Ex-Post Project Evaluation 2013: Package III-3 (Vietnam, Laos)

November 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

OPMAC Corporation

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

November 2014
Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Socialist Republic of Viet Nam

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Project for Enhancing Functions of Agricultural Cooperatives"

External Evaluator: Tomoo Mochida, OPMAC Corporation

0. Summary

The Project aimed to establish good models for enhancing the functions of agricultural cooperatives (hereinafter referred to as "ACs") which, in turn, would lead to improvement in the livelihoods of the members of three Pilot Agricultural Cooperatives (hereinafter referred to as "PACs") and the surrounding 11 Satellite Agricultural Cooperatives (hereinafter referred to as "SACs")[1] in the two Pilot Provinces (Thai Binh and Hoa Binh provinces) in the north of Vietnam. Under the Project, PACs and SACs were provided with support for formulating mid-term plans based on their members' needs, for formulating and implementing concrete programs for improving their activities and developing their organizations based on the mid-term plans, and for carrying out training for the capacity development of officials and staff of PACs and SACs, and government officials. The Project is highly relevant to Vietnam's development policies and needs, and to Japan's ODA policy towards Vietnam. Generally speaking, all of the Outputs were achieved by the completion of the Project. Although the functions of PACs were enhanced and the results of the Project were utilized in policy documents relevant to the development of ACs, it is considered that good AC models, which are expected to be duplicated in other areas, have not been established yet. Therefore, the effectiveness and impact of the Project are evaluated to be fair. In terms of the Inputs of the Project, as both the Project cost and the period of cooperation exceeded the plan, the efficiency of the Project is evaluated to be fair. No major problems have been observed in the policy background and institutional, technical, financial aspects of the implementing agency and counterparts. Therefore, sustainability of the Project effects is high.

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

[1] There are three PACs in total. They are An Ninh and Binh Dinh ACs in Thai Binh province and Dong Tam 1 AC in Hoa Binh province. On the other hand, there are eleven SACs, six in Thai Binh province and five in Hoa Binh province. The six SACs in Thai Binh province are Trong Quan, Nguyen Xa, Thuy Phong, Quynh Nguyen, Thai Binh Joint Marketing and Hong An ACs. The five SACs in Hoa Binh province are Ba Lam 1, Hoa Son, Mu Rieng, Khu Pheo, and Dan Chu ACs.

1. Project Description

Project Locations

Office of Binh Dinh AC, one of the PACs, in Thai Binh Province

1.1 Background

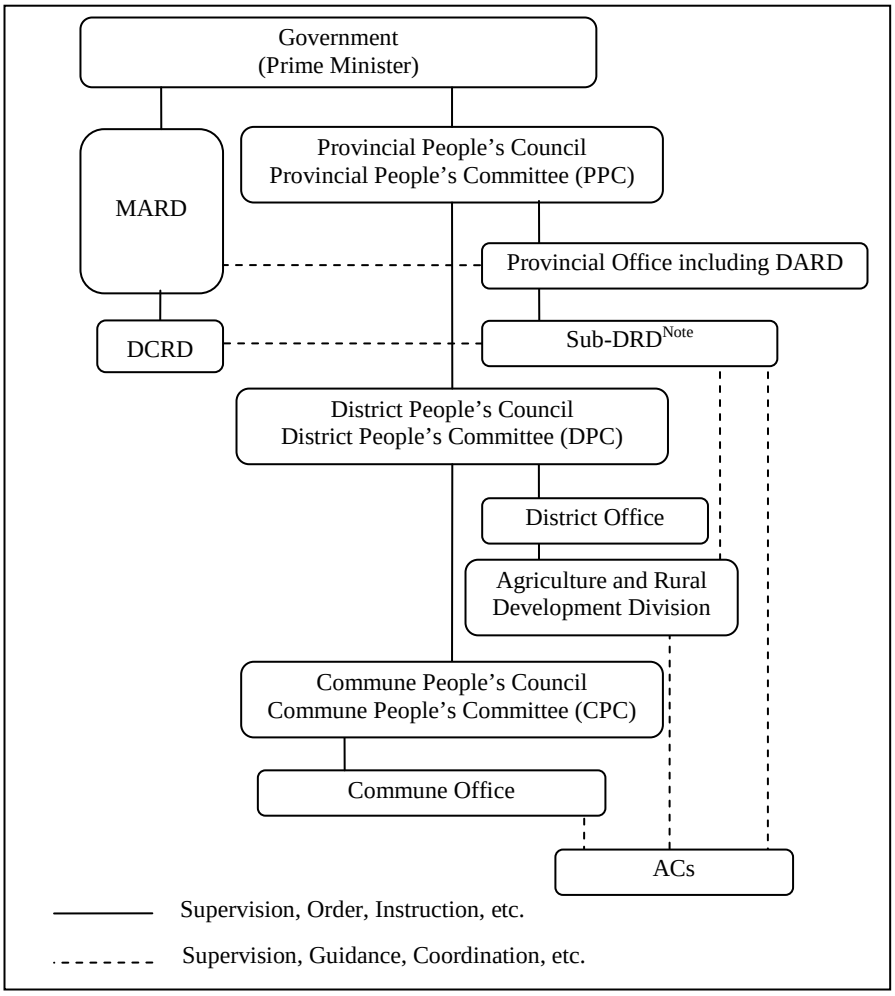
In order to strengthen ACs, the Government of Vietnam strived to transform the old style of ACs into a new regime, establishing new forms of ACs based on the "Law on Cooperatives (1996)". Since 1999, with cooperation from the Japan International Cooperation Agency (hereinafter referred to as "JICA") and other organizations, the Government has actively tried to transform ACs into the new type. With the backing of the Law, there was a total of 9,069 ACs in Vietnam as of the end of November 2004 as the new forms of ACs were established and the old types transformed into the new forms. However, as the activities of the old ACs had centered on primary production, many of the ACs did not carry out processing works and sales of agricultural products on their own initiative. The business functions and management methods of the new ACs followed the style of the old ACs. In addition to this, due to lack of experience and ability on the part of management officers and staff at ACs, efforts to engage in businesses, such as processing of agricultural products, joint purchase of materials for production, joint sales of agricultural products and internal credit businesses, were too slow to meet the high expectations of AC members.

The Project aimed to establish good AC models to strengthen the functions of ACs, which would lead to an improvement in the livelihoods of members. For this purpose, the Project supported the preparation of mid-term plans (three to five years) based on the needs of AC members, the promotion of business activities and organizational development based on the mid-term plans, and capacity development of AC management officers and staff, and government officials. After the completion of the Project, AC models developed under the Project are expected to be recognized as AC models for the improvement of farmers' livelihoods widely in Vietnam, with the models utilized not only in the northern region but also in the other regions of Vietnam.

1.2 Project Outline

Overall Goal		AC models made by the Project are recognized as AC models for improving farmers' livelihood in Vietnam, and the models are utilized in not only in Northern Region but also in the other regions of Vietnam.
Project Purpose		Good models for enhancing of functions of ACs that lead the members' livelihood improvement are established in Pilot Provinces.
Outputs	Output 1	Activities of the PACs & SACs are improved.
	Output 2	Organizational development of the PACs and the SACs is promoted.
	Output 3	Capacity of the related officials and staff of PACs and the SACs is enhanced.
	Output 4	Capacity of public officials in the Pilot Provinces to strengthen functions of agricultural cooperatives is enhanced.
Inputs		<Japanese Side> 1. Experts: 7 experts 6 long-term, 1 short-term 2. 23 Trainees received in Japan 3. 19 Trainees for Third-Country Training Programs (10 for Thailand and 9 for the Philippines) 4. Equipment: 17 million Japanese yen 5. Local cost:85 million Japanese yen 6. Construction cost of three AC offices: 46 million Japanese yen <Vietnamese Side> 1. 16 Counterparts 2. Land and Facilities: Project offices (Ministry of Agriculture and Rural Development (hereinafter referred to as "MARD"), and Department of Agriculture and Rural Development (hereinafter referred to as "DARD") in Thai Binh and Hoa Binh provinces), land for offices at PACs 3. Local Cost: 3.0 billion Vietnamese dong (VND)[2]
Total Cost		509 million Japanese yen (JPY)
Period of Cooperation		March 2006 – March 2010 with an extended period from March to September 2010
Implementing Agency		MARD, Department of Cooperatives and Rural Development (hereinafter referred to as "DCRD")
Cooperation Agency in Japan		Ministry of Agriculture, Forestry and Fisheries
Related Projects		<Technical Cooperation> - Training for AC chairpersons in Vietnam (1999 - 2004) - Conferences on acceleration of establishment of ACs in the south (2001 - 2003) - Dispatch of Japan Overseas Cooperation Volunteers (hereinafter referred to as "JOCV") - Dispatch of experts for ACs (1998 - 2005) - Project for enhancing functions of agricultural cooperatives Phase 2 (2012 – 2015) <Multilateral Institutions> - Strengthening the competitiveness of smallholder farmers (The World Bank, 2008 - 2014) - Developing Business with the Rural Poor Programme (International Fund for Agricultural Development, 2008 - 2014)

[2] The Vietnam dong (VND) is the unit of local currency in Vietnam. The JICA exchange rate is 0.0048 VND/JPY (December 2013).



Note: Sub-DRD is a sub-department under DARD.

Figure 1: Relations among relevant organizations

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of the Project Purpose at the time of the Terminal Evaluation

MARD issued to the respective provinces a guideline regarding the mid-term plans, which form the backbone of the good AC models. At the time of the terminal evaluation, ACs supported under the Project were evaluated, and it was found that they had effectively introduced a cycle to prepare mid-term plans based on the practical needs on site and to implement them at the respective ACs. As businesses were expanded, it was noted that many ACs recorded increasing turn-overs and at the same time, contributed to the establishment of good AC models that would lead to improvements in the livelihoods of members. Although attention should have been paid to see the progress of the respective business activities, it was considered that the Project Purpose was likely to be achieved if ACs continued to carry out these activities.

1.3.2 Achievement of the Overall Goal at the time of the Terminal Evaluation

Among the ACs assisted by the Project, some had been recognized as successful cases by related organizations in Vietnam. If experiences from these cases, which would be regarded as models, were shared, and mutual efforts to learn from the cases spread, it was considered that the Overall Goal (AC models made by the Project are recognized as AC models for improving the livelihoods of farmers in Vietnam) was likely to be achieved. However, with regard to the dissemination of the models to regions other than the north, further examination was needed as the historical background to the establishment of new ACs, the development of agriculture and the progress of the market-economy were different in some regions.

1.3.3 Recommendations at the time of the Terminal Evaluation

The cooperation period of the Project was extended by half a year in order to accelerate the following works, which had yet to be achieved under the Project at the time of the terminal evaluation. Recommendations and actual responses for the extended cooperation period of the Project are described in the table below:

Short-term issues to be handled during the extended period of the Project	
Recommendations	**Measures taken**
(1) Wrap-up of the Project for the wider deployment of good AC models	
Review of relationship between the strengthening of AC functions and the management of agriculture	Preparation of surveys on the utilization of ACs and the relationship between the enhancement of the functions of ACs and improvements in the livelihoods of AC members were carried out for AC members who participated in the Project. However, the results have not been confirmed.
It is necessary to wrap up the activities and the manuals of the Project, and establish a `tool` for implementing training and guidance on AC activities in other areas.	The preparation of extension tools and education and training activities were continued as measures towards wider deployment of good AC models. Although the concrete contents of the extension tools were not confirmed, support for the preparation of mid-term plans and mid-term plan formats led to the issuance of MARD Guideline in May 2010.
Measures to promote understanding on ACs and to meet changes in perspectives of AC members and other farmers.	Measures to promote understanding of ACs were continued. Leaders of crop production groups were not invited to the training, but JICA experts attended meetings of AC members, which were held to assist the formation of crop production groups for joint sales
Necessity for the Project to commit itself not only to PACs but also to SACs	Support was continued. For example, six SACs were provided with personal computers in relation to the internal credit businesses.
Advice on the criteria for a “good AC” in order to make use of knowledge acquired through the Project	At the time of the terminal evaluation, the concept of good AC models was streamlined, but it was not shared with related organizations in Vietnam. However, the “Overall Rating of Vietnam Agricultural Cooperatives” is being utilized in the second phase of the Project.

Short-term issues to be handled during the extended period of the Project	
Recommendations	**Measures taken**
(2) Development of AC business activities	
In order to take measures to solve the problems of the existing AC business activities, the Project should be continued for at least one more cropping period under the guidance of the experts.	The Project cooperation period was extended by six months and activities were continued under the guidance of the experts.
It is necessary to take into consideration differences between the conditions and levels of AC business activities in Vietnam and those in Japan, when technology transfer for the Japanese AC model is conducted.	Differences between the conditions and levels of AC business activities in Vietnam and those in Japan were taken into account when technology transfer for the Japanese AC model was conducted.
Among the issues of AC business activities, there are issues that ACs cannot handle by themselves. It is important that the Project makes policy recommendations to DARD and MARD.	Although it was not a policy recommendation made directly from the Project, DCRD pointed out the Prime Minister Decision No.62 (62/2013/QĐ-TTg) as an example of a policy document that reflected the results of the Project. It is thought that the decision reflects the results of the Project as the counterparts were engaged in the drafting of it. As a concrete example, the decision incorporates measures to assist the strengthening of links between production and the sales of agricultural products. In this regard, a relation with joint sales, which was promoted under the Project, can be assumed.

In addition, it was decided that activities needed to be continued at least for about five years in order to evaluate the extent to which business activities would take root and the effectiveness of them. Recommendations to be taken into account when good AC models were to be disseminated to the central and south regions are shown below, together with the measures which had been taken by the time of the ex-post evaluation.

Medium- and long-term issues after completion of the Project	
Recommendations	**Measures taken (at the time of the ex-post evaluation)**
Development of existing business activities at PACs and SACs in parallel with deployment into other regions	In formulating the second phase of the Project, it was decided to continue support for PACs and some SACs, which were assisted during the first phase. Therefore, depending on necessity, they are in a position to avail themselves of additional guidance.
It requires input of capital to implement mid-term plans. It is necessary to examine how to secure the required capital for deployment into other regions.	At the time of the ex-post evaluation, increase in capital had not been confirmed at PACs. Among the ACs that participated in the second phase, DCRD reported that there was an AC that had mobilized contributions and increased its capital.
There are differences between the central and south regions and the north region in terms of the history behind the establishment of new ACs, the conditions of the distribution of agricultural products and development of the market-economy. Therefore, sufficient study and analysis will be required.	It was not confirmed what measures had been taken.

Meanwhile, it was found that in the conclusions drawn at the time of the terminal evaluation, some of the relevant points had not been reflected in the recommendations. Furthermore, some recommendations found in the Japanese version of the terminal evaluation report were not identified in the English version.

2. Outline of the Evaluation Study

2.1 External Evaluator

Tomoo Mochida, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: October 2013 – November 2014

Duration of the Field Study: December 12, 2013 to January 6, 2014 and
March 15 to 21, 2014

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

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of Vietnam

At the beginning of the Project, it was considered urgent as well as important that the organizational capacity and business activities of ACs were strengthened in order to contribute to the ”reduction of poverty in rural areas” and to form remedial measures against “disparity between agriculture and industry” and “disparity among regions”. In the “Five Year Socio-Economic Development Plan (2006-2010)”, which was in preparation at that time, promotion of, and support for, the development of ACs was an important policy issue, following the policy of the previous five year plan. In addition to these development plans, at the time of completion of the Project, it was considered important that cooperatives, etc. were set up in the “National Target Program on Building a New Countryside during 2010-2020” (Prime Minister’s Decision No. 491 (491/2009/QD-TTg). Later in 2013, MARD Circular No.41 (41/2013/TT-BNNPTNT) set criteria for effective ACs in connection with the said Prime Minister’s Decision. Furthermore, after commencement of the Project, cooperation was sought with the JOCV activities of JICA. As a result, volunteers in the field of vegetable cultivation and village development and extension work were dispatched and technical cooperation activities were carried out with the management officers, staff and members of ACs .

The Project, which aimed to enhance the functions of ACs, is highly relevant to national policies such as the “Socio-Economic Development Plan” and the “national target program on building a new countryside”.

3.1.2 Relevance to the Development Needs of Vietnam

At the beginning of the Project, in order to effectively increase the income of small-scale farmers amid the development of a market economy in the agricultural sector, it was considered necessary to establish new types of ACs through voluntary cooperation among farmers, on their own initiative, which could generate economic benefit from a larger scale of operations, and

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

[4] ③: High, ②: Fair, ①: Low.

strengthen their business activities and management. However, for many ACs, the activities of their previous forms had centered around agricultural production. At the same time, they followed the operation methods of the previous forms of ACs in terms of business functions and management methods. In addition, due to lack of experience and capacity on the part of management officers and staff at ACs, the progress of measures formed to undertake the processing of agricultural products, the joint purchase of input materials for production, the joint sales of agricultural products, internal credit businesses and so on, was too slow to meet the high expectations of AC members.

Under these circumstances, the Project aimed at strengthening the organizational and business operation capacity of ACs, which would lead to an improvement in the livelihoods of AC members in the two provinces[5] in the north, at the establishment of good AC models in Vietnam and at the dissemination of lessons learnt and other results in the northern region and provinces in regions other than the northern region. It is recognized that the Project met the needs of the recipient country and the priority issues of its policy.

Also at the time of completion of the Project, it was confirmed that the Project met the respective needs of the target group such as MARD, DARD and the management officers and staff of ACs. In particular, with regard to the consistency between the needs of the management officers and staff of ACs and the Project activities, government officials from the provinces as well as management officers and staff of ACs pointed out that the Project had facilitated changes in the attitude of the ACs who used to carry out activities under the old regime of AC management, had made contributions to improvements in the capacity of the management officers and staff of ACs (such as in the preparation of midterm plans, new business activities, capacity strengthening of ACs, and so on), had helped them expand their knowledge regarding joint purchases and the management of ACs through training inside and outside of Vietnam, had improved their operation capacity through the introduction and utilization of office equipment, and so on. Thus, the Project is highly consistent with the development needs.

3.1.3 Relevance to Japan's ODA Policy

In Japan's Country Assistance Program for Vietnam (April 2004) the existence of a large

[5] In selecting the Pilot Provinces, the following four criteria were applied in the ex-ante evaluation and preparatory study mission report in 2005: 1) priority in Vietnam as well as Japan's priority in ODA (priority regions for development for "reduction of poverty" and "remedy for economic disparity among regions"); 2) degree of easiness in cooperation with MARD; 3) readiness of local governments of Pilot Provinces to implement the Project and their relations with ACs; and 4) relations with the programs of other donors and NGOs. The report states that "out of the northern region, which is characterized with a higher rate of ACs and which is a priority region for 'reduction of poverty' and 'remedy for economic disparity among regions' mentioned in the objectives of national socio-economic development, Thai Binh and Hoa Binh provinces were selected. The business activities of ACs in Thai Binh province are relatively active while those of ACs in Hoa Binh province are, in general, lagging behind". From this statement, it can be assumed that areas with different characteristics were selected in order to ensure general applicability of models. Furthermore, geographically, access to these two provinces from Hanoi is relatively good. Therefore, it is recognized that selection was made in consideration of the degree of easiness in carrying out the Project activities.

poor population and economic disparity among regions were regarded as development challenges. In the fields of agriculture and rural development, under the “improvement in lifestyle and social aspects”, one of the three pillars of the assistance program for Vietnam, priority for assistance is given to the establishment and management of organizations to support farmers as measures to raise income and diversify its sources. In light of the above, the Project was considered to be highly consistent with Japan’s ODA Policy.

3.1.4 Appropriateness of the Project Plan and Approach

According to the ex-ante project evaluation and preparatory study mission report, SACs other than PACs were selected in respective districts in the provinces for the identification of common issues among Vietnamese ACs so that the general applicability of the models to be established under the Project could be ensured. It was planned to provide SACs with opportunities to attend training at PACs. In particular, they were to be given opportunities to learn the methods of conducting needs surveys and preparing mid-term plans that would form the basis for launching new activities, improving existing activities and developing organizations. These were scheduled mainly at PACs. On the other hand, PACs were not necessarily expected to play an active role in disseminating models. They were, instead, requested to share their experiences through the provision of venues for training and the reception of study tours from ACs other than SACs. However, at the time of the ex-post evaluation, it was confirmed that in many cases SACs had been provided with limited opportunities for training. In addition, while physical inputs such as AC offices and drying facilities were granted to PACs, physical support to SACs, other than the provision of office equipment, was limited. As a result, this unequal treatment of PACs and SACs generated a sense of unfairness among participating ACs, partly leading to a decrease in the effectiveness of training.

As a result of the above, a feeling of unfairness emerged among participating ACs, whereas it can be presumed that, in addition to the identification of common issues among ACs in Vietnam in order to ensure general applicability of the models, the reason for the adoption of this type of approach was that it could aim to verify the extent of the effectiveness of the dissemination of the practical experiences of PACs to SACs under conditions where no inputs were expected from external organizations (i.e., the conditions generally applicable to those ACs not supported by the Project). It is not always considered necessary that SACs be set up in order to identify common issues and verify the effectiveness of dissemination. Instead, these issues could be handled by examining the conditions of ACs other than those supported by the Project and by providing training opportunities widely to those ACs.

However, as for the position of “SACs”, it cannot be denied that the Project aimed at assuring continuing participation of specified ACs in Project activities such as training by grouping them as SACs, like a group with a fixed membership, instead of dealing with an

unspecified or unfixed number of ACs.

As described above, although there is a room for improvement in the approach, a certain level of rationale behind the selection of SACs at the planning stage of the Project cannot be denied. Therefore, it cannot be said that the Project plan encompassed such fundamental problems as to downgrade the evaluation of its relevance.

In light of the above points, implementation of the Project is considered to have been highly relevant to the country's development policy and development needs, as well as Japan's ODA policy, although there is some room for improvement in terms of approach. In conclusion, relevance of the Project is high.

3.2 Effectiveness and Impact[6] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

1) Output 1: Activities of the PACs and SACs are improved.

At the 14 ACs, both PACs and SACs, needs surveys were conducted to improve the activities of ACs. Mid-term plans (three to five years) were then prepared by the management officers and staff at ACs based on the survey results. Through training and the provision of information to strengthen activities such as joint sales, internal credit businesses, joint use of agricultural machinery and so on, methods for business activities were improved, efforts were made for new activities and development of the organizational set-up of activities was facilitated. In addition, offices and facilities necessary for these activities were identified and developed at the three PACs.

Indicator 1-1: 10 manuals for business function improvement of the PACs and the SACs are developed.

By the time of the terminal evaluation, manuals and other documents that covered important aspects of the business activities of ACs had been prepared (these included a total of 10 types, such as those covering the joint marketing business of advanced cooperatives and simple software for the management of loans and savings; out of these, three types were yet to be distributed).

