions in the Phase 2 project).

Recommendations made at the first terminal evaluation	Responses to the recommendations
【Recommendation to the project team】	
Training of Trainers (TOT) for newly	TOT training was carried out continuously during

employed agricultural officers, as well as Refresher Training.	the project extension period and has also been continuously implemented in the phase 2 project.
【Recommendations to NARO】	
Ongoing collaboration with the UNHCR and other partner organisations.	TOT training was conducted in collaboration with the UNHCR during the project extension period. TOT training and training for refugees and others has been continuously implemented in the phase 2 project.
A strengthened training function in the National Crops Resources Research Institute (NaCRRI)[5].	The Ugandan and JICA sides agreed to establish a training section at NaCRRI during the project extension period. The training section is functioning in the phase 2 project.
【Recommendations to the Ugandan implementing agencies】	
Information-sharing on counterpart funding for the project (including information on the use of funds).	The limited cost burden on the Ugandan side remained unchanged during the project extension period and has not changed in the phase 2 project.

2. Outline of the Evaluation Study

2.1 External Evaluator

Isao Dojun, Chuo Kaihatsu Corporation

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: October 2022 – March 2024

Duration of the Field Study: 5th February 2023 – 14h March 2023, 30th November 2023 – 12nd December 2023

2.3 Constraints during the Evaluation Study

The overall goal is the "income of the participating households in training is increased, " and the indicator is the "income from rice production in the target districts is increased at least by 5% by 2020, compared with the same in 2015/16." Uganda has kept no statistical data on annual rice production by district. As this precludes the collection of data on income from rice production by district, no indicator data on the overall goal can be obtained from the government's statistical data. A quantitative interview survey of around 100 training-participant farmers was conducted in this ex-post evaluation, and supplementary information

[5] One of the research institutes under NARO

on the estimated increase of income from rice production, rice sales prices, etc. was taken into account in the estimation of the increase in rice income. Data were also collected on rice production (production and sales prices) before the training course and during the previous cropping season (124 farmers interviewed in 11 districts), as the farmers may have provided somewhat inaccurate information on their rice income in the cropping season in 2015/16 and 2020. This sample size was limited relative to the total number of training-participant farmers (51,702 households).

3. Results of the Evaluation (Overall Rating: B[6])

3.1 Relevance/Coherence (Rating: ④[7])

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Uganda

The agricultural sector was positioned as one of the pillars of economic growth, with particular emphasis on strengthened agricultural production and productivity, in the development plans Uganda was pursuing both during the planning of the project and at project completion (*the National Development Plan 2010/11 - 2014/15* and *the third National Development Plan 2020/21 - 2024/25*). Rice was positioned as a priority Research & Development crop and a priority/strategic commodity. Mechanisation, the multiplication and distribution of quality seeds, and the provision of extension services were also needed to increase rice production. As such, the targeted increase in rice production in the project was highly consistent and well aligned with the development plan of the Government of Uganda. Uganda's development plans during the ex-post evaluation focused on improving agricultural production and productivity, emphasizing post-harvest handling, strengthening value chains, and improving coordination among the various government agencies providing related services. The objectives of the project are well aligned with the priority issues positioned in the national development policy and other policies.

3.1.1.2 Consistency with the Development Needs of Uganda

Rice production was growing robustly in Uganda during the planning of the project because of the spread of NERICA rice cultivation. Rice consumption still outpaced the production growth, however, and the country depended on rice imports to meet the shortfall. Increasing the rice production therefore posed a major challenge. At the time of project completion, rice production was still insufficient to meet the demand generated by the increased rice consumption in the country. The Government of Uganda

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[7] ④: Very High ③: High, ②: Moderately Low, ①: Low

continued to set targets for increased rice production and self-sufficiency in rice. The increase in rice production was therefore consistent with Uganda's development needs both during the planning of the project and at project completion.

The interviews with farmers during the ex-post evaluation confirmed that the Ugandan farmers who cultivate rice are highly motivated to do so. In some cases, farmers who can purchase or lease additional farmland using income from rice sales are increasing their rice cultivation areas. Rice farmers also need appropriate post-harvest processing in order to improve their productivity (e.g., achieve higher unit yields), ensure the quality of their rice, and gain capacity in negotiating sales prices with traders. The need to continue disseminating appropriate rice cultivation techniques, both for existing rice farmers and new rice farmers, remains high.

Self-sufficiency in rice in Uganda was not yet achieved as of the ex-post evaluation, so the country basically remains a rice importer. The patterns and levels of rice distribution vary from region to region, however, because of the large size of the country and high distribution costs. While the rice imported from Asia, Tanzania, and produced in Uganda is distributed in Kampala, the capital city, Uganda reportedly exports rice to Kenya from its Eastern Region and to South Sudan and the Democratic Republic of Congo from its Northern and Western Regions. As the demand for rice in Uganda is expected to continue rising, the demand for domestically grown rice is likewise expected to remain high.

3.1.1.3 Appropriateness of the Project Plan and Approach

The project plan was formulated in consideration of a lesson learned from a previous project: "further strengthening of the rice research and dissemination system at NaCRRI is expected to improve Uganda’s rice research and development capacity"; the capacity of NaCRRI's rice researchers and training system has been strengthened; and the linkage with agricultural-extension-related organisations was enhanced. The rice research capacity of NaCRRI and ZARDIs was enhanced through implementing rice researches with JICA experts, receiving knowledge transfer at seminars conducted by JICA experts, and participating in training in Japan, etc. On the agricultural extension side, agricultural officers have used the teaching materials developed under the project to conduct farmer training sessions after receiving TOT training on appropriate rice cultivation techniques. Each farmer who participated in the training received 1 kg of rice seed to start rice cultivation using the techniques learned and to produce rice seed for the next cropping season. If the training-participant farmers were serious about rice cultivation using their 1 kg of rice seed and adopting appropriately the rice cultivation techniques they learned, they could be expected to effectively continue rice cultivation

in the following years. This agricultural extension method was appropriate, unique, and effective in fostering the adoption of rice farming practices and a sense of ownership by new rice farmers. A farmer-to-farmer technology transfer mechanism was improved into a more functional agricultural extension approach in a later stage of the project period. This improved agricultural extension approach has been adopted continuously in the phase 2 project, and this method was evaluated as highly effective. The agricultural extension approach has been further improved. As described in the section on sustainability, it is pointed out that there are some minor issues on the sustainability of the project, such as challenges on budget for research, training, and agricultural extension. These are financial issues of the Ugandan government side and are not issues caused by the Project Plan and Approach of this project.

3.1.2 Coherence (Rating: ④)

3.1.2.1 Consistency with Japan's ODA Policy

One of the priority areas in Japan's ODA policy for Uganda at the time of planning was "agricultural development: rice promotion, value addition of agricultural products, etc." Therefore, the promotion of rice and the increase in rice production through this project were consistent with Japan's ODA policy.

3.1.2.2 Internal Coherence

This project provided training on rice cultivation techniques to Japan Overseas Cooperation Volunteers (JOCV members) dispatched to Uganda, to equip them with useful knowledge for their subsequent activities. JOCV members dispatched to neighbouring African countries were also invited to Uganda as part of the wide-area training (once a year, about 25 persons per training session), and in the process received training on rice cultivation techniques. Government officials working with the JOCV members were also invited to participate in the training in the course of the project. In addition, some of the JOCV members who were sent to Uganda were assigned to ZARDIs and carried out activities related to rice research and extension of rice cultivation techniques. These types of collaborative activities on rice promotion implemented with JOCV members have contributed to the promotion of rice cultivation.

3.1.2.3 External Coherence

Rice cultivation technology training for refugees and host community farmers has been implemented in collaboration with the UNHCR from the mid-stage of the project. A large number of refugees from South Sudan and the Democratic Republic of Congo are living in the Northern Region in Uganda. The refugee communities have needs related

to food and technical assistance (guidance on food production and post-harvest handling techniques). This project provided training on rice cultivation techniques in response to a request from the UNHCR, which was responsible for food aid and the installation of post-harvest processing facilities (rice mills and rice storage). More specifically, this project conducted TOT training for NGO staff commissioned by the UNHCR and for a part of refugees and host community farmers. Then, NGO staff, who attended the TOT training, provided farmer training to other refugees and host community farmers. As a result, refugee and host community farmers acquired rice cultivation techniques, leading to new or increased production of rice as a cash crop. The UNHCR, meanwhile, constructed rice storage and rice mills in some locations. The sale and marketing of milled rice has been facilitated in some cases, leading to further increases of income from the sale of milled rice rather than un-milled rice. This synergistic effect has contributed to the high external coherence of the project activities.

The project's objective of "Rice production is increased in the target districts of the Project" was consistent with the development plan and development needs of the Government of Uganda both during the planning of the project and at project completion. The approach to technology dissemination was also appropriate. The project was also consistent with one of the priority areas of Japan's ODA policy for Uganda, namely, "agricultural development: rice promotion, value addition of agricultural products, etc." The support for rice promotion through training and collaboration with JOCV members was consistent in terms of coordination and collaboration with other JICA projects, and good results were achieved. Synergistic effects, such as increased rice production and income, have been observed among the refugees and host community farmers who were trained under the collaboration with the UNHCR (an international organisation in charge of refugee assistance). As such, this project was highly coherent with the various other international initiatives underway. Therefore, its relevance and coherence are very high.

3.2 Effectiveness and Impacts[8] (Rating: ④)

3.2.1 Effectiveness

3.2.1.1 (Project Output)

Three outputs of the project, specifically Output 1 "Research and development capacity (selection of appropriate varieties, recommendation of appropriate water management technologies, compilation of research results, development of rice cultivation technology packages, rice seed multiplication, breeding of disease-resistant lines) of rice-related institutes (NaCRRI and ZARDIs) is strengthened," Output 2: "Extension capacity of rice-

[8] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

related service providers (agricultural officers) is strengthened (development of training materials, development and training of agricultural officers, implementation of farmer training, and preparation and submission of farmer training reports)," Output 3: "Capacity of the stakeholders involved in the rice value chain is strengthened to improve quality of rice (preparation of value chain survey report, trainings to rice millers and others, and support for establishment of rice millers' council)," were deemed to have been achieved (source: *Project Completion Report* (March 2019)). The specific achievement status is summarized in the table below.

Table 1: Achievement of the Outputs

Output (target)	Achievement (Results)
Output 1: Research and development capacity of rice-related institutes (NaCRRI and ZARDIs) is strengthened.	(1) Three varieties for the rainfed uplands were recommended and two varieties for the rainfed lowlands and irrigated lowlands were registered by the government organisation[9]. (2) The following techniques were recommended: (i) techniques to flatten the land and enclose it with ridges in order to increase the rainfall collection and retention capacity (for rainfed uplands), (ii) techniques to create ditches within fields to improve the water drainage capacity (for rainfed lowlands) and (iii) techniques to manage the water depth within fields (for irrigated lowlands). (3) A document entitled "*Tractor Hiring Service Models for Agricultural Mechanisation in Uganda*" was elaborated. (4) A report summarizing the project's research findings was produced (and shared within NaCRRI). (5) "Technology packages" for different rice cultivation environments were developed. (6) The target of multiplying at least 10 tons of rice seed each year was achieved. (7) Promising rice lines resistant to the Rice Yellow Mottle Virus (RYMV) were identified, and further selection was underway. Work on the purification[10] of recommended rice varieties (e.g., NERICA varieties, WITA 9, Supa, and others) is being maintained. (8) A rice seed production plan was prepared each year.
Output 2: Extension capacity of rice-related service providers (agricultural officers) is strengthened (development of training materials, training of agricultural officers, farmer training, preparation and submission of reports on farmer training).	(1) A rice cultivation poster, a rice cultivation handbook, and teaching materials on rice disease and pest and water management were developed and distributed to agricultural officers during the TOT training. A separate rice cultivation handbook for farmers was prepared and distributed to the farmers participating in the training. (2) Every agricultural officer who attended the TOT training conducted at least one farmer training session. (3) The total number of training-participant farmers reached 51,702. (4) The average adoption rates of upland rice cultivation techniques in Luweero and Soroti districts were 71% and 66%, respectively. The technology adoption rate for lowland rice cultivation was very high in the Namutumba district, at 93%. (5) A total of 227 agricultural officers attended the TOT training, and a total of 31 researchers from ZARDIs in four locations attended technical training / workshops / internal training. The total number of training participants was 258.

[9] Reviewed and registered by the National Variety Release Committee within the MAAIF.
[10] Work to ensure that there is no mixing of different varieties.

	(6) The agricultural officers in charge created the demonstration plots for farmers in all seven of the target pilot sites (seven districts). (7) The neighbouring farmers were invited to the farmer field training on the demonstration plots along with the target farmer groups, in order to realise effective extension methods (farmer-to-farmer technology transfer). (8) All agricultural officers in charge of the pilot sites submitted farmer training reports after the implementation of the farmer training.
Output 3: Capacity of the stakeholders involved in the rice value chain is strengthened to improve the quality of rice in the market.	(1) A document entitled "*Rice in Uganda*" was prepared and distributed to relevant organisations after the implementation of a rice value chain survey. (2) Training sessions were organised for rice millers and rice traders in 2013. The direction of this activity was subsequently changed to establish a rice millers' association. The Rice Millers Council of Uganda was established in 2015 and officially registered at the Ministry of Trade Industry and Cooperatives. Activities to encourage the removal of stones during the rice milling process were subsequently implemented.

3.2.1.2 Achievement of Project Purpose

The project purpose was "Rice production is increased in the target district of the project," and three indicators were set. The degree to which each indicator was achieved is shown in the table below, based on the Project Completion Report.

Table 2 Achievement of the Project Purpose

Project Purpose	Indicator	Actual
Rice production is increased in the target district of the project	Indicator 1: Rice growing areas increase more than 15,000 ha.	The increase in the area of rice cultivation at the end of the project was estimated at 19,210 ha. The 15,000 ha target was surpassed (achieved).
	Indicator 2: Amount of rice production increases more than 45,000 tons (10 % of the rice production at the commencement of the Project) on the basis of paddy (un-milled) at household level.	As of the end of the project, the increase in rice production (estimated value) among the farmers who received training was 51,122 tons, exceeding the 45,000 tons target (achieved).
	Indicator 3: Rice technologies are disseminated in all pilot areas through NARO and district government collaboration.	The agricultural officers in charge at all of the pilot sites conducted the farmer training using the demonstration farms (9 sites) and training materials (achieved).

TOT training for agricultural officers has been conducted under the project, and the agricultural officers who acquired knowledge on recommended rice cultivation techniques instructed the farmers on the techniques through training in the field. As a result, the rice cultivation area was increased by an estimated 19,210 ha and rice production was increased by an estimated 52,122 tons, compared with the figures before the start of the project. The results of the project surpassed the achievements planned.

The project achieved its purpose more than planned.

3.2.2 Impacts

3.2.2.1 Achievement of Overall Goal

The overall goal, the indicators, and the degrees to which the indicators were achieved (actual) are shown in the following table.

Table 3 Achievement of the Overall Goal

Overall Goal	Indicator	Actual
Income of the participating households in training is increased.	The income from rice production in the target districts is increased at least by 5% by 2020, compared with the same in 2015/16.	In Uganda, data on rice production income by district is not available in annual statistical yearbooks and other sources. Therefore, it was decided to estimate the level of achievement of this indicator based on the results of the farmer survey (interviews) conducted in this study. Interviews were conducted with 124 training-participant farmers in 11 districts[11] (quantitative survey). Table 4 shows the change in income from rice production (mean value) of the training-participant farmers (including both new and existing rice farmers) at the time of training (note 1) and at the last cropping season (year 2022). Income from rice production increased by 1.46 times (46% increase) on average, which was well above the 5% target.

Note 1: The training participation timing varied from farmer to farmer and ranged between the years 2012 and 2018.

Table 4 Change in income from rice production during the training and during the last cropping season

Category of farmer	Number of surveyed farmers (households)	Average value of rice production (UGX) per farmer during the training	Average value of rice production per farmer (UGX) during the 2022 cropping season	Change in income from rice production
New rice farmer	38	1,040,969	1,616,300	575,331 UGX increase **(increased by 1.55 times)**
	(value in yen)	(36,954 JPY)	(57,379 JPY)	(20,424 JPY increase)
Existing rice farmer	86	1,890,712	2,719,611	828,899 UGX increase (**increased by 1.43 times**)
	(value in yen)	(67,120 JPY)	(96,546 JPY)	(29,426 JPY increase)

[11] Adjumani, Arua, Butaleja, Kaliro, Kanungu, Kikuube, Luwero, Mayuge, Mukono, Nebbi, and Sironko districts

Average (Number of surveyed farmers is the total)	(124)	1,630,306	2,381,500	751,194 UGX increase (**increased by 1.46 times**)
	(value in yen)	(57,876 JPY)	(84,543 JPY)	(increased by 26,667 JPY)

Note: 1 UGX (Ugandan Shilling) = 0.0355 JPY (Japanese Yen) (February 2023, when the quantitative survey was conducted)

As shown in Table 4, the interviews with training-participant farmers revealed that their income from rice production in the 2022 cropping season increased by an estimated 46% compared with their income from rice production before the training, thanks mainly to the increase in unit yields achieved through the adoption of appropriate rice cultivation techniques, the increase in the areas of rice cultivation for some of the farmers, etc. The increase of income from rice production (46%) exceeded the 5% target. As rice is a cash crop, the 46% increase in income from rice production has contributed significantly to improving the livelihoods of the training-participant farmers.

It can therefore be inferred that the results of the project surpassed the overall goal targeted. Even though the data on income from rice production is not verifiable at the district level, the project can be assumed to have achieved its overall goal.

3.2.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

This project was judged to have minimal undesirable effects on the environment based on the JICA Guideline for Environmental and Social Considerations (formulated in April 2010), and was classified as Category C. In addition, the project had no direct negative impacts on the environment.

2) Resettlement and Land Acquisition

No resettlement or land acquisition occurred in this project.

3) Gender Equality, Marginalized People, Social Systems and Norms, Human Well-being and Human Rights, etc.

Rice farming operations (from ploughing the land to selling the harvested products) are oftentimes carried out by both men and women, either in cooperation with each other or, for some types of farm work, on a shared basis (this information is based on farmer survey results). Rice is a cash crop, and positive gender effects accompanying the increase in income from rice sales have been observed: (i) husbands and wives make household decisions in consultation with each other (including decisions on the expenditure of the rice income); (ii) conflict and violence in the household has decreased (because of the

increased income); and (iii) women feel more independent in the household (information based on the farmer survey results).

4) Unintended Positive/Negative Impacts

a) Impacts on ordinary Ugandan farmers and others

Disposable income has increased to households through the production and sale of rice as a cash crop, which in turn has brought about the following effects/impacts (information from the interviews with the farmers who received the training).

