

Summary of Evaluation Results

1 . Outline of the Project	
Country: The Republic of Madagascar	Project Title: Rural Development Project through Diffusion of Aquaculture of Tilapia in the Province of Mahajanga (Region of Boeny), North West of Madagascar
Sector: Agriculture and Rural Development	Cooperation Scheme: Technical Cooperation Project
Division in charge: Rural Development Department,	Total Cost (at the time of evaluation): 550million Yen
Period of Cooperation(R/D): March, 2011-September, 2014 (3.5 years)	Partner Country's Implementation Organization: Ministry of Fishery Resources and Fishery (MRHP)
	Supporting Organization in Japan: Ministry of Agriculture, Forestry and Fisheries
<p>1-1 . Background of the Project</p> <p>Madagascar is located in the Indian Ocean off the coast of southern Africa. It is the fourth largest island in the world with an area of 587,040km² (1.6 times as large as Japan) and population of 22.3 million as of 2012 (World Bank).</p> <p>Although the country has marked more or less steady economic growth over the recent years, poverty is still prevailing all over the nation. As of 2010, the percentage of the population living below the international poverty line \$1.25 (in purchasing power parity terms) a day, and below the national poverty line, reached 81.3% and 76.5%, respectively (World Bank, 2012 and National Institute of Statistics (INSTAT), 2012).</p> <p>In Madagascar, more than 70% of the total population is engaged in agriculture and living in rural areas. According to the statistics of INSTAT, the poverty ratio reaches 82.2% in rural areas, while 54.2% in urban areas in 2010. As such, poverty reduction in the country is equivalent to that in rural areas, and poverty reduction measures for rural population are of great importance.</p> <p>Under the circumstances, fishery and aquaculture subsector has been perceived one of the major activities to boost economic development of Madagascar. The master plan for fisheries and aquaculture for 2004-2007 aimed to increase freshwater production in order to help to meet the growing population's food needs and increase foreign currency earnings by exporting fisheries products.</p> <p>In line with it, development of inland fishery in coastal and rural area has been regarded effective since it diversifies farmers' income sources, and simultaneously increases the amount of protein supply to Malagasy people. Specifically, Tilapia culture is considered one of the most suitable measures, as the year-round operation and seed production are possible in fresh as well as brackish water regions. Furthermore, Tilapia meets the taste of Malagasy people and popular commodity in the local market.</p> <p>Boeny Region in former Mahajanga Province, situated in the north west of the country, has been facing poverty continuously like most of the other regions. In 2009, the regional poverty ratio reached 89.1%, although it has gradually decreased to 71.6% in 2010 according to INSTAT.</p> <p>Prolonged doldrums of coastal fisheries including shrimp fishing and shrimp aquaculture which have been important income sources of the residents for a long time, are considered one of the main causes of poverty in the region, as well as other causes such as low level of agricultural productivity.</p> <p>Meanwhile, the region is considered to have high potential for tilapia culture, in terms of climatic and natural conditions, such as annual rainfall (1,000 - 1,500mm), average temperature (27°C), as well as presence of paddy fields and flood plains that can be utilized as fishponds.</p> <p>In 2006, the Government of Madagascar requested to the Government of Japan for technical cooperation aiming at improving income and livelihoods of farmers in Mahajanga through extension of aquaculture of tilapia. In response to the request, JICA dispatched Preliminary Study Teams in November 2007 and December 2009, respectively. Based on the Study results, R/D was agreed and signed in December 2010, and the Project started in April 2011 with cooperation period of three and half (3.5) years.</p> <p>In October 2012, two years after the commencement of the Project, the joint Mid-term Review was conducted to ascertain the outcomes of the Project, provide evaluation in terms of five evaluation criteria and recommendations for steady progress of the Project.</p> <p>In May 2014, Terminal Evaluation was jointly conducted by the Malagasy and Japanese sides to evaluate the Project in terms of five evaluation criteria and provide recommendations on the actions to be taken during the remaining cooperation period to secure the sustainability of the Project, as well as drawing lessons useful for technical cooperation schemes, in general.</p>	
1-2. Project Overview	
(1) Overall Goal: Through the extension of Tilapia aquaculture, livelihoods of farmers in the target area are improved.	
(2) Project Purpose: Tilapia aquaculture extension system is established in the target area.	
(3) Outputs:	
Output 1: Seed production techniques suitable for the target area are developed.	

