

Country Name	Project for Promotion of Smallholder Rice Production (Phase 1) (Phase 2)
Papua New Guinea	

I. Project Outline

Background	<p>In Papua New Guinea (PNG), rice is one of the important staple foods. However, while a large amount of rice was imported annually, domestic production was very limited. Thus, foreign currency outflow was a major problem and a concern for the Government of PNG. Purchasing expensive imported rice was a big expenditure for small-scale farmers, which was a heavy burden for them. JICA implemented the “Project for Promotion of Smallholder Rice Production” (2003-2008) for developing a rice farming extension system through the Model Farmers (MFs), the system of public rice milling services and seed distribution was applied in the two provinces. For dissemination of the system to other provinces, the phase 2 of the project was requested.</p>																										
Objectives of the Project	<p>Through trainings for MFs and provincial staff, selection of appropriate milling machines, distribution of seeds, and establishment of the Rice Extension Unit (REU), the projects aimed at extending smallholder rice farming with the Model Farmer approach, thereby contributing to expanding it to other areas.</p> <p><Phase 1> Overall Goal: Food security situation of the target provinces is improved. Project Purpose: Sustainable subsistence rice farming is practiced by smallholders by developing and applying the support system for Model Farmer extension activities.</p> <p><Phase 2> Overall Goal: Rice farmers and rice production are expanded sustainably in the targeted provinces. Project Purpose: Smallholder rice farming is extended by applying and improving the Model Farmer approach and its support system in the targeted provinces.</p>																										
Activities of the project	<p>1. Project site: <Phase 1> Madang and East Sepik Provinces. <Phase 2> Madang, East Sepik, Manus, and Milne Bay Provinces.</p> <p>2. Main activities: <Phase 1> Training of MFs, establishment of the model milling center, training of operators of the milling machine, development of manual on operation and maintenance of the milling machine, distribution of seeds, establishment of REU etc. <Phase 2> Development of training modules for MFs, training of MFs and provincial staff, selection of the recommended milling machines, development of guidelines on extension services and mechanical milling services, etc.</p> <p>3. Inputs (to carry out above activities)</p> <table border="0"> <tr> <td>Japanese Side</td> <td>PNG Side</td> </tr> <tr> <td><Phase 1></td> <td><Phase 1></td> </tr> <tr> <td>1) Experts from Japan: 16 persons</td> <td>1) Staff allocated: 39 persons</td> </tr> <tr> <td>2) Training in Japan: 23 persons</td> <td>2) Land and facilities: Office space, equipment, etc.</td> </tr> <tr> <td>3) Training in the third country: 32 persons</td> <td>3) Operation cost.</td> </tr> <tr> <td>4) Equipment: vehicles, office equipment, audiovisual equipment for training, etc.</td> <td><Phase 2></td> </tr> <tr> <td>5) Operation cost.</td> <td>1) Staff allocated: 16 persons</td> </tr> <tr> <td><Phase 2></td> <td>2) Land and facilities: Office space and equipment, space for rice milling services, etc.</td> </tr> <tr> <td>1) Experts from Japan: 9 persons</td> <td>3) Operation cost.</td> </tr> <tr> <td>2) Training in Japan: 2 persons</td> <td></td> </tr> <tr> <td>3) Equipment: Vehicles, office equipment, rice mills, soil examination kits, etc.</td> <td></td> </tr> <tr> <td>4) Operation cost for training, office utilities, etc.</td> <td></td> </tr> </table>			Japanese Side	PNG Side	<Phase 1>	<Phase 1>	1) Experts from Japan: 16 persons	1) Staff allocated: 39 persons	2) Training in Japan: 23 persons	2) Land and facilities: Office space, equipment, etc.	3) Training in the third country: 32 persons	3) Operation cost.	4) Equipment: vehicles, office equipment, audiovisual equipment for training, etc.	<Phase 2>	5) Operation cost.	1) Staff allocated: 16 persons	<Phase 2>	2) Land and facilities: Office space and equipment, space for rice milling services, etc.	1) Experts from Japan: 9 persons	3) Operation cost.	2) Training in Japan: 2 persons		3) Equipment: Vehicles, office equipment, rice mills, soil examination kits, etc.		4) Operation cost for training, office utilities, etc.	
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Project Period	<p><Phase 1> December 2003 to November 2008</p> <p><Phase 2> December 2011 to May 2015</p>	Project Cost	<p><Phase 1> (ex-ante) 252 million yen, (actual) 438 million yen</p> <p><Phase 2> (ex-ante) 250 million yen, (actual) 293 million yen</p>																								
Implementing Agency	<Phase 1, 2> National Department of Agriculture and Livestock (NDAL).																										
Cooperation Agency in Japan	<p><Phase 1> National Committee.</p> <p><Phase 2> Ministry of Agriculture, Forestry and Fisheries.</p>																										