* They can use the money to pay for their children's school fees and other educational expenses. They attach great importance to their children's education and try to send their children to private schools with better educational environments if they afford to the money (private tuitions are higher than public tuitions).
* The money can be used for medical, clothing, and food expenses.
* Rice became one of the staple crops, and its production improved household food security. Many rice-producing households are eating rice two to three times a week, more often than before. In particular, more children are coming to prefer rice at mealtimes.
* Rice income is used to purchase or lease farmland, which leads to further increases in rice production and/or growing of other crops (cassava, maize, etc.), which in turn increases the availability of staple foods.
* Some farmers have been able to use their rice income to purchase cattle, goats, chickens and other livestock to generate income through livestock fattening and milk production.
* In many cases, the knowledge and skills learned in rice farming training are taught to neighbouring farmers, which contributes to the spread and expansion of appropriate rice cultivation techniques and increased rice production (progress in disseminating rice cultivation techniques among farmers).
* The use of improved technologies for rice cultivation on low marshlands, land which was previously unused, has brought higher incomes.

b) Impact of the training provided to refugees and others

The project conducted rice cultivation training for refugees and farmers in the communities where refugees reside (host community farmers), in collaboration with the UNHCR. Specifically, 266 refugees and host community farmers received TOT training and another 798 refugees and 519 host community farmers received regular farmer training. Interviews with 11 refugees and 14 host community farmers who received the training revealed the following impacts, in addition to the impacts enumerated above.

* The refugees' rice production for their own households improved their household food security and reduced their dependence on food supplied through the UN World Food Programme (WFP).
* After the refugees and host community farmers attended the training, they began to carry out rice cultivation works (weeding, harvesting, etc.) in cooperation with each other, which in turn improved their relationships. The men and women also began to work together (men began to do some of the weeding work, which was something previously considered a chore for women). Refugees have been borrowing land from host communities to cultivate rice, which has benefited both the refugees and host community farmers by securing labour for rice cultivation and for the cultivation of the land as farmland. The refugees and host community farmers also provided mutual support for funerals and weddings (e.g., by providing rice and other foodstuffs to households holding funerals), which again brought them closer together[12].
* The refugees became more involved in community activities (community meetings, road repair works, etc.).
* The refugees were able to use their rice income to pay for school fees, medical expenses, and leasing costs for agricultural land, which increased their independence and greatly improved and reinforced their self-esteem.
* Rice cultivation techniques were disseminated to neighbouring farmers.
* Rice cultivation techniques were shared with other refugees and host community farmers during joint working activities (through oral explanations and practice). Specifically, each trained refugee shared his/her rice farming knowledge with 3-10 neighbouring farmers.
* Income increase: The estimated change in rice production and income in the households of the interviewed refugees (11 people) immediately after the training and during the final cropping season showed that the rice production per refugee (rice producer) fell from 850 kg to 636 kg. As none of the refugees interviewed had produced rice before taking part in the training, however, the amount of rice produced in the final cropping season represented an increase in rice production comparing the situation before the training. The income from rice production in the final cropping season was approximately 1,738,000 Ugandan Shillings (approximately 61,700 Japanese Yen) for 636 kg of rice.

[12] The interviewees were refugees from South Sudan living in refugee settlements in the Adjumani district and spoke the same local language as the Ugandans in the area. The common language made communication easier, which may have contributed to the smooth development of cooperation and collaboration between the refugees and host community farmers (note that the refugees mainly from the Democratic Republic of the Congo live in western Uganda, where the situation is reportedly different).

c) Other impacts

* The introduction of rice cultivation in many new areas (such as Buvuma Island in Lake Victoria) and the increase in rice production have led to an increase in small-scale rice millers.
* This project provided technical training on rice cultivation to JOCV members. Some of the members have since become JICA experts, while others have found employment in consultant companies involved in Japan's Official Development Assistance. In this way, the project has contributed to human resource development in the rice farming sector.

This project has achieved the project purpose of "Rice production is increased in the target districts of the Project" and the overall goal of "Income of the participating households in training is increased" more than planned. Therefore, effectiveness and impacts of the project are very high.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	Plan	Actual
(1) Experts	6 Long-term More than 3 Short-term	12 Long-term (405.3 MM*) 15 Short-term (65.1 MM)
(2) Trainees received	About 8 persons/year	35 persons in total
(3) Equipment	---	Vehicles and research equipment
(4) (Others)	---	266.5 million yen
Japanese Side Total Project Cost	About 900 million yen in total	1,083 million yen in total (Reference: The total project cost for the first five years was 845 million yen.)
Ugandan Side Total Project Cost	Recurrent expenses (e.g., project activity costs, utilities, etc.)	About 140 million yen in total

* MM stands for man month.

3.3.1.1 Elements of Inputs

As the project period increased from the originally planned five years to seven years and five months, the resulting increases in activity costs and dispatch of experts drove the total project costs on the Japanese side far above the costs initially planned. The number of

trainees received, on the other hand, was less than planned[13].

3.3.1.2 Project Cost

The project cost was slightly exceeded the plan (120% of the plan), with actual costs of 1,083 million JPY compared with the plan of approximately 900 million JPY. The increase in the project cost mainly stemmed from the ongoing need to pay for local project activities (activities related to research, and the training and dissemination of rice cultivation techniques), although efforts were made to reduce the number of experts dispatched when the project period was extended. The cost for the initial project period (November 2011 - October 2016) was lower than the planned cost of approximately 900 million JPY [14]. The achievement of the project objectives and results, on the other hand, was very high and commensurate with the outputs. Although additional project costs were required, they were an appropriate input in light of these factors.

3.3.1.3 Project Period

The project period was 89 months (November 2011 - March 2019), which exceeded the plan (60 months: November 2011 - October 2016) by 148% of the plan.

The project period was extended twice, first from November 2016 to March 2018 (17 months) and next from April 2018 to March 2019 (12 months). One of reasons for the first extension was the National Agricultural Advisory Service (NAADS), one of the implementing agencies in charge of agricultural extension, shed its agricultural extension function under a reorganisation taking place in 2014. The dismissal of the agricultural officers from NAADS who had attended TOT training made it necessary to strengthen the capacity of agricultural officers from the district administration. In addition, the reason for setting the extension period at 17 months was due to the need to ensure two cropping seasons during the extension period, taking into account the local rice growing season in order to strengthen the capacity of agricultural officers. The reason for the second extension was the need to increase self-sustainability of the basic research capacity, extension system and seed production of the Ugandan side in order to ensure the sustainability of the successor Phase 2 project before initiating it.

Therefore, efficiency of the project is moderately low.

[13] Mainly because the counterparts were sent to “Group and Region-Focused Training” in Japan at JICA’s invitation, which resulted in the dispatch of fewer people to training in Japan than planned.

[14] The actual project cost for the five years and five months from November 2011 to March 2017 amounted to approximately 845 million JPY (source: *the Terminal Evaluation Report* (October 2017)), which was within the originally planned project cost.

3.4 Sustainability (Rating: ②)

The ultimate goal of the project was to increase rice production and increase the income of the farmers who had received training through the practice of the recommended rice cultivation techniques in the project target districts. Therefore, this section on sustainability looks at sustainability in terms of techniques, i.e., whether the farmers have continued to practice the recommended rice cultivation techniques since the completion of the project, and also in terms of institutions and policies, organisation and systems, and finance, i.e., whether technical training on rice cultivation has been implemented since the completion of the project and whether the rice promotion area has expanded.

3.4.1 Policy and System

The objectives of *the Third National Development Plan (2020/21 - 2024/25)* at the time of the ex-post evaluation were to "increase household income and improve the quality of life of the population," and encompassed 18 programmes. One of the programmes, the "Agro-industrialisation Programme," focuses on increasing the growth rate of the agricultural sector, increasing the labour productivity of the agro-industrial value chain, creating jobs in the agricultural sector, increasing the proportion of food-secure households, and increasing the export value of selected agricultural products. The Agro-industrialisation Programme presents six objectives: (i) increasing production and productivity; (ii) improving post-harvest handling and storage; (iii) increasing agro-processing and value-added creation; (iv) improving market access and increasing the competitiveness of agro-products in and outside the country; (v) mobilising the equitable access and use of agricultural finance; and (vi) strengthening coordination among relevant institutions to improve service delivery. Note that one of the agricultural products covered by the programme is rice.

Although there are concerns that the unpublished Second National Rice Development Strategy (NRDS2) (as of November 2023) and the President's statement banning rice cultivation in wetlands in 2022 may slightly attenuate the policy priority of rice production, rice has been identified as a priority crop in the above national development plan, which ensures its sustainability in policy terms.

3.4.2 Institutional/Organizational Aspect

Each of the implementing agencies (MAAIF, NARO, NaCRRI, ZARDIs and district administration) has its own role in promoting the agricultural sector (central government administration, rice research, rice cultivation technology dissemination, etc.) and promotes agriculture through collaboration and coordination among them. The establishment of a training section in NaCRRI was recommended during the project period, and a staffed training section established during the ex-post evaluation is presently functioning within

NaCRRI. Though no seed production section has been established within NaCRRI, note that the organisation develops a seed production plan each year to produce pre-basic and basic rice seeds for distribution to the training-participant farmers and for sale to general farmers.

Around two to three rice-related researchers/technicians from each ZARDI participated in the project. As of the ex-post evaluation, a number of rice researchers/technicians were either studying abroad or had been reassigned to other ZARDIs. ZARDIs are NARO-affiliated research institutions in which personnel changes periodically occur. While newly assigned researchers/technicians who lack sufficient knowledge and experience in rice cultivation may sometimes need to receive the same through technology transfers, NARO basically retains personnel with strengthened capacity in rice cultivation technology. As such, there should be no major problems in terms of the organisational structure. According to MAAIF, a total of 4,000 agricultural officers are dispatched throughout the country. Though no data were obtained on the fixed number of agricultural officers or their overall coverage rate, interviews conducted at 10 district agricultural offices indicated a coverage rate of 61.3%. The number of new employees in the 10 districts after the end of the project (from April 2019 onwards) averaged 3.8 per district, which means that the employment of new agricultural officers is proceeding and the agricultural extension system is improving. Based on the above, the sustainability of the organisation and system is evaluated as moderately high.

3.4.3 Technical Aspect

1) Researchers

A total of 39 researchers and technicians from NaCRRI and ZARDIs were assigned in the Phase 2 project, the successor to this project. Some of these rice-related researchers and technicians have been involved in breeding (breeding disease-resistant varieties), cultivation technology experiments, and training activities. Their involvement in these activities has strengthened their knowledge and skills in conducting research and training. There will be a challenge, however, in ensuring the continuity of knowledge and skills of a number of project-employed researchers and technicians who work alongside the Japanese experts, as the experts will be leaving when JICA's technical cooperation comes to an end. Overall, NARO will need to continue strengthening the capacity of the rice-related researchers.

2) Agricultural officers

The Phase 2 project has also conducted training of trainers (TOT training) for agricultural officers in charge of sub-counties[15] in high-priority rice production districts. Refresher TOT training (follow-up training) has also been conducted for the agricultural officers who

[15] Administrative unit under district

attended the TOT training. The agricultural officers report that rice cultivation technology has been continuously disseminated in response to the farmers' needs, and a certain degree of sustainability in maintaining and strengthening the rice farming knowledge of the agricultural officers has been achieved.

3) Farmers

The adoption rate of rice cultivation techniques for paddy rice among farmers was as high as more than 90% according to the assessments in the first terminal evaluation of the project. Although this rate was about 20 points lower in the ex-post-evaluation, it remained above 70% on average (above the 50% target). The adoption rate of the sowing and drying techniques for the cultivation of upland rice has improved, and currently stands at just above 70% on average. The sustainability and retention of the recommended techniques at the level of the trained farmers has been ensured.

Each trained farmer transfers the rice cultivation techniques learnt at the training to about three to four surrounding farmers, as well as to his/her own family members. While these farmers may be limited in number, the farmer-to-farmer technology dissemination is taking place. The adoption rate of appropriate rice cultivation techniques in Phase 2 projects, where the new extension methods have been fully applied, is high (e.g., the adoption rate of techniques for lowland rice cultivation, such as young seedling transplanting, field levelling, the use of modern rice varieties, and row planting, has increased from 3%-39% before the training to 73%-99%). The farmer-to-farmer technical transfer has also been good (technical transfer from one trained farmer to an average of 9.8 surrounding farmers in total, and the adoption rate of appropriate rice cultivation techniques by surrounding farmers increased from 0%-30% to 57%-97%)[16].

The technology adoption and retention among trained rice farmers has been good, and further farmer-to-farmer technical dissemination has also been observed. While NaCRRI assigns full-time staff to rice research, training, and seed multiplication, the employment of a number of project staff in research, training, and seed multiplication at JICA's expense may incur some minor issues with technical sustainability.

3.4.4 Financial Aspect

The Ugandan counterpart budget for the Phase 2 project was very limited. There continues to be a shortage of budgetary resources for rice research. Another factor is the lack of a properly workable mechanism to ensure that the funds obtained by MAAIF from the Ministry of Finance are properly transferred to research institutes under NARO such as NaCRRI and others. Rice seed production is carried out in NaCRRI and the ZARDIs, and some of the

[16] Source: *Midterm Review, Musomesa Field School, Survey Report,* December 2021

seed produced is either used for distribution during farmer training or sold to general farmers and others. A mechanism currently being put in place at NARO is to use the income from seed sales as wages for the workers involved in the seed production. The financial sustainability of the seed production is improving. The extension activities largely depend on the available agricultural extension budget at the district administration level. According to interviews at the district agricultural offices, the budget for agricultural extension activities is completely insufficient[17]. The table below shows the agricultural extension-related budgets at the 10 district agricultural offices interviewed.

Table 5: Agricultural Extension Budgets of the District Agricultural Offices and Number of Sub-Counties

	District	Ugandan Shillings (UGX)	Yen equivalent (JPY)	Number of Sub-Counties
1	Adjumani	20,000,000	710,000	10
2	Arua	15,000,000	532,500	30
3	Sironko	82,000,000	2,911,000	21
4	Mayuge	28,000,000	994,000	14
5	Nebbi	28,100,000	997,550	12
6	Mukono	512,588,000	18,196,874	16
7	Kaliro	62,400,000	2,215,200	12
8	Luwero	(data not obtained)	---	(13)
9	Kikuube	(data not obtained)	---	(7)
10	Kanungu	317,235,333	11,261,854	17
Average		133,165,417	4,727,372	16.5

Note 1: The conversion rate from Ugandan Shillings to Japanese Yen is 1 Ugandan Shilling = 0.0355 Japanese Yen.
Note 2: The average number of Sub-Counties is the average of the eight districts where information was received.

The average annual extension budget of a district agricultural office is about 4.73 million Japanese Yen. As there are 16.5 sub-counties in a district on average, the annual extension budget per sub-county is about 290,000 Japanese Yen, or only about 24,000 Japanese Yen per month.

Though the above mechanisms to cover the costs of seed production are being put in place, the financial sustainability is low because the budgets are lacking both for rice research and training and for rice technology extension activities at the district administrative level, the

[17] Most district administrations have little or no independent financial resources such as tax revenues and rely heavily on financial resources from the central government, which limits the allocation of agricultural extension-related budgets.

level responsible for extension activities.

3.4.5 Environmental and Social Aspect

None in particular

3.4.6 Preventative Measures to Risks

None in particular

Some minor issues have been observed in terms of the technical and the financial aspects. They are not expected to be improved. Therefore, sustainability of the project effects is moderately low.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project aimed to increase rice production in the target districts through promoting recommended rice cultivation techniques to the trained farmers by (i) strengthening the research and development capacity of rice-related research institutes, (ii) strengthening the extension capacity of rice-related service providers (agricultural officers), and (iii) strengthening the extension capacity of stakeholders (rice millers) in the rice value chain to improve the quality of rice in the market.

The targeted increase in rice production in the target districts in this project was consistent with Uganda's development plan and development needs both during the planning of the project and at project completion. This project was also consistent with Japan's ODA policy for Uganda during the planning stages (in which one of the priority areas was "agricultural development: rice promotion, value addition of agricultural products, etc.). Further, the project was implemented in collaboration with the Office of the UNHCR) (an international organisation responsible for refugee assistance), which brought synergy effects. As the project was consistent with international initiatives in these respects, the relevance and coherence of the project were very high. The implementation of the project led to an increase in rice production through the development of recommended rice cultivation technologies, capacity-building of agricultural officers and other actors, and the adoption and expansion of rice cultivation techniques by the farmers who participated in the training in the project's target districts. The effectiveness and impact of the project were very high, as the project brought about more effects and impacts than planned, such as a greater-than-expected increase in rice production among the trained farmers after project completion, an expansion of rice production areas through the dissemination of technologies from farmer to farmer, expanded rice production among refugee and host community farmers, and improved roles

for women within households. The project cost and period were higher than planned, but these were due to factors beyond the control of the project implementer. The outcomes and project purpose were achieved to a very high degree. The efficiency of the project was moderately low, even when accounting for the fact that the invested human resources and expenses efficiently contributed to the achievement of the project targets. Although some aspects of the project's sustainability are ensured by the current implementation of the successor project (Phase 2 project), there are still financial challenges, particularly in terms of the budgets for research, training, and agricultural extension. Thus, the sustainability of the project is evaluated as moderately low.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Allocation of Ugandan counterpart funds for technical cooperation project activities (recommendations to MAAIF and NARO)

Some Ugandan counterpart funds were disbursed under the project, but only to a limited extent. Counterpart funds were disbursed in the first year of the ongoing Phase 2 project, but no disbursements are expected from the second year onward. MAAIF and NARO need to improve their funding and disbursements to ensure that counterpart funds are available for use in technical cooperation project activities.

(2) Improved employment opportunities for project-employed staff as permanent staff (recommendation to NARO).

A number of staff employed by the project (with JICA funds) have been working at NaCRRI under this project and Phase 2 project. Among them are researchers and technicians who have garnered knowledge and experience in rice farming through their work in technical cooperation projects. It is important that these personnel be taken in as permanent employees of NARO, chiefly in order to enhance the sustainability of the technical aspects of research, training, and seed production. Their recruitment by NARO will require some navigation of the government regulations set on the employment of permanent staff. It is desirable that information is shared with the staff employed by the project to help them move into permanent staff positions in the future.

4.2.2 Recommendations to JICA

Compilation of JICA's cooperation achievements and results in the field of rice promotion in Uganda, the promotion of further understanding among senior officials at MAAIF (Ministry of Agriculture, Animal Industry and Fisheries) and NARO (National Agricultural

Research Organisation), and others

JICA's cooperation in rice promotion in Uganda started in 2004 with the dispatch of an individual expert and has been carried out through a grant aid project and a number of technical cooperation projects in the 20 years since. JICA cooperation has contributed to increased rice production and improved incomes for rice farmers in Uganda. While MAAIF and NARO are well aware of the extent to which JICA assistance has contributed to increased rice production through information-sharing at various meetings, some of the officials in these organisations have no detailed knowledge on the specific achievements, results, and impacts of JICA assistance. One way to further promote understanding among the senior officials is to have the JICA experts working on the ongoing Phase 2 project or planned Phase 3 project in cooperation with MAAIF provide the officials with a document of a few pages outlining the achievements, results, and impacts of JICA assistance to date. Such a document would facilitate the implementation of technical cooperation projects related to rice promotion. Given the growing importance of food security today, it will also be very important to engage in dialogue with counterpart government agencies to increase government budget disbursements for the agricultural sector in general, including rice production, beyond the counterpart budget disbursements for technical cooperation projects.