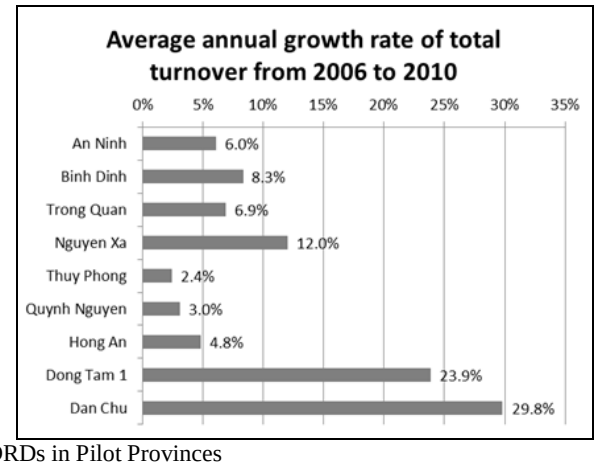
Among the above materials, some manuals and other documents were distributed nationwide. According to answers to the questionnaire from the Sub-Departments of Rural Development (hereinafter referred to as "Sub-DRD") it was confirmed that, at the time of the ex-post evaluation, Sub-DRDs and other organizations and/or ACs in Thai Binh and Hoa Binh provinces had received the manuals, etc. The external evaluator checked the availability of distributed manuals and other documents at the ACs he visited. As three to five years had

[6] Sub-rating for Effectiveness is to be included with consideration of Impact.

already passed since the time of distribution, the whereabouts of some manuals and other documents could not be confirmed. However, making a comprehensive judgment on the basis of confirmation at the time of the terminal evaluation and the answers from Sub-DRDs at the time of the ex-post evaluation, it can be said that the manuals and other documents were utilized to some extent (or were utilized in the drafting process) by the time of Project completion, contributing to the improvement and enhancement of business activities at PACs and SACs. Accordingly, the indicator 1-1 was fulfilled.

Indicator 1-2: Growth rate of total turnover of each PAC marks 8%.

During the period from 2006 to 2010, the growth rates of the total turnover of An Ninh AC and Binh Dinh AC in Thai Binh province were 6.0% and 8.3%, respectively. Dong Tam 1 AC in Hoa Binh Province recorded a growth rate of 23.9% (all figures in nominal terms). Two ACs achieved the target rate of 8% per year while one AC did not. Accordingly, the achievement of this indicator is fair[7].



Source: Sub-DRDs in Pilot Provinces
Note: Ba Lam 1 AC started new business activities in 2009, and the average annual growth rate from 2006 to 2010 was calculated at 189.8%. Therefore, the record for Ba Lam 1 AC was excluded from the above figure.

Figure 2: Average annual growth rate of total turnover from 2006 to 2010

Indicator 1-3: At least one business activity is started in each PAC newly.

At the time of the terminal evaluation, there were six new business activities at the three PACs and 19 new activities at nine SACs, including joint sales and internal credit businesses. Because these businesses were at an early stage, the accumulation of experience and the number of participating members were limited. Furthermore, it was deemed necessary to examine the results of the business activities, which had not been sufficiently evaluated at that

[7] The growth rate used at the time of the terminal evaluation was also nominal. As the average annual inflation rate and the average GDP deflator during the period were 10.9% and 11.1%, respectively, the turnover decreased in real terms at some ACs. The reason for the use of the nominal growth rate of 8% as an indicator is not known.

time, together with the implementation and adjustment of the mid-term plans after the next cropping season was completed (from July to August 2010). At the time of the ex-post evaluation, the external evaluator visited three PACs and four SACs. Based on interviews with concerned personnel of ACs, it was confirmed that at the time of Project completion, these seven ACs at least were carrying out new business activities, which had been confirmed at the time of the terminal evaluation.

The indicator 1-1 was achieved while the indicator 1-3 can be presumed to have been fulfilled. However, there were some PACs and SACs that did not reach the targets set for total turnover at the time of the Project completion. As the indicator 1-2 was not achieved, the extent of the achievement of Output 1 is evaluated to be fair.

2) Output 2: Organizational development of the PACs and the SACs is promoted.

Based on the needs survey of AC members, mid-term plans were prepared for organizational development. Concrete programs for development were then implemented based on the mid-term plans. Manuals such as “manuals for developing mid-term plans” and the “manual for organizing a general meeting in an agricultural cooperative” were elaborated and distributed. In parallel, seminars were carried out and the experts visited PACs and other ACs to provide guidance.

Indicator 2-1: 5 manuals for developing organizational functions of the PACs and the SACs are developed.

By the time of the terminal evaluation, seven types of manuals and other documents that covered important aspects of organizational development had been elaborated and distributed (a guideline concerning development of mid-term plans was scheduled to be delivered and the “self-evaluation format for the management of agricultural cooperatives” was at the final emendation stage). Some of the manuals were scheduled to be distributed to all provinces and cities in Vietnam by December 2009.

At the time of the ex-post evaluation, according to answers to the questionnaire from Sub-DRDs in Thai Binh and Hoa Binh provinces, it was confirmed that Sub-DRDs and other relevant provincial offices and/or ACs had received the manuals, etc. At the ACs visited by the external evaluator, confirmation was made of the existence of only some of the manuals and other documents. However, judging from the facts confirmed at the time of the terminal evaluation as well as the answers from Sub-DRDs at the time of the ex-post evaluation, manuals (and/or its draft) and other documents relevant to organizational development were utilized , mainly by AC management officers and staff, by the time of the Project completion, thus contributing to the organizational development of ACs. Accordingly, it is considered that the indicator 2-1 has been fulfilled.

Indicator 2-2: At least one members' group aimed at organizational strengthening is formed in each PAC.

At the time of the terminal evaluation, all the PACs set up farmers' groups in order to carry out joint sales activities. However, farmers' groups were organized only starting from that time and therefore their accumulated experience and the number of participating AC members were limited. At the same time, it was found necessary to examine the process from primary production to sales. Meanwhile, no guidance was given to SACs nor farmers' groups organization was proceeded yet at SACs. The conditions of crop-based farmers' groups at the PACs visited by the external evaluator during the period of the ex-post evaluation are shown in Table 1 below. With regard to SACs, joint sales operations were carried out at neither Mu Rieng nor Hoa Son, both of which were ACs in Hoa Binh province visited by the external evaluator. Farmers' groups had been organized at Trong Quan and Nguyen Xa ACs in Thai Binh province. However, although the farmers' group at the former AC (Trong Quan) was linked to the joint sales operations, the characteristics of the farmers' group at the latter AC were not clear.

Table 1: Changes in the number of farmers' groups and members at PACs that were engaged in joint sales activities

Name of AC	**2009**	**2010**	**2011**	**2012**	**2013** Note 1
Thai Binh province					
An Ninh	3 groups (185 persons)	3 groups (200 persons)	3 groups (210 persons)	3 groups (200 persons)	3 groups (200 persons)
Binh Dinh	5 groups (587 persons)	2 groups Note 2 (53 persons)	4 groups (354 persons)	7 groups (691 persons)	8 groups (1,817 persons)
Hoa Binh province					
Dong Tam 1	2 groups (40 persons)Note 3	2 groups (40 persons)Note 3	2 groups (40 persons)Note 3	2 groups (40 persons)Note 3	1 group (20 persons)Note 3

Source: JICA Project Office for the Project for Enhancing Functions of Agricultural Cooperatives in Vietnam (Phase 2) for the data for An Ninh AC from 2009 to 2011, and the data for Binh Dinh AC and Dong Tam 1 AC from 2009 to 2012. An Ninh AC for the data from 2012 to 2013. Binh Dinh and Dong Tam 1 AC for the data for 2013.
Note 1: Agricultural products for the joint sales activities were watermelon, paddy seeds, potatoes and other vegetables at An Ninh AC, paddy seeds at Binh Dinh AC and maize at Dong Tam 1 AC.
Note 2: Due to the poor harvest of seed paddies, three groups were dissolved.
Note 3: The number of members per production group was limited to 20. Other farmers sell products under the name of the members. During the interview at Dong Tam 1 AC at the time of the ex-post evaluation, there was only one group (20 persons) in 2013 and it was said that there was only one production group operating.

As an example, the operations of the joint sales activities for potatoes at An Ninh AC were described as follows:

Column: an example of joint sales at An Ninh AC

Interviews with the management team of a joint sales group at An Ninh AC, one of the PACs, revealed that their conditions of operation were as follows:

(a) Agricultural products handled: potatoes, etc. (handling volume: 300 tons/year)

(b) Number of management team members for joint sales activities: 2 persons

(c) Number of household members for joint sales activities: 50 households

(d) Schedule (for potatoes)
October: conclusion of a contract between An Ninh AC and the company (prices and the contents of technical assistance are negotiated)
November: land preparation and planting (potato cultivation starts after the second season of the water paddies is finished)
January to February: harvest and sales before the Vietnamese new year (Tet). The standard time from planting to harvesting is 85 days after planting. However, the price tends to increase before the Tet New Year, and harvesting tends to take place before the New Year even though the potatoes are small.

Photo 1: the building on the above photo is a village culture house. Members bring potatoes to the front yard of the house. After selection, the company collects potatoes.

(e) Potato seeds: Potato seeds are provided by the company. There is an arrangement for the payment for potato seeds. It works as follows: fifty percent of the seeds price is paid when seeds are received while the remaining half is deducted from the sales price when potatoes are sold.

(f) Collection and sales price of potatoes: members bring potatoes to the front yard of the village cultural house and the company collects them after selection. The company sets three days for the collection of potatoes. Potatoes that meet the standards of the company are categorized into two classes (A and B) with different prices attached to each class. Sales prices are also changed depending upon the volume of sales. Sales prices are determined through negotiations between An Ninh AC and the company before the contract is concluded. During negotiation, members are consulted by the AC about the level of sales prices.

(g) Payment: within 15 days after collection of potatoes, money is transferred into the bank account of the AC and each member is directly paid by the AC.

(h) Role of management team for joint sales: the management team consists of two persons. They receive information on the contents of the contract from the AC and hold meetings with members to discuss the harvesting schedule, etc. For management, they receive a fixed amount of payment per unit weight (a commission system based on the sales volume)

(i) Support from the company: the company sends experts in order to provide training, to monitor cultivation activities and give information about the time to pick up harvested products.

(j) Comments from the joint sales management team: joint sales activities contributed to an increase in income with the following factors: (1) the company offers higher purchase prices than the prices offered by middlemen; (2) the company provides members with technical support in planting, maintaining and monitoring; and (3) sales prices are fixed under the contract.

As described above, it was confirmed again at the time of the ex-post evaluation that farmers' groups for joint sales activities had been formed at the three PACs. However, the formation of groups was not confirmed at all the ACs including the SACs. Therefore, the achievement of Output 2 is evaluated to be fair.

3) Output 3: Capacity of the related officials and staff of the PACs and the SACs is enhanced.

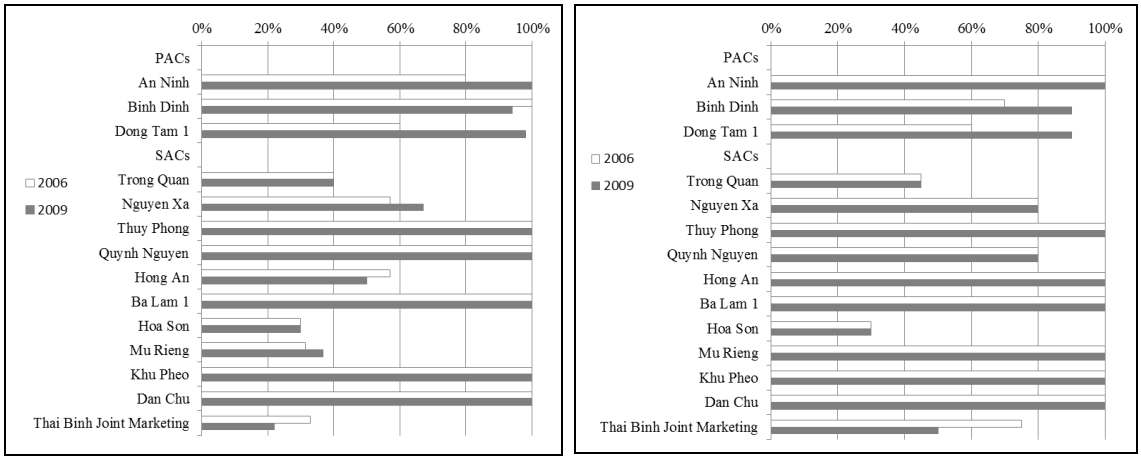
Seminars such as “seminars on the preparation of mid-term plans”, “seminars on internal credit business” and “seminars on joint marketing” were carried out, and study tours in Japan and third countries such as Thailand and the Philippines were conducted.

Indicator 3-1: All related officials and staff of the PACs and the SACs participate in trainings for agricultural cooperative development.

Indicator 3-2: The participants’ degree of satisfaction towards the training for agricultural cooperatives development is more than 70%.

Indicator 3-3: 70% of the related officials and staff of the PACs and the SACs are well aware that their capacities are developed by their participation in this project.

According to the answers to the questionnaires from the respective ACs at the time of the terminal evaluation, the level of satisfaction of the training for management officers and staff of ACs and the self-evaluation of the effects of the training varied from AC to AC, but were high in general. In concrete terms, with regard to the indicator 3-1, the participation ratio of PACs ranged from 60% to 100%, showing an increasing trend as time went on. On the other hand, that of SACs ranged from 30% to 100%, with variations among SACs (the left-hand side of Figure 3 below). With regard to the indicator 3-2, most of the participants responded “highly satisfactory” and “satisfactory”. If weight is given to their answers for quantification, a calculation of 79.1% out of the total score of 100% can be made. With regard to indicator 3-3, the ratio of respondents who acknowledged that they improved their capacity through training ranged from 60% to 90% at PACs and from 30% to 100% at SACs (the right-hand figure of Figure 3 below). A calculation of 81.9% is made if weight is given to their answers for quantification. Also, in the answers from AC members to the questionnaires, it was clear that there was an appreciation of improvements in the capacity of management officers and staff at ACs although differences were observed among ACs.



Source: The terminal evaluation report of the Project, January 2011

Figure 3: Comparison of the records between 2006 and 2009 for the participation ratio of management officers and staff of ACs in the training (above left) and the ratio of management officers and staff of ACs who recognized capacity enhancement through the training (above right)

At the interviews with SACs made by the external evaluator when he visited at the time of the ex-post evaluation, there were claims that there had been limited chances to participate in training (that chances was given to chairpersons, mainly) in comparison with PACs, and that there was a shortage of the skills necessary to conduct needs surveys for the preparation of mid-term plans and of the financial resources[8] to implement the plans. On the other hand, a chairperson at one PAC pointed out that since an AC at an advanced level of development would pursue a higher level of development, they would also pursue a higher level of needs. According to the chairperson, ACs participating in the same training should be at the same level of development. The chairperson also commented that, as it was not appropriate for those from ACs located in mountainous areas to visit ACs located in flatlands, the destination of the study tours should be selected based on the geographic conditions of the corresponding ACs.

As described above, some ACs found room for improvement in terms of the contents and methods of training. However, the indicators were, in general, fulfilled and the capacity of management officers and staff at PACs and SACs were more or less enhanced through the Project activities. It was evaluated that Output 3 was achieved.

[8] Inputs in SACs from the Project were smaller in comparison with those in PACs. Some SACs pointed out that they did not have their own offices and storage so they faced problems in enhancing their functions. These ACs did not seem satisfied with the explanations and the reasons behind the differing degree of support from the Project to ACs, although the Project did explain the reasons to them. Therefore, the possibility that differing treatment by the Project might have influenced the participation ratio and level of their satisfaction cannot be denied. In addition, at the Sub-DRD in the Pilot Province visited by the external evaluator, a government official pointed out a case where trust in the management officers and staff of ACs was undermined to a certain extent because mid-term plans were not implemented as planned at some ACs.

4) Output 4:Capacity of public officials in the Pilot Provinces to strengthen functions of agricultural cooperatives is enhanced.

Activities were carried out in such a way that provincial officials attended training prepared for the management officers and staff of ACs, which is related to Output 3.

Indicator 4-1: All related public officials in the Pilot Provinces participate in the trainings for enhancing their capacities.

Indicator 4-2: The participants' degree of satisfaction towards the trainings is more than 70%.

Indicator 4-3: 55% of public officials are well aware that their capacities are developed by their participation in this project.

According to the survey at the time of the terminal evaluation, the participation ratios of local government officials such as DARD ranged from 80% to 100% in Hoa Binh province (an actual total of 29 against a planned total of 32 participants) and from 70% to 100% in Thai Binh province (an actual total of 35 against a planned total of 46 participants). Most of the participants responded that their degree of satisfaction was "highly satisfactory" or "satisfactory" on a four-point scale for evaluation. Although the participation ratio did not reach 100%, it is considered that the indicator was, in general, fulfilled. Meanwhile, training was not conducted specifically for government officials in the Pilot Provinces, but government officials participated in the training prepared for the management officers and staff of ACs, an activity for Output 3. As a result, government officials, management officers and staff attended the training with a same role although their educational backgrounds, positions and the contents of their tasks were different[9]. In terms of self-evaluation on effects of training, all participants recognized that they improved their capacity through the training.

At the time of the ex-post evaluation, instead of asking questions on specific training carried out during the cooperation period of the Project, questions were raised on the effects of the training and seminars in general[10]. The response to the questions from Sub-DRD in Hoa Binh province indicated improvement in the capacity of staff through the Project activities. The comments from Sub-DRD in Thai Binh province were related to the accumulation of knowledge and experience in the field of management, and the application of these to accomplish their works and to prepare provincial policies, through participation in training and study tours inside and outside of Vietnam. There were also comments on improvement of effectiveness of their

[9] In the second phase of the Project, the system was improved in such a way that government officials could provide guidance to management officers and staff, etc. of ACs.

[10] During the cooperation period of the Project, seminars on joint marketing, seminars on mid-term plans, training seminars on the joint utilization of agricultural machinery and so forth were carried out. As it was considered difficult to ask questions relating to specific seminars, which were held several years before, the questions were generalized into "seminars/trainings undertaken by the Project" in order to make it easier for the participants to answer.

work through capacity enhancement carried out under the Project. At ACs visited by the external evaluator, some positive comments were made, such as: "government officials have come to pay more attention to assist ACs" while others, particularly from SACs, made comments on the shortage of specific assistance by the government officials on site, saying: "no one come to support us" and "no assistance was given".

Through the Project activities, the capacity of government officials in the Pilot Provinces can be considered to have been enhanced in order to promote and strengthen the functions of ACs by assisting in the preparation of their plans and so forth. Accordingly, Output 4 has been fulfilled.

3.2.1.2 Achievement of Project Purpose

Project Purpose: Good models for enhancing of functions of ACs that lead the members' livelihood improvement are established in Pilot Provinces.

1) Indicator 1: Guidelines on good models of AC are made.

Under the Project, assistance was given for the preparation of mid-term plans, with the aim of enabling ACs to work out plans based on the needs and consensus of members instead of following government instructions as they did during the old regime of ACs. The mid-term plans are supposed to incorporate types of business activities in high demand from members, amid market-oriented economic reform, such as joint sales, joint purchases, internal credit businesses and so on. Subsequently, ACs are expected to implement the plans. With regard to the preparation of the mid-term plans, which form an essential part of good models, a guideline (224/KTHT-HTTT) dated May 10, 2010 was issued by MARD to DARDs in the respective provinces[11]. The guideline explained the effectiveness of the preparation of a mid-term plan and gave the format. Prior to issuance of the guideline, DCRD organized workshops for representatives of Sub-DRDs and ACs from 63 provinces in order to have their comments.

However, although the mid-term plans are supposed to form an essential element of good models, it is difficult to treat the said guideline as a guideline for good AC models. At the time of the terminal evaluation, the concept of "good AC models" was streamlined to ACs whose organizational management and business activities can serve as a guide, or a model, to improve and enhance organizational as well as business management of other ACs[12]. However, when the Vietnamese counterparts (i.e., officers in charge at DCRD and Sub-DRDs in Hoa Binh and Thai

[11] According to the Project Mid-term Review Report (May 2008), MARD introduced mid-term plans to ACs outside the Project target areas and uploaded some examples of the plans at its website.

[12] At the time of the terminal evaluation, the concept of good AC models was summarized as follows: (1) operation and management in a democratic way through improvement of the organization of AC management and business activities; (2) contribution of business activities to the improvement of the livelihoods of members; (3) sound financial conditions with stable revenues and expenses; (4) provision of proactive and continuous education and training to members, management officers and staff of ACs; and (5) efforts to enhance cooperation and collaboration with governments and other relevant organizations.

Binh provinces) were interviewed at the time of the ex-post evaluation, this concept of good AC models had not yet been shared with them.

At the time of the terminal evaluation, DARD in Hoa Binh province indicated their intention to make use of Dong Tam 1 AC as a model for the development of ACs in the province while MARD acknowledged that Nguyen Xa AC, one SAC in Thai Binh province, was an AC that had successfully carried out their internal credit business. Also in the recommendations of the terminal evaluation report, it was said to be difficult to establish business models within one to two years in the agricultural sector, which is usually affected by climate, and supply and demand conditions, when good AC models are to be disseminated to the central and southern regions. It was found necessary that business activities should be continued for about five years at least in order for them to be well established. It was considered more appropriate to evaluate the effect after that.

At the time of the ex-post evaluation, the Vietnamese side commented that PACs were good ACs and good models[13, 14]. However, one official at Sub-DRD in the province visited by the external evaluator said that good AC models and good ACs were different and although PACs could be regarded as good ACs, they were yet to become models for other ACs. He observed that good AC models, characterized with general applicability, had yet to be established.

During the cooperation period of the Project, discussions were held over "models". However, as pointed out in the terminal evaluation report, the concept of good AC models had not been shared among the personnel concerned from the beginning of the Project. Thus, it was thought that a common image for the establishment of models among relevant personnel, which was necessary for the uniformed understanding on the Project Purpose, was difficult to share[15].

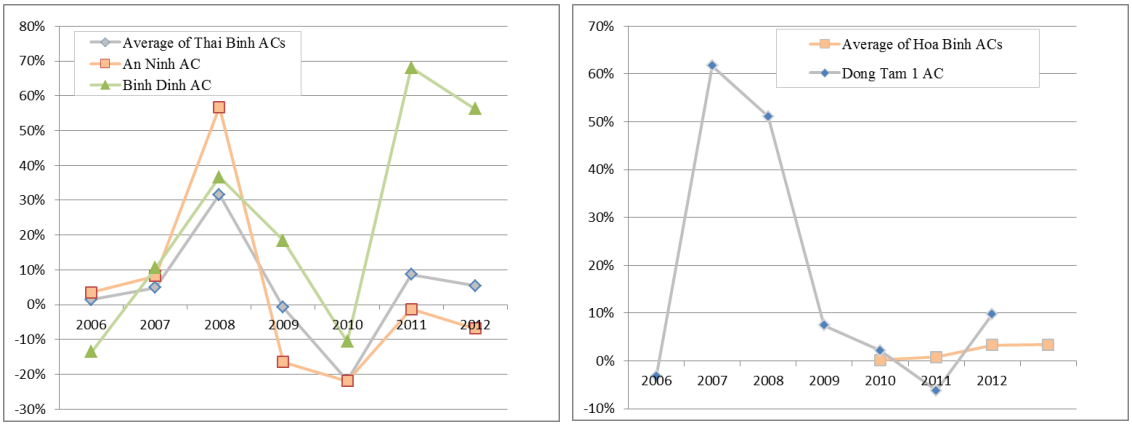
2) Indicator 2: Growth rate of total turnover of each PAC is higher than the average growth rate of other ACs' total turnover in the same Pilot Provinces.