II. Result of the Evaluation

<Special perspectives considered at the ex-post evaluation>

- The two projects had same objectives, while the target area was expanded in the Phase 2. Therefore, at the ex-post evaluation, these two projects were interpreted and evaluated as one intervention. For verification of the achievement status at the time of project completion, indicators of the both phases were used, and for verification of the continuation status of the project effects, indicators of the Phase 2 were used.

- The target year of the Overall Goal of the Phase 2 was set as 2020. As data collection of the ex-post evaluation was conducted from June to September 2019, evaluation judgement was made with data which could be confirmed as of the time of ex-post evaluation.

1 Relevance

<Consistency with the Development Policy of PNG at the time of ex-ante evaluation and project completion>

The “National Food Security Program” (2000-2010) included programs for promoting rice farming of smallholders, related organizations, and semi-commercial farmers. In the “Development Strategic Plan” (2010-2030) and the “Mid-term Development Plan” (2011-2015), rice farming is considered as one of the strategic crops in the agricultural sector. Thus, the project objectives were consistent with the development policies of PNG from the time of both ex-ante evaluation of the phase 1 to the time of project completion of the phase 2.

<Consistency with the Development Needs of PNG at the time of ex-ante evaluation and project completion>

In PNG, rice has been one of the important staple foods. While many tons of rice were imported annually, domestic production was quite limited. In addition, international rice export prices were increasing. For farmers and rural people, purchasing rice has been one of the big expenditures, and it has been a big burden for small-scale farmers. Most farmers and rural people had access to arable land and plentiful water source, however, appropriate knowledge, and skills on basic rice cultivation and processing were lacking. Thus, the project was consistent with the development needs of PNG for rice cultivation for self-consumption, from the time of both ex-ante evaluation of the phase 1 to the time of project completion of the phase 2.

<Consistency with Japan’s ODA Policy at the time of ex-ante evaluation>

PNG was regarded important in sustaining a friendly relationship with South Pacific countries through Pacific Islands Forum and Pacific Community at the time of ex-ante evaluation of the Phase 1¹. Based on the policy consultation in 2006, one of the priority areas was set as agricultural development (promotion of agricultural and fishery development including small-scale self-sufficient agriculture)². Thus, the project was consistent with Japan’s ODA policy at the time of ex-ante evaluation of both the Phase 1 and Phase 2.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement for the Project Purpose at the time of Project Completion>

The Project Purpose of the phase 1 was achieved. The number of smallholders who grew rice for self-consumption exceeded the target in Madang, Sumkar, and Maprik District (Indicator 1).