4.3 Lessons Learned

The importance of extension methods that allow farmer-to-farmer technical transfers to function.

The method of farmer training was improved in the second half of the project. Before the improvement, the TOT-trained agricultural officers (including some farmers) trained general farmers in sessions lasting about half a day. After the improvement, TOT-trained agricultural officers (some of whom were farmers) trained lead farmers (using demonstration plots) who then went on to train the surrounding general farmers (farmer-to-farmer technical transfer). Many African countries share the common challenges of limited budgets for agricultural extension activities, limited numbers of agricultural extension workers, and limited motorbikes and fuel due to government budget shortfalls. During the implementation of a technical cooperation project, farmer training and post-training farmer monitoring activities can be carried out using the budget from the Japanese side. A lack of budget, however, hinders the effective implementation of farmer training and other activities after a project ends. If functioning mechanisms for farmer-to-farmer technical transfer are set in place, techniques can be transferred to farmers who lack knowledge of proper rice cultivation techniques, which in turn can reduce a project's heavy reliance on agricultural extension budget. It is therefore important to experiment with an agricultural extension system that allows the farmer-to-farmer technical transfer to function.

Setting of the indicator for the overall goal

The indicator for the overall goal of this project is: "The income from rice production in the target districts is increased at least by 5% by 2020, compared with the same in 2015/16." Uganda keeps no annual statistical data on rice production by district. As this precludes the collection of data on income from rice production at the district level, no indicator data on the overall goal can be obtained from the government's statistical data. The targets of the overall goal of a project are generally set to be achieved three years after the end of the project. When no successor project takes places, changes in income can be used as an indicator if the information available from the government statistics can be used to determine those changes (the indicators are preferably set using government statistics published annually). When the government data cannot be used for that determination, an indicator other than income should be considered. If a successor project is foreseen, a possible method for collecting data on the indicator for the overall goal is generally included in the project costs of the successor project. Alternatively, the cost of a sample survey for the indicator data collection could be included in the cost of the ex-post evaluation survey (e.g., through re-commissioning to a local consultant or the use of a local survey assistant).

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

None in particular

5.2. Additionality

None in particular

United Republic of Tanzania

FY2022 Ex-Post Evaluation Report of Technical Cooperation Project

"Project for Supporting Rice Industry Development in Tanzania"

External Evaluator: Sawa Hosokawa, International Development Center of Japan Inc.

0. Summary

This project aimed to increase rice yield in the project target area through the implementation of (i) training on irrigated rice cultivation technology, (ii) training on rainfed rice cultivation technology, and (iii) subject-matter training[1] on the rice industry value chain by enabling participating farmers to use the rice cultivation technologies introduced in the training. Furthermore, the project aimed to increase rice production in the target area through continuous practice of rice cultivation technologies by farmers participating in the training and practice of the technologies by neighboring farmers through farmer-to-farmer extension, and to increase rice production on a national level through the implementation of rice cultivation technology training in rice production areas other than the target area.

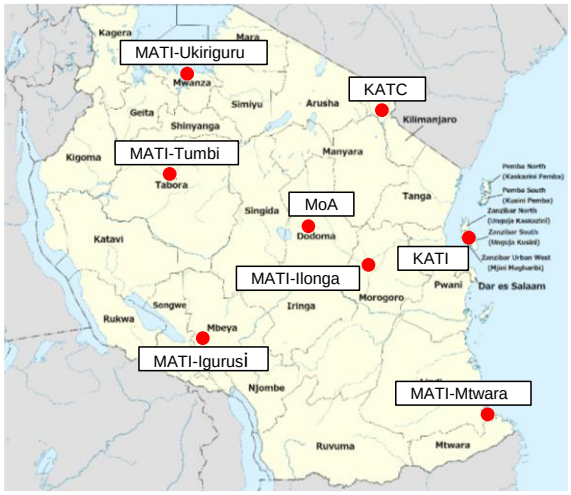
The increase in national rice production aimed for this project was consistent with Tanzania's development policy and needs at the time of planning and completion of the project. Furthermore, the project was consistent with Japan's ODA policy for Tanzania and was implemented as technical cooperation to improve productivity through the adoption of appropriate rice farming technologies by farmers under JICA's cooperation program, the *Rice Production Capacity Enhancement Program*. The project was also implemented under the international framework of the Coalition for African Rice Development (CARD),[2] an international initiative aimed at doubling rice production. Therefore, the relevance and coherence of the project are high. The effectiveness and impacts of the project are very high, as the implementation of the project led to an increase in rice yield through the utilization of rice cultivation technologies by farmers in the target area, and the increase in rice production at the national level has been confirmed, with the effects of the project having been more than planned. Although the project cost and period were slightly higher than planned, there were no problems with the outputs produced to the inputs, and the efficiency of the project is high. The sustainability of the project is moderately low because, although the effects of the project itself have been sustained, the project has not been expanded to include the rice cultivation technology training in other rice production areas after the completion of the project, and there are major financial issues to be addressed.

In light of the above, this project is evaluated to be satisfactory.

[1] Subject-matter training here is not a type of training program conducted by JICA mainly in Japan, but refers to training conducted in Tanzania specially under this project on the following topics: (i) Irrigation scheme management, (ii) Gender, (iii) Marketing, (iv) Post-harvest technology, and (v) Agricultural machinery.

[2] An international initiative launched by JICA in collaboration with the international NGO Alliance for a Green Revolution in Africa (AGRA) at the Fourth Tokyo International Conference on African Development (TICAD IV) in 2008.

1. Project Description



Project Locations
(Source: Prepared by external evaluator based on web-free map)

Demonstration plots used for rice cultivation technology training
(Rice plants are planted at equal spacing)
(Source: External evaluator)

1.1 Background

As part of its support for the agricultural sector in Tanzania, Japan has been cooperating in irrigated rice cultivation technology in Kilimanjaro Region since 1970s. As a result, the functions of the Kilimanjaro Agricultural Training Centre were strengthened, and a cultivation system and training methods were established to improve rice productivity in farmers' fields. In 2007-2012, the Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture (also known as TANRICE1) was implemented in collaboration with five Ministry of Agriculture Training Institutes in charge of each area to disseminate rice cultivation technologies nationwide by utilizing this training method. Under TANRICE1, training was conducted in about 40 irrigation schemes to improve rice productivity, and the results were confirmed at the farmer field level.

To achieve the goals of the *National Rice Development Strategy*, it was necessary to continue to promote technology dissemination through training, especially in irrigated rice cultivation. In particular, to implement more efficient and effective training nationwide, the following issues were to be addressed: (i) further capacity building of Tanzanian implementing agencies, (ii) further involvement of local administrative agencies such as district agriculture officers and agricultural extension officers, and (iii) strengthening the rice industry value chain, including not only production but also post-harvest processing and marketing. In addition, from the perspective of poverty reduction, it was necessary to address rainfed upland rice cultivation and rainfed lowland rice cultivation, and this project (also known as TANRICE2) had been implemented since 2012 as the successor to TANRICE1.[3]

[3] Since June 2023, the Project for Strengthening Capacities of Stakeholders of Rice Industry Development (also known as TANRICE3) has been implemented as the successor to this project.

1.2 Project Outline

Overall Goal		Rice production is increased in the rice production areas across the country.
Project Purpose		Rice farming technologies are adopted by farmers in the priority rice production areas.
Output(s)	Output 1	Training approach for disseminating the appropriate irrigated rice cultivation technologies (standard training) is strengthened nationwide.
	Output 2	Training approach for disseminating the appropriate rainfed rice cultivation technologies is developed.
	Output 3	The subject-matter training courses on the value chain of rice industry are strengthened.
Total cost (Japanese Side)		1,068 million yen
Period of Cooperation		November 2012 - December 2019 (Extended period: December 2018 - December 2019)
Target Area		Priority rice production areas across the country
Implementing Agency		- Agricultural Training, Extension Services and Research Division, Ministry of Agriculture (MoA)[4] - Kilimanjaro Agricultural Training Centre (KATC) - Ministry of Agriculture Training Institute (MATI) at Igurusi (MATI-Igurusi), MATI-Ilonga, MATI-Mtwara, MATI-Tumbi, MATI-Ukiriguru (5 MATIs in total) - Kizimbani Agricultural Training Institute (KATI)[5]
Other Relevant Agencies/ Organizations		- President's Office, Regional Administration and Local Government (PO-RALG) - Ministry of Agriculture, Irrigation, Natural Resources and Livestock (MAINL), Revolutionary Government of Zanzibar - Local Government Authorities (LGAs) in the target area[6]
Organization in Japan		Ministry of Agriculture, Forestry and Fisheries
Related Projects		<Technical Cooperation> - Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture (2007-2012) - Project for Strengthening Capacities of Stakeholders of Rice Industry Development (2023-2028, planned) <Other Development Partners> - World Bank, Agricultural Sector Development Project (Financing from the Japan Policy and Human Resources Development (PHRD) Fund)[7] (2011)

[4] The division was reorganized in 2022 and changed to the Agricultural Training and Research Division.
[5] KATC and each MATI are under MoA in Tanzania mainland, while KATI is under the Ministry of Agriculture in Zanzibar. KATI became an affiliate of the School of Agriculture (SoA), State University of Zanzibar after the completion of the project.
[6] Each agricultural training institute (KATC, MATI, and KATI) is a training institute for agricultural extension officers, who belong to LGAs under PO-RALG in Tanzania mainland or MAINL in Zanzibar.
[7] The World Bank's programmatic trust fund, fully funded by the Japanese government, is designed to help government agencies in developing countries enhance their skills, know-how, and expertise to address key development challenges.

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

In the terminal evaluation conducted in July 2018, the project purpose was determined to be on track to be achieved. Two quantitative indicators were set as indicators for the project purpose, and Indicator 1, "adoption of straight row transplanting/direct planting[8] method by more than 15,000 farmers," met its target as of the terminal evaluation. On the other hand, for Indicator 2, "adoption of other important technologies contributing to the improvement of rice farming by more than 2,400 farmers," it was not specified which other important technologies to improve rice farming, and the corresponding quantitative data were not available. Although quantitative data based on one interpretation of 'other important technologies' was collected in the terminal evaluation, the evaluation team determined that it was not appropriate to judge whether the indicator was achieved or not based on the results of the quantitative data collected.

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation
(Including other impacts.)

At the time of the terminal evaluation, the indicator for the overall goal of "annual national rice production of 2.5 million tons or more" had already been achieved, and it was judged that the overall goal had been achieved; however, the necessity of separately investigating the contribution of this project in achieving the overall goal was pointed out.

1.3.3 Recommendations from the Terminal Evaluation

The following four recommendations were made in the terminal evaluation.

(1) (Recommendation for the project to be implemented by the end of the project) To strengthen public relations to actively disseminate the results of the project to the outside.
(2) (Recommendation for MoA) To make efforts to raise training funds to continue to conduct each of the rice farming promotion training programs introduced in the project.
(3) (Recommendation for MATIs) To take steps to obtain funding for each rice farming promotion training program.
(4) (Recommendation for MATIs) To further improve the accounting reporting of training expenses, based on the use of external funds in the implementation of training.

2. Outline of the Evaluation Study

2.1 External Evaluator

Sawa Hosokawa, International Development Center of Japan Inc.

[8] Planting seeds or seedlings in straight rows with equal spacing.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: October, 2022 – November, 2023

Duration of the Field Study: November 29, 2022 – December 24, 2022, May 15, 2023 – May 21, 2023

3. Results of the Evaluation (Overall Rating: B[9])

3.1 Relevance/Coherence (Rating: ③[10])

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Tanzania

At the time of planning the project, Tanzania's National Development Plan, the *First National Five Year Development Plan* (FYDP) (2011/12-2015/16),[11] stated that while the agricultural sector was responsible for approximately 70% of the working population, it generated only 20% of GDP and that growth in the sector would have a significant impact on the country's overall growth, and was positioned as one of the keys to poverty reduction. FYDP set a target of increasing the growth rate of the agricultural sector to 6.0% by 2015, and to achieve the modernization and commercialization of agriculture, priority was to be given to the development and rehabilitation of irrigation facilities and the acquisition of knowledge and technology for agribusiness. In the second FYDP (2016/17-2020/21) at the completion of the project, the agricultural sector was still positioned as the core of Tanzania's industrialization and livelihood improvement of the people, with eight priority crops in the crop subsector, including rice, and the goal was to continue to increase the growth rate of the sector to 6.0% by 2020 through promotion of irrigation development, promotion of research and development, improvement of agricultural extension services, improvement of land use planning, and promotion of market development.

Furthermore, the *Agricultural Sector Development Program* (ASDP) (formulated in March 2006), which was the sector development plan at the time of planning, aimed to improve agricultural productivity, profitability, and farmers' income through the utilization of farmers' knowledge and skills and by ensuring access to markets, and as an agricultural sector strategy, efforts to increase food production toward self-sufficiency in staple food production, including rice, were considered important for food security. ASDP Phase II (formulated in November 2017) at the completion of the project emphasized crop value addition, to transform the agricultural sector to higher productivity, commercialization, and increased income for small-scale farmers for improved livelihoods, food security, and

[9] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[10] ④: Very High, ③: High, ②: Moderately Low, ①: Low

[11] Tanzania's fiscal year runs from July to June.

nutrition.

In addition, Tanzania has been selected as a CARD-supported country, and a *National Rice Development Strategy* (NRDS), to be developed in each target country, was formulated in 2009. Tanzania's NRDS set the goals of doubling rice production (paddy basis) from 899,000 tons in 2008 to 1,963,000 tons in 2018, increasing yield from 1.3 ton/ha to 2.8 ton/ha, and increasing the proportion of rice cultivation area from rainfed lowland cultivation to irrigated and rainfed upland cultivation. On the other hand, rainfed rice accounted for 70% of the country's total rice cultivation area, and it was considered important to promote the shift to irrigation from the perspective of national food security, as well as to improve the productivity of rainfed rice cultivation from the perspective of food security for individual farmers. NRDS Phase II (formulated in 2019) at the completion of the project continues the policy on increasing rice production and sets the following numerical targets for increasing production in 2025 and 2030.

Table 1 Targets for Increased Rice Production in NRDS II

	2018/19	2025	2030
Area under cultivation (million ha)	1.1	1.43	2.2
Output (milled rice) (ton/ha)	2	3	4
Yield paddy before milling (ton/ha)	3.08	4.3	6.15
Post-harvest losses (%)	30	20	10
Harvest (milled rice) (million tons)	2.2	4.29	8.8

Source: *National Rice Development Strategy Phase II (NRDS II) 2019-2030*, Ministry of Agriculture, July 2019

3.1.1.2 Consistency with the Development Needs of Tanzania

At the time of planning the project, rice was the second largest grain production in Tanzania after maize, but consumption had increased significantly from 10 kg/person (1980) to 30 kg/person (2010), and domestic production could not keep up with the increase in consumption, so more than 100,000 tons, or 7% to 8% of domestic consumption, was imported from overseas.[12] In addition, rice was a cash crop in Tanzania with a high potential for increased production from a technological perspective, and increasing rice production was a priority for the Tanzanian government, which was aiming to commercialize agriculture. Furthermore, Tanzania was the largest rice producer in East Africa and was therefore an important country in terms of food security in the region.

At the time of project completion, while rice production in Tanzania was increasing steadily and NRDS's goal of doubling rice production by 2018 had been achieved, consumption was also increasing at 38.5 kg/person (2016) due to population growth (4% annual increase) and urban residents' increasing desire to eat rice,[13] and the need for

[12] Source: Ex-Ante Evaluation Paper, 2012
[13] Source: *Final Report on CARD Terminal Review*, JICA, March 2018

increased rice production remained high. In addition, demand for rice continued to increase in Africa due to population growth and the spread of rice eating, and CARD Phase 2 was launched at TICAD 7 in 2019 with the goal of "further doubling rice production by 2030 (from 28 to 56 million tons). In addition to the efforts made by each country, a *Regional Rice Development Strategy* has been formulated for each African Regional Economic Community to solve common problems in each region, and rice development is being promoted. Tanzania plays an important role in meeting the needs of rice demand in the region because of its high potential for increasing rice production.

3.1.1.3 Appropriateness of the Project Plan and Approach

One of the lessons learned from TANRICE1, which preceded this project, was the need to ensure consistency with ASDP and the *District Agricultural Development Plan* (DADP). It was necessary to have more LGAs conduct training through the provision of information from each agricultural training institute to LGAs' officers by the timing of the annual DADP formulation, and enhanced explanation of the project contents. As a result, it was planned that in addition to farmers, district agriculture officers and agricultural extension officers would also participate in the rice cultivation technology training conducted under the project.

Furthermore, since the effectiveness of gender training was confirmed in TANRICE1, it was deemed necessary to continue gender training in this project, and gender training was set as one of the topics for subject-matter training. In addition, the guiding principle for gender-related efforts in NRDS was the need to promote the use of appropriate technology and farm equipment to reduce the heavy workload of rice cultivation, as women have an excessive workload due to farming and household chores and have less access to farm equipment than men. The project was planned to promote women's access to appropriate technology by setting an indicator that the participation rate of women in rice cultivation technology training should be 45% or higher, and the activities were planned to address the reduction of women's workload in rice farming by setting gender training as one of the topics for subject-matter training, in line with the NRDS guidelines.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

In the *Country Assistance Policy for the United Republic of Tanzania* (formulated in June 2012) at the time of planning, one of the priority areas was "economic growth for poverty reduction" and the policy for efforts in this area included prioritizing support for ASDP and, in particular, for increased rice production.

Furthermore, in the *Rolling Plan for the United Republic of Tanzania* (formulated in April 2012) at the time of planning, under the cooperation program *Rice Production Capacity*

Enhancement Program, it was stated that Japan would promote CARD, especially to achieve the goal of doubling rice production (approximately 2 million tons by 2018) set by NRDS and that Japan would provide support in line with the framework of ASDP, focusing on promoting irrigation development, training and capacity building of irrigation engineers, and promoting and expanding irrigated rice cultivation and upland rice cultivation, which are areas where Tanzania has great potential.

3.1.2.2 Internal Coherence

Under the above-mentioned cooperation program *Rice Production Capacity Enhancement Program*, JICA planned to cooperate to double rice production under NRDS through both (i) development of irrigation facilities through financial support to the ASDP Basket Fund and the District/National Irrigation Development Fund and technical cooperation such as the Project for Capacity Development for the Promotion of Irrigation Scheme Development under DADP, and (ii) technical cooperation to improve productivity through adoption of appropriate rice farming technologies by farmers. This project was implemented as a technical cooperation project to support the second part of the cooperation program as a follow-up to TANRICE1.