Output 2: Grow-out techniques suitable for the target area are practiced.	
Output 3: Capacity of extension staff (staff of NGO, CSA, DRRHP, Boeny Region, CDA) is enhanced.	
Output 4: Farmer-to-farmer extension approach is developed.	
Output 5: The regional Tilapia aquaculture development plan is developed.	
(4) Inputs (at the time of evaluation (2014.2))	
Japanese Side Dispatch of Experts: 10 Experts (100.0MM) Provision of Equipment: Approximately 24.1 million yen. Local Cost: Approximately 116.2 million yen	
Malagasy Side Allocation of CPs: 15 Land and Facility (Office Space for Japanese Experts, Laboratories, etc.) Operation Cost : Salary of CPs, Utilities, etc.	
2 . Joint Evaluation Team	
Japanese Team Members	Malagasy Team Members
(1) Mr. Satoshi CHIKAMI (Leader), Senior Advisor, Japan International Cooperation Agency (2)Dr. Masahiro YAMAOKA (Aquaculture Extension), Professor, Graduate School, Hiroshima University) (3) Mr. Kenichi. MATSUMOTO (Planning and Management),Deputy Director, Arid and Semi-Arid Farming Area Division 1, Rural Development Department, JICA (5) Dr. Hideaki HIGASHINO (Evaluation Analysis), Senior Consultant, RECS International Inc.	(1) Mrs. RABOANARIJAONA Harilalao Zoelys (Leader), Director, Direction of Aquaculture, MRHP (2) Mr. RAZAFINDRAZAKA Tony Harilala , Chief, Freshwater Aquaculture Section, MRHP (3) Mrs. RAZAFIARIVONY Reine Baovola , Chief, Internal Audit Section, MRHP (4) Mrs. RAOLINJATOVO Genevieve , Chief, Program and Evaluation Section, MRHP
Period of Evaluation	May 19-June 5, 2014
Type of Evaluation: Terminal Evaluation	
3 . Results of Evaluation	
3-1 . Project Performances	
(1) Summary of Project Purpose Achievements	
Project Purpose: <i>Tilapia aquaculture extension system is established in the target area.</i>	
Indicator 1: <i>Income of Tilapia core fish farmers is increased by 30%</i>	
* 7 out of 26 core fish farmers have sold tilapia by May 2014. Based on the available sales records of these farmers and annual farming income without fish farming, it was found out that their income increased as much as 125.3% on average.	
Indicator 2: <i>More than 320 farmers who are trained tilapia aquaculture techniques</i>	
* Out of 1,146 farmers who participated in the farmer-to-farmer trainings conducted by core fish farmers, 305 farmers started tilapia culture. Therefore, indicator 2 is almost satisfied at the time of the Terminal Evaluation and will be satisfied by the end of the Project cooperation period (September 2014).	
* When these farmers succeed in tilapia culture in the future receiving technical support from the extension teams and core fish farmers, more farmers will be interested in tilapia culture and be involved in tilapia culture.	
(2) Summary of Outputs Achievements	
Output 1: <i>Seed production techniques suitable for the target area are developed.</i>	
Indicator 1: <i>At least 1 technical package and at least 1 training / extension material (*) are prepared for tilapia seed production.</i>	
(*) for extension staff and core fish farmers	
* Based on the results of various on-site verification trials, a technical package “Techniques for Tilapia Seed Production” comprising of “Tilapia seed production” and “Common-carp Seed Production” was prepared in December 2013.	
* A “teaching material for tilapia seed production” containing practical and technical components such as selection of seeds (male-female discrimination by vision), water quality management, data collection and management, etc., was prepared in December 2013 and used for TOT and seed production trainings. In addition, video tutorials for core fish farmers, extension staff as well as ordinary fish farmers, are under preparation now and will be completed in August 2014.	
Output 2: <i>Grow-out techniques suitable for the target area are practiced.</i>	
Indicator 2: <i>At least 2 technical packages (*) and at least 2 training / extension materials (**) are prepared for tilapia grow-out techniques.</i>	
(*) (A) for extension staff and core fish farmers, (B) for grow-out farmers	
(**) (A) pond aquaculture, (B) rice-cum-fish culture	

* Based on the on-site verification tests trials, 2 technical packages, namely, “Methods of tilapia culture and growing out for core fish farmers” and “Methods of tilapia culture and growing out for ordinary farmers” were prepared and used for TOT and famer-to-farmer trainings.