The growth rate trend of the total turnovers of ACs is shown in the figures below:

[13] DCRD pointed out that PACs were good AC models as they provided more services (joint sales and internal credit businesses in particular), increased annual total turnovers, and prepared and implemented the mid-term plans.

[14] The criteria for cooperatives with effective management are stipulated in article 17 of MARD Circular No.41 (Circular 41 /2013/TT-BNNPTNT). However, since they are criteria, they are not considered as models. DCRD said that as the drafting members of MARD Circular No. 41 (2013) included members of the Project Management Unit (hereinafter referred to as "PMU") of the Project, drafting works were undertaken, based on the knowledge and experiences of the Project. However, it is not possible to consider this Circular as part of the results of the Project.

[15] If the Project Purpose were set as "capacity to prepare mid-term plans is improved", it can be considered that the Project Purpose was achieved because the guideline regarding the preparation of mid-term plans was made, relevant documents such as manuals were prepared and capacity improvement was carried out through trainings. However, in this case, it is considered that the appropriateness of the assistance to improve facilities under the Project would be decreased.



Source: Sub-DAD in Thai Binh and Hoa Binh provinces
Note: There is a possibility that the turnovers of An Ninh AC and Dong Tam 1 AC, and the provincial average of the turnover do not include the revenues from the joint sales activities.

Figure 4: Trend of the total turnovers at ACs

The annual average growth rate of the total turnovers of ACs in Thai Binh province from 2005/2006 to 2009/2010 was 3.1% (in nominal terms) while that of An Ninh AC and Binh Dinh AC, both of which are PACs in Thai Binh province, were 6.0% and 8.3%, respectively. The annual average growth rates in Hoa Binh Province in and after 2010 were also obtained. The average annual growth rate of ACs in Hoa Binh province in 2010 was 0.2% against the previous year, while that of Dong Tam 1 AC was 2.2%. Accordingly, at the time of completion of the Project, it can be said that the indicator 2 was fulfilled.

Meanwhile, after completion of the Project, the growth rate at An Ninh AC exhibited lower rates than the provincial average. In case of Dong Tam 1 AC also, the growth rate was lower that the provincial average in 2011, after completion of the Project[16].

3) Indicator 3: The PACs members' degree of satisfaction towards functions of ACs increase more than 10 point.

A comparison of the results of the baseline surveys conducted in 2007 and 2009 under the Project revealed an increase in satisfaction.

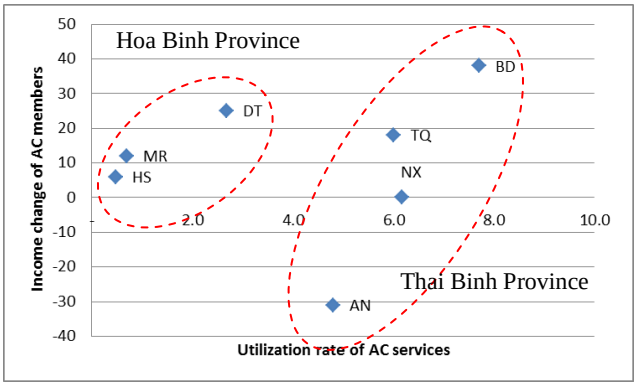
4) Relation to improvements in livelihood

Although it is not included in the indicators of the Project, the Project Purpose includes the establishment of good AC models, which leads to improvements in the livelihoods of members. For this reason, the relation between the Project Purpose and the improvement of

[16] In case of An Ninh AC, the revenues from electricity sales were subtracted from revenue sources in and after 2009, and the revenues from joint purchases showed a decreasing trend in and after 2011. On the other hand, Thai Binh DARD pointed out that some ACs did not record revenues from joint sales in their accounting books. When the financial documents at An Ninh AC were examined, sales revenues from joint sales were not clear in some years. Therefore, there is a possibility that revenues reported by An Ninh AC may be lower than the actual amount. Likewise, it was said that the revenues from joint sales were not reflected in the total revenue at Dong Tam 1 AC.

livelihoods is examined. At the time of the ex-post evaluation, a beneficiary survey[17] was conducted. Quantified results of how respondents felt about increased or decreased income from their agricultural activities (changes in income from agricultural activities in 2010, which are shown on the vertical axis) are compared with the utilization ratio of AC services obtained through a quantification of the utilization of AC services (on the horizontal axis). The scatter plot below summarizes the results. It is estimated that the higher the utilization ratio of AC services, the higher the possibility that AC members experienced an increased income.

Among the three PACs, many respondents from farm households in the villages where An Ninh AC provides services felt that their income had decreased. In addition, the utilization ratio of AC services tends to be low at An Ninh AC if compared with other ACs surveyed in Thai Binh Province.



Note 1: The income increase or decrease on the vertical axis was quantified by assigning -1 for a decrease, 0 for no change and +1 for an increase, and then summing-up of responses. The utilization ratio of AC services on the horizontal axis was obtained by summing up the ratios of the respondents who answered that "they utilized" respective services provided by ACs.
Note 2: DT stands for Dong Tam 1 AC, MR for Mu Rieng AC, HS for Hoa Son AC, AN for An Ninh AC, BD for Binh Dinh AC, TQ for Trong Quang AC and NX for Nguyen Xa AC.

Figure 5: Utilization ratio of AC services and increase or decrease in income

The targets of indicators 2 and 3 of the Project Purpose were achieved. In terms of indicator 1, although a guideline for the preparation of mid-term plans, the essential part of good AC models, was issued, the guideline showed only the usefulness of preparing mid-term plans, together with the formats. Therefore, it cannot be said that, with that guideline, guidelines on good AC models for other ACs had been prepared. As good AC models for other ACs to follow were yet to be established, part of the Project Purpose has therefore not been achieved.

[17] The beneficiary survey was conducted in December 2013 and January 2014 at villages where the three PACs and the four SACs provided services and at villages where these ACs might possibly expand their services in Hoa Binh and Thai Binh provinces where the Project was implemented. In selecting SACs, discussions were held with DCRD and Sub-DRDs. Accordingly, SACs that seemed to perform relatively well and SACs that needed future improvement were selected. In the communes where ACs subject to the survey were located, villages with many AC members and villages with a small number of members were chosen (priority was placed on villages where ACs planned to expand their services in the future). Furthermore, through discussions with AC management, three to four villages were selected in each of the communes. Villages with a relatively large number of rich, middle-income and poor were chosen. At the villages selected, a systematic random sampling was carried out based on the list of villagers. Enumerators visited the households selected and conducted interviews based on the questionnaire. Through the sampling, 50 to 60 farm households were selected (about 60 at PAC and about 50 at SAC). The total number of samples was 391 farm households.

3.2.2 Impact

3.2.2.1 Achievement of the Overall Goal

Overall Goal: AC models made by the Project are recognized as AC models for improving farmers' livelihood in Vietnam, and the models are utilized in not only in Northern Region but also in the other regions of Vietnam.

1) Indicator 1: Results of the Project are utilized for making policies for promoting agricultural cooperatives in the other regions of Vietnam[18].

At the time of the ex-post evaluation, although good AC models had yet to be established, it was found that the results of the Project had been utilized for the preparation of policy documents that would contribute to the development of ACs. In concrete terms, they are, among others, MARD Guideline No. 224 (224/2010/KTHT-HTTT) on the preparation of mid-term plans, the Prime Minister Decision No.62 (62/2013/QĐ-TTg on encouraging policies for cooperation and linking production and consumption of agricultural products and the development of a wider field), and the Prime Minister Decree No. 193 (193/2013/NĐ-CP) in 2013 on regulations detailing a number of articles of the Law on Cooperatives (23/2012/QH13) in 2012. The Prime Minister Decree No.193 stipulates support for the training of managers and so on[19].

In particular, with regard to mid-term plans, training on the preparation of mid-term plans continued in Hoa Binh province, following the guideline of MARD, after completion of the Project. Training was offered to about 60 or more ACs in the province in 2013, for example. However, practical on-site guidance was not given on how ACs could take measures against the conditions where each AC was placed. Therefore, the number of ACs that were able to complete mid-term plans was limited. Aside from the preparation of mid-term plans, training was also carried out on internal credit businesses and marketing business. Depending on the contents, leaders of the farmers' groups of ACs were provided with training.

In Thai Binh province, based on lessons learnt from, and documents prepared under, the Project, the Provincial People's Committee (hereinafter referred to as "PPC") issued an instruction document on the operation and management of AC services in 2011. In addition, Sub-DRD in Thai Binh province produced training manuals for the preparation of mid-term plans in 2012, which contained the formats for mid-term plans newly revised by Sub-DRD in Thai Binh province. Similar to Hoa Bin province, training on the preparation of mid-term plans, internal credit businesses and so forth were also offered to ACs other than PACs and SACs in

[18] At the time of the ex-ante evaluation, the following two indicators were set for the Overall Goal. Indicator 1: policy, the number of staff assigned and budgets of MARD in order to disseminate good AC models, indicator 2: the number of provinces that establish policies for the implementation of the dissemination of good AC models. However, the indicators were changed to the indicators described in the main text above without any explanation of the changes being provided. It is assumed that indicators which more adequately reflected the Overall Goal, were chosen.

[19] DCRD pointed out that because PMU members of DCRD participated in drafting of the Prime Minister Decision No.62 (2013) and the Prime Minister Decree 193 (2013), it was listed as one of the indirect impacts of the Project.

Thai Binh province.

At DCRD, aside from activities under the second phase of the Project, which was on-going at the time of the ex-post evaluation, training materials for the preparation of annual plans were worked out and the training of trainers (hereinafter referred to as "ToT") was carried out.

Making use of training materials based on the documents prepared during the first phase, these having been adjusted, annual plans were prepared in the same way as mid-term plans, based on the needs of AC members. Because not all of the ACs were able to prepare mid-term plans, training on the preparation of annual plans was carried out. A total of 252 persons from all the provinces attended training on the preparation of annual plans held in 2013.

With regard to the indicator set for the Overall Goal, it was confirmed that the Project results had been partly utilized for the preparation of AC promotion policies at ACs other than ACs supported by the Project and in regions other than the target provinces of the Project. One example is the guideline for the preparation of mid-term plans, which form an essential element of AC models. Therefore, the indicator was fulfilled. However, as for the Overall Goal itself, the evaluation is that "good AC models are recognized as models for farmers' organizations" is yet to be realized in the same way as that in which the achievement of the Project Purpose was evaluated. Therefore, it is concluded that part of the Overall Goal has not been achieved.

2) Contribution of Outputs and the Project Purpose to achievement of the Overall Goal

Under the Project, business activities were enhanced and organization was strengthened at PACs and SACs. In parallel, the capacity of management and staff at ACs was developed and the capacity of government officials in the Pilot Provinces for the support of ACs was enhanced. It is considered that this set of Outputs and the Project Purpose made contributions towards the achievement of the Overall Goal.

In order to make effective use of the Project results in the provinces inside and outside the northern region, MARD issued a guideline regarding the preparation of mid-term plans to DARD in the country. Some of the manuals and other documents prepared under the Project were distributed to provinces and ACs nationwide. At the time when the ex-ante evaluation and preparatory study mission was dispatched, one participating province each was scheduled to be selected in the central and southern regions where the results of the Project could be disseminated and promoted. It was also planned that measures would be taken in order to provide the necessary information to these provinces during the cooperation period of the Project. However, these measures were not incorporated in the actual Project Activities[20].

[20] It was planned that, in order to examine whether or not models developed in the north region could be generally applicable in the central and southern regions and to make appropriate adjustments to the models, several seminars on ACs would be held during the cooperation period of the Project, inviting one province each from the central and southern regions to participate. However, it is not considered feasible by the external evaluator to develop models that could be also applicable to the central and southern regions just with comments from representatives of the two

3.2.2.2 Other Impacts

In terms of impact on policy, indirect impact is recognized on MARD Circular No.41 that set up the conditions for effective ACs, apart from the policy documents listed in connection to the Overall Goal.

In addition, DCRD answered that ACs played a bridging role between the state and people in rural areas, where these people were regarded as the main actors in the "national target program for building a new countryside". ACs are engaged in building up new rural areas in various ways. Environmental services and water supply services, etc. are examples. A concreate example under the Project could be the garbage collection services at Binh Dinh AC using a small truck (supported under the Project)[21].

Photo 2: Binh Dinh AC: Garbage collection using a small truck supported under the Project

Photo 3: Local market managed by Dong Tam 1 AC

Furthermore, Dong Tam Commune Peoples' Committee (CPC)[22] built a local market in 2007 using government budgets in order to provide farmers with opportunities to sell agricultural products. The local market has been managed by Dong Tam 1 AC since 2010.

As described above, as a result of the Project Activities, Outputs are evaluated as follows: achievement levels of Output 1 (enhancing and strengthening of business activities at PACs and SACs) and Output 2 (development of organizations at PACs and SACs) are evaluated to be fair while Output 3 (capacity development of management and staff at PACs and SACs) and Output 4 (enhancement of the capacity of government officials in the Pilot Provinces for the promotion of ACs) were achieved. With regard to the Project Purpose, the judgment is that good AC models were yet to be established. Although some problems were observed in achieving

provinces gained through organizing several seminars. Therefore, even though such measures were not incorporated in the Project Activities during the cooperation period of the Project, it is not considered necessary to lower the evaluation of the criteria for "Relevance" and "Effectiveness and Impact".

[21] In other words, under the policy, the "national target program on building a new countryside", ACs have been placed in a situation where they had to carry out services where it would be difficult to secure profits.

[22] A People's Committee is an executive body of the state that reports directly to the Government. As local executive units, there are provinces, etc. at the first level, districts, etc. at the second level and communes, etc. at the third level. Commune People's Committees (CPC) are at the lowest level of the local executive units. Refer to Figure 1.

indicator 1 (preparation of guidelines on good AC models), indicator 2 (growth rate of total turnover at PACs) and indicator 3 (the degree of satisfaction of ACs on the part of members of PACs) were fulfilled. As for the achievement of the Overall Goal, it is considered that achievement is limited as good AC models were yet to be recognized. Based on the above points, it is judged that the effectiveness and impact of the Project is fair since a certain level of effects from the implementation of the Project was observed.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	Plan	Actual Performance [Note]
(1) Experts	➢ Long-term experts: chief advisor/economic activities, management and activity improvement, training coordinators ➢ Short-term experts: as required	➢ Long-term experts: 6 persons: chief advisor, coordinator/training, internal credit business, sales and purchase activities ➢ Short-term experts: 1 person: socio-economic survey
(2) Trainees received	As required	Number of trainees received: 23 persons
(3) Third-Country Training Programs	As required	Third country training : 19 trainees (Thailand: 10 persons, Philippines: 9 persons)
(4) Equipment and Local Operational Cost	Vehicles, office equipment, field work equipment, training equipment, equipment for activities of PACs, others.	Equipment: 17 million Japanese yen Local Operational Cost: 85 million Japanese yen Construction costs of 3 AC offices: 46 million Japanese yen
Total Project Cost	380 million Japanese yen	509 million Japanese yen
Inputs from the Government of Vietnam	Assignment of 9 counterparts in total, office space and facilities, land and facilities, and operational cost	Assignment of 16 counterparts, project offices (MARD, DARD in Thai Binh and Hoa Binh provinces), land for offices of PACs, local costs about 3.0 billion VND (equivalent to about 160,000 US$)

Note: Actual performances are based on the terminal evaluation report.

3.3.1.1 Elements of Inputs

The Project Activities consisted mainly of the preparation of mid-term plans, support for the formulation and implementation of programs for improving business activities and the development of organization at PACs and SACs based on the mid-term plans, education and training for management officers, staff and members of ACs and government officials in the Pilot Provinces. The Inputs described above were used in order to implement the Project Activities.

1) Dispatch of experts

A total of six long-term experts was dispatched, including two who replaced experts previously assigned. Their professional fields were chief advisory works, coordination/training, internal credit businesses, and sales and purchase activities. These experts were assigned with consideration for the incorporation in mid-term plans of “joint sales activities”, “joint purchase

activities", "internal credit businesses" and so on, and for putting these into practice. These activities were found to be necessary as a market-based economy was introduced and progressed, and AC members' needs for these kinds of activities were great. In addition, from February to March 2009, a short-term expert (socio-economic survey) was dispatched in order to collect information on ways to disseminate good AC models to other regions in Vietnam.

2) Trainees received and third-country training programs

Study tours in Japan were conducted twice for the organization and management of ACs and a total of 23 trainees (officials from MARD and DARD, management of ACs, etc.) participated in the tours. In addition, third-country trainings were carried out in Thailand and the Philippines with similar topics and a total of 19 trainees (officials from MARD and DARD, management officers of ACs) attended the programs.

3) Provision of equipment

At the beginning of the Project, six vehicles, 13 personal computers, five printers, three projectors, 13 units of a moisture checking machine[23] and so on were provided to MARD, DARD, PACs and SACs.

4) Local operational costs

Local operational costs include development costs for facilities (drying and rice-milling facilities, irrigation channels and facilities, improvement of a cold storage) in order to strengthen business activities at the three PACs.

Photo 4: Dong Tam 1 AC:
Irrigation facilities and drying equipment

Photo 5: An Ninh AC:
Storage-cum sales facilities for fertilizers, etc.

[23] For example, it was observed on a visit to an AC during the ex-post evaluation that a moisture checking machine had been introduced at drying facilities in order to measure the level of moisture contained in agricultural products.

Photo 6: An Ninh AC:
Cold storage for seed potatoes, etc.

Photo 7: Binh Dinh AC:
Inside the AC office

(5) Construction of offices at the three PACs

At all the PAC offices, a multi-purpose hall is placed on the first floor and an office for the chairperson, meeting rooms, offices, a showroom-cum waiting lounge and toilets are located on the second floor. Construction of AC offices was completed at an early stage after commencement of the Project (completed at the end of March 2007)

3.3.1.2 Project Cost

The Project cost exceeded the original plan. The ratio of actual cost (509 million Japanese yen) against planned cost (380 million Japanese yen) was 133.9%.

The actual cost exceeded the planned cost by 129 million Japanese yen. It is not possible to compare the actual cost with the planned one by each item of expenditure. However, if compared with the Inputs projected at the time of the ex-ante evaluation, it is thought that the main factors that pushed up costs included the construction of AC offices at PACs, the development of other facilities (drying facilities, storages for purchased goods, irrigation channels at Dong Tam 1 AC, drying and rice-milling facilities, storages for purchased goods, pumping stations for irrigation at Binh Dinh AC, and a cold storage for agricultural products and storages for purchased goods at An Ninh AC), and the dispatch of experts when the cooperation period of the Project was extended by half a year. It is thought that although the development of offices and the construction and improvement of facilities at PACs contributed to an enhancement and strengthening of business activities and a strengthening of the organization of ACs, support given generated a sense of unfairness with the SACs that did not receive assistance through such Inputs. It seems that this was reflected in low participation ratios in and low satisfaction ratios of the training on the part of some SACs. In addition, in the terminal evaluation report, concerns were raised over the necessity of procuring a large amount of funds if the Government of Vietnam extends the same level of support to other ACs as in the facilities and equipment provided to PACs. According to DCRD, generally speaking, ACs are short of facilities and equipment. Although expectations of the support from the Project were

considered to be high when the Project was to be implemented, the appropriateness of the size of the Inputs to PACs cannot be judged simply by the amount of money. However, judging from the viewpoint of whether or not these Inputs are indispensable for achievement of the Project Purpose, it cannot be denied that some of the Inputs might be evaluated as excessive. In addition, it is thought that there is some room for improvement in that offices with uniform specifications were constructed at the three PACs even though the environment where the ACs are placed varied[24]. Having said that, it is assumed that cost reduction and a simplification of procedures were pursued in terms of the design costs as well as the procurement of construction materials.

3.3.1.3 Period of Cooperation

In terms of the period of cooperation, the ratio of the actual cooperation period (55 months) against the planned period (49 months) is calculated at 112.2%, which exceeds the planned duration. The period of cooperation was extended by half a year with such reasons as: 1) as it was not possible to evaluate the results of respective business activities appropriately at the time of the terminal evaluation, it was considered necessary to examine them in parallel with the process of implementation and the revision of mid-term plans after the completion of one cropping season (by July to August in 2010); and 2) it was necessary to prepare and conduct case studies on links between production and sales, and its processes, as crop-based production groups for joint sales had just been organized.

In addition, with regards to the Project Activities, it was pointed out at the time of the terminal evaluation that preparation of mid-term plans took longer time than expected and that efficiency could be higher if activities were implemented with consideration to the capacity enhancement of Vietnamese experts, as Japanese experts provided direct instructions mainly to PACs. Regarding the reasons why it took longer to prepare mid-term plans, Sub-DRD in Thai Binh Province, for example, pointed out the following: it took time to carry out the set of processes from the survey on members' needs in formulating mid-term plans, to analysis of the strengths and weaknesses of ACs, to the preparation of future plans, to exchange of communications over drafting mid-term plans between ACs and the Project office, and finally to go through the internal approval processes at ACs. Furthermore, it was mentioned that the level of education of management at ACs was not high, office equipment used for the formulation of mid-term plans at ACs was poor and so on.

Both the Project cost and the period of cooperation exceeded the plans. Therefore, the efficiency of the Project is fair.

[24] For example, the number of member households at Dong Tam 1 AC is 540 while that at Bin Dinh AC is 2,711. There is a large difference in their turnovers. Therefore, the scale of their activities is considered to be different.

3.4 Sustainability (Rating: ③)

3.4.1 Related Policy toward the Project

MARD issued a guideline to DARD in the provinces for the preparation of mid-term plans (224/2010/KTHT-HTTT) by attaching the format of the plans. In addition, a strengthening of the functions of ACs as part of modernization of rural areas was aimed at through the "national target program on building a new countryside" . Thus, the sustainability of the policy aspect is confirmed. In addition, as previously described, in Thai Binh province, an instruction built upon the results of the Project was issued on ways to operate and manage services at ACs. Furthermore, Sub-DRD in Thai Binh province formulated training manuals on the preparation of mid-term plans in 2012 apart from activities under the second phase of the Project, which was on-going at the time of the ex-post evaluation. No specific problems were seen in the sustainability of the policy aspect.

3.4.2 Institutional and Operational Aspects of the Implementing Agency and Counterparts

Table 2 shows the actual number of staff assigned in DCRD, Thai Binh and Hoa Binh provinces, to take measures on policy issues. While it is observed that the number of staff at DCRD promoting policies nationwide and the number of staff assigned at the respective provinces to promote good models is small, DCRD said that they had been preparing training programs for the management officers of ACs with the cooperation of the College of MARD 1 and 2 (hereinafter referred to as CMARD 1 and 2) since 2012. Thus, training was carried out making use of existing resources within MARD. As seen in the training programs for ACs held at Sub-DRDs in Hoa Binh and Thai Binh provinces after completion of the Project, it is clear that training continued using their own budgets. These activities are expected to continue in the future. In addition, it is thought that the frequency of transfers of key counterparts assigned during the cooperation period of the Project was relatively low and that staff members, who developed capacity, will continue to engage themselves in related activities.