In addition, as part of technical exchange under CARD, officials from JICA's technical cooperation projects for rice cultivation promotion in neighboring countries[14] and CARD officials from Uganda, Rwanda, and Egypt visited Tanzania to learn about the project's rice cultivation promotion support case studies. In addition, project staff participated in a training in Egypt as a third-country training program. The exchange of opinions and field visits during the technical exchange and the third-country training with these neighboring countries also helped to strengthen the capacity of the personnel of each agricultural training institute, which is the implementing agency of this project.[15]

3.1.2.3 External Coherence

In the Tanzanian agricultural sector, financial support for the ASDP Basket Fund was provided by five major development partners in the agricultural sector (World Bank, African Development Bank, International Fund for Agricultural Development, and Ireland), including Japan (JICA) under ASDP, with World Bank contributing funds through PHRD. In TANRICE1, LGAs (48.5%) and the central government (9.7%) together covered 58.2% of the training expenses by utilizing the DADP budget financed by the ASDP Basket Fund, and

[14] Rice-based and Market-oriented Agriculture Promotion Project in Kenya, Project on Enhancing Gender Responsive Extension Services in Kenya, Project for Supporting the Improvement of Rice Farming in Burundi, Project for Improvement of Techniques for Increasing Rice Cultivation Productivity in Nante, Maganja da Costa District, Zambezia Province in Mozambique, The Project for Functional Enhancement of the National Rice Research and Training Center (EthioRice) in Ethiopia

[15] Source: Materials provided by JICA

it was planned that this project would also utilize the DADP budget to share training costs between the Tanzanian and Japanese sides. However, at the time of planning the project, allocations from the ASDP Basket Fund to the DADP budget were on a downward trend, and after 2012/13, immediately after the start of the project, there were virtually no allocations to the DADP budget, which limited the cost-sharing of training costs in this project.[16]

In Tanzania, several donors and NGOs are implementing rice cultivation promotion projects, and one of the projects implemented at the same time and in the same area as this project was the Global Agriculture and Food Security Program's[17] Expanding Rice Production Project (ERPP) (2012-2020, supervised by World Bank). ERPP targeted irrigated rice production areas in Morogoro Region and Zanzibar and implemented activities such as ensuring sustainable seed systems, increasing productivity through improved management of irrigation schemes and crop management, adopting innovative marketing strategies, promoting bulk purchasing of inputs, and coordinating sales through a warehouse program. ERPP also supported the System of Rice Intensification, which reduced water use by up to 50% in rice production and promoted improved water use efficiency in irrigated rice production.

Although there was no specific collaboration between this project and ERPP, such as joint training, farmers in some irrigation schemes in Morogoro and Zanzibar participated in the rice cultivation technology training provided by both projects. According to MATI-Ilonga, which has jurisdiction over Morogoro Region, there were some discrepancies between the technical content of the rice cultivation technology training in TANRICE (including 1 and 2) and the rice farming technology instruction in ERPP, causing confusion among the farmers who received training under both projects. For example, while 30 cm x 10 cm is recommended for seedling transplanting spacing in TANRICE, 25 cm x 25 cm is recommended in ERPP, and 21 to 28 days is recommended for seedling growing in TANRICE, while 8 to 14 days is recommended in ERPP, among other differences. Although several rice promotion programs provide training on rice cultivation technologies, information sharing and exchanges of opinions among the programs take place at donor meetings, but the content of the training provided by each program is not coordinated, and it is expected that there are other examples of differences in training content.

On the other hand, as mentioned above, this project was implemented as a project of the international initiative CARD, which was consistent with the international framework. Tanzania is the largest rice producer in East Africa, and the increase in rice production through both TANRICE1 and 2's enhancement of irrigated rice cultivation contributed to

[16] The ASDP Basket Fund was terminated as part of the transition to ASDP Phase II.
[17] A multilateral financing platform launched by the G20 in the wake of the global response to the 2007-2008 food price crisis and organized to build resilient and sustainable agriculture and food systems in the poorest countries and improve global food and nutrition security.

achieving CARD's goal of doubling rice production (from 14 million to 28 million tons). Furthermore, as a result of many years of KATC-based technical assistance, including TANRICE1 and 2, KATC has accumulated know-how on rice promotion, and KATC is now functioning as a base for the CARD Regional Training with Uganda and Cameroon in CARD Phase 2.[18]

The project's goal of increasing Tanzania's national rice production by increasing rice yield through the use of rice cultivation technologies is consistent with Tanzania's development policy and needs at the time of planning and completion of the project.

Furthermore, this project was implemented as technical cooperation for improving productivity through the adoption of appropriate rice cultivation technologies by farmers under JICA's cooperation program, *Rice Production Capacity Enhancement Program*, which is consistent with Japan's ODA policy for Tanzania. In addition, this project was implemented in cooperation with CARD, an international initiative that aims to double rice production, and the increase in rice production in Tanzania aimed for by this project contributed to achieving CARD's goal of doubling rice production, which is also consistent with the international framework. Therefore, its relevance and coherence are high.

3.2 Effectiveness and Impacts[19] (Rating: ④)

3.2.1 Effectiveness

3.2.1.1 Project Output

The target areas of the project are irrigated rice cultivation areas, rainfed upland rice cultivation areas, and rainfed lowland rice cultivation areas among the rice production areas under the jurisdiction of each agricultural training institute (KATC, 5 MATIs, and KATI).

In TANRICE1, an irrigated rice cultivation training course was developed and conducted for 5,255 small-scale rice farmers in 44 irrigation schemes. Under Output 1 of the project, the Standard Training (ST) introduced in TANRICE1 was conducted in other irrigation schemes, and a Modified Standard Training (MST) was developed to reduce the cost of ST. Three types of MST (pilot training) were conducted in the 2013/14 and 2014/15 crop seasons (generally from September to August), and based on the results of these trainings, the content of MST was finalized and conducted beginning in the 2015/16 crop season. The training contents of ST, pilot MST, and MST are shown in Table 2 below.

[18] Source: Interview with JICA Tanzania office

[19] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Table 2　Contents of ST, Pilot MST, and MST of Irrigated Rice Cultivation Technology Training

	ST	Pilot MST			MST
		Type 1	Type 2	Type 3	
No of irrigation schemes	1	1	2	1	2
No of key farmers (KF) and intermediate farmers (IF) Note 1	16 KF 80 IF	16 KF 80 IF	10 KF 50 IF	10 KF 50 IF	8 KF 40 IF
No of technologies	All (44)	All (44)	Selected (Under 44)	Selected (Under 44)	Selected (Under 44)
Training days	36 days	20 days	20 days	14 days	16 days
Training cost per irrigation scheme (million TZS) Note 3	30 (approx. 1.5 million JPY)	15 (approx. 0.75 million JPY)	8-10 (approx. 0.4-0.5 million JPY)	6-8 (approx. 0.3-0.4 million JPY)	15 (approx. 0.75 million JPY)
Training for Agriculture Extension Officers			3 days	3 days	4 days
No of training component Note 2	7	5	3	3	4
1. Baseline survey	4 days	4 days	4 days	4 days	3 days
2. Residential training Note 1	12 days		12 days		5 days
3. 1st Infield training Note 1	4 days	4 days		6 days	5 days
4. 2nd Infield training	4 days	4 days			
5. 3rd Infield training	4 days	4 days			
6. 1st Monitoring	4 days	4 days	4 days	4 days	3 days
7. 2nd Monitoring	4 days				
Follow-up by training tutors			1	1	1

Source: Prepared by external evaluator based on *The Project for Supporting Rice Industry Development in Tanzania (TANRICE2) Final Report,* JICA, December 2019

Note 1: Farmers who participate in residential training conducted at each agricultural training institute are called key farmers, farmers who participate in infield training in each irrigation scheme are called intermediate farmers, and other farmers are called neighboring farmers.

Note 2: The training component refers to each training menu, including baseline survey, residential training, infield training, and monitoring.

Note 3: Tanzanian Shilling (TZS) and Japanese Yen (JPY) are converted at 1 TZS = 0.05 JPY (the exchange rate commonly used for this project).

By the completion of the project, ST was conducted in 27 irrigation schemes and MST in 63 irrigation schemes (including 9 schemes where pilot MST was conducted), for a total of 90 irrigation schemes. The number of key and intermediate farmers who participated in both trainings was 5,078, and out of a total of 22,708 farmers including neighboring farmers, the average percentage of farmers who adopted the rice cultivation technologies introduced in the training (Bund making, Levelling, Straight row transplanting/direct planting) was 65.3%, achieving the target value of 50% or more.

Under Output 2, two new rainfed rice cultivation technology training courses for upland and lowland areas were developed, and based on the selection of target areas for both training, rainfed upland rice cultivation technology training (hereinafter referred to as "NERICA training") and rainfed lowland rice cultivation technology training (hereinafter referred to as "lowland training") were conducted starting in the 2013/14 crop season and 2015/16 crop season, respectively. The content of both trainings was based on MST described above and arranged for rainfed upland or lowland. By the end of the project, the NERICA training was conducted in 47 areas, with 749 key and intermediate farmers participating, and the lowland training was conducted in 30 areas, with 7,445 key and intermediate farmers participating. Of the total 8,194 farmers who participated in both trainings, an average of 44.0% adopted

the rice cultivation technologies introduced in the trainings (Bund making, Levelling, Straight row transplanting/direct planting, Fertilizer application, Use of improved varieties), achieving the target value of 25% or more.

Under Output 3, training courses on (i) Irrigation scheme management, (ii) Gender, (iii) Marketing, (iv) Post-harvest technology, and (v) Agricultural machinery were conducted mainly to strengthen the organization of Water Users' Associations (WUA) in irrigation schemes and improve farmers' farming practices, respectively. The respective courses were targeted at WUAs in irrigation schemes, and each course targeted different irrigation schemes, many of which were different from the target irrigation schemes for Output 1. In particular, the agricultural machinery training targeted irrigation schemes with access to machinery and thus focused on schemes different from the schemes targeted by Output 1. In addition to the irrigation schemes, the gender training covered the rainfed lowland rice cultivation areas in Zanzibar, which were among the target areas of Output 2. By the completion of the project, a total of 193 training courses were conducted in 97 irrigation schemes and 3 rainfed lowland rice cultivation areas: (i) 61 on Irrigation scheme management, (ii) 38 on Gender, (iii) 34 on Marketing, (iv) 4 on Post-harvest technology, and (v) 56 on Agricultural machinery.[20]

3.2.1.2 Achievement of Project Purpose

Two quantitative indicators were set as indicators for the project purpose: the first indicator, "adoption of straight row transplanting/direct planting method by more than 15,000 farmers," was set as a measure of the effect generated by achieving Output 1 and Output 2, and the second indicator, "adoption of other important technologies contributing to the improvement of rice farming by more than 2,400 farmers," was set as a measure of the effect generated by achieving Output 3.

However, in light of the project purpose of "adoption of rice farming technologies by farmers in the priority rice production areas" and the overall goal of "increase in rice production in the rice production areas across the country," the achievement of the first indicator alone, "adoption of straight row transplanting/direct planting method," does not indicate a causal relationship as to whether the adoption of the technology leads to an increase in rice production, which is the overall goal. Therefore, it is necessary to set an indicator to confirm the change in unit yield before and after the training as a measure of whether the adoption of the technology has led to an increase in rice yield. Furthermore, for the second indicator, "adoption of other important technologies contributing to the

[20] The post-harvest technology course was changed to agricultural machinery course at the time of the mid-term review for this project, in light of some overlap with the content of the marketing course and the growing local need for agricultural machinery utilization.

improvement of rice farming," it was not possible to obtain the relevant quantitative data because it was not specified which technologies were being referred to. Therefore, as an alternative indicator to the second indicator, it is necessary to set a qualitative indicator to confirm the changes that have occurred as a result of participation in subject-matter training.

Based on the above, the following indicators were set to judge the achievement of project purpose in this ex-post evaluation: (i) the first indicator, (ii) an additional indicator for the first indicator, "Average unit yield of rice increases in the target areas for Output 1 and Output 2," and (iii) an alternative indicator for the second indicator, "changes resulting from participation in each course of the subject-matter training." The results of these three indicators were used to determine the level of achievement. The results of the three indicators are shown in Table 3 below.

Table 3 Achievement of Project Purpose

<table>
<tr><th>Project Purpose</th><th>Indicator</th><th>Actual</th></tr>
<tr><td rowspan="3">Rice farming technologies are adopted by farmers in the priority rice production areas.</td><td>The straight row transplanting or direct planting method is adopted by at least 15,000 farmers in the priority rice production areas in 2018. Note 1</td><td>The number of farmers (including key, intermediate, and other farmers) who adopted straight row transplanting/direct planting by the completion of the project totaled 26,468 as follows.
<table><tr><th>Rice cultivation areas</th><th>Number of farmers adopted</th></tr><tr><td>Irrigated</td><td>18,900</td></tr><tr><td>Rainfed upland</td><td>1,227</td></tr><tr><td>Rainfed lowland</td><td>6,341</td></tr><tr><td>Total</td><td>26,468</td></tr></table></td></tr>
<tr><td><Additional indicator>
Average unit yield of rice increases in the target areas for Output 1 and Output 2.</td><td>The average unit yield of rice at baseline and endline surveys in the irrigated, rainfed upland, and rainfed lowland rice cultivation in the target areas increased for all rice cultivation types as follows.
<table><tr><th>Rice cultivation type</th><th>Baseline</th><th>Endline</th></tr><tr><td>Irrigated</td><td>3.2 ton/ha</td><td>4.6 ton/ha</td></tr><tr><td>Rainfed upland</td><td>0.5 ton/ha</td><td>1.2 ton/ha</td></tr><tr><td>Rainfed lowland</td><td>1.7 ton/ha</td><td>2.1 ton/ha</td></tr></table></td></tr>
<tr><td>Other important technologies contributing to the improvement of rice farming are adopted by at least 2,400 farmers.

<Alternative indicator>
Changes resulting from participation in each course of the subject-matter training</td><td>- Irrigation scheme management: The number of active members in WUAs, the number of farmers paying fees to WUAs, and the number of farmers participating in maintenance activities in WUAs increased, and the operation of irrigation facilities was improved.
- Gender: Several examples of benefits were reported such as reduced labor costs, improved efficiency and quality of work, and increased cooperation between husband and wife and family members in each rice farming task. Note 2
- Marketing: Several examples of positive effects were reported such that the marketing training led to collective marketing in several irrigation schemes, the importance of warehouses for storing rice was recognized and used to stagger the timing of harvested rice sales, the bookkeeping training led to the recording of rice production and sales volumes, and the ability to negotiate with buyers when selling rice was improved.</td></tr>
</table>

		- Agricultural machinery: In a few cases, farmer groups that owned agricultural machinery provided by PHRD and 2KR were not able to use the machinery because they did not know how to use it. The training provided these farmer groups with the opportunity to learn how to operate the machinery and to make full use of it.

Source: *The Project for Supporting Rice Industry Development in Tanzania (TANRICE2) Final Report,* JICA, December 2019 and Results of qualitative survey
Note 1: Since the original project period was through December 2018, the indicator is set to the number of farmers adopted through 2018; however, since the project period was extended, the actual numbers are calculated through the completion of the project.
Note 2: For more specific details on changes by gender training, see the section "3.2.2.2 Other Positive and Negative Impacts" to be mentioned below.

As shown in Table 3, the first indicator was achieved because 26,468 farmers adopted straight row transplanting/direct planting, far exceeding the target of more than 15,000 farmers by the completion of the project. Furthermore, the average unit yield of rice increased after the training in the target areas of irrigated rice cultivation, rainfed upland rice cultivation, and rainfed lowland rice cultivation, so the additional indicator was also achieved. In addition, the subject-matter training contributed to the improvement of rice farming in the target irrigation schemes by improving the management of WUAs, reducing labor costs, and increasing the efficiency and quality of work by having couples work together on rice cultivation, improving rice sales, and effectively utilizing agricultural machinery, etc., and the alternative indicator was also achieved. Thus, the project achieved its purpose more than planned.

3.2.2 Impacts

3.2.2.1 Achievement of Overall Goal

The result of the indicator set for the overall goal is shown in Table 4 below.

Table 4 Achievement of Overall Goal

Overall Goal	Indicator	Actual
Rice production is increased in the rice production areas across the country.	The annual paddy production exceeds 2.5 million tons per year across the country by 2021.	- The national rice production (paddy basis) in Tanzania from 2009 to 2020 is shown in Table 5. Looking at the production trend from 2009 to 2020, there were large increases and decreases in production from 2009 to 2014, but production has been increasing steadily every year since 2015. The production in 2018 was 3,414,815 tons, achieving the target of more than 2.5 million tons. The production in 2019 was 3,474,766 tons and in 2020 is 3,038,000 tons (estimated value), maintaining the target of more than 2.5 million tons. - Also as shown in Table 5, the trends in harvested area and unit yield of rice throughout Tanzania from 2009 to 2020 are generally in line with the trends in production, indicating that the increase in production is not only due to the increase in harvested area but also to the increase in unit yield.

Source: FAOSTAT (Accessed in May 2023)

Table 5 National Rice Production (paddy basis), Harvested Area, and Unit Yield in Tanzania (2009-2020)

	2009	2010	2011	2012	2013	2014
Production (ton)	1,334,800	2,650,120	2,248,320	1,800,551	2,194,750	1,681,000
Harvested area (ha)	805,630	1,136,290	1,119,324	799,361	928,273	957,218
Unit yield (ton/ha)	1.7	2.3	2.0	2.3	2.4	1.8
	2015	2016	2017	2018	2019	2020
Production (ton)	1,937,000	2,229,000	2,451,707	3,414,815	3,474,766	3,038,000
Harvested area (ha)	1,154,467	1,039,205	1,097,283	1,032,902	1,052,547	1,038,343
Unit yield (ton/ha)	1.7	2.1	2.2	3.3	3.3	2.9

Source: FAOSTAT (Accessed in May 2023)
Note: Data for 2020 are estimates.

As shown in Table 5, the indicator for the overall goal has been achieved since 2018, with annual national rice production reaching more than 2.5 million tons. The project has achieved its overall goal.

Then, to analyze the contribution of the project in achieving the overall goal, a qualitative survey was conducted in this ex-post evaluation to confirm; after the completion of the project, (i) whether rice production has increased through the continuous practice of rice cultivation technologies by farmers in the target areas, and (ii) whether rice cultivation technologies have spread to neighboring farmers other than the key and intermediate farmers that participated in the training. In the qualitative survey, interviews were conducted in Kilimanjaro Region, Morogoro Region, and Zanzibar (Unguja Island), among the target areas, with 30 farmers who participated in each training conducted under the project and 10 neighboring farmers who did not participate in the training, totaling 40 farmers. A breakdown of the target sites and farmers for the qualitative survey is shown in the table at the end of this report, and a summary of the survey results is as follows.[21]

Results of the Qualitative Survey

Implementation status of rice cultivation technologies by farmers participating in the training after the project completion

- Regarding the status of implementation of each rice cultivation technology (5 technologies of Straight row transplanting/direct planting, Bund making, Levelling, Fertilizer application, Use of improved varieties) after the project completion, the overall practice rate is high, with irrigated rice cultivation being practiced more frequently than rainfed rice cultivation.
- In irrigated rice cultivation, 13 out of 16 farmers participating in the training continue to practice all 5 technologies, and 3 farmers are practicing all 4 technologies except fertilizer application. The 3 farmers who do not apply fertilizers are all in Zanzibar, and although they began selling rice after participating in the training, they still cannot afford to buy fertilizers due to the rising cost of fertilizers.
- In rainfed rice cultivation, the practice rates of straight row transplanting/direct planting and

[21] As a limitation of the evaluation in the qualitative survey, it should be noted that the information collected in the survey, such as the state of practice of each rice cultivation technology, production volume, and unit yield, was based on farmers' verbal responses and not on visual confirmation or actual measurement data, and thus is not accurate data. Furthermore, as a limitation in the selection of sites for the survey, the target site for rainfed lowland rice cultivation areas was only in Zanzibar because rainfed lowland rice cultivation areas in the mainland is located far from each agricultural training institute.

levelling are high, with 15 out of 17 farmers participating in the training practicing straight row transplanting/direct planting and 17 out of 17 practicing levelling (however, many farmers had been practicing levelling before the training). The practice rates of the other 3 technologies are lower than that of the 2 technologies because bund making was not part of the training content in the NERICA training, and because of the challenges in obtaining fertilizers and seeds for fertilizer application and use of improved varieties. The reason for the problem of obtaining fertilizers and seeds is that irrigated rice farmers can afford to purchase fertilizers and seeds each time because they have income from rice sales, but rainfed rice farmers often cannot afford to purchase fertilizers and use the previous year's seed rice instead of purchasing seeds.