The Project Purpose of the phase 2 was achieved, too. The number of smallholders farming rice exceeded the target in Madang, East Sepik, Manus, and Milne Bay Provinces (Indicator 1), where the improved monitoring plan introduced by the project were implemented (Indicator 2). As trainers of supplementary training for MFs, 11 were trained at REU and provincial level (Indicator 3). MFs gave guidance to more than 10,000 smallholders (Indicator 6). After the supplementary training, most MFs got sufficient understanding as 72.9% passed the exit exam (Indicator 4). Two mechanical rice milling machines were recommended by the project, and their improvement plans for rice milling services were implemented in 83.3% of the target districts (Indicator 5). Thus, the smallholder rice farming has been extended in the four target provinces.

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

It is judged that the project effects have continued. Most of the farmers who received guidance from MFs have continued rice farming. However, the number of smallholder households farming rice has decreased almost by half. This is because many farmers in Madang and East Sepik have partially shifted to the cash crop farming, vanilla, due to its high price in the year after 2015. Other factors include non-timely seed distribution and insufficient extension services in remote areas. Although no Provincial Divisions of Agriculture and Livestock (PDALs) currently have a seed bank, PDAL of East Sepik has a plan to establish one after 2020. The improved plans for monitoring and mechanical milling service have been used in all of the target districts. In addition, there have been more trainers at REU and provincial levels for MF supplementary training. Also, most MFs who got a good understanding of the project training have continued rice farming.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been achieved. The number of smallholder households could not be confirmed, but the number of farmers increased much right after the project completion (Indicator 1). However, the number has been on a decreasing trend. Reasons include, as mentioned above, production shift from rice to vanilla in East Sepik and Madang, insufficient seed distribution and other extension services, limited access to milling stations for some farmers, volcanic eruption in East Sepik in January 2018. All smallholder farmers in the target provinces have produced rice for their home consumption for the last three years (Indicator 2), although the percentage of those who had received guidance from MFs depends on each province. The percentage of smallholder farmers who produce more than 50 kg of paddy rice has been decreasing in three of the four target provinces, and it did not reach the target in all the provinces in 2018 (Indicator 3). However, PDALs told that there could be more farmers who produced more than 50 kg. As mill stations are located far from many farms, requiring high transportation cost, farmers usually bring rice only for their home consumption to mill stations. All districts holding MFs have adopted guidelines on the extension services and milling services since 2015 (Indicator 4).

<Other Impacts at the time of Ex-post Evaluation>

First, more women have got involved in rice farming activities which were new food to be planted, together with their husbands. Madang PDAL Food Crop Officer is an active female officer, which has promoted women’s participation. Second, NDAL has diffused the MF approach to PDALs in other provinces including West Sepik, East New Britain, and Northern Province, through REU officers’ visit to these PDALs. In addition, the MF approach was introduced in opportunities such as the National Agriculture Summit 2018 where all Provincial Agriculture Advisors were gathered. Third, PDALs of East Sepik and Madang have introduced the concept of “commercial rice” for the surplus of rice. For example, in East Sepik, PDAL in coordination with farmers has developed the brand “Sepik Organic Rice” to sell it in local shops, which has brought incomes to farmers. It was also showcased to the delegates of the Asia Pacific Economic Cooperation (APEC) 2018 meeting held in Port Moresby City. Also, PDAL of Madang developed “Magic Marasin” as locally commercialized rice. Fourth, MFs have been empowered through MF activities. As they got well-acknowledged, some of them became ward councilors.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

¹ Ministry of Foreign Affairs (2003) “ODA Databook 2002.”

² Ministry of Foreign Affairs (2011) “ODA Databook 2010.”