* Training/extension materials for core fish farmers and extension workers, which are also used for tilapia seed production trainings, include the following 8 components:

Training and Extension Materials for Core Fish Famers

Contents of the Materials for Core fish farmers and Extension Workers

Title: Water Quality Management	Title: Cooperation between PATIMA and Farmers
Title: Method of Tilapia Culture and Growing Out	Title: Site Selection for Farming
Title: Biological and Taxonomical Information	Title: Aquaculture Record Keeping
Title: Feeding and Nutrition	Title: Aquaculture Extension

“Training materials for famer-to-farmer training” that are simplified materials targeting ordinary fish farmers were also prepared.

* In addition, video tutorials for grow-out techniques, which will be used for core fish farmers, extension staff as well as ordinary fish farmers, are under preparation now.

* Rice-cum-fish culture extension materials will be prepared before the end of the Project cooperation period.

Output 3: Capacity of extension workers is enhanced.

Indicator: At least 15 extension staff have enough capacity to train core farmers and support them of seed production techniques.

* As of May 2014, 13 extension workers are assigned as summarized in the table below:

Current Extension Team by District

District	Staff Nos.	Team Members
Mahajanga II	5	Boeny Region staff (1), NGO (1), CSA (1), DRRHP (1), MRHP (1)
Marovoay	4	Boeny Region staff (1), NGO (1), CSA (1), CiRRHP (1)
Ambato Boeny	4	Boeny Region staff (1), NGO (1), CP (1), CSA (1), CiRRHP (1)

* It is considered that a significant progress was made as for Output3 taking into consideration the fact that the formulation of the extension teams started from scratch, and *indicator 3* is almost satisfied in terms of the number of extension workers,

* However, from the standpoint of securing sustainability of the Project, it should be pointed out that significant part of technical transfer of seed production currently depends on the Project staff and the NGO members who will leave the Project at the end of the Project cooperation period.

* The Project has been assisting establishment of networks among core fish farmers by enhancing farmer-to-farmer extension in 3 districts. However, it may take some more time until they will be fully operational.

Output 4: Farmer-to-farmer extension approach is developed.

Indicator4-1: More than 25 core farmers who are to supply Tilapia seeds and to provide trainings of aquaculture techniques are trained.

* 26 core fish farmers are selected as of May 2014. All of them have conducted farmer-to-famer trainings, as Indicator 4-1 requires. Therefore the Indicator 4-1 is almost achieved.

* The number of farmers who participated in the farmer-to-farmer trainings by the core fish famers amounted to 1, 146 until the end of February 2014. According to the information by the Japanese Experts, 305 (26.6%) ex-participants newly started construction of fishponds for tilapia culture.

Indicator4-2: More than 40,000 Tilapia seeds per year are produced to their neighbors from core fish farmers.

* At the time of Mid-term Review (October 2012), no core fish farmers had started tilapia seeds production yet. Meanwhile, until May 2014, 21 out of 26 core fish farmers have produced seeds as well as 1 core fish farmer candidate.

* According to the data given by the Project, the production of tilapia seeds by the 21 core fish farmers during the past year is approximately 31,000 on average, ranging from 4,000 to 78,000.

* However, some core fish farmers have experience of seed production less than a year. The average seed production of 8 core fish farmers, who have more than a year experience, reached 56,750. As core fish farmers gain experiences, it is expected the average production of tilapia seeds by each core fish farmer will surpass 40,000 per year.

* Distribution of seeds has not been conducted quite actively yet since most of neighbor fish farmers started tilapia culture recently.

Indicator4-3: More than 750 farmers take part in the trainings conducted by core fish farmers.

* The number of farmers who participated in the farmer-to-farmer trainings, conducted in Mahajanga II, Marovoay, and Ambato Boeny by the core fish famers, amounted to 1, 146 until the end of February 2014. Among the participants, 305 (26.6%) started to construct fishponds for tilapia culture.