- Several farmers indicated that the reason for not applying fertilizers to both irrigated and rainfed rice cultivation was that their land was fertile and there was no need to apply fertilizers, but the agricultural extension officers indicated that the lack of fertilizer application caused poor rice growth.
- All 4 farmers participating in the NERICA training in Zanzibar are not currently producing NERICA rice, but only growing rainfed lowland rice; the farmers in North District A are growing rice in separate lowland plots because their upland plots were converted to residential land in 2021; and the farmers in North District B are not producing NERICA rice because after growing NERICA varieties introduced by the training they participated in 2018, the government no longer distributes the same varieties and the lack of rainfall at the required time has affected the harvest, resulting in almost no seed rice of the NERICA varieties. These farmers have been practicing some of the rice cultivation technologies introduced by the training, such as straight row planting, in rainfed lowland areas, but they have not disseminated these technologies to neighboring farmers. Rainfed rice cultivation is easily affected by weather conditions, and the yield is not stable even when NERICA varieties are used.
- 6 out of 9 NERICA training participants in Morogoro are also no longer growing NERICA varieties. These farmers are growing another certified variety (SUPA Kyera) because the introduced NERICA variety can no longer be harvested due to weather conditions and damage from birds and animals, and because the NERICA variety is not popular in the market and is not selling well. In Kolela Village, Mvomero District, the NERICA variety is grown only in demo plots, and no farmers have voluntarily grown this variety. However, there are a certain number of farmers who have increased their yield and production by applying rice cultivation technologies, even if they do not grow NERICA varieties.

Change in rice production after the project completion

- Regarding changes in rice yield and production, all of the irrigated rice farmers (16 out of 16) have increased both yield and production after participating in the training. The unit yield was as high as 4-5 tons/ha even before the training and increased to more than 6 tons/ha after the training, and the increase is still being maintained. In rainfed rice cultivation, most of the farmers who participated in the training increased both yield and production in the year immediately after their participation, but the increase is not constant and varies from year to year. Rainfed rice cultivation, whether in upland or lowland areas, is greatly affected by the weather of the year, and is not stable, with production increasing in some years due to the implementation of rice cultivation technologies, while in other years production is lower than before participation in the training due to crop failure caused by drought.
- All farmers in the qualitative survey also produce crops other than rice (maize, beans, horticultural crops, etc.), and none of them are dedicated rice farmers. For farmers in irrigated rice cultivation areas, rice is a cash crop, and the more rice they produce, the more income they earn, so many of them have expanded their rice plots since they participated in the training to increase their production. On the other hand, for farmers in rainfed rice cultivation areas, rice is mainly for their consumption, so the benefits of increasing production are not as great as for irrigated rice farmers. In some cases, rainfed rice farmers have reduced their rice plots by half since participating in the training and are growing other crops instead, due to the increased yield and work required to implement the rice cultivation technologies.

Dissemination from key and intermediate farmers to neighboring farmers

- In irrigated rice cultivation areas, WUAs and affiliated farmers' groups are organized, and since each farmer's plot is located in the same irrigation scheme, there are opportunities to observe other farmers' plots. It was confirmed that the mechanism of disseminating rice cultivation

technologies from key farmers to intermediate farmers and then to other farmers functions, and that technologies are also disseminated to non-participating farmers through farmer-to-farmer extension.

- Since farmers in rainfed rice cultivation areas are not organized, as part of the training program, 4 key farmers introduced rice cultivation technologies to 2 intermediate farmers each, forming a group of 25 to 30 neighboring farmers in each village, where key farmers, intermediate farmers, and agricultural extension officers disseminated rice cultivation technologies to other farmers. Thus, although the technologies were disseminated from key and intermediate farmers to neighboring farmers when the training was implemented, there is no systematic dissemination of technologies from these core and intermediate farmers to other farmers after the project completion, and opportunities to observe other farmers' plots are limited due to the dispersed location of each farmer's plot, limiting the status of farmer-to-farmer extension.
- Among the non-participating farmers, all of the farmers in the 4 irrigation schemes visited are practicing all 5 rice cultivation technologies, but less than half of them are practicing them in rainfed rice cultivation areas. However, in some irrigation schemes, although extension from key farmers to intermediate farmers in demo plots was conducted, extension from intermediate farmers to neighboring farmers was not followed up. Conversely, in some rainfed rice cultivation areas where agricultural extension officers are active, follow-up training by extension officers was conducted. According to the observations of extension officers and key farmers, the dissemination rate of rice cultivation technologies in irrigated areas is about 70%, while in rainfed areas it is 20-30%.

Other Situations

- In Mlali Village of Mvomero District, Morogoro, where both the irrigated rice cultivation technology training and the NERICA training were conducted, several farmers practice both irrigated and rainfed rice cultivation, and each farmer has little awareness of the clear distinction between the two. Furthermore, in the case of rainfed rice cultivation, farmers were less aware of the clear distinction between upland and lowland, and some farmers perceived their plots as upland in the lowland training area, and vice versa. In most cases, rainfed rice farmers seem to perceive that they are cultivating upland rice when NERICA varieties are grown and that they are cultivating lowland rice when NERICA varieties are not grown.
- The first year, when the rice cultivation technology training was conducted in this project, was 2014, and at the time of the ex-post evaluation, nearly 10 years had passed since the year of training conducted in some target areas. In several cases, the farmers targeted in the qualitative survey had different cultivation plots at the time of participation in the training and at the time of the ex-post evaluation (e.g., relocation due to conversion of farmland, moving, or expansion of plots). In general, in irrigated rice cultivation areas, although the aging of irrigation facilities was pointed out as an issue, there are no significant changes in the rice farming environment after the project completion, and there are few differences in the effects of the project among farmers in the same irrigated area. On the other hand, in rainfed rice cultivation areas, there are several cases where changes occurred in the rice farming environment, such as cases where the target farmers' plots were changed after the project completion, cases where the crops were almost destroyed due to damage by birds and animals, and cases where the rice production was severely damaged due to a drought. It is difficult to average the effects of rainfed rice cultivation in the area because of the large differences among farmers due to area differences and individual farmers' circumstances even within the same area.

As shown in the results of the above qualitative survey, regarding (i) whether rice production has increased through the continuous practice of rice cultivation technologies by farmers in the target areas after the completion of the project, all farmers (16 out of 16) who participated in the irrigated rice cultivation technology training have increased their unit yield after participating in the training, and some farmers also have increased the area of their plots, and their production has continued to increase every year up to the time of the ex-post evaluation. Although 7 out of 13 farmers participating in the NERICA training and

2 out of 4 farmers participating in the lowland training have increased in both unit yield and production, the production by farmers in rainfed rice cultivation areas varies from year to year, with some years production increased and other years decreased from the time of training participation to the time of the ex-post evaluation, due to crop failure caused by drought, plot conversion, reduction in plot area, and decreased harvest due to damage from birds and animals, and is not constant.

Regarding (ii) whether rice cultivation technologies have spread to neighboring farmers other than the key and intermediate farmers who participated in the training after the completion of the project, neighboring farmers who did not participate in the training also practice rice cultivation technologies in the irrigated rice cultivation areas, confirming farmer-to-farmer extension, while in the rainfed rice cultivation areas, rice cultivation technologies are not as disseminated as in the irrigated areas.

Therefore, as the contribution of the project in achieving the overall goal, farmers have continued to practice rice cultivation technologies in the irrigated rice cultivation areas after the completion of the project, and rice production has increased significantly, contributing to a certain extent to the increase in rice production in the country as a whole. On the other hand, in the rainfed rice cultivation areas, although the rate of farmers practicing rice cultivation technologies other than fertilizer application and introduction of improved varieties is high, and an increase in unit yield is confirmed, the production is not stable due to conditions of weather and the surrounding environment, thus contributing only limitedly to the overall increase in rice production for the country. However, a total of 22,708 farmers, including neighboring farmers, participated in the irrigated rice cultivation technology training under the project, and a total of 8,194 farmers participated in the rainfed rice cultivation technology training, 73% of which were farmers in the irrigated rice cultivation areas. Therefore, the contribution of this project to the achievement of the overall goal is high. Furthermore, while the irrigated rice cultivation technology training was also conducted in TANRICE1 and the training content was established in this project, the rainfed rice cultivation technology training was introduced from this project, and was not envisioned that the training content was established in this project. Therefore, in the rainfed rice cultivation areas, the objective was to increase rice yield through the implementation of training in this project, and it was not assumed that the training would have the impact of increasing rice production.

3.2.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

This project was judged to have minimal undesirable effects on the environment based on the *JICA Guidelines for Environmental and Social Considerations* (formulated in April

2010) and classified as Category C.

2) Resettlement and Land Acquisition

No resettlement or land acquisition has occurred in this project.

3) Gender Equality, Marginalized People, Social Systems and Norms, Human Well-being and Human Rights

The following examples of gender-related changes resulting from the project were reported.[22]

- The project has led to a reduction in labor costs and an improvement in the efficiency and quality of the rice cultivation process by having each task performed jointly by husband and wife and among family members.
- Family budgeting has enabled them to plan rice production more efficiently and use the income generated from rice production.
- Husbands began to cooperate with their wives in household chores such as cooking, fetching water, and collecting firewood.
- By keeping a household account book, families began to plan their expenditures and savings. In addition, families began to discuss how to use the income from rice sales, which increased the transparency of family finances and reduced conflicts over financial issues among family members.
- Women were selected for leadership positions in local farmer organizations.

No particular differences were found between male and female respondents in the qualitative survey regarding the status of implementation of each rice cultivation technology and the onset and continuation of effects, such as changes in rice yield and production, after participation in the training. The differences in the onset and continuation of effects observed among training participants were not due to differences between men and women, but rather to differences between irrigated and rainfed rice cultivation, and differences in the cultivation environment among areas in rainfed rice cultivation. However, female-headed households tended to own smaller plots than male-headed households, and therefore also tended to produce less rice.

As mentioned above, the project has produced effects such as reducing women's workload in rice cultivation and reflecting women's opinions in household economies, and it was confirmed that women who participated in the rice cultivation technology training have practiced and continued to practice the technologies to the same extent as men and that the project has produced effects in increasing rice yield and production. Thus, the project's target

[22] Source: Results of qualitative survey and *The Project for Supporting Rice Industry Development in Tanzania (TANRICE2) Final Report,* JICA, December 2019

of 45% or more participation rate of women in the training promoted women's access to rice cultivation technologies, which also led to women's economic empowerment and contributed to gender equality and women's empowerment.

4) Unintended Positive/Negative Impacts

Farmers in the irrigated rice cultivation areas produce rice as a cash crop, and all farmers targeted by the qualitative survey increased their production after participating in the training and their income from rice sales. All 4 irrigation schemes in the qualitative survey had two cropping seasons, and most of the farmers produced more than one ton of rice per year, and some farmers sold all the rice they harvested instead of consuming it on their own. Irrigated rice farmers in Zanzibar increased their production and began earning income from rice sales after participating in the training, while irrigated rice farmers in Kilimanjaro and Morogoro Regions, who had been selling rice before participating in the training, increased both sales volume and income due to increased production. Many farmers have increased their rice plots since they participated in the training by purchasing new land for rice cultivation or converting plots used for other crops to rice cultivation, using the income from rice sales as a source of income, and they have more than doubled their rice production from before the training, due in part to the increase in yield resulting from the application of rice cultivation technologies. In addition, farmers outside of Zanzibar do not use their seed rice, but purchase seed each time from agricultural training institutes, seed companies, seed producers, etc. Rice is sold by private buyers from central and neighboring cities in the districts, and in the case of Kilimanjaro Region, from Kenya.

On the other hand, farmers in the rainfed rice cultivation areas grow rice in an area of almost 0.1 ha to less than 1 ha, and few farmers sell rice (5 out of 14) because it is mainly for their consumption, and many of them still purchase rice. However, cases were identified of among farmers who increased their rice production after participating in the training, (i) farmers who increased the amount of rice sold, (ii) farmers who started selling rice, and (iii) farmers who decreased their rice purchases, and these farmers contributed to a certain amount of income growth by increasing household disposable income, and may also have contributed to food security at the household level.

This project has achieved the project purpose of adopting rice farming technologies by farmers in the priority rice production areas and the overall goal of increasing rice production in the rice production areas across the country more than planned. Therefore, effectiveness and impacts of the project are very high.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

Inputs	Plan	Actual
(1) Experts	Chief Advisor, Coordinator, Rice Cultivation Technology, Rice Cultivation Extension/Monitoring, Water Management/Farmers' Organization, Marketing/Post-harvest Processing, Irrigation Scheme Management, Gender Mainstream, Agricultural Machinery, etc.	8 Long-Term 22 Short-Term
(2) Trainees received	Approx. 3 persons per year	57 persons (42 in training in Japan, 15 in third countries training)
(3) Equipment	Materials and equipment required for project activities	Agricultural machinery (tillers, etc.), vehicles, office equipment, etc.
(4) Local operational cost	-	332,483,387 yen
Japanese Side Total Project Cost	961 million yen	1,068 million yen
Tanzanian Side Total Project Cost	Irrigated rice cultivation technology training costs	81,332,430 TZS (Approx. 4 million yen, irrigated rice cultivation technology training costs)

3.3.1.1 Elements of Inputs

The performance of each input (experts dispatched, trainees received, and equipment provided) was generally in line with the plan, and there were no problems with the outputs produced to the inputs provided.

3.3.1.2 Project Cost

The actual project cost was 1,068 million yen compared to the plan of 961 million yen (111% of the plan), slightly exceeding the plan (over 100% and under 125%). One of the reasons for the higher-than-planned project cost was the extension of the project period, which led to an extension of the dispatch period of some experts.

Furthermore, in TANRICE1, the Japanese and Tanzanian sides shared the cost of the training, with the Tanzanian side bearing 58.2% of the training cost, so it was planned to share the cost of the irrigated rice cultivation technology training with the Tanzanian side in this project as well. The actual training costs incurred in this project totaled 1,563,588,900 TZS (approximately 78 million yen), of which 81,332,430 TZS (approximately 4 million yen) was borne by the Tanzanian side. Cost sharing was 94.8% on the Japanese side and 5.2% on the Tanzanian side, a much lower share on the Tanzanian side compared to

TANRICE1. Thus, the project cost exceeded the plan because the Tanzanian side's share of training costs was lower than planned, and the local operational cost was higher than planned due to the increased burden on the Japanese side.

3.3.1.3 Project Period

The actual project period was 85 months compared to the planned 72 months (118% of the plan), slightly exceeding the plan (over 100% and under 125%). The reason for the extension of the project period is that the component of rice cultivation technology training includes monitoring and follow-up by training tutors 1 to 2 years after the infield training, and it was determined in the terminal evaluation that monitoring and follow-up for farmers trained in the 2017/18 and 2018/19 crop seasons needed to be carried out. Therefore, the project period was extended by extending the duration of the dispatch of the rice cultivation technology and rice cultivation extension experts in charge of monitoring and follow-up, and other than both experts, the chief advisor, project coordinator, and other experts were not assigned for the extended period.

The Japanese and Tanzanian inputs were generally as planned, except for the local cost burden (training implementation costs) on the Tanzanian side. Although both the project cost and period were slightly higher than planned, all three outputs were achieved by the end of the project, and there were no problems in the achievement of outputs. Therefore, efficiency of the project is high.

3.4 Sustainability (Rating: ②)

The overall goal of this project is to increase rice production on a national level by increasing rice production through continuous practice of rice cultivation technologies by farmers in the target areas and by providing rice cultivation technology training in rice production areas outside the target areas. Therefore, the sustainability of the project will be reviewed in terms of the technical aspect, i.e., whether the farmers continue to practice rice cultivation technologies after the completion of the project, and in terms of policy and system, institutional/organizational aspect, and financial aspect, i.e., whether the rice cultivation technology training is conducted outside the target areas after the completion of the project for areal expansion.

3.4.1 Policy and System

The national development plan at the time of the ex-post evaluation, the third FYDP (2021/22-2025/26) focuses on the agricultural sector to improve agricultural production and enhance storage capacity through the introduction of modern crop management systems, and

to make agriculture more productive and sustainable by: (i) expanding sustainable water and land use management through integrated land use planning and improved irrigation systems; (ii) transforming and commercializing sectors that improve climate-smart agriculture; (iii) using science, technology, innovation, and R&D to improve productivity and quality of crop production; and (iv) increasing the number of extension officers and better access to extension services. ASDP II and NRDS II have not been changed since the project was completed. In the first and second FYDPs, the target of raising the agricultural sector growth rate to 6.0% by 2015 and 2020 respectively was set but was not achieved. However, in 2022, the current president proposed the *Agenda 10/30*, which promotes an initiative to raise the sector growth rate to 10% by 2030, and rice is positioned as one of the priority crops that will contribute to achieving the 10% target.

At the time of the ex-post evaluation, MoA is in the process of rehabilitating facilities and constructing accommodations for each MATI and is implementing a nationwide motorcycle grant for extension officers as a measure to strengthen agricultural extension activities.

Therefore, there has been no change in the Tanzanian government's policy for rice promotion since the project's completion, and the sustainability of the project in terms of policy and system is high.

3.4.2 Institutional/Organizational Aspect

As the implementation system for each training course conducted under the project (irrigated rice cultivation technology training, NERICA training, lowland training, and subject-matter training courses), tutors from each agricultural training institute (KATC, 5 MATIs, and KATI) served as training instructors and key and intermediate farmers in the target areas participated in the training. In addition, district agriculture officers and agricultural extension officers in the target areas also participated in each training, and the extension officers assisted the tutors in monitoring and follow-up of each training. Since each agricultural training institute is a training institute for agricultural extension officers, each training conducted under the project was not the normal business of each training institute. After the completion of the project, each training institute was to conduct each training upon request from LGAs (MAINL in Zanzibar) in its area of jurisdiction, and the training costs were to be covered by each LGA and MAINL.

While the responsible body of MoA was changed from the Agricultural Training, Extension Services and Research Division at the completion of the project to the Agricultural Training and Research Division due to the reorganization in 2022, and the extension service was transferred to the Crops Division, the implementation system of each training after the project completion is the same as during the project implementation.