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results																														
(Project Purpose) <Phase 1> Sustainable subsistence rice farming is practiced by smallholders by developing and applying the support system for Model Farmer extension activities.	1. Sustainable smallholders growing rice becomes 580 farmers in Madang and Sumkar Districts and 400 in Maprik District, respectively by the year 2008.	<u>Status of achievement: Achieved.</u> (Project Completion) - 706 smallholders in Madang and Sumkar Districts and 780 farmers in Maprik District, respectively, have cultivated rice for self-consumption by May 2008.																														
(Project Purpose) <Phase 2> Smallholder rice farming is extended by applying and improving the Model Farmer (MF) approach and its support system in the targeted provinces.	1. Number of smallholder (agricultural households) growing rice becomes over 5,000 in the four target provinces in 2014/15 season.	<u>Status of achievement: Achieved (Partially continued).</u> (Project Completion) - As of May 2014, 5,624 households were farming rice in the four targeted provinces. (Ex-post Evaluation) - 3,076 households still cultivate rice in 2018, among the 5,624 households who grew rice during the project period in the four target provinces. However, in East Sepik and Madang, 63 and 41 more smallholders cultivate rice again in 2019, respectively.																														
	2. Number of the districts or LLG that implement the improved monitoring plan: 80% or more of all the districts involved.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) - As of September 2014, 100% of districts and LLGs in the four targeted provinces implemented the improved monitoring plan. (Ex-post Evaluation) - All districts in the four targeted provinces have implemented the improved monitoring plan.																														
	3. Number of the REU and provincial trainers capable of conducting the MF supplementary training: 10 persons or more.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) - 11 REU and provincial trainers became capable of conducting the supplementary training for MFs and provincial staff. (Ex-post Evaluation) - There are four trainers at REU and 14 provincial trainers in the target provinces capable of conducting MF supplementary training.																														
	4. Number of the MF who can pass the exit exam of the supplementary training: 80% or more of all the trainees.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) - As of September 2014, 72.9% MFs shown 80% understanding of supplementary training for MFs and provincial staff. (Ex-post Evaluation) - There are 128 MF who passed the exit exam of the supplementary training and got 80% of the understanding in the target provinces (82.1% of 156 MFs who received supplementary training of the project).																														
	5. Number of the districts or LLG that implement the improvement plan(s) for mechanical milling service: 80% or more of all the districts involved.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) - 83.3% of districts implemented the improvement plan for mechanical rice milling services. (Ex-post Evaluation) - All districts in the four targeted provinces have implemented the improved plan for mechanical milling services.																														
	6. Over 10,000 smallholders (agricultural households) receive guidance from MF trained by the Project.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) - By December 2014, a total of 10,881 smallholders (farmers) receive guidance from MF trained by the Project. (Ex-post Evaluation) - Among the smallholders who received guidance from MF, there are 8,471 smallholders continuing rice farming.																														
(Overall goal) <Phase 2> Rice farmers and rice production are expanded sustainably in the targeted provinces.	1. Number of smallholder (agricultural households) growing rice becomes over 7,500 in the target provinces by 2020.	<u>Status of achievement: Not verified.</u> (Ex-post Evaluation) - The number of households was not available. - The number of smallholder farmers increased in 2015 right after the project completion, but then it has been decreasing. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Madang</td> <td>4,830</td> <td>4,482</td> <td>3,852</td> <td>3,586</td> </tr> <tr> <td>East Sepik</td> <td>10,979</td> <td>8,446</td> <td>6,828</td> <td>4,668</td> </tr> <tr> <td>Manus</td> <td>48</td> <td>31</td> <td>10</td> <td>10</td> </tr> <tr> <td>Milne Bay</td> <td>412</td> <td>382</td> <td>315</td> <td>207</td> </tr> <tr> <td>Total</td> <td>16,269</td> <td>13,341</td> <td>11,005</td> <td>8,471</td> </tr> </tbody> </table>		2015	2016	2017	2018	Madang	4,830	4,482	3,852	3,586	East Sepik	10,979	8,446	6,828	4,668	Manus	48	31	10	10	Milne Bay	412	382	315	207	Total	16,269	13,341	11,005	8,471
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	2. More than 10% of randomly selected smallholder farmers (agricultural households) in the target provinces produce rice for their home consumption for the	<u>Status of achievement: Achieved.</u> (Ex-post Evaluation) - 100% of smallholder farmers in the four target provinces have produced rice for self-consumption for the last three years, and 64.6-100% of them have received guidance from MFs.																														