Table 2: Actual number of staff assigned to promote policies of good AC models (actual)

Unit: Persons

Organizations	2009	2010	2011	2012	2013	2014 (Plan)
DCRD	6	5	6	6	7	No answer
Thai Binh Sub-DRD	6	6	6	7	7	7
Hoa Binh Sub-DRD	4	5	5	6	6	6

Source: Answers to the questionnaires by respective organizations

Table 3 shows the number of management at PACs. In particular, management of ACs in Thai Binh province, visited by the external evaluator, work on a full-time basis. They are thought to be more actively engaged in the business activities of ACs.

Staff members carrying out activities at ACs, other than management officers, are employed on a contract basis at some ACs. There are also cases where management teams are

formed for joint sales and joint purchases and paid on a performance basis to provide services to AC members. The assignment of personnel facilitated depending upon the requirements of work volume and content is considered to be appropriate.

Table 3: Number of management and members at PACs

Province	Thai Binh		Hoa Binh
Item	An Ninh AC	Binh Dinh AC	Dong Tam 1 AC
Total number of management officers	5	7	6
Out of which:			
Chairman	1	1	1
Vice chairman	1	1	2
Chief accountant /accountant	1	2	1
Controller/Auditor	1	1	1
Casher/store or stock keeper	1	1	1
Number of member households (members)	2,139 HH	2,771 HH	540 HH (1,285 persons)[Note]

Source: Respective PACs
Note: In the case of Dong Tam 1 AC, the number of AC members is different from the number of member households.

No specific issue was found in terms of the numbers of management officers. Although people tended to avoid working for ACs as staff members due to a relatively low level of income in the agriculture sector, among the ACs visited by the external evaluator, some commented that it would be important to recruit young educated personnel[25]. Another AC pointed out the importance of actively engaging CPC and AC members in AC activities.

As seen above, no major problems are seen in the institutional and operational aspects of the implementing agency and counterparts.

3.4.3 Technical Aspects of the Implementing Agency and Counterparts

During the cooperation period of the Project, the knowledge and capacity of government officials at MARD and DARD were improved in terms of the establishment and promotion of ACs. After completion of the Project, it was confirmed that training was conducted for officials of local governments at MARD and for management officers and staff of ACs and leaders of farmers' groups, etc. at DARD in Thai Binh and Hoa Binh provinces.

Furthermore, based on the results of the Project and the operating conditions of good ACs, DCRD found that the capacity of AC management officers was an important factor in the development of ACs. Accordingly, a training program has been prepared for management of cooperatives in collaboration with CMARD 1 and 2 since 2012. At the time of the ex-post evaluation in December 2013, the program had been approved by MARD and pilot implementation was continuing. Also, as described earlier, ToT was carried out at DCRD with training materials for the preparation of annual plans, if not mid-term plans, based on the results of the Project. In addition, manuals on general guidance on organization and management were

[25] In fact, a young chairperson was actually appointed at An Ninh AC in 2014.

prepared when services were to be provided. Detailed instructions for the operation of joint sales were also scheduled to be completed in 2014 and training was expected to be held, using training documents.

As described above, no concern is raised in terms of the sustainability of technical aspects of the implementing agency and counterparts.

3.4.4 Financial Aspects of the Implementing Agency and Counterparts

At the time of the ex-post evaluation, questions were raised to DCRD and Sub-DRDs in the Pilot Provinces about their budgets for capacity development of ACs (mainly expenses for education and training). Their responses are summarized in Table 4 below. Although, in the case of DCRD, the amount of the budgets for promotion of good AC models is not considered sufficient for an extension of their activities nationwide, their budgets have made a rapid increase over the last five years. In the case of Hoa Binh and Thai Binh provinces, the budgets are not deemed to be sufficient[26] to promote good models, although within their budgets, training on improvement of the capacity of Sub-DRD officials and ACs has been conducted about 10 times per year in each of the provinces, as those activities are prioritized (training on the preparation of mid-term plans and plan preparation for internal credit businesses, etc.). Taking into account the trend after completion of the Project, training is expected to be continued from now on.

Table 4: Amount of the budgets for promotion of good AC models (actual)

Unit: Million VND

Organizations	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 (Plan)**
DCRD	200	200	760	1,000	2,000	1,300
Thai Binh Sub-DRD	About 1,000/year					
Hoa Binh Sub-DRD	170	210	338	376	453	74

Source: Answers to the questionnaires by respective organizations

As many ACs have not received capital contributions or investment from members, it has been difficult to raise new investment at ACs. ACs are expected to continue their business activities with revenues as their resources, which is expected to be increased making use of strengthened and enhanced business activities at ACs through capacity development which have been promoted by the Project.

In this respect, the average annual growth rates of the turnovers at ACs from 2005 to 2012 showed positive growth rates at all the ACs except the three ACs (Hoa Son AC, Khu Pheo AC and Thai Binh Joint Marketing AC) for which data could not be obtained. If a comparison is

[26] According to one of the Pilot Provinces, the amount of the budgets is about half of what is required.

made between the provincial average growth rate in Thai Binh province and the rates at PACs and SACs in Thai Binh province, the annual average growth rate is more or less at the same level as the provincial average (however, the average annual growth rate at Binh Dinh AC is quite high) and the amount of the turnover at the four ACs visited by the external evaluator is about twice the provincial average. In particular, the amount for Binh Dinh AC far exceeded the provincial average. The three PACs from which profit and loss statements were obtained recorded profits over the last five years. Based on the data in the available financial documents, sustainability of the financial aspects can be expected.

As described above, taking into account budgetary allocations to take measures towards the capacity development of ACs and the financial conditions of PACs, sustainability of the financial aspects can be recognized. Particularly at PACs, management officers who participated in the training are expected to be engaged in the operation of ACs from now on.

No major problems have been observed in the policy background and institutional, technical, financial aspects of the implementing agency and counterparts. Therefore, sustainability of the Project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project aimed to establish good models for enhancing the functions of ACs which, in turn, would lead to improvement in the livelihoods of the members of the three PACs and the surrounding 11 SACs in the two Pilot Provinces (Thai Binh and Hoa Binh provinces) in the north of Vietnam. Under the Project, PACs and SACs were provided with support for formulating mid-term plans based on their members' needs, for formulating and implementing concrete programs for improving their activities and developing their organizations based on the mid-term plans, and for carrying out training for the capacity development of officials and staff of PACs and SACs, and government officials. The Project is highly relevant to Vietnam's development policies and needs, and to Japan's ODA policy towards Vietnam. Generally speaking, all of the Outputs were achieved by the completion of the Project. However, although the functions of PACs were enhanced and the results of the Project were utilized in policy documents relevant to the development of ACs, it is considered that good AC models, which are expected to be duplicated in other areas, have not been established yet. Therefore, the effectiveness and impact of the Project are evaluated to be fair. In terms of the Inputs of the Project, as both the Project cost and the period of cooperation exceeded the plan, the efficiency of the Project is evaluated to be fair. No major problems have been observed in the policy background and institutional, technical, financial aspects of the implementing agency and counterparts. Therefore, sustainability of the Project effects is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency and Counterparts

(1) Training and the assignment of capable young personnel in order to improve the management capacity of ACs:

One of the factors that influences the future development of ACs is improvement of management capacity. For this purpose, it is important to train capable young members and farmers who have acquired a certain level of education, and assign them as management officers of ACs. Meanwhile, at the time of the ex-post evaluation, some ACs officers said that because it was difficult to increase agricultural income, young people were reluctant to engage themselves in agricultural work. At the same time, the level of salaries at ACs was not high enough to attract the capable young people. Under such circumstances, as implemented under the Project Activities, it is important to improve activities and the livelihoods of AC members by responding to the needs of AC members through the preparation of mid-term plans and, as a result, to increase the profitability of ACs, improve the livelihoods of AC members and upgrade the working conditions of management officers. In the case of the succeeding project in progress, it is desirable that support to ACs includes activities for development of younger human resources.

(2) Importance of on-site follow-up activities after training:

As a lesson learnt from the fact that Japanese experts gave direct instructions mainly to PACs in the Project Activities, the terminal evaluation report pointed out that “if Japanese experts are busy visiting ACs to give direct guidance, the Project is likely to lose its goal”. On the other hand, in order to enhance the effects of training, it is important that on-site direct guidance or on-the-job training is provided at ACs as follow-up activities after training in class is completed. It is recommended that also in the implementation of the succeeding project (i.e., the second phase of the Project), which was on-going at the time of the ex-post evaluation, the Vietnamese counterparts should take the role of instructors in carrying out on-site follow-up guidance after training has been completed, while having the support of Japanese experts.

4.2.2 Recommendations to JICA

(1) Needs for making concrete recommendations and sharing understanding at the time of the terminal evaluation of the second phase of the Project:

Part of the conclusions derived from the terminal evaluation seemed to be not linked with the recommendations and the parties to which recommendations are addressed were not clearly mentioned. (The relevant part of the terminal evaluation report is in the conclusion that states “in particular, since production groups by crop for joint sales of agricultural products had just been organized, it is necessary to review the process from production to sales, and to conduct case studies.” In addition, the English version of the terminal evaluation report does not include

this part of the conclusion.) Furthermore, some recommendations do not appear in the English version of the terminal evaluation report although they do appear in the Japanese version (The relevant part is “First of all, in order to prove that strengthening of ACs will lead to improvement of farmers’ livelihoods, it is necessary to ‘review the relationship between the enhancement of the functions of ACs and the improvement of agricultural management”). If it is intended that actions are facilitated through the conclusion and recommendations of the terminal evaluation of the second phase of the Project, it is desirable that the personnel concerned on both the JICA and Vietnamese sides clarify and then share the contents of the recommendations, etc. in order that the parties to whom the recommendations are addressed can acquire a clear image of the concrete actions to be taken.

4.3 Lessons Learned

1) Needs to take measures to extend well-balanced and fair support among participants in a project:

Large differences existed in terms of the contents of support given to the PACs and SACs that participated in the Project Activities. For example, facilities such as AC offices and drying facilities were provided to all the three PACs, but physical support to SACs was limited to provision of office equipment, moisture checking machines and so on. Since opportunities to participate in training also differed, as a result, the degree of satisfaction from participation in the training was found to be low at some of the SACs. It is thought that these SACs were not satisfied due to the differences in support. There are cases where the effectiveness of training may decrease due to feelings of unfairness generated among organizations if the level of support to participating organizations is different during the same period under the Project. Therefore, it might be necessary to adopt measures to provide well-balanced support to participating organizations or a target group.

On the other hand, it was pointed out that it is important to provide participating organizations with different levels of support, depending upon their degree of development (or capacity), in order to enhance the effectiveness of training. The contents of the training required would be different between those ACs which are highly capable in the provision of many types of services including joint sales and joint purchases, and those ACs where most of the activities are stagnant.

Accordingly, it is desirable that appropriate measures are taken in terms of the methodologies of training so that participants can be convinced and are satisfied with differences in support when pilot organizations and other organizations are supported at the same time, as was the case with this Project. For example, it is recommended to classify ACs into a group of more advanced ACs and a group of less advanced ACs based on a criteria agreed among the stakeholders. Or, it is also possible to divide the period of the Project chronologically into the pilot phase and the phase for extension.

2) Clarification of the Project Purpose:

The Project had as its Project Purpose, the establishment of good models, but it was found at the time of the ex-post evaluation that a concrete image of “models” was not shared among the parties concerned. When setting a project purpose, it is necessary to have a common concreate image of “models” as a status or condition that should be reached by the project. However, although there are repeated discussions about the models envisioned by the project planners, for those who are engaged in project implementation, it may be difficult to confirm and share a concreate concept of the models throughout the cooperation period because of the general applicability with which “models” are supposed to be equipped. At the time of an ex-ante evaluation, if it is difficult to share a concept or framework of models, even a tentative one, among the parties concerned, the establishment of models as a project purpose should be avoided and instead, a more concrete status or set of conditions that can be achieved by the project should be described.

Social Republic of Viet Nam

Ex-Post Evaluation of Japanese Technical Cooperation Project
"Forest Fire Rehabilitation Project"

External Evaluator: Wataru Yamamoto, OPMAC Corporation

0. Summary

The "Forest Fire Rehabilitation Project" aimed to develop and disseminate techniques for the Melaleuca (*Melaleuca cajuputi*)[1] planting using embankment[2] with high economic returns on acidic sulphate soil[3] whose topsoil was consolidated after the damage caused by a large forest fire. The plantation technique[4] was developed by a former JICA technical cooperation project[5]. The project was in line with Vietnam's development policy as well as development needs but it was evaluated that environmental consideration on the risk involving with acidic sulphate soil was not sufficient during the project formulation stage. Therefore, relevance is evaluated as fair.

The impact of trial implementation of Melaleuca processing technologies was limited but Melaleuca plantation on embankment has been disseminated and expanded covering the target area of the overall goal. Also, trial implementation in the field, livelihood support to the demonstration farms (hereinafter called demo farms), showed a large impact on their income and outputs on forest fire prevention activities are effectively being utilized; therefore effectiveness and impact of the project are evaluated as high.

The cooperation period of the project was three years as planned; however, the input of human resources was increased due to development and transfer of new technologies. The project input was increased because the equipment planned to be utilized was unable to be utilized. Therefore, efficiency of the project is evaluated as fair.

The Forest Fishery Enterprise (hereinafter called FFE), one of the implementing agencies was institutionally and financially strengthened with political support by the Department of Agriculture and Rural Development (hereinafter called DARD). FFE became a forest company (hereinafter called Forest Company) through merger and liberalization. However, because of a political issue on immigrant farmers who live in the lands managed by Forest Company as well as a technical issue on formation of acid water by installing embankment, sustainability is

[1] Tree species belong to Melaleuca genus, Mytasceao family; distributed in tropical and sub-tropical region and characterized by tolerant against acidity and inundation.

[2] Raising ground level on line. See Figure 1.

[3] Soil that has a layer of sulfate sediment called Pyrite which contains sedimentation at the bottom of shallow sea. Sulfate sediment is oxidized by exposing to air at soil surface, producing sulfuric acid resulting in strong acidity of soil. The area is corresponding to the soil with peat formation on which organic matters are accumulated without decomposition by influence of inundation. Large proportion of clay contents consolidated at soil surface by forest fire made direct tree planting difficult. It was needed to dig line to break hard soil layer.

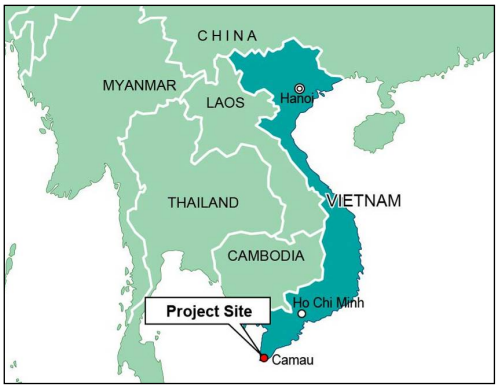
[4] Plantation site preparation method to avoid inundation which disturbs tree growth. The method raises the level of plantation site by digging and making embankment on line one after the other. Please Figure 1.

[5] Technical cooperation project, the Afforestation Technology Development Project on Acid Sulfate Soil in the Mekong Delta. Implemented between March, 1997 and March 2002.

evaluated as fair.

Thus this project as a whole is evaluated as partially satisfactory.

1. Project Description



Project Location

Melaleuca plantation on embankment, eight years old

1.1 Background

In Ca Mau province located at the Southern part of Viet Nam, a large scale forest fire burned more than 4,000 hectares of forest and damaged peat soil[6] and agricultural lands at U Min Ha area[7] in March 2002. Vietnamese government took the situation seriously and initiated a forest rehabilitation program in July 2002 towards the target year 2010 with a special public finance. The program was composed of tree planting for forest restoration, improvement of forest quality on burned-over forest and livelihood development of local residents. However, the large size of forest which needed restoration as well as the lack of knowledge to use reforestation methods with high effects on forest fire prevention, and the complicated social situation of local residents caused by poverty problems, the prompt dissemination of the program was impeded.

Therefore, Ca Mau province together with South Vietnam Office of Vietnam Forest Academy (hereafter called VAFS) utilized the technologies applicable for reforestation on acid sulfate soil developed by the technical cooperation of JICA, the Afforestation Technology Development project on Acid Sulfate Soils in the Mekong Delta (March 1997 – March 2000). However, due to lack of experience in handling the technical applications on the special soil condition after the forest fire which was different from normal acidic sulphate soil (clay soil

[6] With the influence of strong acidity with high level of underwater level, undercomposed humus is accumulated creating a layer of peat soil.

[7] Lower part of U Minh District (near the sea) is called U Minh Ha region.

after burning peat soil) as well as lack of knowledge, techniques, and experience of FFE[8] and the farmers on reforestation, equipment needed for land preparation for plantation, the area reforested by the technologies was very limited.

Based on the background, the project was implemented for three years, from February 2004, with the purpose of developing and disseminating reforestation techniques required in the forest restoration program in U Minh Ha region. The main activities of the project included: 1) enhancement of technical applicability of reforestation in the target area; 2) enhancement of knowledge and technologies related to marketing and processing of Melaleuca timber; and 3) technical support on strengthening forest fire prevention system and livelihood development for local residents.

1.2 Project Outline[9]

Overall Goal		Techniques developed under the project are utilized by people and Forest and Fishery Enterprises (FFE) in some areas of Mekong Delta.
Project Objective		Necessary techniques for implementation of the rehabilitation and forest fire prevention program of U Minh Ha region are developed and disseminated.
Output(s)	Output 1	Establishment and expansion of appropriate techniques of silviculture activities in U Minh Ha region.
	Output 2	Knowledge and techniques related to market research and the wider-use and processing of Melaleuca timber are improved among those engaged in silviculture activities.
	Output 3	a Fire prevention system is improved in the target area. b Training on livelihood development for local farmers is implemented.
Inputs		Japanese Side: 1. Experts: 0 for Long-Term, 9 for Short-Term 2. Trainees received (10 for Counterpart Training Programs in Japan) 3. Third-Country Training Programs (0) 4. Equipment: 71.51 million yen (soil survey equipment, GPS, excavators[10], bulldozers, tractors, etc.) 5. Local Cost: 56.9 million yen
Inputs		Vietnamese Side: 1. 12 Counterparts (Project director, vice director, etc.) 2. Local cost share: 19.81 million yen in total, DARD (2.56 million yen), U Minh 1 Forest Fishery Enterprise (17.33 million yen)

[8] At project appraisal, five FFEs (U Minh 1, U Minh 2, Son Trem, Tran Van Thoi, and April 30) were involved in plantation activities in project implementation. These FFEs were merged as U Minh Ha Forest Company in November 2007.

[9] According to the information provided by JICA, Project PDM was produced in April 2004 and never changed since then.

[10] Excavators shovel with oil pressure.

	3. Land and Facilities, Project Office, Utilities (power and water) Other Local Cost: Counterpart Salary, Cost for nursery establishment, etc.
Total cost	257 million yen
Period of Cooperation	February, 2004 – February, 2007
Implementing Agency	Ministry of Agriculture and Rural Development (MARD), Ca Mau Province Department of Agriculture and Rural Development (DARD), Vietnam Forest Academy South Vietnam Office (VAFS), Ca Mau Provincial People's Committee (PPC), Forest Fishery Enterprises (FFE).
Cooperation Agency in Japan	Japan Overseas Forest Consultants Association (JOFCA), Japan International Forestry Promotion Organization (JIFPRO).
Related Projects	· Afforestation Technology Development Project on Acid Sulfate Soils in the Mekong Delta (Technical Cooperation). · Ca Mau Province Regional Development Advisor (Dispatch of Expert). · Forest Management, Ca Mau Province U Minh Ha Forest Company (Junior Overseas Cooperation Volunteer, JOCV) · The Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province (Grant Aid) · Forest Protection Program (Grant Aid by Ministry of Foreign Affairs)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Project Purpose at the Time of the Terminal Evaluation

According to the result of a questionnaire survey conducted at the Terminal evaluation, 100% of respondents (except for those who did not respond) are satisfied with the techniques developed by the project either at highly or certain level, and wish to disseminate the techniques. Therefore, the evaluation regarded that the project purpose was mostly achieved.

1.3.2 Achievement of Overall Goal at the Time of the Terminal Evaluation

At the time of the Terminal Evaluation, Ca Mau Province alone had an implantation plan to develop 3,000 hectares of Melaleuca plantation within four years from the completion of the project, and techniques developed by this project were planned to be utilized in most of the area. Also it was regarded that the techniques developed by the project had high potential to be utilized in other areas with similar soil, topography, climate and social conditions. The application of the technologies outside the demo farms had also been started showing some positive impacts. However, it was thought that in order to achieve the overall goal of the project, budgetary support by related governmental organizations and/or utilization of external funding were needed.

1.3.3 Recommendations at the Time of the Terminal Evaluation

The recommendations raised were as follows:

1) Utilization of the guideline for dissemination of the project outcomes and implementation of environmental impact assessment depending upon the size and type of the development area;
2) Implementation of feasibility study for processing of Melaleuca timber in order to promote its effective utilization for purposes other than construction materials;
3) Support by the governmental agencies for strengthening function and role of Agriculture Dissemination Club[11] and Agroforestry Activities Support Committee[12]; and
4) Positive approach for seeking external funding in order to disseminate the model developed by the project in the surrounding areas.

2. Outline of the Evaluation Study

2.1 External Evaluator

Wataru Yamamoto, OPMAC Corporation

2.2 Duration of Evaluation Study

This ex-post evaluation was carried out as follow[13]:

Duration of the Study: October, 2013 – November, 2014

Duration of the Field Study: November 17, 2013 – December 22, 2013

February 23, 2014 – March 10, 2014.

2.3 Constraints during the Evaluation Study

The ex-post evaluation was implemented seven years after the termination of the project. The collection of information on project activities was restricted due to the change of FFE staff caused by the institutional reform. The study was carried out for the most part to the beneficiaries who are considered to be important[14] and the situation from the time of the terminal evaluation up to the completion of the project was judged based on the information obtained at the time of ex-post evaluation.

[11] A farmers' group to connect trainings and technical information by Agriculture Dissemination Center with member farmers.

[12] A committee composed of leaders of farmers' groups, Agriculture Dissemination Center, FFEs, etc. The committee forms farmer groups and train them in agricultural activities.

[13] Ex-post evaluation on "the Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province" was conducted at the same time.

[14] In the ex-post evaluation, interviews were carried out with training participants, 14 in totals: DARD (2), Sub department of Forestry (6), former FFEs (5), and Sub department of Forest Protection (1), and Demo farms (40 households, including 40 control farms who did not receive benefits from the project).

3. Results of the Evaluation (Overall Rating: C[15])

3.1 Relevance (Rating: ②[16])

3.1.1 Relevance to the Development Plan

At the time of project appraisal, the project was in line with the basic principles of Vietnam's forest policy, forest protection and restoration, as well as the objective of the National project, "The Five Million Hectare Reforestation Program (5MHRP)"[17]. After the large scale forest fire in 2002, the restoration of lost forest was an urgent issue of the nation. Also, it was a top priority of the forest policy in Ca Mau Province to stabilize livelihood of local residents by improving profitability by restoring Melaleuca forest. In addition, the Vietnamese government was aiming to enhance the forest quality for sustainable use in its "Five Year Forest Protection and Development Plan (2006-2010)" and "Forest Development Strategy (2006-2010)". These policies had not been changed at the time of project completion. Thus the project activities were in line with the national issues and provincial policies.