Output 5: The regional Tilapia aquaculture development plan is developed.

Indicator: Modified regional Tilapia aquaculture development plan is approved by the Regional Government.

* As a preliminary step, the Project WG (working group) for preparation of the development plan was officially set up in the 1st JCC in August 2011 and the group meeting was held 2 times (October 2011 and February 2012) to exchange views and opinions for aquaculture development in the region.

* In the 3rd year of the Project (2013.4-2014.3), sessions to formulate the plan were convened 6 times

with the participation of stakeholders such as MRHP, DRRHP, NGO, and core fish farmers on the initiative of the Project WG.

*As a result, a draft regional tilapia aquaculture development plan for 5 year (2014-2018) including target figures (verifiable indicators), roles and functions of concerned agencies, budget estimate, personnel allocation, and so on, was prepared in January 2014 and has been in the process of official approval by the regional government.

3-2 Summary of Terminal Evaluation Results

Evaluation results based on 5 evaluation criteria are as follows:

- (1) **Relevance: High** The Project is highly relevant with the Malagasy development policies, needs of local communities and Japan's aid policies, too.
- (2) **Effectiveness: Relatively High**
- (3) **Efficiency: Relatively High.**
- (4) **Impact:** Various positive impacts (Institutional, technical and economic aspects) are observed. No negative impacts have been observed so far.
- (5) **Sustainability: Moderate** There is a concern about budget arrangement by the Malagasy side after the Project cooperation period.

3-3. Factors promoting the production of effects

3-3-1. Factors pertaining to planning

No particular factors pertaining to planning were recognized.

3-3-2. Factors pertaining to the implementation process

- (1) Active participation of core fish farmers in the Project activities, such as farmer-to-farmer trainings, not only contributed to the progress of the Project activities, but also contributed to enhance their skills and knowledge on tilapia culture, as a result.
- (2) Various trainings, seminars and workshops conducted under the Project, including overseas training in Japan, and the third countries (Indonesia and Cambodia) were effective to maintain motivation of CPs, core fish farmers, and relevant stakeholders.
- (3) In response to the request by the Project to formulate extension teams in 3 districts, relevant organizations, such as Boeny region, MRHP, DRRHP, etc., assigned staffs quickly and smoothly.

3-4 Factors inhibiting the production of effects

3-4-1. Factors pertaining to planning

No particular factors pertaining to planning were recognized.

3-4-2. Factors pertaining to the implementation process

- (1) In rainy season, flood frequently occurs and causes damage to the irrigation and related facilities, roads and paddy fields, and hampered the progress of the Project. In addition, a part of the target areas, namely, Sumasse, Dirimane, and Rembor, is difficult to access due to lack of road network.
- (2) During the rainfall season from October 2013 to May 2014, severe weather events caused flooding in the northwestern region of Madagascar, and a part of the Project area was inundated and resulted in loss of tilapia through breach of dykes of fishponds.
- (3) Some of the fish farmers in the target area live in isolated areas with road networks undeveloped. In rainy season, roads were damaged and it was significantly difficult to reach the farmers.

3-5 Conclusion

The Joint Evaluation Team conducted the Terminal Evaluation of the Project based on five evaluation criteria, through site inspection, interview to stakeholders (Malagasy CPs, Japanese experts, and core fish farmers, etc.) and a series of discussion with Malagasy governmental officials.

The Project was evaluated as highly relevant with Malagasy development policy and Japan's aid policy and strategy, at the time of Terminal Evaluation. As for Impact, positive impacts were observed in institutional, economic and technical aspects.

The Team confirmed that implementation of activities has been accelerated in the 2nd half of the Project, and indicators of Output and Project Purpose were almost achieved based on available data at the time of the Terminal Evaluation.

Meanwhile, the Team figured out that there were some issues to be dealt with. Although the number of core fish farmers appeared satisfactory, it is observed that some of them need more practical experiences to support neighbor fish farmers. Strengthening of the extension system including farmer-to-farmer extension is necessary, too. These issues slightly lowered the evaluation results of Effectiveness and Efficiency (relatively High).

When it comes to Sustainability, there still remains slight concern in terms of budget allocation to continue tilapia culture in the 3 target districts, as well as insufficient human resources for extension activities.