last three years, and more than 80% of them have received guidance from the Model Farmers (MF) trained by this Project in 2020.		Farmers who have produced rice for self-consumption for the last three years	Farmers who also received guidance from MFs		
	Madang	100.0%	70.3%		
	East Sepik	100.0%	64.6%		
	Manus	100.0%	100.0%		
	Milne Bay	100.0%	68.1%		
3. More than 5% of randomly selected smallholder farmers (more than 50% of rice growers) in the target provinces produce more than 50 kg of paddy rice in 2020.	<u>Status of achievement: Achieved.</u> (Ex-post Evaluation) - 9.8%-40.0% of smallholder farmers produced more than 50kg of paddy rice in the four target provinces in 2018.				
		2015	2016	2017	2018
	Madang	18.9%	16.0%	14.5%	9.8%
	East Sepik	98.3%	93.3%	29.0%	21.6%
	Manus	10.4%	16.1%	50.0%	40.0%
	Milne Bay	60.4%	31.2%	27.6%	25.6%
4. More than 80% of the districts holding the MF adopt and implement the guideline on the extension services for smallholder rice production and on the milling services in 2020.	<u>Status of achievement: Achieved.</u> (Ex-post Evaluation) - All districts holding MFs have adopted and implemented guidelines on the extension services for smallholder rice production and on the milling services as of 2018.				

Source: Project Completion Report and information provided by NDAL and PDALs.

3 Efficiency

Although the total project period of the two phases was as planned, the total project cost exceeded the plan (Ratios against the plan: 100% and 146%, respectively). Outputs were achieved as planned. Therefore, the project efficiency is fair.

4 Sustainability

<Policy Aspect>

Besides large-scale commercial rice farming, also promotion of smallholder rice farming has been prioritized in the national development policies including the “Medium Term Development Plan III” (2018-2022) and the “National Policy on Domestic Rice Industry Development.”

<Institutional Aspect>

REU established within NDAL during the project implementation has remained functioning. A Provincial Rice Coordinator has been assigned in each target province, and a District Agriculture Extension Worker has worked in each district, who has worked to promote rice farming. The number of officers responsible for promoting rice farming with the MF approach has not been sufficient in PDALs and District Divisions of Agriculture and Livestock (DDALs), according to the interviewed PDAL officers of the target provinces. 112 MFs are still active, thus allegedly sufficient for covering part of smallholders. Though MFs are voluntary, PDALs plan to put incentives to attract new MF candidates.

The MF approach has been still effective, as each stakeholder has its responsibilities. MFs have information neighbor smallholders' name, land use, type of soil, etc. These data are transferred to DDALs, and then DDALs report to PDALs. Provincial Managers, Provincial Mill Technicians, and Provincial Rice Coordinators organize semiannual workshops, where DDALs present their progress. Then, PDALs submit reports to REU.

There are 77 milling machines in the four provinces, but the number has not been sufficient to cover the needs of all farmers, especially those residing in remote areas. PDALs have planned to procure micro rice mills in each village that has more than 10 smallholders growing rice, or constantly provide portable rice milling service in remote areas.

<Technical Aspect>

Officers of REU and PDALs have sustained sufficient skills for promoting rice farming with the MF Approach. Although they cannot always make monitoring visits due to fund shortages, REU has provided advice to PDALs by phone and email upon request, and also Rice Coordinators of PDALs have materials including guidelines on extension services and mechanical milling services, which were developed by the project. As well, it is judged that Extension Workers have sustained sufficient knowledge and skills in promoting rice farming, as many farmers have continued rice growing including land clearing, sowing, growing, harvesting and drying rice ready to be milled. Mill Operators have sustained sufficient skills for operation and maintenance, judging from interviews with PDAL officers and the fact that milling machines are still in operation in all target provinces. They also receive support from JICA volunteers on machine repair.