3.1.2 Relevance to the Development Needs

The Soil in the target area of the project contains peat soil[18] which formed a hard layer at top soil after the forest fire; it was difficult to directly plant trees on such soil. Therefore, in land preparation for reforestation, it was needed to dig up the surface soil layer. Before the project started, DARD and FFEs studied and proposed the application of Melaleuca plantation on embankment in Ca Mau Province, the technique proved by Afforestation Technology Development Project on Acid Sulphate Soils in the Mekong Delta, a JICA's technical cooperation project.

The technologies introduced by the project (Melaleuca plantation on embankment) are characterized by: 1) effective for forest fire spread prevention by land preparation and plantation methods establishing water canals and agricultural lands between the plantation sites; and 2) relatively short rotation cycle of timber production producing straight timbers with high demand for construction materials, which are expected to have high marketability and income generation effects (Table 1). As direct beneficiaries, the farmers of U Min Ha region, who live in the poorest area in Ca Mau Province, face difficulty in agriculture due to acidic soil conditions, and are relying on the forest resources, which had been seriously damaged by the forest fire, were the main target of the project.

Hence, considering these conditions it is regarded that selecting a native species, Melaleuca

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

[16] ③: High, ② Fair, ① Low

[17] Reforestation Program formulated in 1998 by the Vietnamese government. The program contributed to environmental conservation for watershed protection, economic development by promotion of forest activities, and social development for poverty alleviation for the purpose to recover 5 million hectares of forest by 2010 through reforestation and forest restoration by assisting natural regeneration.

[18] Forest fire on peat soil is difficult to extinguish because of remaining fire in soil. Thus peat causes expansion of forest fire and caused the large forest fire in 2002.

which is tolerant against acidic soil and inundation, introducing continuously plantation on embankment highly profitable, with technical collaboration with FFEs and DARD and providing a model to directly support the poorest farmers who are victims of the forest fire, were continuously needed not only at the time of project appraisal but also at the time of the project completion. Therefore, it was judged the project is highly in line with development needs of the target area.

Table 1: Cost/benefit Comparison of Melaleuca Plantation by Existence of Embankment

Plantation status	Plantation cost in the first year (Million dong /ha)	Harvest year	Income* (Million dong/ha)
With embankment	14.0	7-8	50
Without embankment	7.5	13	30-40

Source: U Minh Ha Forest Company, Purchase price of logging company in 2013
Remark: *purchase price of local logger in 2013.

3.1.3 Relevance to Japan's ODA Policy

Japan's Country Assistance Program for Viet Nam[19] at the time of project planning was to support economic infrastructure development and strengthening competitiveness for growth promotion, poverty alleviation by agriculture and rural development, and enhancing quality of life and social aspects. In the Country Assistant Program, forest protection and restoration was one of the target areas of cooperation. Therefore, the project was in line with Japanese government's ODA policy for Viet Nam.

3.1.4 Appropriateness of Operation Plan and Project Approach

The project established embankment on acid sulphate soil (94 hectares of industrial plantation and 129 hectares of plantation at demo farms, 223 hectares in total). Acidic sulfate soil produces sulfuric acid by being exposed to oxygen in the air[20]; thus digging up soil has environmental risk.

"Environmental and Social Consideration Guidelines on Forest Development in 1994" by JICA suggests to produce "Table of Project Location on Environment"[21] and clarify the site-specific condition with regard to the environmental risk as a preliminary screening during project formulation (e.g. peat soil). If environmental conditions of the project location need special care, the guideline suggests conducting a survey to collect sufficient information in order to figure out the environmental impact. However, in the terminal evaluation it was pointed out

[19] The final plan was presented at 14th Meeting on ODA Integrated Strategy in October 2003.

[20] The following article suggests a negative impact of acidic sulphate soil on environment.: Naylor, S.D., Chapman, G.A., Atkinson, G., Murphy, C.L., Tulau, M.J., Flewin, T.C., Milford, H.B., Morand, D.T. 1998, Guidelines for the Use of Acid Sulfate Soil Risk Maps, 2nd ed., Department of Land and Water. Conservation, Sydney.

[21] Attachment to project profile table of special considerations to grasp the impacts on environment including socio-economic conditions, natural environmental conditions, existence of local conditions which need special care, and examples of large impacts on environment.

that the project appraisal of the project was promptly conducted and mitigation of risk as well as removal of uncertainty was not sufficiently considered. In addition, according to the beneficiary survey carried out in the ex-post evaluation, 54% of the demo farms[22] claimed the problems of rice growth, death of fish at maximum for three years after establishing embankment[23].

Thus in the project formulation, even though installing embankment on acidic sulphate soil had environmental risk to acidify water by exposing sulphate salt to oxygen, proper countermeasures were not undertaken. Conducting certain countermeasures such as preliminary screening on evaluation of environmental impact, elaboration of environmental risk through opinion hearing from experts, or incorporating implementation of environmental monitoring in an action plan was needed.

Hence, the project was in line with Vietnamese development plan, development needs and Japan's ODA policy. However, the consideration on the environmental risk of sulphate soil was not sufficient. Therefore, the relevance is judged as fair.

3.2 Effectiveness and Impact[24] (Rating:③)

3.2.1 Effectiveness

3.2.1.1 Project Output

1) Output 1: Appropriate silvicultural techniques at project site are established and expanded.

Indicator ①: Survival rate of planted trees at demo farms based on reforestation guidelines is higher than 85%.

The project developed embankment and planted Melaleuca as industrial plantation (94ha) at degraded lands after forest fire directly managed by U Minh 1 FFE and at an area managed by individual households (40 demo farms, 129 ha) (Figure 1)[25]. According to the Terminal Evaluation, inspection conducted by DARD together with FFE and farmers after completing tree plantation, entire survival rate was higher than 90%.

[22] Considering dissemination effects on other farms the project established Melaleuca plantation on embankment and L shape water canal at neighbor farms (trench to control water in the farm).

[23] Beneficiary Survey targeting 40 demo farms.

[24] Sub-rating for Effectiveness is to be put with consideration of Impact.

[25] Please see Figure 2 for land development at demo farms.

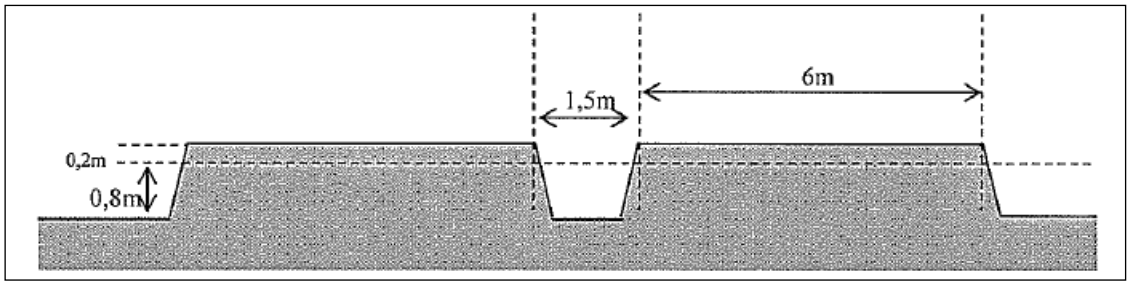


Figure1: Example of Cross Section of Embankment Installation
(The example of embankment: 0.2m higher than ground level with 6m wide,
0.8m digging with 1.5m wide)

Also, through the field site surveys conducted at the Ex-post Evaluation as those conducted at the Terminal Evaluation, good growth of Melaleuca were confirmed. In 2013 at ex-post evaluation, Melaleuca planted under the project were maintained at forests as a source of high quality seeds for seedling production (industrial plantation managed by Forest Company). Among those planted at the demo farms, Melaleuca was harvested and replanted at 11 farms[26], the survival rate of the second rotation is higher than 90%.

Thus the indicator 1 was evaluated as achieved.

Indicator ②: Staff of VAFS and DARD, Ca Mau Province carries out 18 technical training courses on appropriate reforestation techniques in U Minh Ha region.

Indicator ③: Staff of VAFS and DARD, Ca Mau Province and farmers acquire the techniques of the reforestation manual.

The project[27] produced two technical manuals on Melaleuca plantation on embankment for technical staff and farmers and distributed them to relevant organizations. Technical trainings were held 22 times for technical staff of U Minh 1 FFE in the second year and for staff of other FFEs (U Minh 2, Son Trem, Tran Ban Thoi, and April 30) in the third year. Technical training on forest plantation for the demo farmers was held twice.

According to questionnaire survey at the Terminal Evaluation, 91% of counterparts[28] expressed their confidence in conducting a technical training on Melaleuca plantation for other people. Also at the Ex-post Evaluation, more than 80% of participants of training courses expressed that they understood almost all the contents of training and have enough confidence in teaching them to others (Table 2).

At the Ex-post Evaluation, 97% of demo farmers highly evaluated the training of

[26] Total area reforested in the 11 farms was 33 hectares.

[27] In this project, working groups were formed by each output: sub department of forestry for Melaleuca plantation on embankment and training for demonstration farms, Forest Company for construction of demo farms, sub department of forest protection for forest fire prevention, and DARD for timber processing.

[28] Based on interviews with seven staff nominated as counterparts who belong to DARD, Sub department of Forestry, U Minh 1 FFE, sub department of forest protection

Melaleuca plantation techniques. In the demo farms[29] in which harvested Melaleuca was harvested in 2013, farmers applied the techniques for replanting which were learnt at the training using the technical manual on replanting Melaleuca produced by the project[30] [31] (Table 3).

Therefore, indicators 2 and 3 were evaluated as achieved.

Table 2: Evaluation of Melaleuca Plantation Training by Vietnamese Government and Forest Company

Unit: # of persons

Contents of training	Participants	Highly Evaluated[1)]	With confidence[2)]	With confidence (%)
Experience at Long An[3)]	12	12	10	83
Land preparation for tree planting	12	12	12	100
Characteristics of Melaleuca	14	14	13	93
Establishment and tendering of nursery	14	14	12	86
Inspection and treatment of acid soil	10	10	7	70
Hoa An[4)] Field Trip	11	11	11	100
Utilization of heavy equipment	2	2	2	100
Geographic Information System (GIS)	6	6	5	83

Source: Interview survey with 14 training participants (DARD (2), Sub-department of Forest Protection Sub-department of Forestry (6), former FFEs (5)) at ex-post evaluation

Note: 1) Participants were asked whether they highly evaluate the contents of training or not.
2) Participants were asked whether they can conduct training course or not.
3) Project sites of Afforestation Technology Development on Acid Sulfate Soils in the Mekong Delta.
4) Trial site of Melaleuca plantation on embankment.

Table 3: Evaluation of training by demo farms

Theme	No. of participants	Highly evaluated		Partially applied	
		#	%	#	%
Melaleuca and reforestation techniques	37	36	97	36	97
Forest fire prevention	37	28	76	35	95
Charcoal and wood vinegar production	35	23	66	21	60
Rice production technology	38	33	87	35	92
Vegetable/Fruit production	35	24	69	31	89
Livestock production/Pig raising	34	22	65	26	76
Soil enhancement technology	35	32	91	34	97

Source: Interviews with 40 demo farmers at ex-post evaluation.

Thus, Melaleuca plantation on embankment had high survival rate. Appropriate techniques to the project site were developed and considered to be acquired by relevant parties. Therefore, output 1 was evaluated as achieved.

[29] Replanting was carried out at 11 farms in 40 demo farms. The remaining 29 farms also plan to harvest in 2014.

[30] In case of forest plantation by famer's investment, farmers will receive 95% of profit excluding the cost such as harvest planning and harvest itself. In case Forest Company invests, farmers will receive 80% of the profit.

[31] Based on interviews with 40 demo farms

2) Output 2: Knowledge and techniques related to market research, utilization and processing of Melaleuca timber are improved among those who engaged in rehabilitation activities

Indicator: Staff of VAFS, DARD, and FFE holds extension training courses on market research and utilization/processing of Melaleuca timber three times.

Trainings on wood processing were carried out nine times (study tours six times, training lectures twice and workshop once) for staff of VAFS, DARD and FFE during the project period. In the second year JICA expert lead a market survey providing instructions to the counterparts. In the 3rd and 4th years, the counterparts themselves conducted survey of wood processing factories four times in Ho Chi Minh and Hanoi cities. As a result, the counterparts realized the importance of chip boards and block boards to expand the use of Melaleuca and proposed extension of the project for technical instruction in order to obtain the technologies to make them at FFE (the proposal was not accepted). Also at the village of demo farms, enhanced oven (10 ovens) for charcoal making with Melaleuca was experimentally manufactured and trainings on charcoal making and wood vinegar[32] were conducted. At the Terminal Evaluation, 67% and 89% of the counterparts who participated in the activities reported that they understood the contents of training on marketing research (to certain extent) and the charcoal/wood vinegar making, respectively. 78% of the participants evaluated highly the project achievement.

Utilization of Melaleuca processing technologies

At the time of ex-post evaluation, 90% of participants were confident in the contents training on research and development, feature, processing technologies, and future potential of Melaleuca, visit for processing companies with advanced processing technologies, and international marketing study, and they were confident to hold trainings themselves. However, only one third of participants are confident in charcoal and wood vinegar production (Table 4). Regarding the processing technologies, training on market research and wood processing factories surveys are offered, and through the training, the participants understood the importance of chip boards and block boards as possible ways to utilize Melaleuca. However, it is not practical to utilize Melaleuca as chip boards or block boards due to competition with other species (e.g. Acacia), and that thick bark reduces the part to be utilized as wood to only 10%. It is possibly one of the reasons why the processing technologies of Melaleuca had discontinued at the time of ex-post evaluation. According to the interview of demo farmers, training on charcoal and wood vinegar production using Melaleuca was conducted but it was difficult to use the techniques in practice due to high technical requirement with high cost. Thus, regarding output 2, trainings related to marketing study and utilization and processing of Melaleuca were

[32] The clear layer of fluid of dry distillation liquid produced as by-product during the process of charcoal making. The fluid has an effect of natural pesticide.

conducted and the level of knowledge and techniques was enhanced; however, continued utilization of the knowledge and techniques was not observed at the time of the ex-post evaluation.

Table 4: Evaluation of Training for Melaleuca Processing

Unit: # of persons

Contents of training	Participants	Highly evaluated	With confidence*	With confidence (%)
Charcoal and wood vinegar production	9	9	3	33
Wood processing technology	3	2	1	33
Research and development	1	1	1	100
Feature, processing technologies and future potential of Melaleuca	10	10	9	90
Market development	8	8	8	100
Visit for companies with advanced processing technologies	2	2	2	100
International marketing analysis	1	1	1	100

Source: Based on interviews with 14 training participants at ex-post evaluation
Note: *Questioned if they are confident to hold a training program of the subject.

3) Output 3a Fire prevention system is improved in the target area

Indicator: DARD Ca Mau staff is capable to operate forest fire prevention training system.

The project produced a manual on fire prevention and conducted forest fire prevention training with focus on strengthening public relations activities (one session for three days, ten times in total) in order to strengthen forest fire prevention for staff of Sub-department of Forest Protection, FFE, local farmers and primary school students. The activities included: a basic training on forest fire prevention, a slogan contest on forest fire prevention, an exercise to make firefighting stick, fire extinguishing exercises, and forest fire prevention poster contests for primary school students. Based on these activities, in the third and fourth years of the project, DARD Sub-department of Forest Protection initiated original activities such as competition of fire extinguishing by commune[33] representatives through Youth Union[34] with their own budget.

At the Terminal Evaluation, among seven counterparts, all of them found that Forest Fire Prevention Manual was effective, five found that the forest fire prevention model was effective (two did not respond) and four marked the excellence and goodness of the achievement of the project[35] (three did not respond).

At the ex-post evaluation, 100% of the training participants from DARD and FFE evaluated highly the training contents on forest fire prevention and showed confidence in

[33] The smallest political unit in Viet Nam.
[34] National organization of youth organized by community party.
[35] Evaluation was based on four levels: Excellent, Good, Satisfactory, Un-satisfactory, and No response.

knowledge acquisition (Table 5). 95% of demo farmers (38 out of 40 farmers) responded that they had applied the techniques taught in training in their practices (Table 7).

Table 5: Evaluation for the Training on Forest Fire Prevention

Unit: # of persons

Contents of training	Participants	Highly evaluated	With confidence	With confidence (%)
Basics of forest fire prevention, fire extinguishing, slogan making	10	10	10	100

Source: Based on interviews with 14 training participants at ex-post evaluation.

Implementation of forest fire prevention measures and actual status of forest fire occurrence

At the time of ex-post evaluation, based on the supervision of DARD Sub-department of Forest Protection, U Minh Ha Forest Company annually carried out forest fire prevention training for local farmers once a year in each village based on this experience using the technical manual developed by the project. Farmers are organized into three groups per village (20 people in one group), as a unit of fire extinguishing activities when a fire occurs. Also at least two persons of each household are obliged to stay in the house during the forest fire season (from January to May). Fire warning is alerted on extremely dry days by sign and radio (Photo 1).

Photo 1: Alert sign board to show the risk of forest fire by level of dryness

As seen in the record of forest fire occurrence and damaged area from the time of project implementation to 2013, with exception of the driest years, 2010 and 2013, damaged area by forest fire tends to be reduced (Table 6).

Table 6: Damaged Area by Forest Fire and Number of Incidence in Ca Mau Province

Year	Damaged area (ha)	# of forest fire
2006	0.3	3
2007	17	19
2008	15	22
2009	4	3
2010	235	23
2011	1	3
2012	3	12
2013	43	27

Source: DARD.
Remarks: In the boundary of Forest Company, forest fires damaged 1 ha (2 occurrences) in 2011, 680m2 (2 occurrences) in 2012, and 15.9 ha (6 occurrences) in 2013.

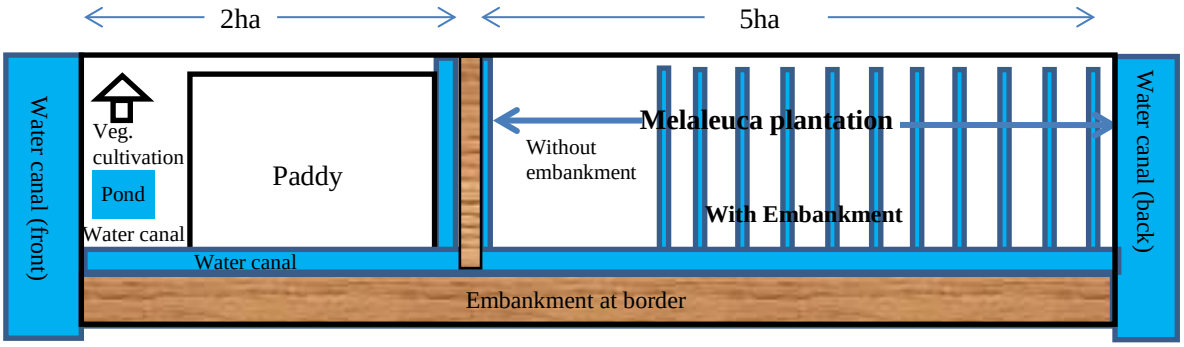
Thus at the time of ex-post evaluation, under the supervision of DARD Sub-department Forest Protection, U Minh Ha Forest Company carries out fire prevention training for local farmers by using the manual produced by the project and organizes farmers to participate in forest fire extinguishing practices. It confirms forest fire prevention and firefighting system

were strengthened based on the experience of the project. In addition, even though it is hard to clarify the direct impact of the project, fire occurrence and damaged area are likely to be reduced except for the driest years, 2010 and 2013. Hence, output 3a is judged as achieved.

4) Output 3b Trainings on livelihood development for local farmers are implemented
Indicator: Not specified since this output was mixed with Output3a.

For the 40 demo farms households, along with the embankment for Melaleuca plantation, L shape water canals[36] and embankment along the canal were also introduced as basic facilities in order to prevent acidic water inflow from plantation area to agricultural lands next to each other (Figure 2). Trainings on livelihood development techniques (rice production techniques, vegetable/fruit production, and livestock production/pig raising and soil improvement techniques) were conducted 28 times (lectures (23) and study tours (2) and workshops (3)).

In order to arrange the support system for demo farms, "Technical Support Committee on Agroforestry Activities[37]" composed of demo farmers, counterparts, DARD, dissemination centers of agriculture/fishery/livestock production, Agriculture Sub-department at district level and U Minh 1 FFE was established. "Agriculture Dissemination Club" was formed among demo farms led by advanced farmers as a system to receive technical support by DARD.



Remark: Diagram seen from the sky: the things supported by the project (embankment installment at the boundary, L shape water canal (surrounding two sides of paddy and residential area), and embankment and water canal for plantation).

Figure 2: Typical Land Use Model at a Demo Farm

[36] The land allocated to farmer in FFE is divided into forest and agricultural land (demo farmers live in the land based on forest protection contract for 5ha forest and 2 ha agricultural land). This project constructed L shape water canal and embankment to enclose the agricultural land in order to drain the strong acidic water which is generated at the beginning of rainy season.

[37] An organization composed of advanced farmers, FFE, Extension centers, DARD, etc. Established in order to sustainably support farmer activities and widely disseminate impact of project.

At the terminal evaluation, 87% of demo farmers believed that the outcome of the project would continue to produce benefits and 75% was motivated for the continuation and 94% viewed the project achievement as excellent or good based on the four level scale assessment. At ex-post evaluation, more than 90% of demo farmers suggested that they applied the contents of training in their practices (Melaleuca planting, forest fire prevention, rice production, vegetable/fruit production, soil enhancement techniques) except for charcoal and wood vinegar production/livestock production and pig raising (Table 7).

Table 7: Evaluation on Technical Training by Demo Farms

Theme	No. of participants	Highly evaluated		Partially applied	
		No	%	No	%
Melaleuca reforestation techniques	37	36	97	36	97
Forest fire prevention	37	28	76	35	95
Charcoal and wood vinegar production	35	23	66	21	60
Rice production techniques	38	33	87	35	92
Vegetable and fruit production	35	24	69	31	89
Livestock production and pig raising	34	22	65	26	76
Soil enhancement techniques	35	32	91	34	97

Remark) Based on interviews with 37 demo farmers at ex-post evaluation.

Although it was not setup as an indicator, 11 demo farms which harvested Melaleuca in 2013 had 1.2 million Dong of income on average, equivalent to approximately 30% of their annual income (14.9 million Dong). Demo Farmers are enabled to increase production of rice, fruit and fish having 2.4 times more income than neighbor farms (ref. supplementary analysis). This is largely the result of the introduction of water level control by means of L shape water canals for rice production, and fruit production on embankment (Photo 2).

Agriculture Dissemination Club of demo farms has 37 member households. They have monthly meetings, provide support information from DARD dissemination centers and share the fund to provide credit with no interest to members who need financial support.