As for the actual implementation of each training after the completion of the project at

each agricultural training institute (KATC, 5 MATIs) and SoA, only 4 training courses on irrigated and rainfed rice cultivation technology were conducted at MATI-Ilonga. In MATI-Ilonga irrigated and rainfed rice cultivation technology training was conducted once each in September, October, and December 2022, funded by an NGO called Campaign for Female Education (CAMFED) Tanzania. The training participants were 230 young female farmers from Morogoro, Tanga, and Iringa Regions, and they chose either irrigated or rainfed rice cultivation according to their preference and received about 10 days of residential training and infield training in demonstration plots at MATI-Ilonga. In addition, 80 women farmers participated in a rice cultivation technology training funded by World Vision in 2020. After these trainings, there has been no specific monitoring by MATI-Ilonga and targeted LGAs.

According to KATC and MATIs other than MATI-Ilonga, the main reason for not conducting the training after the project completion is that no budget has been allocated for the training implementation in either case. There has been no change in the training implementation system at each training institute, many of the tutors remain assigned to each institute, there are no particular technical challenges in conducting the training, and as long as the budget is available, the training can be continued.

Although KATI was reorganized under SoA after the project completion, KATI tutors continue to be assigned as SoA tutors, and there is no change in the training implementation system. In SoA, as in KATC and each MATI, the main reason for not conducting the training after the project completion is that there is no budget allocated for the training implementation. There are no particular technical challenges in conducting the training, and as long as the budget is available, the training can be continued.

Monitoring and follow-up by agricultural extension officers to farmers in the target areas are conducted as part of the regular monitoring by extension officers, which includes providing technical guidance and information sharing on rice cultivation, such as introducing quality seeds and encouraging fertilizer application. However, in the areas visited in the qualitative survey, many of the extension officers who participated in the training during the project implementation have been transferred or resigned, and many of the current extension officers were not participating in the training at the time of the ex-post evaluation. In the areas where the extension officers who participated in the training are still in place at the time of the ex-post evaluation, they are also contributing to the dissemination of rice cultivation technologies to neighboring farmers through farmer-to-farmer extension.

3.4.3 Technical Aspect

According to the results of the qualitative survey conducted in this ex-post evaluation, regarding the status of implementation of each rice cultivation technology (Straight row transplanting/direct planting, Bund making, Levelling, Fertilizer application, Use of

improved varieties) after the completion of the project, the overall practice rate is high, and the rate is higher for irrigated rice cultivation than rainfed rice cultivation. In irrigated rice cultivation, 13 of 16 farmers participating in the training continue to practice all 5 technologies, while the remaining 3 farmers practice all 4 technologies except fertilizer application. In rainfed rice cultivation, the practice rates of straight row transplanting/direct planting and levelling are high, with 15 out of 17 farmers participating in the training practicing straight row transplanting/direct planting and 17 out of 17 practicing levelling (however, many of the farmers had been practicing levelling before the training). The practice rates of other technologies are lower than that of the 2 technologies since bund making was not included in the training content in the NERICA training and there are challenges of obtaining fertilizers and seeds for fertilizer application and use of improved varieties. Furthermore, farmer-to-farmer extension is functioning, especially in irrigated rice cultivation areas, and in the 4 irrigation schemes covered by the qualitative survey, non-participating farmers were practicing all rice cultivation technologies. These farmers learned and applied the technologies through information sharing from farmers who participated in the training and observation of neighboring farmers' plots.

Thus, the rice cultivation technologies introduced in the training were disseminated from the key and intermediate farmers who participated in the training to neighboring farmers. According to interviews with the target farmers, the fact that these rice cultivation technologies were applicable to the farmers led to the promotion of farmer-to-farmer extension and a high adoption rate of technologies. For example, as shown in Table 2, the content of each rice cultivation technology training consists of multiple components that include residential and infield technical instructions as well as baseline survey, monitoring, and follow-up and is structured so that a series of training components are implemented throughout multiple cropping seasons. The post-training adoption rate of rice cultivation technologies introduced in the training is more firmly established than planned, and the practice rate of the training contents and the adoption rate of rice cultivation technologies are improved by conducting a set of training components, including monitoring and follow-up after the technical guidance.

Furthermore, according to interviews with experts, the introduction of subject-matter training contributed to embedding the contents of rice cultivation technology training among participants by taking a multifaceted approach that not only improved rice cultivation technologies but also strengthened other aspects of rice promotion, such as irrigation scheme management, gender, marketing, post-harvest technology, and agricultural machinery.

According to the questionnaire responses by KATC, MATIs, and SoA, many of the tutors who are training instructors in each training continue to be assigned to the same institute after the completion of the project, and there are no particular technical problems in the

implementation of each training, and as long as the budget can be raised, it is possible to continue the training.

3.4.4 Financial Aspect

Among the irrigated rice cultivation technology training, rainfed rice cultivation technology training, and subject-matter training conducted under this project, rainfed rice cultivation technology training and subject-matter training were newly introduced under this project; therefore, it was planned that the training costs for the two trainings would be borne by the Japanese side, while the irrigated rice cultivation technology training was to be conducted through cost sharing with the Tanzanian side (LGAs and MoA), in addition to reducing its training cost by introducing MST. Although the introduction of MST lowered the overall training cost by 35.7%, the cost-sharing was 94.8% for the Japanese side and 5.2% for the Tanzanian side (4.1% for LGAs and 1.1% for MoA), which means that the Tanzanian side's share of training costs was much lower than in TANRICE1. The main reason is that since 2012/13, there has been virtually no budget allocation from the ASDP Basket Fund to the DADP budget.

Furthermore, as mentioned above, there is no record of each training being conducted other than MATI-Ilonga after the completion of the project. The annual budgets of the Agricultural Training and Research Division of MoA and MAINL, and the annual budgets and expenditures of each agricultural training institute and SoA are shown in Tables 6, 7, and 8 below. All institutes indicated no budget allocation for each training at each agricultural training institute and SoA. The budget for the Agricultural Training and Research Division of MoA is increasing steadily; however, this increase is primarily due to increased seed research and seed production facilities at the Tanzania Agricultural Research Institute.

Table 6 Annual Budget of Agricultural Training and Research Division, MoA

Unit: TZS

Budget item	2019/20	2020/21	2021/22	2022/23
Other charges	1,204,005,880	3,246,932,490	3,426,932,490	10,680,261,000
Development budget	8,940,048,000	24,293,500,000	34,995,500,000	

Source: Questionnaire response by Agricultural Training and Research Division, MoA

Table 7 Annual Budget of MAINL

Unit: TZS

Budget item	2019/20	2020/21	2021/22
Total budget	88,173,299,661	129,862,460,000	53,704,753,000
Training budget	57,040,000	24,900,000	33,540,000

Source: Questionnaire response by MAINL

Table 8 Annual Budgets and Expenditures of Agricultural Training Institutes and SoA

Unit: TZS

Institute	Item	2019/20	2020/21	2021/22	2022/23
KATC	Budget	263,000,000	263,000,000	360,000,000	NA
	Expenditure	131,500,000	131,500,000	216,000,000	
MATI-Igurusi	Budget	43,000,000	55,000,000	55,000,000	78,000,000
	Expenditure	NA	23,794,800	23,841,000	
MATI-Ilonga	Budget	1,243,000,000	1,560,000,000	1,560,000,000	1,363,251,895
	Expenditure	983,000,000	901,000,000	1,076,000,000	
MATI-Mtwara	Budget	1,800,000,000	3,100,000,000	2,300,000,000	2,134,669,200
	Expenditure	600,000,000	2,100,000,000	800,000,000	
MATI-Tumbi	Budget	417,988,746	220,568,908	219,218,350	760,122,600
	Expenditure	223,699,441	91,653,436.00	111,470,350	
MATI-Ukiriguru	Budget	2,396,361,842	2,497,460,497	2,323,450,397	2,155,236,648
	Expenditure	538,768	558,758	645,896	
SoA	Budget	598,560,130	444,682,760	596,400,320	481,973,320
	Expenditure	538,704,117	377,980,346	357,840,192	

Source: Questionnaire response by each institute

Note: Budget refers to the amount budgeted in the application, and expenditure refers to the amount allocated in the budget, with responses based on estimated and actual amounts depending on the institute. Reasons for the large variation in budgets and expenditures from institute to institute and from year to year include the fact that each institute varies in size (number of staff) and that some years include large-scale expenses such as facility renovations.

The institutes providing the training under this project are the agricultural training institutes under MoA, and each agricultural training institute is a training institute for agricultural extension officers and does not usually provide training for ordinary farmers, and budgets for farmer training are not usually allocated. Each training institute is supposed to conduct farmer training at the request of LGAs within its jurisdiction, and the cost of the training is to be borne by the respective LGAs. As mentioned in "3.3. Efficiency," the share of training costs borne by each LGA during the project implementation was limited, but even after the project completion, no training was provided at the expense of each LGA. Since each training institute does not expect LGAs to cover the training cost, they are submitting application proposals to conduct the training to obtain funds from other donors and NGOs. However, this does not mean that there is no communication between each training institute and each LGA, and there is communication as needed between the officers of each training institute and the district agriculture officers and agricultural extension officers in each LGA.

In Zanzibar, unlike on the mainland, agricultural extension officers do not belong to LGAs but to MAINL, and all training budgets are allocated from MAINL, not LGAs. However, as shown in Table 7, the training budget in the overall MAINL budget is very limited, and no rice cultivation technology training is provided at MAINL expense.

Therefore, after the completion of the project, the budget for the implementation of each training has not been allocated by MoA, the respective LGAs, and MAINL to the respective agricultural training institutes and SoA, which poses a major challenge to financial sustainability.

3.4.5 Environmental and Social Aspect

According to each agricultural training institute, several responses indicated that the project's rice cultivation technology training is environmentally friendly because it encourages the application of organic fertilizers.

3.4.6 Preventative Measures to Risks

As mentioned above, each agricultural training institute submits application proposals to other donors and NGOs to obtain training funds, but other than MATI-Ilonga, there is no record of each training being conducted at the expense of other organizations after the project was completed.

Some major issues have been observed in terms of the financial aspect and they are not expected to be resolved. Therefore, sustainability of the project effects is moderately low.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to increase rice yield in the project target area through the implementation of (i) training on irrigated rice cultivation technology, (ii) training on rainfed rice cultivation technology, and (iii) subject-matter training on the rice industry value chain by enabling participating farmers to use the rice cultivation technologies introduced in the training. Furthermore, the project aimed to increase rice production in the target area through continuous practice of rice cultivation technologies by farmers participating in the training and practice of the technologies by neighboring farmers through farmer-to-farmer extension, and to increase rice production on a national level through the implementation of rice cultivation technology training in rice production areas other than the target area.

The increase in national rice production aimed for this project was consistent with Tanzania's development policy and needs at the time of planning and completion of the project. Furthermore, the project was consistent with Japan's ODA policy for Tanzania and was implemented as technical cooperation to improve productivity through the adoption of appropriate rice farming technologies by farmers under JICA's cooperation program, the *Rice Production Capacity Enhancement Program*. The project was also implemented under the international framework of CARD, an international initiative aimed at doubling rice production. Therefore, the relevance and coherence of the project are high. The effectiveness and impacts of the project are very high, as the implementation of the project led to an increase in rice yield through the utilization of rice cultivation technologies by farmers in the target area, and the increase in rice production at the national level has been confirmed, with the effects of the project having been more than planned. Although the project cost and

period were slightly higher than planned, there were no problems with the outputs produced to the inputs, and the efficiency of the project is high. The sustainability of the project is moderately low because, although the effects of the project itself have been sustained, the project has not been expanded to include rice cultivation technology training in other rice production areas after the completion of the project, and there are major financial issues to be addressed.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Although the training provided by each training institute under this project is provided by agricultural training institutes, the budget for farmer training is not normally allocated in each training institute, and each training institute conducts farmer training upon request from LGAs, and the training costs are borne by each LGA. In this project, it was planned that the irrigated rice cultivation technology training would be conducted through cost-sharing of implementation expenses between the Tanzanian and Japanese sides, but the Tanzanian side's burden was limited. Furthermore, since the completion of the project, neither MoA, MAINL, nor LGAs have allocated budgets to the training institutes for the implementation of the training, and any of the training has not been conducted by the Tanzanian government budget. Under the successor project, TANRICE3, the rainfed rice cultivation area will be the main target area, and TANRICE3 plans to cover the implementation costs of the rainfed rice cultivation technology training. The Agricultural Training and Research Division of MoA, MAINL, and agriculture offices of the respective LGAs should ensure that the training budget is allocated for the irrigated rice cultivation technology training so that the Tanzanian side can independently bear the costs. In practice, however, it is difficult for each agency to secure training budgets from the central government and the respective LGAs, so MoA and MAINL need to actively encourage external agencies to raise training funds from other development partners. Alternatively, it is suggested that another funding mechanism be considered in the implementation of the training. For example, it is proposed that farmers, MoA, and each LGA share the training costs as follows: (i) irrigated rice farmers, many of whom have income from rice sales, should be charged a fee for a portion of the training costs, which would be collected from participating farmers; (ii) daily subsistence allowance (DSA) costs for the agricultural training institute tutors to conduct the training should be covered by the Agricultural Training and Research Division, MoA; and (iii) monitoring and follow-up of the training should be conducted by agricultural extension officers, with LGAs bearing the costs of

conducting them. On the other hand, in Zanzibar, the agricultural extension officers belong to MAINL, not to LGAs, and MAINL needs to bear DSA and monitoring costs for SoA tutors and agricultural extension officers, so MAINL should approach other development partners for funding or the Zanzibar government for a budget allocation.

(2) MATI Ilonga reported that there are some discrepancies in the content of training on rice cultivation technologies in TANRICE (including 1 and 2) and ERPP, confusing farmers who participated in training under both projects. Although several rice promotion projects provide training related to rice cultivation technology, there are other examples of differences in the content of each training program, because although information is shared and opinions are exchanged at inter-donor meetings and other forums, the content of the training provided by each program is not coordinated. Therefore, it is suggested for each agricultural training institute and SoA that when updating the training materials in TANRICE3, the task groups composed of tutors from each agricultural training institute and SoA in charge of each training program should summarize the differences between the rice cultivation technologies recommended by TANRICE and those recommended by other rice cultivation programs, including ERPP, and why they are different, and discuss which technology is preferable to use under which cultivation conditions, and add explanations in the training materials.

4.2.2 Recommendations to JICA

(1) In this ex-post evaluation, it was confirmed that the training in the irrigated rice cultivation area significantly increased rice production and contributed to the increase in rice production at the national level, while the training in the rainfed rice cultivation area increased unit yield, but production was not stable due to weather and surrounding environment conditions, and the contribution to the increase in rice production for the entire country was limited. In TANRICE3, rainfed rice cultivation areas will be the main target area, and the rainfed rice cultivation technology training introduced in this project is planned to be strengthened. On the other hand, since irrigated rice cultivation has a greater impact on rice production than rainfed rice cultivation, it would be more efficient to conduct the training in more irrigated areas in TANRICE3, if increasing national rice production remains the overall goal of TANRICE3. Therefore, it is necessary to carefully consider the areas where the training is to be conducted based on what TANRICE3 is specifically designed to achieve. In particular, a loan project for irrigation infrastructure development by the Exim Bank of Korea is underway in Zanzibar, but the project is only for the development of irrigation facilities and does not plan to provide technical training, and there is a high need to provide technical training to the target farmers. In addition, irrigated rice farmers in Zanzibar tend to own smaller plots and earn less income from

rice sales than those on the mainland, making it difficult for farmers themselves to bear the cost of participating in rice cultivation technology training, and MAINL needs to bear all the training costs including monitoring costs of agricultural extension officers. Therefore, particularly in Zanzibar, while encouraging MAINL to cover the training costs, it is suggested that consideration be given to continuing to target irrigated rice areas as the primary areas for the training implementation in TANRICE3.

(2) As mentioned above, this ex-post evaluation confirmed that the rice cultivation technology training conducted under the project was effective in increasing rice yield and production. While there is room for improvement in the content of the rainfed rice cultivation technology training, it is expected that the content will be strengthened in TANRICE3. Thus, through the implementation of TANRICE 1, 2, and 3, KATC and other agricultural training institutes have accumulated know-how in implementing packaged training in rice cultivation technology, and in CARD Phase 2, KATC, together with Uganda and Cameroon, is the base for the CARD Reginal Training. Therefore, JICA should develop packaged rice cultivation technology training programs in African countries under CARD Phase 2 to effectively utilize the training programs introduced and improved in TANRICE 1, 2, and 3.

4.3 Lessons Learned

<u>The necessity of positioning the partner country's budget-bearing organizations as the implementing agencies and obtaining their budgetary commitments</u>

The training provided by each training institute under this project is provided by the respective agricultural training institutes, but the budget for farmer training is not normally allocated in the budget of each training institute. In this project, the irrigated rice cultivation technology training was planned to be conducted through cost-sharing of implementation expenses between the Tanzanian and Japanese sides, but the Tanzanian side's burden was limited, and there is no record of training being conducted with each LGA bearing the costs after the project completion. A major reason for the low-cost burden for each LGA is that the DADP budget, which is financed by the ASDP Basket Fund, was eliminated after the start of the project. In addition, this was partly because no formal commitment by LGAs to pay for the training was obtained, as neither LGAs nor PO-RALG that governs LGAs were originally positioned as implementing agencies for the project. Before the start of the project, LGAs targeted by the project were not identified, and since LGAs targeted by the project covered more than 40 districts, it is not realistic to position all the targeted LGAs as implementing agencies. Therefore, at the time of planning, it was necessary to position PO-RALG, which oversees all LGAs, as the implementing agency and to obtain a commitment by LGAs through PO-RALG to pay for the training.