Based on the verification and analyses, the Joint Evaluation Team considers that the Project Purpose will be achieved around the end of the cooperation period (September 2014 as stipulated in R/D) by focusing on resolving the issues pointed out above during the remaining cooperation period, and assuming implementation of timely follow-up assistance by the Japanese side after the cooperation period.

3-6. Recommendations (Details are in the Chapter 5 of the Joint Evaluation Report)

3-6-1. Recommendations to the Project Team

(1) Clarification of Prioritized Activities

As remaining time is limited, the Project Team is advised to prioritize activities that should be implemented during the remaining cooperation period to ensure sustainability of the Project.

Intensive support to core fish farmers to enhance seed production techniques to ensure their independence, and clarifying the issues and proposing countermeasures in terms of extension system such as further development of core fish farmers network, should be included in the prioritized activities.

Based on the process of clarification and prioritization, increasing the number of Malagasy Cps and hiring new fish farming technicians should be also considered as necessity rises.

(2) Support to Marketing of Tilapia

The Project Team is recommended to give technical advice and information to fish farmers on sales of tilapia to improve marketability, as well as support to promotion activities at the commune level.

(3) Data Collection

In order to evaluate the effectiveness of the Project at the time of Ex-Post Evaluation (3 years after the end of the Project cooperation period), collection of necessary data is required for:

- * Definition of remaining quantitative indicators (Indicator of Overall Goal)
- * Verification of indicators related to fish farmers' income (Indicator of Overall Goal), and
- * Verification of indicators related to capacity development of Extension Staffs (Indicator 3) and core farmers (Indicator 4-1).

Therefore, the Project Team is requested to collect these data by means such as statistic reference, sampling survey, exams, self-evaluations, questionnaires and so on.

(4) Fish Net Cage in the Lake Amboromalandy

The Project Team is recommended to decide, during the cooperation period, how and who to manage the fish net cages in the Lake Amboromalandy after September 2014, including the possibility of removal, unless the Malagasy side is able to secure necessary budget.

3-6-2. Recommendations to the Malagasy Side

(1) Regional Aquaculture Plan

Tilapia Aquaculture Plan in the Region Boeny (2014-2018) was drafted by the Malagasy WG members in February 2014. The Malagasy side is recommended to steadily implement the plan. To improve the feasibility of the plan, it is necessary to continuously update it based on the results and experiences of the Project.

(2) The Role of CDA

Some core fish farmers started growing brood stock, which is preferable from the standpoint of sustainability of the Project. Meanwhile, CDA has been conducting brood stock management since the beginning of the Project. It is expected that CDA will continue the activity and play a central role in brood stock management and improvement of tilapia in Madagascar and assist core fish farmers by providing them with technical advice.

Research activities aimed at improving the performances of local tilapia strains must be carried out at the level of the CDA.

(3) Monitoring of Disbursement by the Core Fish Farmers

The Project has assisted core fish farmers, bearing construction cost of fishpond excavation work as well as necessary materials on the conditions that the farmers will reimburse 20 % of the total cost in kind (tilapia seeds; 50 MGA per head) within 2 years. In this regard, MRHP and core fish farmers exchange MOU in terms of repayment conditions.

As of May 2014, 10 out of 26 core fish farmers have already paid liabilities. The Malagasy side is required to decide who and how to monitor the repayment schedule of core fish farmers who still have liability after the end of the Project cooperation period.

3-6-3. Recommendations to the Japanese Side

The Japanese side is recommended to monitor the Project activities carefully during and after the cooperation period and consider provision of follow-up assistance as necessity rises. The Japanese side is also advised to assist the Malagasy side by offering information on the procedure of application, types of available budget resources (grant aid, counterpart fund, etc.), and so on.

3-7 Lessons Learned

(1) Farmer to Farmers Extension

Before the Project started, there was no governmental framework of extension for aquaculture technologies.

Thus, the Project applied a concept of the farmer-to-farmer approach making the most of motivation of core fish farmers. As of May 2014, 26 core fish farmers are selected and all of them actively participate in the Project activities.

For formulation of a rural development project where the governmental extension structure is weak, farmer-to-farmer extension will be one of useful options