Moreover, “Technical Support Committee on Agroforestry Activities” was not sustained after the completion of the project. The reasons for the discontinuation are: 1) the committee was established specifically for demo farms, thus lacking general-purpose to support farmers, 2)

Photo 2: Paddy field (near) and banana on embankment (further) at demo farms by level of dryness

since technical dissemination is carried out by dissemination centers, additional multi-sector organization was not easy to be accepted.

Although some activities related to output 3b was not continued, installation of L shape water canal and embankment was highly evaluated by farmers and generated actual livelihood development impacts with the techniques introduced. Therefore, output 3b was evaluated as achieved.

Supplementary analysis: Impact of livelihood development on demo farms

The project activities for local farmers including Melaleuca plantation on embankment, constructing L shape water canal and embankment along the canal, and technical trainings showed significant impacts on livelihood development. The impact of livelihood development was more noticeable on the farms under medium and wealthy income levels than poor farms, and higher on farms which have access to road.

The project carried out technical trainings and establishment of Melaleuca plantation on embankment (tree planting in 2005, total area 129 ha, seedlings and installing embankment are provided by the project and planting activities was conducted by farmers). L shape water canal and embankment along the canal was installed as basic infrastructure for agricultural production. Trainings on rice production technologies, vegetable and fruit production, livestock production/ pig raising, and soil improvement techniques using water canal and embankment were conducted.

Followings are the comparison between 40 demo farms and 40 farms in the vicinity. Melaleuca planted by the project was harvested at 11 demo farms in 2013 producing 119.6 million Dong (standard error + 8.9 million Dong, mean 112 million Dong, 8 years rotation, 14.9 Million Dong /year). This income is significant as 2.4 times of their annual income from agriculture (30% for annual income on average of eight years). On the other hand, at other farms in the vicinity, the Melaleuca harvest without embankment was conducted at four farms in 2013 generating 12 million Dong on average (standard error$\pm$2.4 million Dong, mean 12 million Dong) (10.3 years to harvest, annual average income, 1.2 million Dong). It suggests that Melaleuca plantation on embankment generated 12.4 times larger income per household in 2013 (=14.9 million Dong /1.2 Million Dong) than those from non-embankment.

Regarding comparison between rice and fruit production between 2003 (before the project) and 2013 (ex-post evaluation), there was a 50% increase in demo farms for rice production but 29% decrease in non-demo farms were found, as well as 2700% increase in demo farm and only 16% increase in non-demo for fruit production. Agricultural production based on the value of 2013 has increased by 106% in demo farms but only by 4% in non-demo farms.

However, according to the income level comparison among demo farms[38], poor farms did increase their fruit production, but decreased in total due to the decrease of rice, pig and charcoal production. Medium level farms increased fruit, rice and honey, thus total agricultural production was increased by 154%. Rich farms increased fruit, rice as well as pig raising, resulting in 113% increase in total production. The increase in income from agriculture is 61 times larger in rich farms than poor farms and 27 times in medium farms than poor farms.

Moreover, most of demo farms were connected to District center by a paved road in 2008. The comparison between farms connected and not connected to the road showed that both farms doubled their agricultural production but income is 1.9 times larger in farms with road than farms without road.

[38] Poor households, annual income less than 25 million Dong, Medium households 25-100 million Dong, Rich households more than 100 million Dong.

3.2.1.2 Achievement of Project Purpose

Project Purpose: Necessary techniques for implementation of the rehabilitation and forest fire prevention program of U Minh Ha region are developed and disseminated.

1) Indicator ①: 100 percent of staff of VAFS and DARD, FFE agreed with techniques developed by the project and will implement the extensions of the techniques

At the terminal evaluation, both VAFS and DARD staff intended to disseminate Melaleuca plantation by using the technique developed by the project. All the counterparts' responses to the questionnaires were positive for the dissemination of the technique. The material provided by JICA suggested that the participants of plantation techniques from FFEs other than U Minh 1 are intended to use the knowledge obtained in the training in their job.

The questionnaire survey to training participates at the ex-post evaluation suggested that more than 80% of participants are confident to teach the contents of all the trainings except for inspection and treatment of acidic soil inspection.

Current situation of Melaleuca plantation on embankment

Since 2002, PPC and DARD have been supporting U Minh Ha Forest Company for Melaleuca plantation on embankment. The Forest Company received a loan of commercial bank for Melaleuca plantation on embankment from 2004 to 2007 and provided refinancing to farmers with the loan. With the political and financial support, Melaleuca plantation on embankment expanded to 2,422 hectares in 2007 and 4,229 hectares in 2013.

Hence, more than 80% of VAFS and DARD staff who participated in training is confident to teach others on the content of the training. The technique developed by the project has been utilized with political and financial support by counterparts with consistent dissemination activities. It is considered that the counterpart agencies had clear intention to disseminate Melaleuca plantation on embankment. Therefore, the project purpose is evaluated as having been achieved.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

Overall goal: Techniques developed by the project are utilized by people and Forest and Fishery Enterprises in some areas of Mekong Delta[39].

[39] Mekong Delta extends to 12 provinces and Ho Chi Minh city in Viet Nam. Outcomes of the project is applicable only with similar soil conditions. Therefore the Mekong Delta in this context was considered to indicate the Melaleuca area in Ca Mau province (Project target area).

Indicator: Forest plantation area established by the technique developed by the project reaches 2,000 hectares.

As mentioned above, the plantation area of Melaleuca on embankment had reached 2,422 hectares in 2007, reaching the figure targeted by the overall goal. In 2013, the area of Melaleuca plantation by embankment reached 4,229 hectares in total in U Minh Ha Forest Company (composed of Five FFEs) (Table 8) and the area is still expanding.

Table 8: Melaleuca plantation area by embankment

Unit: ha

Year	Directly management by Forest Company	Contract with other company	Contract with farmers	Total
2007	727*	0	1,695*	2,422
2013	1,648.	847	1,734	4,229

Source: U Minh Ha Forest Company
Note: *Estimated values.

Contribution of Outputs and Project Purpose for achievement of Overall Goal

Although some project activities including charcoal making trial as well as wood vinegar production (Output 2) was not realized, technical development by FFE (Output 1), strengthening forest fire prevention in collaboration with local farmers (Output 3a) and implementation of plantation model combined with agricultural activities (Output 3b) were realized and dissemination activities were carried out by the Forest Company (merged with former FFEs) and other implementation agencies (the project purpose). Techniques of Melaleuca plantation on embankment established by the project were expanded and contributed to the achievement of the overall goal.

It was considered that the following factors had contributed for the achievement of the overall goal: 1) PPC policy to introduce Melaleuca on embankment in 2002; 2) utilization of bank loan by FFE between 2004 and 2007 (FFE provided loan of 50 million Dongs to farmers); and 3) larger potential of reinvestment from Melaleuca harvest (re-planting) produced in the shortened rotation[40].

Contributing factors for expansion of Melaleuca plantation on embankment from 2007 to the recent years (2013)

Melaleuca plantation on embankment was further expanded by the project "Empowerment to the Community Damaged by Forest Fire in Ca Mau Province'' (Plantation area 500ha) by JICA, investment of private company (847ha) and the Forest Protection

[40] Based on an interview with the Forest Company.

Program[41] (360ha) by Japan's Ministry of Foreign Affairs in 2012. Eight excavators provided by "the Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province", made the expansion of Melaleuca plantation on embankment easier. The Forest Company implemented 733 hectares of Melaleuca plantation on embankment in 2013. Moreover, as an external factor, the upward trend of the price of Melaleuca pole since 2012 contributed to the expansion of Melaleuca plantation on embankment reflecting the high demand of construction materials (Table 9, Photo 3 & 4).

Table 9: Market price of Melaleuca pole (5m in length and 4.2-4.9cm in diameter)

Unit: Dong/m^3

	2009	2010	2011	2012	2013
Price	549,000	549,000	549,000	610,000	732,000

Source: U Minh Ha Forest Company

Thus the area of Melaleuca plantation on embankment not only reached the area targeted by the overall goal but also is steadily expanding even after the global economic crises in 2008, after being supported by Japanese aid as well as the private sector investment. Therefore, overall goal is evaluated as achieved.

Photo 3: Melaleuca shipping yard (shipped as round wood)

Photo 4: Melaleuca pole to sustain a concrete building

3.2.2.2 Other Impacts

Increased employment by introducing Melaleuca plantation on embankment

Melaleuca plantation is sold by auction as standing tees (approximately 1,200 hectares of plantation was sold in 2013) to logging companies. According to a logging company which harvested 150 hectares in 2013, the company hires 110 workers and 70% of their harvest comes from Melaleuca plantation on embankment. Assuming the company is an average company which is engaged in Melaleuca harvest, it is roughly estimated that entire Melaleuca plantation

[41] A grant aid targeting Mekong Delta region implemented in order to rehabilitate forest in the region by supporting forest fire prevention and endemic tree planting on the area and shifting cultivation had been conducted.

on embankment creates job for approximately 600 workers (=110 workers x (1200 hectares x 70%)/150 hectares).

Impact on natural environment

According to the Forest Company, in order to prevent the exposure of pyrite[42] in the soil, digging operation was contrived as follow: 1) shallow digging in order not to touch pyrite in the area where pyrite is present in shallow place; and 2) digging deeper than the soil layer of pyrite where pyrite is present in deeper soil and covering the pyrite with soil dug under the pyrite. When developing embankment, excavator operations were conducted twice and pyrites were covered for the second time (the first time was to dig the soil). While digging, presence of acidic water was treated with caution. In case of presence of acidic water, the amount of required lime was previously studied. Training to farmers for treatment of acidity (introduction of a variety tolerant against acidity, drainage method, fertilization and utilization of lime) and preparation of guidelines were conducted.

However, according to a beneficiary survey to demo farms, 54% of farmers (22 farmers) stated that the negative influence of embankment on their farm production (bad growth of rice and death of fish, in particular) lasted for three years at longest (Table 10).

Table 10: Damage by acidic water at demo farms

Category	# of farms	%
Damage by acidic water	19	54
No damage by acidic water	14	40
I do not know	2	6
Total	35	100

Remark) Based on interviews with 40 demo farmers at the ex-post evaluation

A farmer who experienced negative impact described their damage after developing embankment as follows: the first year serious damage (100% damage on agricultural crops), the second year (70%), the third year (30%) and then they recovered normal production. It is considered as a reason why the project could not prevent the damage, that the project could not sufficiently monitor digging operations and excavators dug deeper than the limited depth (1.2m), which was a limit set to prevent the exposure of pyrite, resulting in stronger acidity of water. The other reason is that the support for farmers was limited to group training, and support for individual farmers was not provided. In the field survey, no damage on humans was observed; however, in order to maintain the damage at minimum, not only the countermeasures to the situation mentioned above but also sufficient consideration on countermeasures including environmental risk assessment as well as planning and execution of environmental monitoring and consideration of taking necessary measures in case damages occur was needed.

[42] Substance in the soil layer to be acidified by exposing to the air producing sulfuric acid which causes strong acidification of soil. In order to prevent it, pyrite needs to be covered not to touch the air.

In summary, the following two negative factors are present in the project impact, but they are considered to be either trivial or positively treated by beneficiaries.

1) Impact of enhancement of Melaleuca processing techniques is limited but considered to be merely trial implementation; and,
2) Acidic water had negative impact on agricultural production but recovered in a few years and farmers accepted it.

Effectiveness/impact of the project is judged as high considering the following factors: 1) areas of Melaleuca on embankment have enhanced soil conditions and transformed land use to be highly profitable with sustainable use, and reached the target of the overall goal and are expanding steadily; 2) livelihood development of demo farms had a large positive impact; and 3) forest fire prevention shows effective impact.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	Plan	Actual (Terminal Evaluation)
(1) Experts	Short-Term 5 Experts, 19 Man Months (original plan for consultants) Participatory forest management, forest soil/planning analysis, timber utilization development, forest fire prevention, agroforestry/agriculture, other as needed.	Short-Term 9 Experts, 33 Man Months (Based on the revised contract) Participatory forest management, forest soil/planning analysis, marketing, timber utilization development, forest fire prevention, agroforestry/agriculture, project coordinator
(2) Trainees received	Field(s) of training: not described	Field(s) of training: plantation planning, operation management, technology, timber utilization and processing technology
(3) Third-Country Training Programs	Field(s) of training: None	Field(s) of training: None
(4) Equipment	Main equipment provided Equipment for reforestation, agroforestry, forest fire prevention, and timber processing	Main equipment provided Equipment for soil survey, GPS, Satellite images data, excavator, speed boats, tractor, bulldozers, etc. 71.51 million yen in total
Local Cost	Not described	Seedling production, a part of demo farms construction, etc. 56.90 million yen in total
Total Project Cost	200 million yen	257 million yen
Total Local Cost	Unknown	DARD 2.56 million yen, U Minh 1 FFE 17.33 million yen[43] 19.89 million yen in total

Source: JICA.

[43] The 68% of the budget total (17.33 million yen) is paid by U Minh 1 FFE to construct demo farms which includes cost for seedling production and amount paid by farmers.

3.3.1.1 Elements of Inputs

Dispatch of experts and provision of equipment were carried out as planned. The trainings were carried out in the fields of plantation planning, operation management, technology, timber utilization and processing technology; all were evaluated as appropriate.

3.3.1.2 Project Cost

The project cost was 257 million yen, which was higher than the amount planned (129% of the planned amount). Due to the different soil condition from the project site of the previous technical cooperation, new technology development was needed; thus human resource input, as well as the period of expert dispatch, was increased from 19 Man Months to 33 Man Months. For the same reason, since the equipment utilized by the former technical cooperation[44] could not be utilized, new equipment was purchased. Therefore the increase of the actual project cost (30% higher than the amount planned) was judged as reasonable.

3.3.1.3 Period of Cooperation

The period of cooperation was three years as planned. The inputs of expert dispatches were increased and adjusted without extending the project period by increasing the assignment period per year (input density). Equipment arrived late and the training for equipment utilization was delayed, resulting in the delay of tree planting from 2004 to 2005. However the delay of tree planting did not affect the entire plan of the project.

Although the project period was within the plan, the project cost exceeded the plan. Therefore, efficiency of the project is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy towards the Project

"Ca Mau Provincial Forest Protection and Development Plan"[45] aims to reach 56,000 hectares of industrial forest plantation by 2020. DARD plans to plant Melaleuca and Acacia half-by-half in the plantation area. Acacia is weaker against inundation and acidic water; therefore, it needs larger investment compared to Melaleuca due to the requirement of deeper ditches to make higher embankment. Therefore, the possibility to replace existing Melaleuca with Acacia plantation is considered to be limited. Also, according to the Annual Operation Plan 2013, approximately 50% of entire plantation area planned for 2013 by U Minh Ha Forest Company is Melaleuca plantation, suggesting that the recognition of importance of Melaleuca plantation was maintained at the time of ex-post evaluation.

[44] The Afforestation Technology Development Project on Acid Sulfate Soil in the Mekong Delta.
[45] PPC Decision No. 1200, 2012.

Ca Mau Provincial People's Committee (PPC)[46] approved "Resettlement Plan of Citizen and Production in Melaleuca area"[47] and approved the land use plan in the scale of 1/2,000[48]. According to the plan, targeted farmers (950 households) will obtain place of residence, houses, and agricultural lands and access to roads, schools and health centers and drainages. If this plan is realized, plantation on embankment and L shape canal for agriculture are separated at the targeted farms; thus the model developed by the project at demo farms (operating both agriculture and forestry at one farm) may not be applicable. On the other hand, the other non-targeted farms (approximately 2,000 households) maintain both forest and agricultural lands since they do not move to the new area, the agro-forestry combined model developed by the project will be applicable.

The 15 year forest protection contract made by FFE with the demo farms who immigrated in early 1990s, with the warranty of Commune People's Committee (CPC), already expired in 2005 but not yet renewed. The outcome of the project is maintained only by automatic renewal of the contract[49].

Therefore, due to the limitation in dissemination of agroforestry model combined in one farm unit, as well as unclear treatment of forest protection contract which sustains the model, the project sustainability is judged as having some policy issues to be considered.

3.4.2 Institutional Aspects of the Implementing Agency

U Minh Ha Forest Company is an implementation agency of Melaleuca plantation on embankment, tendering of trees and taking care of forest fire prevention. The farmers who live in the lands of the Forest Company receive some support for their livelihood directly or indirectly from the Forest Company. U Minh Ha Forest Company was a group of FFEs at the project start, and was changed to a national company in 2007 by merging five FFEs, then became a one member limited[50] in 2010 in the process of institutional reform. The number of the Forest Company employees was reduced from 143 in 2010 to 79 in 2013 by 55%; thus management rationalization is in progress. According to MARD, it is expected that the Forest Company will be strengthened by transforming to a joint stock company[51] which is able to receive investment from the private sector. In this case, PPC would own 70% of stock and 30% would be allocated to the private sector; then the Forest Company will be strengthened by financial support, technologies and markets of private companies while maintaining policy

[46] The highest administrative organ of the government appointed by People's Council which is selected by citizen.
[47] PPC Decision No. 227, 2009.
[48] PPC Decision No. 475, 2013.
[49] The automatic extension of forest protection contract with proper operation of forest protection is described in Forest Protection Contract.
[50] One member limited liability company is owned by a company or an individual alone. In case of U Minh Ha Forest Company is owned by PPC Ca Mau. PPC Ca Mau is responsible for all the debt and other liability up to the limit of capital described in the article of association.
[51] Form of company owned by stockholders. It enables co-ownership by both government and private companies.

support of PPC. At the time of ex-post evaluation, the profit of the Forest Company had been doubled in the recent years and Melaleuca plantation has been expanding by investment by private companies. Some private companies showed interests in investing Melaleuca plantation with high profitability. Thus, it is expected that the investment of private companies on Melaleuca plantation as well as on the Forest Company is expected to increase.

Agriculture and Fishery Dissemination Centers under DARD have dissemination activities in DPC of U Minh district (3 staff) and CPC (one staff each in eight communes).

VAFS is a public institute and special budget is not provided for supporting the maintenance of the project. VAFS has an office in Ca Mau and has a capacity to provide a technical service continuously when requested.

Thus U Minh Ha Forest Company started plantation on embankment with strong political support of PPC and would be strengthened in terms of finance, technologies and market by private sector investment in the near future. Also, other implementing agencies have sufficient capacity to maintain the project outputs. Therefore, there are no issues related to institutional sustainability in implementing agencies.

3.4.3 Technical Aspects of the Implementing Agency

U Minh Ha Forest Company has sufficient techniques for installing embankment for Melaleuca plantations; thus it can expand the embankment by itself. Also Forest Company uses the manuals and techniques developed by the project and carries out forest fire prevention. Furthermore, Agricultural and Fishery Extension Centers use the manuals of agroforestry model provided by the project.

However, the treatment for acidic water produced by the embankment was not monitored though irrigation facilities were constructed to promote drainage of acidic water to the sea and water level is monitored by the department of irrigation[52].

Therefore, technical sustainability has some issues in acidic water monitoring and its treatment partly as an issue.

3.4.4 Financial Aspects of the Implementing Agency

Financial aspects of sustainability depend on the financial base of U Minh Ha Forest Company. The Forest Company became financially independent in 2007 and does not receive any subsidy from the government.

The sales of the Forest Company in 2013 are approximately 66.8 billion Dong. The sales of Melaleuca on embankment have high profitability accounting for 90% of the sales. The sales and profit for the three years between 2011 and 2013 have been doubled, indicating the financial stability (Table 11). The Forest Company has terminated paying back its debt that was taken

[52] This project attempted to form monitoring committee for prevention of acidity by embankment installment among the stakeholders but the continuity of the activities is not observed.

over from former FFEs in 2007. As of ex-post evaluation, Forest Company allocated budget of 14 billion Dong for Melaleuca plantation and 2.5 billion Dong for forest fire prevention. Furthermore, it is planned to transform into a joint stock company which can receives investment from private companies. Since there is an increase in the investment on Melaleuca plantation on embankment by private companies, it is expected that U Minh Ha Forest Company will receive investment from private companies and will be financially strengthened.

No issue is observed in financial sustainability based on the following facts: high profitability of Melaleuca plantation on embankment: U Minh Ha Forest Company paid back its debt, having increased both sales and profit, and financially strengthened by having investment from private companies.

Table 11: Financial status of U Minh Ha Forest Company

Unit: million Dong

	2011	2012	2013
Sales	32,072	51,669	66,820
Cost	28,937	48,994	60,851
Profits	3,135	2,675	5,969

Source: U Minh Ha Forest Company

Thus, although U Minh Ha Forest Company has been strengthened through merger and liberalization and transformed to have limited liability, the political issues on change on united agroforestry development in one farm, non-renewal of forest protection contracts of resident farmers, and the technical issue of acidic water by installing embankment are existent. Therefore, sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The “Forest Fire Rehabilitation Project” aimed to develop and disseminate techniques for the Melaleuca (*Melaleuca cajuputi*) planting using embankment with high economic returns on acidic sulphate soil whose topsoil was consolidated after the damage caused by a large forest fire. The plantation technique was developed by former JICA technical cooperation project. The project was in line with Vietnam’s development policy as well as development needs but it was evaluated that environmental consideration on the risk involving with acidic sulphate soil was not sufficient during the project formulation stage. Therefore, relevance is evaluated as fair.

The impact of trial implementation of Melaleuca processing technologies was limited but Melaleuca plantation on embankment has been disseminated and expanded covering the target area of the overall goal. Also, trial implementation in the field, livelihood support to demo farms, showed a large impact on their income and outputs on forest fire prevention activities are effectively being utilized; therefore effectiveness and impact of the project are evaluated as

high.

The cooperation period of the project was three years as planned; however, the input of human resources was increased due to development and transfer of new technologies. The project input was increased because the equipment planned to be utilized was unable to be utilized. Therefore, efficiency of the project is evaluated as fair.

FFE, one of counterpart agencies was institutionally and financially strengthened with political support by the DARD. FFE became a forest company (Forest Company) through merger and liberalization. However, because of a political issue on immigrant farmers who live in the lands managed by the Forest Company as well as a technical issue on formation of acid water by installing embankment, sustainability is evaluated as fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Reduction of producing acidic water by installing embankment and continuous water quality monitoring[53]

After the introduction of the new plantation technologies by the project, establishing embankment and L shape water canal on acidic sulfate soil, exposure of sulfate was observed and pointed out as negative impacts on agriculture production. It is difficult to say that sufficient treatment is being carried out. Embankment establishment by the Forest Company has reached 4,229 hectares; it is difficult to deny all the negative impact on agriculture and eco-system in the area. DARD is expected to take the following measures in order to minimize the negative impact of acidic water.

- Institutionalization of the guideline for embankment installment which reduces the exposure of pyrite and enforcement of its compliance by the Forest Company;
- Enforcement to the Forest Company of preparing embankment installment plan including soil data (depth of dredging and layer of acidic sulphate soil), and current data and its monitoring plan of water quality;
- Setting up the maximum size for embankment installment at one location in order to control negative impact by acidic water; and,
- Establishment of a water quality monitoring coordination committee among stakeholders[54] for implementation of water inspection, circling and publication of technical information, and coordination to take necessary measures when problems occur.

[53] Based on the result of the Workshop on Environmental Monitoring held on May 24-26, 2006 and recommendations by JICA experts.