In light of the above, to secure the commitment of the partner country to allocate the budget, it is necessary to position not only the agency that will conduct the project activities but also the agency that will bear the budget for project activities as the implementing agency at the time of planning the project and to encourage the budget-bearing agency to allocate the budget as the implementing agency during the implementation of the project.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective Perspective

None

5.2 Additionality

None

(End)

Status of Achievement of Outputs

Output	Indicators	Results
Output 1 Training approach for disseminating the appropriate irrigated rice cultivation technologies (standard training) is strengthened nationwide.	**<Indicator 1-1>** The standard training course or modified standard training course will be conducted in at least 80 priority irrigation schemes by 2018.	**<Achieved>** ST was conducted in 27 irrigation schemes and MST in 63 irrigation schemes (including 9 schemes where pilot MST was conducted), for a total of 90 irrigation schemes.
	<Indicator 1-2> At least 50% of key farmers and intermediate farmers in selected irrigation schemes evaluate that their paddy production technologies are improved.	**<Achieved>** As objective data on "farmers' evaluation of the improvement of their rice production technologies," the percentage of farmers (including neighboring farmers) who adopted or practiced the technologies (bund making, levelling, and straight row transplanting) after participating in ST or MST was collected. The results showed that 59.4% of the farmers adopted or practiced bund making, 62.2% adopted levelling, and 74.2% adopted straight row transplanting, with an average of 65.3%.
	<Indicator 1-3> Extension materials for extension officers and farmers are developed.	**<Achieved>** Six types of extension materials for agricultural extension officers and farmers related to ST and MST were developed and revised as appropriate throughout the training implementation.
	<Indicator 1-4> At least 45% of participants of the training (key and intermediate farmers) are women.	**<Achieved>** A total of 5,078 key and intermediate farmers participated in ST and MST, of which 2,511 were female participants, for a female participation rate of 49.4%. The total number of participants including neighboring farmers was 22,708, of which 10,755 were women, for a participation rate of 47.4%.
Output 2 Training approach for disseminating the appropriate rainfed rice cultivation technologies is developed.	**<Indicator 2-1>** Effective technologies of rainfed lowland rice cultivation are confirmed.	**<Achieved>** The following rainfed rice cultivation technologies were identified: (i) Bund making, (ii) Levelling, (iii) Straight row transplanting, (iv) Straight row direct planting, (v) Fertilizer application, and (vi) Use of improved varieties. At each agricultural training institute, a rainfed upland rice cultivation technology training course (NERICA training) and a rainfed lowland rice cultivation technology training course (lowland training) were developed to introduce these rice cultivation technologies.
	<Indicator 2-2> At least 25% of key farmers and intermediate farmers of rainfed upland and rainfed lowland rice cultivation courses evaluate that their paddy production technologies are improved after 2 cropping seasons.	**<Achieved>** Of the farmers who participated in the NERICA training or the lowland training (including neighboring farmers), the percentages of farmers who adopted and practiced the above rice cultivation technologies after participating in the training were: (i) Bund making (60.1%), (ii) Levelling (64.9%), (iii) Straight row transplanting (22.9%), (iv) Straight row direct planting (26.4%), (v) Fertilizer application (29.5%), (vi) Use of improved varieties (18.4%), and the average was 44.0%.
	<Indicator 2-3> Extension materials for extension officers and farmers are developed.	**<Achieved>** Ten types of extension materials for agricultural extension officers and farmers on the NERICA training and the lowland training were developed and revised as needed throughout the training implementation.
	<Indicator 2-4> At least 45% of participants of the training (key and intermediate farmers) are women.	**<Achieved>** A total of 8,194 key and intermediate farmers participated in the NERICA training and the lowland training (749 in NERICA and 7,445 in lowland), of which 4,011 were women (360 in NERICA and 3,651 in lowland), for a female participation rate of 49.0%.
Output 3 The subject-matter training courses on the value chain of rice industry are strengthened.	**<Indicator 3-1>** Subject-matter training courses are identified.	**<Achieved>** Based on local needs, the following courses were identified: (i) Irrigation scheme management, (ii) Gender, (iii) Marketing, (iv) Post-harvest technology, and (v) Agricultural machinery. Irrigation scheme management and Gender were also implemented in TANRICE1, while the remaining courses were newly introduced in this project.
	<Indicator 3-2> At least 120 subject-matter training courses are conducted.	**<Achieved>** A total of 193 courses were conducted for the subject-matter training courses, of which (i) 61 on Irrigation scheme management, (ii) 38 on Gender, (iii) 34 on Marketing, (iv) 4 on Post-harvest technology, and (v) 56 on Agricultural machinery.

	<Indicator 3-3> Teaching materials, pamphlets, etc. for respective subject-matter training courses are prepared and utilized.	**<Achieved>** Teaching materials, pamphlets, etc. for each of the subject-matter training courses were prepared by the task groups in charge of each course and utilized in the training.

Source: *The Project for Supporting Rice Industry Development in Tanzania (TANRICE2) Final Report*, JICA, December 2019

Target Sites and Farmers for Qualitative Survey

Area	Site	Training Participated	Target Farmers
Kilimanjaro Region	Mtambo irrigation scheme, Hai District (Irrigated rice cultivation area)	Irrigated rice cultivation technology training	■ Farmers participating in the training (2 males and 2 females) ■ Non-participating farmer (1 male)
	Mawala irrigation scheme, Moshi District (Irrigated rice cultivation area)	Irrigated rice cultivation technology training	■ Farmers participating in the training (2 males and 2 females) ■ Non-participating farmers (2 males)
Morogoro Region	Mlali irrigation scheme, Mlali, Mvomero District (Irrigated rice cultivation area, Rainfed upland rice cultivation area)	Irrigated rice cultivation technology training, NERICA training, Gender training	■ Farmers participating in the training (2 males and 2 females) ■ Non-participating farmer (1 female)
	Melela, Mvomero District (Rainfed upland rice cultivation area)	NERICA training	■ Farmers participating in the training (1 male and 2 females) ■ Non-participating farmers (1 female)
	Kolela, Morogoro Rural District (Rainfed upland rice cultivation area)	NERICA training	■ Farmers participating in the training (2 males and 1 female) ■ Non-participating farmer (1 female)
Zanzibar	Bumbwisudi irrigation scheme, West Unguja District (Irrigated rice cultivation area)	Irrigated rice cultivation technology training, Irrigation scheme management training, Gender training, Post-harvest technology training	■ Farmers participating in the training (2 males, 2 females) ■ Non-participating farmer (1 male)
	Chutama, North District A (Rainfed upland rice cultivation area)	NERICA training	■ Farmers participating in the training (1 male, 1 female)
	Kwagube, North District B (Rainfed upland rice cultivation area)	NERICA training	■ Farmers participating in the training (1 male, 1 female) ■ Non-participating farmer (1 female)
	Muyuni, South Unguja District (Rainfed lowland rice cultivation area)	Lowland training, Gender training	■ Farmers participating in the training (1 male, 1 female) ■ Non-participating farmer (1 female)
	Mchangani, Central Unguja District (Rainfed lowland rice cultivation area)	Lowland training	■ Farmers participating in the training (1 male, 1 female) ■ Non-participating farmer (1 female)
Total number of farmers interviewed	■ 30 farmers participating in the training (16 for the irrigated rice cultivation technology training, 4 for the lowland training, and 13 for the NERICA training, of which 3 farmers from Mlali, Mvomero District, Morogoro participated in both irrigated rice cultivation technology and NERICA training) ■ 10 non-participating farmers		

FY2023 Simplified Ex-Post Evaluation Report of Japanese Grant Aid Project

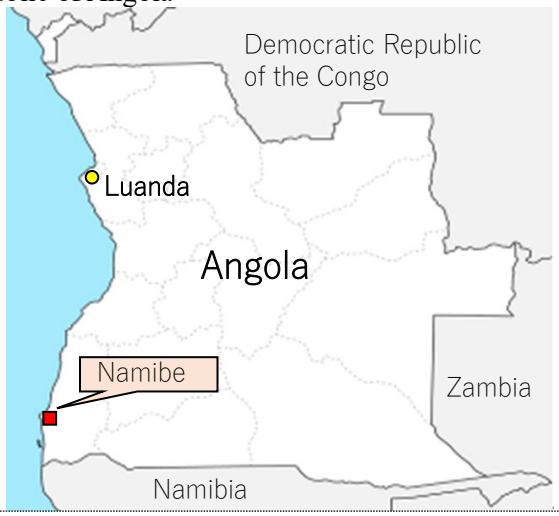
External Evaluator: Tatsuro Yokawa, Chuo Kaihatsu Corporation

Duration of the Study: September 2022-February 2024

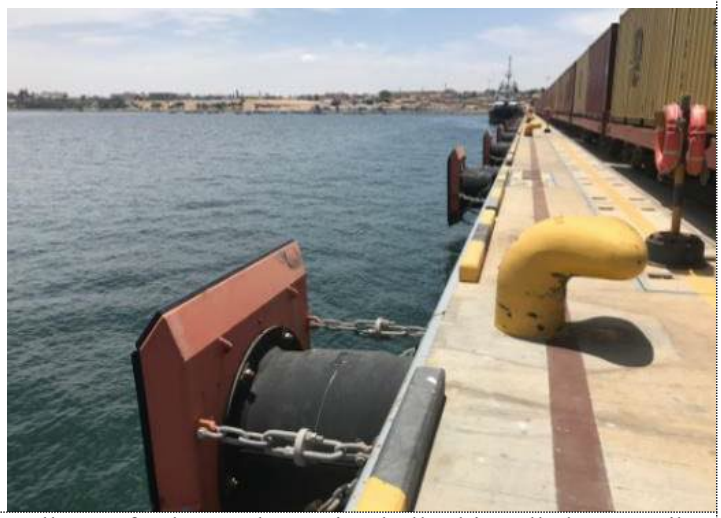
Duration of the Field Study: January 7, 2023-January 21, 2023

Country Name
Republic of Angola

The Project for Improvement of Namibe Port



Location of the Project site
(source: Edited by the evaluator from a map site)



Cell-type fenders and mooring bollard installed at Namibe Port (source: photographed by the evaluator)

I. Project Outline

Background

From 2008 to 2010, JICA renovated port facilities mainly at 3A berth of Namibe Port through grant aid under "The Project for Emergency Rehabilitation of Port Facilities." In April 2010, two experts in port operation management and port facility/equipment management were dispatched to the Port of Namibe Enterprise (EPN) to restore the functionality of Namibe Port, a logistics hub in the southern part of the country. Yet even in areas other than the 3A quay already renovated, inspections revealed deficiencies in the fenders, aging of the mooring bollard, damages incurred to hulls and the quay during the berthing and mooring of ships, and low work efficiency and low safety resulting from the unpaved condition of the aprons. As the volume of cargo handled in this country has been increasing since 2010 due to rapid economic development, further improvement of the port facilities (which currently form a logistics bottleneck) has been an urgent issue. The grant aid under the "The Project for Improvement of Namibe Port" (February 2017 to June 2019) was provided to improve logistics and promote development in the southern region of Angola.

Objectives of the Project

This project aimed to strengthen the transportation capacity of the southern region of Angola by rehabilitating the port facilities of Namibe Port in Namibe Province, and to thereby further promote logistics in the region.

Contents of the Project

1. Project site: Namibe Port in Namibe Province
2. Japanese side: Rehabilitation of the quay wall, the pavement of apron/yard on and behind 3B berth, improvement of the facilities for the reefer containers
3. Angolan side: Proper operation and maintenance of equipment and facilities after installation, and environmental monitoring

Implementation Schedule

E/N Date	January 15, 2016	Disbursement Date	Month Date, Year ( )
G/A or L/A Date	February 27, 2017	Completion Date	May 29, 2019 (Completion of construction)

Project Cost

E/N Grant Limit / G/A Grant Limit: 2,136 million yen, After scope change due to preparatory survey (review) : 1,698 million yen[1], Actual Grant Amount: 1,658 million yen

Executing Agency

Port of Namibe Enterprise (EPN: Empresa Portuária do Namibe)

Conditions (Loan only)

Borrower (Loan only)

Contracted Agencies

Main Consultant(s): Joint Venture of Oriental Consultants Global Co., Ltd. and PADECO Co., Ltd.
Main Contractor(s): TOA Corporation

[1] As the project contents were changed due to the 2016 preparatory survey (review), the project cost and project period were based on the 2016 preparatory survey (review).

II. Result of the Evaluation

Summary

This project aimed to strengthen the transportation capacity of the southern region of Angola by rehabilitating the port facilities of Namibe Port and contribute to the promotion of logistics in the region. The project was consistent with the development policy and development needs of Angola and Japan's ODA policy at the time of the ex-ante evaluation. By utilizing the lessons learned from the previous project, "The Project for Emergency Rehabilitation of Port Facilities," the construction work was completed without any major delays. After the project, however, the implementation of the Environmental Management Plan (EMP) and the submission of environmental monitoring results reports to JICA (quarterly), two responsibilities of the recipient country, could not be verified. Whether JICA Angola monitored the organizational, technical, and financial capabilities of the executing agency was also left unverified. As JICA Angola cold not easily pay frequent visits to Namibe, a province located far from the capital, this plan may not have been realistic. Regarding the "internal consistency" (specific collaboration and coordination with other JICA projects) and "external consistency" (cooperation with organizations outside of JICA) of the project, no specific collaboration or coordination was planned, and no actual collaboration took place. Based on the above, the Relevance/Coherence of the project is evaluated as high. The Implementation of this project has improved the work efficiency of the transport machinery and shortened the time required for container-handling cycles, which in turn has helped to promote logistics, strengthen transportation capacity, and reduce logistics costs. The quantitative indicators, however, were only partially achieved: confirmable results were not obtained for any of the indicators, and the effects of the economic recession in Angola curbed the increase in the logistics volume to less than what had been expected before the project implementation. As qualitative effects, the safety and efficiency of the working machines were improved through the paving of the roads and the expansion of the container transportation space and reefer container space. This led to positive impacts, including a reduction in the incidence of respiratory disease among port workers, and no negative impacts were reported. Therefore, the effectiveness and impact of the project can be evaluated as high. The efficiency of this project was very high, as the project cost was within the plan and the project period was as planned. No specific problems with regard to sustainability are noted in terms of the national policy and system, as improved port functionality is a priority in Angola's national policy and a contract with the private concessionaire was made for an extended period up to 2034. In terms of the organization and structure, the private concessionaire company is well structured to operate and maintain the port facilities sustainably. The private concessionaire has staff with sufficient experience, and there are no concerns regarding the technical aspects of port facility operation. In terms of finances, the Namibe Port operation business operated by the private concessionaire continues to be in the red, though the EPN has been operating in the black since 2017. While the deficit operation of the private concessionaire is not a serious problem as the company's Luanda port operation business is compensating, the private concessionaire and EPN should ideally hold discussions to ensure stable management of the Namibe Port operation. Regarding the environmental and social aspects, no negative impacts were confirmed in the regular environmental monitoring carried out during the construction period, and no concerns regarding the response to risks were noted. In terms of operation and maintenance, some areas were found to be in need of repair in the renovated facility, but these have since been repaired and are currently maintained and operated without remarkable problems. For these reasons, the effects produced by this project are considered to be highly sustainable.

In light of the above, this project is evaluated to be highly satisfactory.

Overall Rating[2]	**A**	**Relevance & Coherence**	③[3]	**Effectiveness & Impacts**	③	**Efficiency**	④	**Sustainability**	③

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ④: Very High ③: High, ②: Moderately low, ①: Low

<Special Perspectives Considered in the Ex-Post Evaluation / Constraints of the Ex-post Evaluation>

This project is a continuation of the grant aid under "The Project for Emergency Rehabilitation of Port Facilities," a project conducted to rehabilitate the port facilities mainly on 3A berth of Namibe Port between 2008 and 2010, and Angolan government requested Japan to renovate Namibe Port facilities, including Berth 3B. Based on the "Preparatory Survey of the Improvement of Namibe Port" conducted from November 2010 to May 2011 in response to the request, JICA determined that the 3B quay renovation was necessary and decided to implement the renovation, at a Japanese Cabinet meeting held in May 2012. However, E/N negotiations were interrupted and stalled for various reasons. Negotiations resumed in 2015, and an E/N was signed on January 15, 2016 with a maximum grant amount of 2.136 billion yen. As more than three years had passed since the Cabinet decision, a cooperation preparatory survey (review) was conducted from January 2016 to September 2016 to revise the details of the project. Therefore, the project cost and period of the original plan reported in the ex-ante evaluation were based on the contents of the E/N, that is, the results of the preparatory survey conducted in 2011, while the project details were determined based on the preparatory survey (review) in 2016. Due to the change of the project content by the preparatory survey (review) in 2016, the project cost and period of the 2016 survey were considered as the original plan.

1 Relevance/Coherence

<Relevance>

- Consistency with the Development Policy of Angola at the Time of Ex-Ante (and Ex-Post Evaluation*)

The National Development Plan of Angola (2013-2017) set out strategic development goals for each province. Among them, five priority strategic development goals for Namibe are listed. One priority development item was the expansion of the functions of Namibe Port. Port renovation was positioned as an action plan in the National Transport Strategy (2000-2015), and this project supported the policy. Meanwhile, the functional expansion, renovation, and modernization of Namibe Port were set as priority issues based on the National Development Plan 2013-2017, the action plan formulated by the Institute of Maritime and Ports of Angola of Ministry of Transport. The purpose of this project, to strengthen the transportation capacity of the southern region of Angola by renovating the port facilities at Namibe Port, was consistent with these development policies.

- Consistency with the Development Needs of Angola at the Time of Ex-Ante (and Ex-Post Evaluation*)

The container-handling volume at Namibe Port was expected to have increased at the time of the ex-ante evaluation. Further headway in rehabilitating the aging port facilities of Namibe Port was positioned as an urgent issue to deal with the expected increase in the container-handling volume. The purpose of this project, to strengthen the transportation capacity of the southern region of the country by renovating the port facilities at Namibe Port, was consistent with the development needs.

- Appropriateness of Project Design/Approach*

* Add only when there is a clear problem with effectiveness or sustainability

Since the E/N was concluded more than three years after the Cabinet decision in 2012, a preparatory survey (review) was conducted in 2016 to review the project details. In addition, the lessons learned from the previous project, "The Project for Emergency Rehabilitation of Port Facilities," were utilized, and the grant agreement (G/A) was also to specify matters such as tax exemption at customs clearance, the prompt issuance of work visas and payment authorizations, etc., as obligations of the recipient government. The project was completed without any major delays associated with the regular monitoring performed by PMR.

On the other hand, whether JICA Angola monitored the organizational, technical, and financial capabilities of the executing agency, which was the lessons learned to this project, was left unverified. The implementation of the Environmental Management Plan and submission of environmental monitoring reports to JICA (quarterly), which were the obligations of the recipient country after the project, were also left unconfirmed. Further, the implementation method for these monitoring activities was unclear, and geographic factors made it difficult for JICA Angola to make frequent visits to Namibe, a prefecture far from the capital. As a consequence, the plan may not have been suited for practical implementation.

<Coherence>

- Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation

This project is categorized as an "Infrastructure Development Program" covering a priority area for "Economic Development Support for Industrial Diversification" under Japan's ODA policy for the Republic of Angola (July 2017), and will contribute to the promotion of logistics. The renovation of Namibe Port, an important infrastructure for promoting domestic logistics, is also necessary from the perspective of regional economic development, and this project is consistent with this policy.

- Internal Coherence

There was no specific collaboration or coordination plan with other JICA projects at the time of project formulation, and there was no collaboration during the project implementation period. The internal coherence could not be confirmed.

- External Coherence
There was no specific collaboration or coordination plan with other donor agencies at the time of project formulation, and there was no collaboration during the project implementation period. The external consistency could not be confirmed.

<Evaluation Result>
Therefore, its relevance and coherence are high[4].

2 Effectiveness/Impacts[5]

<Effectiveness>
(1) Quantitative Effects
Table 1 shows the effectiveness and quantitative effect indicators (standard values, target values, and actual values) of this project. The number of collisions between the quay and the hulls of berthed ships was zero for 3B berth one year after project completion, so it can be said that the target value was achieved. As the indicator of the dust reduction during the apron and yard work had not been measured by the executing agency, it was not possible to determine whether the indicators were achieved. Furthermore, the geographic position of Namibe Port in a desert area made it impossible to completely eliminate the effects of sandstorms from the surrounding area during strong winds. As such, a reduction to zero impact was deemed unlikely to have been achieved. However, the paving of the ground surface with concrete greatly reduced the effects of dust and improved the work efficiency of the transport machinery, hence a sufficient dust-reduction effect can be evaluated. The target time required for the container cargo-handling cycle set for 2022 was achieved, although there were factors outside this project that affected the cargo-handling time (such as the introduction of a new machine called a mobile harbor crane).