Regarding the capacity building system, Extension Workers are periodically trained by respective PDALs. For example, in East Sepik, they have conducted refreshers training every six months, in which MFs participate by taking advantage of the opportunity. Training materials developed by the project have been utilized. Provincial trainers have sustained their skills by referring to the training materials and also receiving support from JICA volunteers.

<Financial Aspect>

Budgets of NDAL and PDALs have been allocated from the national and provincial governments, respectively. Though REU has planned the annual budget at 1,000,000 PGK, NDAL has allocated no fund since 2016. The main reason is that NDAL itself has not

Table: Roles of the MF Approach

	Roles for Rice Promotion
MF	<ul style="list-style-type: none"> - Train smallholders on soil management, cropping calendar, etc. - Purchase or produce seeds for smallholders - Monitor Smallholders' activities
Mill Manager/ Operator	<ul style="list-style-type: none"> - Inspect paddy quality - Advise farmers for quality paddy - Keep records of farmer's produce and records on machine operation hours
District Extension Officer	<ul style="list-style-type: none"> - Visit MFs and Mill Managers/ Operators - Conduct regular meeting with MFs - Collect monitoring records from MFs Mill Operators/ Manager and report to DDALs

secured sufficient budgets due to the national government's much spending for the national elections in 2017 and hosting APEC in 2018. REU has planned to submit a proposal to the national government's Public Investment Plan for funding 300,000,000 PGK for the three years from 2020. Regarding the target PDALs, the budget amount and disbursement have depended on each. Although budgets of East Sepik and Manus have increased since 2016, all of the four PDALs answered that the amounts have not been sufficient for extension of rice farming for smallholders. To overcome the budget shortage, PDALs have made efforts for saving costs, such as going for extension and monitoring activities together as a group of the Rice Coordinator, Mill Operators, and other staff in charge of extension services).

<Evaluation Result>

There have been concerns about the institutional and financial aspects. Therefore, the sustainability of the effects is fair.

5 Summary of the Evaluation

The Project Purpose was achieved, and the project effects have continued. The number of smallholders and rice farmers exceeded the target, and the introduced improved monitoring plan was implemented. The Overall Goal has been achieved as of the time of ex-post evaluation, but the number of smallholders has been on a decreasing trend. Regarding sustainability, more MFs, milling machines, and funding for them have been needed to reach more smallholders, while PDALs and MFs have sustained sufficient skills. As for efficiency, the total project cost of the two phases exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

- It is recommended to NDAL to allocate funds necessary for conducting REU's monitoring visit to the target provinces. Not only understanding the current situation through the reports from PDALs, but also direct observation would be important for NDAL.
- PDALs plan to purchase rice mills. Currently used rice mills were purchased in the county, but their spare parts are not available. The quality of the mills is not good, according to PDAL. It is recommended to PDALs to conduct a careful survey on mills before purchasing, with regard to the quality, durability, service availability of spare parts at near shops.
- For supporting existing smallholders and also extending rice farming to new farmers, it is recommended to PDALs to increase the number of MFs. For training of new MFs, not only provincial trainers but also currently active MFs could transfer rice farming techniques to them. It is also necessary to establish a provincial rice seed bank for timely distribution.

Lessons Learned:

- The project succeeded in drawing a high interest in PDALs for promoting rice and also commercializing rice. One of the project's big impacts was branding "Sepik Organic Rice" of East Sepik and "Magic Marasin" of Madang. Besides home-consumption, rice is sold at the local markets at less price than normal imported rice, and the profits are for farmers. It is important to involve provincial offices in the project activities and let them understand the situations well, in the way they would work with district offices and model farmers so that provincial offices could think of how benefits could be brought to farmers.



Model Farmer with the micro rice mills.



"Sepik Organic Rice" exhibited and given to guests as a souvenir at APEC in 2018.



A wife and husband who clear and prepare the land for rice farming.