[54] PPC, DPC, Department of Natural Resource and Environment (DONRE), Department of Science and Technologies(DOST), etc.

(2) Extension of the forest protection contract with the resident farmers who live in the territory of U Minh Ha Forest Company

Demo farmers who live in the territory of the Forest Company are immigrants who migrated to the area in the early 1990s with the forest protection contract with former FFEs. They are obliged to maintain 70% of the land as forest and are allowed to use the remaining 30% for agriculture. However, the contract terminated in 2005 and no renewal of the contract has been completed, although automatically the contract is supposed to be extended in case no problem is observed. The sustainability of the model developed by the project is at risk due to the instability of land use right. In order to maintain the demo farms as well as technologies developed by the project, the contract is expected to be renewed.

(3) Utilization of the forest-agriculture model proved by demo farms

At demo farms supported by the project, Melaleuca plantation on embankment and L shape water canal were established, trainings on rice production by water canal and embankment, vegetable/fruit production, livestock production including pig raising, soil improvement technologies were carried out. A large impact on livelihood development was recognized. These technologies can be widely applied to other part of Melaleuca area under poverty. It is expected that forest and agricultural areas will be more divided by the “Resettlement Plan of Citizen and Production in Melaleuca area”. However, considering the density of acidic water produced, concentration of Melaleuca plantation on embankment in limited areas may cause negative impact on environment. Hence, DARD is expected to conduct transfer of technologies developed by the project to other farms, applying agriculture-forestry model which minimizes production of acidic water by using dissemination centers.

(4) L shape water canal construction for acidic water control in the farms in the territory of the Forest Company

The project proved that by installing L shape water canal, agricultural production can be increased with proper control of acidic water even for the farms in acidic sulphate soil conditions. However, many farmers who live in the vicinity of demo farms do not have L shape water canal due to the lack of finance and they are suffering from low agricultural production. For the expansion of the project impact, DARD and the Forest Company are expected to provide financial support to the farmers who live inside the territory of the Forest Company and those who immigrate by the resettlement plan.

4.2.2 Recommendations to JICA

The technical knowledge and experience including drainage and irrigation in acidic sulphate soil conditions, irrigation and ground water control, fertilizing and soil improvement considering acidic conditions have been accumulated in advanced farmers among demo farmers.

Agricultural Dissemination Club established among demo farmers provided information for technical support by dissemination centers and loans between members from wealthy farmers to poor farmers who need financial support as self-help activities are in practice. These project outcomes were what the farmers in the area desired; however, the on-going dissemination activities are limited to voluntary activities in a small scale.

JICA is expected to study the technical and institutional conditions of these technologies as well as organizing activities to be materialized, support dissemination through "farmers to farmers" approach and apply them to other areas.

4.3 Lessons Learned

(1) Utilization of "Guidelines on Environmental Consideration for Forest Project Formulation" for forest project formulation

Even though installing embankment on acidic sulphate soil has environmental risk by exposing sulphate to oxygen which produces sulfuric acid, appropriate countermeasures including environmental impact examination by preliminary screening, examination of environmental risk, and environmental monitoring in activity plan, were not incorporated during the project formulation.

The guideline developed in 1994 by JICA, "Guidelines on Environmental Consideration for Forest Project Formulation" demonstrates the methods in detail on environmental consideration and evaluation through developing project profile, the table for environmental conditions of the project location, preliminary screening and scoping with examples. It is expected to review the guideline and further examine a way to complimentarily utilize the contents (e.g. screening during forest project formulation) together with the up-dated JICA's Guideline for environmental and social consideration.

(2) Confirmation on land use right of farmers at project formulation

The project produces a large impact on income generation by combining land development with training for farmers; however due to the unclear land use rights in terms of the access to farmland by farmers, the sustainability in relation to policy background is uncertain. In case the project activities include income generation activities for specific farms by demonstrating land development in their farmlands, land use rights of the farms should be confirmed. If the land use right was not ensured, in order to have higher sustainability it is recommended that the activities to ensure it be included in the project activities.

Social Republic of Viet Nam

Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province"

External Evaluator: Wataru Yamamoto, OPMAC Corporation

0. Summary

The "Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province" aimed to enhance the living environment and income generation of an entire local community at U Minh Ha region[1] in Ca Mau Province, one of the poorest areas in Viet Nam, which is currently experiencing difficult agricultural conditions including acidic soil as a result of a large forest fire. The project established forest plantation by installing embankment[2], model farm development, road and bridge construction, water canal construction, agricultural drainage improvement, infrastructure development supports including building construction and equipment provision for forest fire prevention, schools, and hospitals. The project was in line with development policy, development needs, and Japan's official development assistance (ODA) policy. However, an issue was found in the environmental consideration of the project planning and approach. Therefore, relevance was judged as fair.

Roads, bridge construction and facility enhancement for forest fire prevention and schools showed high level of income generation as well as improvement of living environment. Enhancement of hospital facilities and equipment showed fair effects on improvement of living environment through enhanced medical services, but wood processing equipment which is expected to show much higher income generating effects. On the other hand, the model farm development, water canal construction and agriculture pump for draining agriculture water did not achieve the objective. Considering the amount invested for each component, effectiveness and impact of the project as a whole is judged as fair.

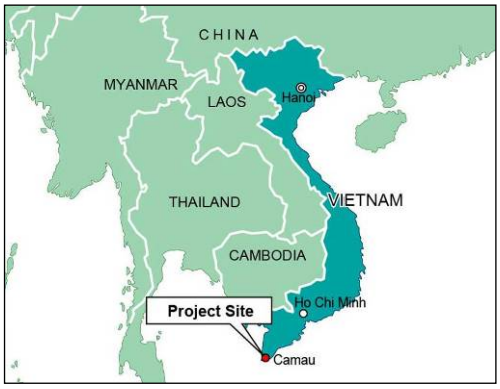
The project was efficiently implemented with the involvement of local contractors as planned in the project budget and period; therefore, the efficiency was judged as high. However, minor problems were found in institutional, technical and financial aspects with regard to maintenance management; therefore sustainability of the effects created by the project was judged as fair.

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

[1] Project area includes entire U Minh District, as well as Khanh Binh Tay Bac and Tran Hoi Communes in Tran Van Thoi District.

[2] Installing embankment in this project is a method of site preparation for forest plantation to raise a ground level by digging trench in line in order to reduce negative impact of inundation on the growth of Melaleuca trees (*Melaleuca cajuputi*, see footnote 4). The method was developed by the project for "Afforestation Technology Development on Acid Sulphate Soils in the Mekong Delta" (1997-2002) and introduced to Ca Mau Province by "Forest Fire Rehabilitation Project" (2004-2007).

1. Project Description



Project Location Map

Constructed road
(Ngyen Phich Commune, U Minh District)

1.1 Background

In the "8th Five Year Socio-economic Development Plan (2006-2010)", the major challenges of the Government of Viet Nam, aiming to reduce the poverty rate to 10-11% (applying new poverty base line) by 2010, were economic growth, enhancement of quality of life and infrastructure development. Mekong Delta region, which has the highest population in the eight regions of Viet Nam, is a poor area including the Northern mountainous region and Central Highlands. Ca Mau Province (with a total population of 1.22 million people in 2005), located at the southern edge of Viet Nam, created the "Ca Mau Socio-economic Development Plan[3] (2006-2010)" in order to reduce population under the poverty line from 19.2 to 10% by 2010.

U Minh Ha region in Ca Mau Province was the only region in the province with large forest accounting for 37% of forest area in the province. The region accepted landless farmers as immigrants in the early 1990s. The region was regarded as the poorest region in Ca Mau because of the restriction on land use to maintain more than 70% as forests and natural conditions of acidic sulphate soil[4] which were not suitable to agriculture. Forest management mainly for Melaleuca[5] (*Melaleuca cajuputi*) was an important source of income for the residents. Also in this region, basic infrastructure including roads, hospitals and schools had not been well developed.

Forest fires damaged a large scale of the region in March 2002, which burned 4,000 hectares of forests with peat soil[6] and agriculture land causing a large negative impact on the district economy. Japan International Cooperation Agency (JICA) implemented a technical

[3] The plan aims to establish early middle schools at all the communes and late middle schools at 20% of communes, and to achieve the national health standard at all the communes.

[4] Soil that has a layer of sulfate sediment called Pyrite which contains sedimentation at the bottom of shallow sea. Sulfate sediment is oxidized by exposing to air at soil surface, producing sulfuric acid resulting in acidity of soil.

[5] Tree species belong to Melaleuca genus, Mytasceao family. Distributed in tropical and sub-tropical region. Characterized by tolerant against acidity and inundation.

[6] Soil with undercomposed humus sedimentation remaining as peat created under the condition of high water table and acidity.

assistance project, *Forest Fire Rehabilitation Project* (hereinafter referred to as "the technical assistance project" or "the TA project"), from February 2004 for three years. The project proved the effectiveness of agroforestry techniques including plantation on embankment and agricultural land development by L shape water canals[7]. However, this region remained facing economic stagnation with little improvement in poor living environment and without effective community development. Dissemination of the techniques developed by the former TA project and support for infrastructure development in roads, hospitals, schools were needed.

1.2 Project Outline

The objective of the project is to enhance the living environment and to develop the livelihood of local communities through expansion of forest plantation areas and enhanced agricultural lands by land preparation installing embankment, model farmland development and by providing basic infrastructures (road and bridge, facilities for forest fire prevention, hospitals and schools) at U Minh Ha Region in Ca Mau Province. The region, one of the poorest regions in Viet Nam, experienced a large forest fire and has difficult agricultural conditions with acidic sulphate soil.

Grant Limit / Actual Grant Amount	905 million yen / 905 million yen
Exchange of Notes Date	March, 2008
Implementing Agency	Provincial People's Committee in Ca Mau Province (PPC), Department of Agriculture and Rural Development[8] (DARD), U Minh Ha Forest Company (hereinafter called "the Forest Company"), Departments of Transportation, Education, Health, and U Minh District People's Committee (DPC).
Project Completion Date	March, 2011
Main Contractors	Contractors Ba Phuc Irrigation Construction Factory, Joint Venture of Tan Phat Co. Ltd and Cuu Long Private Enterprise, Hung Loi Co. Ltd, Thien Hai Construction Co. Ltd, Dong Nam Construction-Consultant Company, Ca Mau Joint Stock Investment and Construction Company, Total Building Systems Limited.

[7] Water canal forming a shape of letter "L" which surrounds an entire agricultural lands in order to remove acidic water from paddy produced in the beginning of the wet season.

[8] An official implementation agency of this project is PPC. PPC appointed DARD as an actual implementation agency. Under the coordination of DARD, Departments of Transportation, Education, Health, Planning and Investment, and DPC formed Project Management Unit (PMU). PMU supported detailed designing by the procurement agency, selection of contractors and equipment suppliers through contractor management consultant and implementation of construction of facilities and equipment supply.

Main Contractors	Equipment Suppliers Itochu corporation, Nam Dien Private Enterprise, Hanoi Fire Control and Prevention Equipment Co. Ltd, Komatsu Vietnam Joint Stock Company, HCM Branch, Southern Telecommunication Electronic Joint Stock Company, Quoc Duy Co. Ltd., Vimedimex Medi-Pharma Joint Stock Company, Thoi Binh Trade Construction Joint Stock Company, Saigon Technologies Inc.
Main Consultants	Procurement Agent: Japan International Cooperation System, Constructor management: Minh Phat Consultant, Design Construction Joint Stock Company.
Basic Design	July, 2007 – March 2008
Detailed Design	August, 2008
Related Projects	• Afforestation Technology Development on Acid Sulphate Soils in the Mekong Delta: 1997.3-2002.3. • Forest Fire Rehabilitation Project: 2004.2-2007.2. • Dispatch of Expert: Ca Mau Regional Development Advisor: 2009.9-2011.9 • Japan Overseas Cooperation Volunteer (JOCV): Forest management, Ca Mau U Minh Ha Forest Company: 2011.6-2013.6.

2. Outline of the Evaluation Study

2.1 External Evaluator

Wataru Yamamoto, OPMAC Corporation

2.2 Duration of Evaluation Study

This ex-post evaluation was conducted on the following schedule[9].

Duration of the Study: October, 2013 – November, 2014

Duration of the Field Study: November 17, 2013 – December 22, 2013

February 23, 2014 – March 10, 2014

2.3 Constraints during the Evaluation Study

The project has various components in rural development, road, health and education sectors by which it was expected to produce integrated effects on improvement of livelihood and living environment. In order to examine local communities as beneficiaries of the project, the survey needed to be carried out at four levels (provincial, district, commune and community) in limited time. Beneficiary surveys were carried out at four locations selected from construction sites (roads, schools and Health stations). Interviews of local residents, up to 20 people at one location (two places 10 people each in each of four locations , 80 people in total[10]) and focus group discussion (four sessions) were carried out (Table 1, Figure 1).

[9] Ex-post evaluation on Forest Fire Rehabilitation Project was conducted at the same time.

[10] Sampling was conducted by purposive selection method. Local residents introduced by village leaders through CPCs were interviewed.

Table 1: Location of Beneficiary Survey

No.	Commune	Road constructed	Characteristics of the area
1	Khanh Lam	Constructed road (length 8.75km) two bridges, Near the beneficiary school	Subsistence agriculture and rice production for sales
2	Khanh Binh Tay Bac	Constructed roads (length 3.85km and 4.16km) one bridge, Near the beneficiary school and health station	Subsistence agriculture, rice production for sales and employment by fishery industry
3	Nguyen Phish	Constructed road (length 4.88km), Two bridges, Near beneficiary district hospital	Subsistence agriculture, employment and rice/shrimp production for sales by some farmers
4	Khanh Hoa	Constructed road (length 6.19km), Two bridges, Near beneficiary health station	Rice/shrimp production for sales

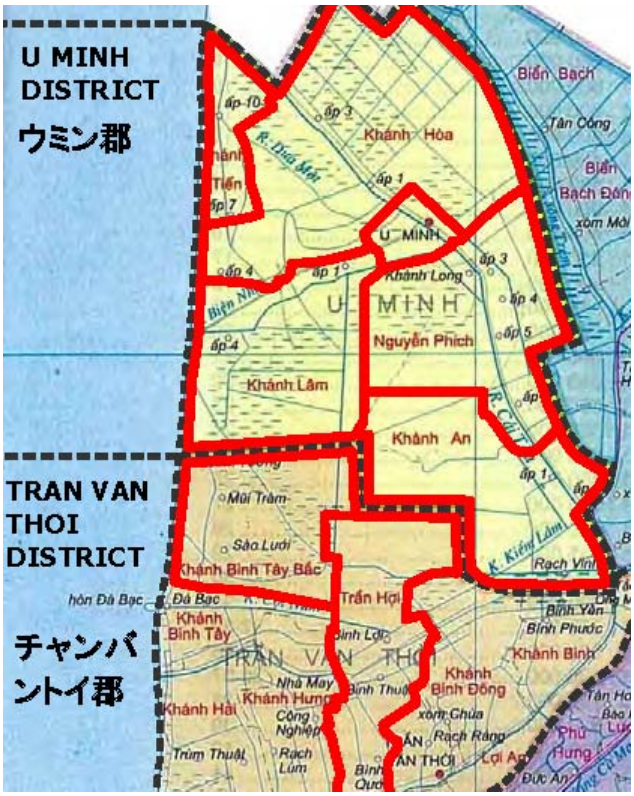


Figure 1: Survey Sites of Beneficiary Surveys

3. Results of the Evaluation (Overall Rating: C[11])

3.1 Relevance (Rating: ②[12])

3.1.1 Relevance to the Development Plan of Viet Nam

In "the 8th Five Year Socio-economic Development Plan (2006-2010)", the Government of Viet Nam states economic growth, living condition enhancement and infrastructure development among the top priorities for sustainable development. The government also aimed

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

[12] ③: High, ② Fair, ① Low

to reduce the percentage of population under poverty line to 10-11% (applying the new poverty level standards) by 2010.

At the time of project appraisal, in "the Provincial Five year Socio-economic Development Plan (2006-2010)", Ca Mau Province aimed to reduce population under the poverty line from 19.2% to 10%, securing road access to all the commune centres, increased classroom numbers in primary schools and improving health stations facilities.

On the other hand, at the time of ex-post evaluation, the "National 9th Socio Economic Development Plan (2011-2015)" aims to reduce population under poverty line by 2% annually and by 4% for districts and communes in poverty.

The "Provincial 9th Socio Economic Development Plan in Ca Mau Province (2011-2015)" aims to promptly reduce the number of households under the poverty line by 2% annually. The plan also includes sustainable agro-forest-fishery combined production, construction of rural roads to commune centres, construction/enhancement of hospital facility at district/commune level, expansion of forest areas. No major changes were observed in development policies at the time of ex-post evaluation.

Therefore the project was relevant to the Government of Vietnam's policy both at the time of project appraisal and ex-post evaluation.

3.1.2 Relevance to the Development Needs of Viet Nam

U Minh Ha Region is the poorest area in Ca Mau Province[13], and also the main area affected by the forest fire in 2002. The region has acidic sulphate soil[14]in the ground and inundate during the rainy season. Thus it is difficult to engage in agriculture, the lives of local residents are dependent upon forestry based on Melaleuca trees.

JICA carried out the TA project between 2004 and 2007 which supported Melaleuca plantations on embankment, wood processing, forest fire prevention, and agricultural land development. The project produced considerable impacts and the dissemination of the impacts was considered to be highly needed.

At the project planning, facilities and equipment for forest fire monitoring and extinguishing were not sufficient. The demand for Melaleuca was also mainly for poles, rough boards and chips; therefore processing of Melaleuca was considered to be important in order to expand the demand.

The canals were the main transportation measures in the region. At the time of project planning, usage of rural roads were limited because most of them were not paved and the roads on the embankment along the canals was full of weeds and shrubs and without bridges. Boats used by rural residents for their transportation were not very safe and required longer time to go from one place to another.

The facility and equipment of the primary medical service facilities such as health stations and district hospitals was not sufficient and outdated; medical and health services were poor in

[13] Poverty rate: 21.2% in 2010, 15.6% in 2012. Materials provided by DARD.

[14] Please see footnote 4.

quality and quantity. Education facilities were also not sufficient and outdated; proper environment for education was not offered.

At the time of ex-post evaluation, the needs for living environment enhancement related to dissemination of plantation techniques, transportation, medical services, and education stays the same. Therefore, both at the time of the project appraisal and the ex-post evaluation, the project was consistent with the development needs of U Minh Ha region in Ca Mau province.

3.1.3 Relevance to Japan's ODA Policy

Japan's ODA policy for Viet Nam in 2004 aimed at living environment enhancement, in particular education, health/medical services and agriculture/rural development; therefore the components of the project was in line with Japan's ODA policy.

3.1.4 Appropriateness of Project Approach

The land where the project was implemented was on acidic sulphate soil that produces sulphuric acid, when sulphate salt in the soil exposes to oxygen in the air. Thus, digging such soil may cause negative environmental effects[15]. Installing embankment and model farm development[16] (501 hectares in total) is located on acidic sulphate soil; thus digging soil may cause acidic water and it is possible that this could have negative impact on the farms next to model farms. In this project, at plantation sites, by installing embankment (1 meter in width and 40-60centimeter in height) in surrounding area and by installing L shape canal as introduced in the TA project, in order to suppress the influence of acidic water.

However, in TA project during the first three years after installing embankment negative impact by acidic water against agriculture was observed. At the terminal evaluation of TA project, it was suggested that the new technologies for planting trees should be introduced by the project, as embankment development and L shape water canal development on acidic sulphate soil, cannot completely avoid negative impacts on the environment. Therefore, by introducing the technologies, it was thought that the project should have formulated a land development plan with further consideration of negative influence on the environment at the stage of basic plan.

According to the "2004 JICA Guideline of Environmental and Social Consideration", the target area of this project was considered as an "environmentally sensitive area" (with large scale salt accumulation). Therefore, the implementation of this project was considered to be equivalent to a large land development[17]. It was judged that the implementation under such conditions needed environmental impact assessment and monitoring afterwards.

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[15] The following article can be referred to for the negative impact of acidic sulphate soil: Naylor, S.D., Chapman, G.A., Atkinson, G., Murphy, C.L., Tulau, M.J., Flewin, T.C., Milford, H.B., Morand, D.T. 1998, "Guidelines for the Use of Acid Sulfate Soil Risk Maps", 2nd edition, Department of Land and Water Conservation, Sydney.

[16] According to the materials provided by JICA, embankment installment by the project during the construction of water canals, if pyrite layer (which produces sulfuric acid when exposed to oxygen) is exposed to the air by excavation, acidification of water and soil occurs. However, the project intended to prevent the acidification by covering the excavated pyrite by top soil.

[17] Larger than 100ha is considered to be a large development.

The implementation of the project was in line with development policy, development needs and Japan's ODA policy; however, appropriateness of project plan and approach has partial problems described above. Hence, the relevance was evaluated as fair.

3.2 Effectiveness[18] (Rating: ②)

The project has complex components in the activities which has produced integrated effect. However, appropriate indicators for monitoring these activities had not been established at the time of the project planning. Therefore, for the analysis of effectiveness, the ex-post evaluation used the level of usage of introduced facilities as operation indicators, and direct impacts on income increase and enhancement of living environment of local population as indicators to measure the effects.

3.2.1 Quantitative Effects (Operation and Effect Indicators)

(1) Development of Melaleuca Plantation and Model Farm Development and Utilization of Equipment

Melaleuca Plantations, Development of Model Farms and Utilization of Equipment

Melaleuca plantation on embankment (five locations, 451ha) and model farms (five locations 50ha) were developed as planned.

Good growth of Melaleuca plantation is observed. However, only one model farm[19] in five farms developed is in operation. Other farms were converted into forest plantation or abandoned. The suggested reasons are: 1) it is difficult to be engaged in agriculture due to influence of acidic water; 2) the agricultural operation is not conducted by farmers due to their remote locations; and 3) crops are attacked by wild rats[20].

Photo 1: Model farms where Acacias were planted and 4 year old Melaleuca plantation (higher plantation behind is older Acacia plantation). .

At the time of the ex-post evaluation, the area of Melaleuca plantation on embankment was expanded to 4,229ha and excavators[21] provided by the project were widely utilized. However, eight pontoons for carrying excavators were not utilized due to a lack of ability to operate digging on board. The water pumps for agriculture, which were planned to be utilized for draining acidic water at the beginning of rainy season, were not utilized for drainage by the farmers because of high operational cost of fuel; The Forest Company is using it for fire prevention[22].

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[18] Rating for Effectiveness considers Impact.

[19] The model farm in operation is also located in remote location as occurred in other farm developments but is being operated by the staff of the Forest Company who wanted to be engaged in Agriculture.

[20] Based on the interviews with VAFS and U Minh Ha Forest Company.

[21] Excavator based on oil pressure shovel.

[22] Forest fire on peat is difficult to extinguish since the fire remains in the peat under soil. Drainage pump for agriculture is used for extinguishing remaining fire of peat underground after extinguished fire on the ground by

Income Generation Effects on Local Residents

The rotation of Melaleuca plantation on embankment is eight years (harvest is planned in 2017). According to the plantation cost norm and an interview with the staff of the Forest Company, income generation effects of local residents by hiring labours for tree planting and harvest in eight years are estimated as: \12,370,000[23] and \55,260,000[24] (equivalent for hiring 25,250 labour days and 112,750 labour days, respectively). The effects is judged to be large considering the poverty status of the district where many local residents go to Ho Chi Minh City for work due to shortage of local employment.