Table 1 Result of indicators

Indicators	Baseline 2011 Baseline Year	Target 2022 3 Years after Completion	Actual 2019 Completion Year	Actual 2020 1 Year after Completion	Actual 2021 2 Years after Completion	Actual 2022 3 Years after Completion
Indicator 1 Vessel contact with berth during berthing	147 (A+B)*1	0	8 (A+B)	9 (A only)	11 (A only)	11 (A only)
Indicator 2 Number of days dust was generated in apron and yard	360	0	Not measured*2	Not measured	Not measured	Not measured
Indicator 3 Cargo handling time from vessel to apron and to yard	13 minutes 11 seconds	10 minutes 35 seconds	10 minutes 00 seconds	9 minutes 58 seconds	10 minutes 45 seconds	4 minutes 58 seconds

*1. The number of contacts between 3A berth: A and 3B berth: B (Namibe Port has 3A berth, which was renovated in 2010 by the previous grant project, and 3B berth, which was renovated in this project. This data is total of 3A and 3B berths combined. The fender repaired at berth 3A was already damaged in 2016, and after this project, the number of contacts at berth 3B became zero, but the frequency of use of berth 3B is approximately 30% and 3A use is 70% so the vessel contact with berth still occurs at 3A even after this project)
*2. The number of days dust was generated in apron and yard was an indicator that was not measured by the EPN or the private concessionaire, so information could not be obtained at the time of the post-survey.
Source: ex-ante evaluation, private concessionaire

(2) Qualitative Effects
According to the EPN, this project has reduced the risks that unpaved ground surfaces create during transport machinery work, which has allowed for safer operation, significantly improved work efficiency, and reduced damage to transport machinery. Furthermore, the container transport space and reefer container space were both expanded, and safe berthing has become possible through the installation of new fenders and mooring bollards. According to the private concessionaire, the apron area has been extended 250 meters and effectively doubled, and the container capacity has likewise doubled from 1,200 to 2,400 containers. In addition, the ground surface pavement made it possible to introduce mobile harbor cranes in 2022. As a result, the rehabilitations of the port facilities by this project led to a restoration and expansion of the port functionality, and increased both the efficiency and safety of work. With the increase in export volume generated by growing demand for Angolan granite in overseas markets such as China, Europe, and the UAE, together with the higher efficiency in cargo-handling operations enabled by the new cranes, the transportation of granite by rail from inland Lubango of Huila state is growing (Moçâmedes Railway). Shipping companies report that the improved efficiency of container-handling operations has shortened the ship berthing time. While this is not an actual measurement, the shipping companies roughly estimate that a 30% to 40% reduction in the ship berthing time has been achieved, along with an approximately 30% decrease in berthing costs (payments to ships and ports). Overall, the quantitative indicators were partially achieved, and some of the results have led to improved logistics,

[4] Relevance: ③, Coherence: ②
[5] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

strengthened transportation capacity, and reduced logistics costs. On the other hand, the economic recession since 2014 has led to declines in Namibe Port's cargo volume, container-handling volume, and number of incoming ships. The container-handling volume, which stood at approximately 26,000 TEU as of 2009, and was expected to increase further at the time of project formulation, but after reached 37,877 TEU in 2014, it started to decreased and recorded 20,947 TEU in 2022 (private concessionaire).

Table 2 Cargo volume and number of vessels of Namibe Port

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
(1) Namibe Port cargo handling volume (tons)	971, 925	1,381,730	1,255,487	881,995	573,443	803,446	848,497	990,874	797,539	922,062	954,567	1,352,232
(2) Namibe Port container handling volume (TEU)	24,475	27,811	35,059	37,877	30,870	21,807	26,032	25,384	20,577	28,832	19,727	20,947
(3) Number of vessels entering Namibe Port	248	248	247	237	189	201	243	238	167	187	229	221

<Source> Questionnaire responses (private concessionaire), previous grant project (emergency port rehabilitation project ex-post evaluation p.10, plan preparatory survey (review) p.4

<Impacts>
According to the EPN, air pollution and water pollution were monitored monthly during the construction period, and the impacts on waste management and the social environment (noise/vibration, working environment, accidents) were reported in monthly construction reports. No confirmed problems were pointed out in these reports. Pollution prevention membranes were also installed, and construction waste locations were set in certain places. These safeguards prevented accidents that led to pollution, so the absence of negative impacts on the natural environment could be confirmed. The project was not a type expected to have impacts on the social environment (land acquisition, resident relocation) or gender, and the absence of such impacts was confirmed. Other positive impacts include a reduction in respiratory illnesses among port workers and improved traffic safety due to a reduction in the number of trucks passing through the town (EPN, Moçâmedes Railway).

<Evaluation Result>
Therefore, effectiveness and impacts of the project are high.

3 Efficiency

<Output>
The output of this project was generally achieved as described above in “I Project Outline - Contents of the Project,” although some project design changes from the content of the preparatory survey (review) were prompted by technical reviews. Regarding the obligations of the recipient government, the items specified for the project implementation period were completed. Several items specified for the period after project completion, however, are not thought to have been implemented. The EPN was unaware of several its obligations, such as the Environmental Management Plan and the submission of the environmental monitoring results to JICA. The communication and agreement between JICA Angola and the EPN are thought to have been impeded at the time by the structural changes taking place in the JICA Angola Office during its shift from a field office to an office, as well as the forced return-to-home orders and restrictions on domestic travel necessitated by the COVID-19 pandemic.

Table 3 Contents of design changes

	Facility	Quantity of plan (preparatory survey - review)	Quantity of implementation (completion report)	Reason for change (The project implementation consultant)
1	Quay wall of 3B berth (240 m)			
	1) Concrete of superstructure	240 m	240 m	---
	2) Cell Fender (1,250 H)	16 units	20 units	Results of a review of the fender installation intervals in consideration of the berthing of small ships.
	3) Mooring bollard (100 t)	150t type 1 unit, 100t type 7 units	100t type 8 units	Results of a review of the standards for the mooring bollard based on the berthing ships.
	4) Mooring ring	3 units	3 units	---
	5) Rubber ladder	1 unit	1 unit	---
	6) Car stop block	240 m	240 m	---
2	Concrete pavement of the apron and container yard	Apron 1,584 m^2 Yard 11,256 m^2	Apron 1,584 m^2 Yard 11,256 m^2	---
3	Concrete pavement of facilities for reefer containers	840 m^2	1,530.5 m^2	Results of a review of the plan to partially pave the reefer container yard in order to ensure dust prevention and the safe transportation of cargo-handling machines.

<Input>
As mentioned before, this ex-post evaluation assumes that the planned project cost was set at 1,698 million yen after the scope was changed by the 2016 preparatory survey (review)[6]. The actual project cost was 1,658 million yen, a level within 98%, and

[6] Assuming that the maximum amount cost under the grant agreement of 2,136 million yen was the planned cost, the actual project cost of 1,658 million

therefore not exceeding the plan. The actual cost of implementation by the partner country was 8 million yen (16,414,000 Kwanza), which was 87% of the planned cost of 10 million yen (18,813,000 Kwanza). The amount came in lower than the plan because there was no longer any need for expenditures related to securing the land necessary for the project.
The planned project period was February 2017 to February 2019, but the actual period was May 2017 to May 2019. The duration of the actual period was 100% of that of the planned period, namely, 25 months[7].

<Evaluation Result>
The project cost was within the plan, and the project period was as planned. Therefore, efficiency of the project is very high.

4 Sustainability
- Policy and System
One of the six pillars of the National Development Plan 2018-2022 is infrastructure development. Infrastructure development of the marine and port subsector includes the repair of infrastructure related to marine and port activities, and the development of port facilities to improve their functions and strengthen their competitiveness is one of the priority items. The construction of a new Sacomar iron ore export pier and the additional construction of a container terminal at Namibe Port (JBIC financing project of TOA Corporation and Toyota Tsusho), a phase 3 project underway for Namibe Port at the time of the ex-post evaluation, are positioned as a priority package in Angola's National Master Plan for the Transport and Road Infrastructure Sector 2019-2038. In addition, the concession contract for Namibe Port operation runs until 2034, so the current private concessionaire can operate the port in line with a long-term management strategy.

- Institutional/Organizational Aspect
The National Maritime Agency supervises the EPN and approves its large-scale projects. No EPN organizational chart was collected in the evaluation, but the EPN outsources the operation and management of the port facilities to private concessionaires. According to the private concessionaire that actually operates and manages the port, there are 150 people in the operation department, an execution team of 100 people who operate the cranes and transport machinery, and a planning team of 50 people who plan and manage cargo handling and transportation. A technical department made up of 50 people performs maintenance on warehouses, vehicles, and cranes. The private concessionaire has established systems to sustainably operate and maintain the port facilities.

- Technical Aspect
The technical aspects of operation and maintenance were not confirmed because no related information was collected from the EPN. On the other hand, the private concessionaire believes that the staff who operated the port facilities have sufficient experience. Internal supervisors from the private concessionaire come from the capital Luanda for inspections to check if there are no problems in operation, and the operators take training every two years. Machine maintenance is performed on a daily basis, and a machine operation checklist is used when the machines are operated. The staff was judged to have sufficient experience, as some of the staff members have worked for more than 10 years and the private concessionaire has accumulated technical experience.

- Financial Aspect
In terms of financial management, the EPN was operating in the red before 2015 but has seen fiscal improvements since 2017 and is currently good financial condition. The reason for the deficit might have been instabilities in the budget (revenue) for the port business caused by undue dependence on the number of ships and amount of cargo handled, factors affected by the economic situation (preparatory survey - review). The port maintenance and management functions have been outsourced to the private concessionaire since 2014. While the financial situation of the EPN has improved since 2017, the Namibe Port operation work of the private concessionaire has remained in the red since the contracting in 2014. The private concessionaire attributes the deficit operation partly to insufficient growth in the number of ships and cargo handled under the constraints of the economic recession ongoing since 2014. This is not an urgent problem for the company at present, as the company's Luanda port operation business is compensating. To ensure the stable operation and appropriate use of the Namibe Port facilities going forward, however, the EPN and private concessionaire should ideally hold discussions toward those ends.

yen was 78% of the planned cost. This planned amount, however, was set based on the 2011 preparatory survey, and was later changed to 1,698 million yen based on the scope change under the 2016 preparatory survey (review).

[7] The ex-post evaluation compared the planned and actual periods under the same conditions and calculated the number of months by including both the start date and final date. Hence, the 23.5 months stated in the preparatory survey (review) was converted to 25 months. The start date was set as the detailed design start (consultant contract date), and the final date was the date of completion of construction.

Table 4 Financial status of the EPN (Unit: thousand kwanza)

	A: Income	B: Cost	A-B: Balance
2011	2,476,188	2,769,024	-292,836
2012	2,858,079	3,316,677	-458,598
2013	Not collected	Not collected	Not collected
2014	2,244,662	2,662,540	-417,878
2015	1,348,591	1,616,224	-267,633
2016	Not collected	Not collected	Not collected
2017	1,584,370	1,565,612	18,758
2018	2,102,415	1,696,857	405,558
2019	2,825,988	1,998,486	827,502
2020	4,837,636	2,103,995	2,733,641
2021	6,228,013	2,529,765	3,698,248

<Source> EPN Annual Report (Relatorios e Contas), Preparatory survey (review) p.19

Table 5 Financial status of the private concessionaire (Unit: USD)

	A: Income	B: Cost	A-B: Balance
2014	17,230	21,530	-4,300
2015	27,354	24,235	3,119
2016	16,111	17,280	-1,169
2017	15,115	15,220	-105
2018	9,325	11,580	-2,255
2019	8,492	9,263	-771
2020	7,531	8,125	-594
2021	7,502	8,024	-522
2022	15,010		

<Source> Private concessionaire

- Environmental and Social Aspect

The project implementation consultant and construction contractor carried out regular environmental monitoring during the construction period under the supervision of the executing agency, and no environmental problems were confirmed. Two responsibilities of the recipient country after project completion, namely, the implementation of the EMP and the submission of environmental monitoring results reports to JICA (quarterly), could not be confirmed. Nonetheless, the environmental aspects have been continuously managed by the safety and environment management personnel responsible from the executing agency, and monthly safety and environment management reports are still being created after the completion of the project. Given that no negative impacts were confirmed during the field survey, and that the safety and environmental aspects are continuously managed and monitored, a management system for environmental and social considerations is judged to have been established.

- Preventative Measures to Risks

The project plans specified that “large-scale disasters will not occur” as an assumed external condition in setting the risk control parameters, and no large-scale disasters occurred at the port facilities, and no problems with other risks were observed.

- Current Status of Operation and Maintenance

Although some parts of the renovated facilities were found to be in need of repairs during the project, they had already been repaired by the time of the evaluation, and the facilities were maintained and operated without problems. There was no major damage to the pavement of the apron/yard, but one spot was found to have sunk by about 5cm. The defect inspection confirmed that the sunk spot had been repaired, and the repair of the spot was later confirmed in the repair inspection conducted by the project implementation consultant on March 7, 2023. Further, during the field survey, the executing agency pointed out that the surface finish of the apron pavement was different from that of the adjacent panels. The surface paved in this project was finished by “broom finishing,” a standard surface finish recognized internationally, in order to reduce the risk that machines or workers would slip when water collected on the surface. While this surface may lead to tire wear of the working machines, the consultant allayed the EPN’s concerns on this point during the defect repair inspection by explaining the anti-slippage benefit. The container storage location markings on the yard still remained during the evaluation. There were no problems with the renovation to the concrete for the superstructure of Namibe Port 3B quay, car stop blocks, mooring bollards, and fenders. Parts of the fender that had rusted or were missing nuts were judged to be in need of repair in the defect inspection, and the corresponding defects were subsequently repaired.

<Evaluation Result>

There are no specific problems regarding the national policy and system, as improvements in the port functionality were a priority under the national policy and a long-term contract was concluded with the private concessionaire. Regarding the organization and structure, while no information on the organizational structure of the EPN was obtained to shed light on the organization and structure, the private concessionaire company has the necessary structure to operate and maintain the port facilities sustainably. The private concessionaire engages staff with sufficient experience, and there are no concerns regarding the technical aspects of port facility operation. In terms of finances, the EPN has been in the black since 2017. The private concessionaire, on the other hand, has been running its Namibe Port business at a deficit since 2014, when the contract began. This is not an urgent problem for the company at present, as revenue from company’s Luanda port operation business compensates. To ensure the stable operation and appropriate use of the Namibe Port facilities going forward, the EPN and private concessionaire should ideally hold discussions towards those ends. Safety and environmental management personnel are assigned responsibility for managing the safety and environmental aspects at the port working facility, so the EPN is judged to have established a system for managing environmental and social considerations. In response to risks, the large-scale disaster reflected in the risk assumption at the time of project planning did not occur. Although there were some places found to be in need of repairs in the renovated facilities during this project, they had already been repaired by the time of the evaluation, and the port facilities were maintained and operated without any problems.

Therefore, sustainability of the project effects is high.

III. Recommendations & Lessons Learned

- Recommendations to Executing Agency

While the EPN's balance of income and expenditures is improving due to higher granite exports, the private concessionaire's business at Namibe Port is still operating in the red. The company runs a Luanda port business that currently generates funds to compensate the deficit operation and fend off urgent financial problems, but this financial situation is undesirable overall. The stable management of the private concessionaire is an important precondition for the appropriate operation of the Namibe Port facilities. In order to ensure the sustainable operation of the private concessionaire, the EPN is expected to hold discussions with the private concessionaire regarding the details of the contract (including a review of the fee structure for port users).

The fenders installed in the previous grant aid project (The Project for Emergency Rehabilitation of Port Facilities 2008-2010) were damaged within a year, so the EPN was concerned about the durability of the fenders from the time it commenced the design of this project. As the fenders installed in this project were highly durable, they were in good condition at the time of the ex-post evaluation. It will be important to continue using them appropriately, in order to keep them good condition going forward. The EPN will need to instruct and manage the private concessionaire to ensure that the facilities are used within the appropriate cargo ship weight and berthing speed ranges. The method of operation was indicated by the project implementation consultant as a notable point of operation, and it will be important to clearly state it as an operation rule if necessary.

- Recommendations to JICA

No

- Lessons Learned

The preparatory survey was conducted in 2011, and E/N negotiations were suspended after the adoption by a Cabinet decision. The negotiations were restarted in 2015, and the preparatory survey (review) was conducted in 2016. The standard values of the quantitative effects indicators were not reviewed in 2016, and the target values for 2022 were not reset. Neither the EPN nor private concessionaire took measurements to determine the number of days dust was generated in the apron and yard, so no information on that indicator could be obtained in the ex-post evaluation. It may be that the EPN failed to sufficiently recognize the target value for the indicators over the three years following the completion of the project. It is judged that the standard values for the quantitative effect indicators should be confirmed and set as the standard values as of the preparatory survey - review (2016), and that the target values for the three years after project completion (2022) should be reestablished according to those standard values. Furthermore, the indicators should be data that the executing agency normally measures, or the indicators of the project should be shared with the executing agency in order to build a common understanding by clarifying the indicators as target values over the three years after project completion and by requiring continuous measurement during and after the project.

The implementation of the EMP and the submission of environmental monitoring reports to JICA (quarterly) had been set as obligations of the recipient government after the project, and as a result, no consultation with JICA Angola and no implementation could be confirmed. The executing agency was unaware of the need to implement a post-project Environmental Management Plan and submit the environmental monitoring reports to JICA, and JICA Angola was unable to sufficiently communicate, reach agreements, or monitor the project. Furthermore, it is thought that the supervision by JICA headquarters was also necessary for these points.

IV. Non-Score Criteria

- Performance
  - Objective Perspective

The project implementation consultant held weekly coordination meetings with the executing agency, the EPN, and the private concessionaire, and good communication and cooperation throughout the construction work were maintained. According to the consultant, JICA Angola's support and tenacity in working with the Ministry of Transport, Ministry of Finance and the Ministry of Environment to obtain banking arrangements and environmental licenses for the construction work at the beginning of the project helped to reduce negative impacts on the bidding process. This helped to minimize the delays and contributed to the high efficiency of the project (especially during the project period). The construction work and construction supervision were highly evaluated as a result, and the consultant received a letter of appreciation from the EPN upon completion of the construction work. However, whether JICA Angola monitored, as planned, the organizational, technical, and financial capabilities of the executing agency during the project implementation, or analyzed to support capacity building according to the necessity of the areas where the executing agency needed knowledge and technology, could not be verified.

The implementation of the Environmental Management Plan and the submission of environmental monitoring results reports to JICA (quarterly), two obligations of the recipient country after the project, were also left unconfirmed, as the EPN was unaware of these obligations and the communications and agreements between the EPN and JICA Angola were insufficient. According to the JICA Angola, this may have been due to the structural changes taking place in the JICA Angola Office during its shift from a field office to an office, as well as the forced return-to-home orders and restrictions on domestic travel necessitated by the COVID-19 pandemic.

Concrete paved apron/yard (source: photographed by the evaluator)

Concrete paved reefer container yard (source: photographed by the evaluator)

(end)