Moreover, the drainage pumps for agriculture provided by the project were being used for forest fire prevention and not for agriculture; therefore no income generation effect were observed by the equipment.

Therefore, although forest plantation on embankment had high income generation effect, the effect by model farm development as well as provision of agricultural drainage pump was judged as low.

(2) Promotion of Utilization of Melaleuca Trees by Processing

Utilization of Equipment for Wood Processing and Sales of Processed Melaleuca Wood

According to the Forest Company, during ex-post evaluation, equipment for wood processing was introduced for processing Melaleuca and currently being utilized at the wood processing factory as a measure to create value using local resources, but its utilization rate is approximately 40%. Considering the Forest Company's annual sales, which is approximately 60 billion Dong, the sales of processed wood (amount processed 30m^3 of rough boards with sales of 226 million Dong in 2013) accounts for only 0.4% of the sales of the company (Table 2). Melaleuca is mainly used as poles for construction materials in Ca Mau because: Melaleuca wood does not grow large enough for processing due to its thick bark; the appearance of wood grain of Melaleuca is not popular[25]. Thus, at the time of ex-post evaluation, due to the limited production of processed products of Melaleuca, its contribution to local residents' income generation was limited.

watering small amount for a long time. If the fire is not completely extinguished, it could expand in underground and could cause a large forest fire.

[23] According to the cost norm of the Forest Company, the plantation cost on embankment (19 million Dong/ha), labour cost (planting, tending, fire monitoring, 100,000 Dong/month) accounts for 29% (5.6 million Dong). For the planted area of 451 has in the project, 5.6 million Dong x 451 ha = 2,525 million Dong (12,370,000 Yen or 25,250 man day) is paid to workers. Exchange rate: 204 Dong/Yen (as of April 2014).

[24] Eight years old Melaleuca plantation on embankment has timber volume of approximately 100-150 m3/ha (125m3/ha on average). At harvest requires 2 man day/m3 (250 man day/year on average). It requires 25 million Dong/ha (100,000 Dong/person/day) of labour and 1127.5 million Dong of labour as a whole (25 million Dong x 451 ha=1127.5 million Dong, 55.26 million Yen) (1409 million Dong/year on average, 6.9 million Yen/year). As a result, it creates approximately 14,090 labour day/year.

[25] Based on the interviews with the Forest Company.

Table 2: Amount and Sales of Processed Melaleuca Timber

Year	Amount(m3)	Sales (Million Dong)
2011	8.77	253
2012	4.88	135
2013	29.95	226

Source: U Min Ha Forest Company

However, the Forest Company has begun to process Acacia[26] since August 2013. In 2014 800-1000m^3 of Acacia[27] are planned to be processed by using the equipment. Acacia is planted near residential area, along the road and on embankment with higher ground level along the L shape canal. As processing Acacia increases, utilization rate of wood processing equipment is expected to improve significantly. The production and sales of Acacia planted near their residences will largely contribute to livelihood enhancement of local people.

(3) Construction of Forest Fire Monitoring Facility

Utilization of Forest Fire Monitoring Facility

Forest fire monitoring is conducted by the staff from the Forest Company (54 staff among the 79 staff in total) and seasonal staff (66 staff) for three months (salary: 2.1 million Dong/month/person). Forest fire is monitored for four months; from the end of January to the end of May. Two to four staff are stationed at the constructed towers and stations during the period. Local residents are also trained to combat forest fire by the Forest Company and they voluntarily participate in the activity. During the monitoring period, forest fire monitoring towers and stations are equipped with extinguishing pumps, radio communications and boats provided by the project. The water in the canal is utilized to extinguish fire in case a forest fire occurs.

Photo 2: Constructed Forest fire monitoring tower
(U Minh Ha National Park).

Reduction of Frequency of Forest Fire Occurrence

The frequency of forest fires and burned area were maintained low (two fires, 1 ha burned in 2011, two fires, 680m^2 in 2012 and, six fires, 15.9ha in 2013) except for the dry year of 2013 (6 fires, 15.9ha burned).

Hence, even though direct relation between the reduction of the frequency of forest fires and the project activities is not proved, the provisions of facilities and equipment for fighting forest fire are effectively utilized and the effects of the effort of people concerned are expected to emerge. Therefore, the emergence of the effect is observed to some extent.

[26] Acacia hybrid, a species crossbred *Acacia mangium* and *Acacia auriculiformis*, has a fast growth and is widely utilized for sawn timber as a material of furniture.

[27] Timber with Diameter at Breath Height larger 12cm which are suitable for furniture production.

(4) Construction of Water Canal

Amount of Traffic by Local Residents and Utilization for Forest Fire Prevention

The water canals constructed are located in U Minh Ha National Park (where no one lives inside) and are utilized for transporting forest firefighting equipment as well as a water source for the combat. However, the canal is not used since no one live along the canal; the canal is completely covered by weeds in the rainy season. The utilization of the canal to transport local residents in their daily activities as planned during project planning is very limited. Therefore, the effects of the canal on living environment enhancement are judged to be limited.

(5) Road and Bridge Construction

Utilization or Roads and Bridges

The roads and bridges (7 roads, a total of 30.7km in length and four bridges) were constructed by the project along the canals.[28] The road and bridges changed the lives of local residents for those who depended on the boats for transportation with new access to roads. At the time of ex-post evaluation the roads are actively utilized for daily activities of local residents by car, motorcycle and on foot.

Income Generation Effects of Local Residents

① Increase in Prices of Agricultural Products and Sales Opportunities

The frequency of going to the market was increased by six times in Khanh Hoa and by three times in Kanh Lam (Table 3), as the road construction helped local residents to go more frequently to the market by using motorbikes. Before the project, local farmers were selling their products for the price decided by middle men. However, after the road construction, local farmers have sufficient market information on agricultural products to negotiate with middle men; thus the selling prices of the products have been raised. Also small amount of products can be sold by using motor bikes bringing them directly to the market. Thus, the higher selling prices[29] resulted in increased income for the local people. In particular the prices of products such as shrimp, honey and banana have been raised.

On the other hand, the price of selling rice stayed the same since it is sold in large quantities and thus not possible to carry by motorbike. Farmers sell rice to middle men as they used to do before the project. However, after the road construction, middle men also come to buy rice in the rainy season by boat and motorbike, though previously it was sold only in the dry season. It shows the project provided a better opportunity for local farmers to sell rice.

② Lowering Fuel Cost by Changing Means of Transportation from Boats to Motorbikes

By changing the transportation method from boats to motorbikes, fuel cost of local residents was reduced. According to the beneficiary survey, such effects were larger in remote areas (e.g. going to market costs 67,000 Dong less in fuel in Khanh Lam, going to district

[28] Due to the condition of inundation, roads are constructed only along the canals where land is higher by digging canals.

[29] According the local people that were interviewed, the selling price of bananas increased by 20%.

hospital costs 92,000 Dong less in Kanh Bin Tay Bac) (Table 3).

Table 3: Change by Road Construction: Visit Frequencies, Reduced Time, and Money Saved for Fuel Consumption by Destination

Destination	Survey sites	# of responses	Frequency per week (before road construction)	Frequency per week (2013)	Shortened time for moving (Min.)	Money saved for fuel (DONG/time)
Market	Khanh Lam	20	0.5	3.3	112	67,284
	Khanh Binh Tay Bac	14	2.9	2.9	42	22,861
	Nguyen Phich	19	0.6	0.9	39	4,842
	Khanh Hoa	20	1.2	3.5	65	21,642
District Hospital	Khanh Lam	17	-	-	115	81,000
	Khanh Binh Tay Bac	13	-	-	225	92,750
	Nguyen Phich	19	-	-	28	12,500
	Khanh Hoa	17	-	-	60	4,000

Source: Based on interviews with 20 households at each location, 80 households in total.

Effects on Living Conditions of Local Residents

① Saving Time for Commuting to School

Before the construction of roads, students were commuting to school by boat in groups, and parents were taking their children by motorbikes[30]. However, after the road construction students of primary schools are able to commute by themselves by bicycle and high school students by their own motorbikes.

② Saving Time for Mobility

By roads were constructed, the time it takes to go to the market and the hospital was shortened: two hours shorter time to go to market at Khanh Lam and, four hours shorter to hospital at Khanh Binh Tay Bac.

③ Enhancement to Go to Hospital at Night

Before the roads were constructed, local residents could not go to the hospital at night because it was dangerous. After the construction, they can go to the hospital even at night by motorbikes in case of emergency.

④ Reduction in Accident Occurrences on the Canals

Before the roads were constructed, the number of boats on the canals was much higher; accidents among boats were more frequent. However, after the construction of roads, there are less boats and the occurrence of accident on water canals was reduced by 80% according to local residents[31].

[30] Due to the bad road conditions, driving motor bikes were difficult. Parents had to take and pick up their children by motorbike.

[31] Based on the Focus Group Interviews with local residents.

⑤ Time Increase for Relaxing and Working at Home

After the road construction, local residents can spend longer time for agricultural work and have more relaxing time at home due to reduced moving time by using motor bike.

Hence, various effects of income generation and enhancement of livelihood were recognized by road and bridge construction. Therefore, the emergence of effects is judged as high.

(6) Enhancement of School Facilities

Utilization of School Buildings and Equipment

School building construction[32] and provision of equipment[33] to schools were implemented as planned. School buildings are effectively being utilized. Among the five schools supported, the number of classes was increased by 10 and the number of teachers was increased by 25 (Table 4). However, the constructed wells were not utilized due to the problem of motor pump at two schools (out of three). As a result, drinking water is obtained by using existing manual wells. One school which uses the well had to purchase a generator because they did not have public power line. Also the well was not utilized for drinking due to mixture of acidic water, as it was not deep enough (drinking water is provided by other existing well). Thus it is considered that the wells should have been constructed based on the analysis of local conditions.

Photo 3: Constructed primary school building
(Lam Ngu Truong I Primary School)

Change in the Number of Student in Each Class

In five schools supported by the project, the number of students per class was increased on the contrary (Table 4). According to the interview with the Department of Education, the reasons of student increase are: increase in natural population[34]; increase in school attending rate (from 97-99% to 99%); and students moving from neighbour schools for the improved facilities[35].

Table 4: Change of Number of Classes and Students in Five Primary Schools Supported by the Project

Year	# of class	# of student	# of teacher	Student #/class
2008	14	842	39	23.4
2013	24	1167	64	27.0

Source: Department of Education, Ca Mau

[32] According to JICA, one new school construction, and renovation at four schools.

[33] Chairs for students and teachers, toilet booths and wells were provided to schools.

[34] Average number of students in one class of the province was increased from 23.4 students/class at the beginning of the project (2008) to 24.9 students/class(2013).

[35] Based on the interviews with the Department of Education.

Hence, the project activities (building construction and equipment provision to schools) did not reduce the number of student per class but the facilities are effectively utilized and enhance the educational environment of the schools for students. Therefore, the emergence of effect was judged as high.

(7) Enhancement of Facilities in Health stations and Hospitals

Construction of Facilities and Equipment Provided

The project supported construction of health stations [36] and provided equipment to health stations and district hospitals. Equipment provided was newly introduced for health stations and added to existing equipment in district hospitals. The beneficiary survey [37] included questions on utilization frequency of the district hospitals and health stations by local residents. Percentage of respondents who visited health stations for consultation in the last one year was 6% (27 people), while 19% (83 people) of respondents visited the district hospitals for consultation (Table 5 and 6). It was also found that the utilization frequency of equipment at district hospitals was much higher than in health stations. The utilization frequency was only once per day for most equipment at health stations (Table 7). The frequencies are particularly high for x-rays equipment and blood analysis equipment (Table 6 and 8).

Photo 4: Building of a health station (Khanh Binh Tay Bac)

Table 5 Number of Users of Provided Medical Equipment * at Commune Health Stations in the Last One Year

Age class	# of patient	General consultation only	Number of medical equipment users					
			Portable ultra sound inspector	Equipment for urine analysis	Nebulizer	Electric inhalation equipment	Electro-cardiograph (ECG)	X ray photographer
> 65	2	2	-	-	-	-	-	-
18 – 65	19	17	-	1	-	-	-	1
6- 18	5	5	-	-	-	-	-	-
< 6	1	1	-	-	-	-	-	-
Total	27	25	0	1	0	0	0	1

Source: Beneficiary survey with 80 households 429 family members。

Remark) *medical equipment at health stations are newly introduced by the project. There is no existing equipment before the project

[36] Each commune has one health station.

[37] Four Survey sites with 80 households (429 family members).

Table 6: Number of Medical Equipment * Users at District Hospital in the Last One Year

Age class	# of patient	General consultation only	Number of medical equipment users						
			Anastasia equipment	Portable X ray photo-grapher	Endoscope for upper digestive canals	Endoscope for large intestine	Endoscope operation system	Equipment for biochemical analysis	Equipment for blood analysis
> 65	8	3	-	4	-	-	-	2	4
18 – 65	67	20	8	38	7	-	2	25	33
6- 18	4	3	-	-	-	-	-	1	-
< 6	4	3	-	-	-	-	-	1	1
Total	83	29	8	42	7	0	2	29	38

Source: Interviews with 80 households, 429 family members.
Remark) *Since district hospital had same medical equipment before the project, the figures include those which used the equipment which existed before the project.

Table7: Status of Utilization of Provided Medical Equipment at Commune Health Stations

Equipment provided	Frequency/month
Portable ultra sound inspector	60
Equipment for urine analysis	30
Nebulizer	30
Electric inhalation equipment	30
Electrocardiograph (ECG)	30
X ray photographer	30

Source: Department of Health, Ca Mau

Table 8 Status of utilization of provided medical equipment at U Minh District Hospital

Equipment	Frequency of use/month
5 Indicator Bedside monitor	10
Electric inhalation equipment	42
Anastasia equipment	42
Incubator	30
Ultrasound scan hand of ultrasound inspector	30
4D Doppler ultra sound inspector	120
Hand washing facilities	53
Automatic blood analyser	1400
Spectrum biochemical analyser	7000
Urine analyser	250
Endoscope for upper digestive canals	10
Junior major surgery tool kit	46
Minor surgery tool kit	54

Source: U Minh District Hospital.

Change in the Number of Sickrooms, Patients and Patients Per Sickroom

At health stations where buildings were constructed and/or equipment was provided, the number of sickrooms was increased by 76% and patients by 17% (Table 9). Also the number of patients per sickroom was reduced from 2,098 patients/year/sickrooms to 1,398 patients/year/sickrooms, suggesting drastic enhancement of environment in medical service.

Table 9: Change in the Number of Sickrooms and Patients in District Hospital and Health Stations Before and After the Project

Name of facility	Provision	2008		2013	
		# of room[2]	# of patient (persons/year)	# of rooms[2]	# patient (persons/year)
Khanh An General Clinic[1]	2 buildings 7 rooms 322m^2	10	26,923	17	29,300
Khanh Lam Health Station	1 buildings 8 rooms 288m^2	6	10,794	11	13,490
Khanh Tien Health Station	1 buildings 5 rooms 170m^2	5	15,872	17	17,880
Khanh Binh Tay Bac Health Station	1 buildings 4 rooms 144m^2	9	22,517	16	26,400
Tran Hoi Bin Health Station	1 buildings 3 rooms 97m^2	11	9,893	11	13,455
Total		41	85,999	72	100,525

Source: Department of Health, Ca Mau province.
Remark)1: Health station larger in size and more equipped than other health stations .
2: Total number of sickrooms does not match with the sum of previously existed and newly constructed sickrooms because in some cases buildings were constructed on the older buildings after removal or some buildings were constructed with other fund.

Effects on Enhancement of Living Environment

According to the interviews with district hospitals and Health stations, the following effects were observed.

① Increased number of doctors in the hospitals

At some hospitals, the number of doctors was increased by having better facilities; at Khanh An hospital[38] the number of doctors was increased by three.

② Opportunity increase of delivery and examination of pregnant women at hospitals near their houses

By increasing the number of incubators at district hospitals, more pregnant women are willing to use the hospitals for delivery; therefore the number of pregnant women going for delivery to hospitals was increased. In this region each pregnant woman is examined three times for antenatal care. At the time of the ex-post evaluation, almost all pregnant women have examination compared to 70% before the project. Now pregnant women have more trust on health services offered in the health facilities partly because of the introduction of ultrasound equipment and its use; thus at the time of ex-post evaluation almost all the pregnant women are examined.

③ Enhanced judgement of doctors at Health stations for deciding where to refer the patient for emergency treatment

By enhanced facilities at health stations, doctor's judgement on emergency treatment, where to send the emergency patient; to either district hospitals or Ca Mau central hospital, became easier.

[38] One of communes in U Minh District.

④ Opportunity to have a health check-up

With enhanced equipment at health stations, it became easier for local residents to have health check-up at health stations instead of going to district hospital, resulting in increased opportunity for health check.

⑤ Increased opportunities to have surgery at district hospital near home[39]

It became easier for family to visit hospitalized patients since it is now possible to have surgery at district hospitals, closer to their homes and not at Ca Mau Central Hospital located far from patient's home.

⑥ Mitigated crowdedness of Ca Mau Central Hospital

Since some treatments were only possible at Ca Mau Central Hospital before the project, many patients piled to the hospitals and had to wait for a long time for a treatment. After the project many types of treatments became available at district hospitals. Therefore, the crowdedness experienced by patients at Ca Mau Central Hospital was mitigated and waiting time by the patients were shortened.

⑦ Enhanced technical level of hospital staff

The staff of health stations and district hospitals were trained on operation techniques of the equipment provided at hospitals in Ca Mau and Ho Chi Minh cities; thus their technical skills has been improved.

Hence, the effects of facilities enhancement as well as equipment provision to the district hospitals and health stations were extensively emerged. However, the frequency of utilizing almost all the equipment provided to health stations were low (once or twice per day) though those provided to district hospitals are well utilized, the level of emergence of effects was judged as fair.

3.2.2 Qualitative Effects

Please refer the chapter on quantitative effects for the qualitative effects of each component.

3.3 Impact

3.3.1 Intended Impacts

Please refer the chapter on the effectiveness with regard to the descriptions on intended impacts by each component.

[39] Road construction enables family to visit their members in hospital on the way to their work by motor bike.

3.3.2 Other Impacts

(1) Reduced opportunity for draining acidic water for rice production

Local residents of U Min Ha region drain acidic water in the beginning of the rainy season in order to reduce acidity in water for agriculture; however, the road construction blocked the draining. At Khanh Lam, approximately 30% of farmers set up the pipes under the road for draining. Although the magnitude of damage is not clear, the road construction may affect agricultural production by blocking drainage of acidic water at farms which did not set up pipes under the road before the road construction[40].

(2) Influence of acidic sulphate soil

At the model farms, pyrites were observed in various places, suggesting that sulphate acid is produced and makes canal water more acidic during inundation period.[41] In order to reduce damage in agriculture, DARD established an irrigation canal making drainage flow to the sea from canal during the rainy season in U Minh Ha region.

(3) Impact on natural environment by water canal construction

U Minh Ha National Park is largely covered with natural forests and plantation of Melaleuca. Old growth of Melaleuca is an important area for protection as a core zone. Water canals constructed by the project are located only in plantation areas; thus no impact on natural forests was observed.

(4) Resettlement of local residents and acquisition of land

According to Ca Mau Department of Transportation, 51 households (30 households in U Minh and 21 households in Tran Van Thoi) were forced to move their for the road construction. Among these households, 50 households simply moved their houses to inner area of their territory and one household moved their house to other area.

In compensation, 1 million Dong each was paid to the households, who shifted their houses in their own territory and 3 million Dong was paid to the one who shifted to other area. These 51 households had agreed to move after sufficient consultation with the government and related agencies before the project. No complaints from resettled residents were reported during and after the project implementation.

Thus, as shown in descriptions on each component, forest plantation on embankment, road and bridge construction, school facility enhancement, and forest fire prevention showed high level of income generation and/or living environment enhancement impacts. On the other hand, wood processing equipment is not used currently as much as expected but expected to be used more efficiently in the near future. Regarding the building construction and equipment provision

[40] At the beginning of the rainy season when the level of water at paddy is low, if acidity is high, planting rice is not possible because rice sprout is sensitive to acidity.

[41] According to JICA internal documents, the depth of sulphate soil depends upon the location. In this project the depth of digging was uniformed to be 1.2m and the influence of acidity to the external water system was controlled by establishing embankment of 1m width and 0.4-0.6m high.

at district hospitals and health stations, utilization of equipment at health stations showed moderate level effects. The model farms were converted to plantations and water canals are not used for transportation of local residents. Drainage pump for agriculture is converted for use of forest fire fighting. These facilities/equipment provided by the project are not used for their original purposes; thus it is judged that the project has not achieved living environment enhancement and income generation of local community. Considering the amount invested on each component, effectiveness and impact of the project is judged as fair (Table 10).

Table 10: Rating for Effectiveness by Each Component

Component	Output level	Outcome level			Operation cost
	Utilization	Income generation	Living environmnet enhancement	Total evaluation	Percentage (%)
Forest land development	High	Medium	N.A.	Medium	25.5
Model farm development	Low	Low	N.A.	Low	2.5
Water canal construction	Low	N.A.	Low	Low	1.2
Road and bridge construction	High	High	High	High	29.2
Forest fire prevention	High	Medium	High	High	12.1
Agriculture water drainage	Low	N.A.	Low	Low	0.5
Wood processing	Low	Low	N.A.	Low	9.1
Medical services	Medium	N.A.	High	Medium	13.8
Education facilities	High	N.A.	High	High	6.0
Total					100.0

Remark) Effectiveness was judged by the sum of outputs, and outcomes (income generation and living environment enhancement). For example, with regard to forest fire prevention, moderate level income generation and high living environment enhancement based on higher utilization of equipment (outputs) were observed; therefore it was judged as high in overall evaluation. However, even though medical service showed high living environment effect, outputs (utilization of equipment) showed moderate level effect; therefore, it was judged as fair in overall evaluation.

3.4 Efficiency (Rating: ③)

3.4.1 Project Outputs

The project supported construction of basic infrastructures including enhancement of forest lands by embankment, model farm development, construction of water canals, roads/bridges, forest fire monitoring towers/stations, buildings of health stations, and primary schools/toilets. According to an internal report of JICA, there have been only small changes with regard to width of embankment, height and locations of bridges, location of water canals, and length and location of roads. Thus, the project was implemented as planned (Table 11). In road construction the project considered the fragile soil conditions of Mekong Delta; the construction cost was reduced by using special road construction standards[42].

Equipment provided includes those for instalment of embankment, drainage pump for agriculture, forest fire prevention, wood processing, and medical care. By using remaining balance produced by a high exchange rate of Japanese yen, equipment was purchased additionally. The detail procurement adjusting the price/exchange rate change was decided by the procurement agency with the consultation of PMU members (DARD, the Forest Company, Provincial Departments of Transport, Education, Health and DPC).

[42] In Viet Nam, when application of road design standards is not appropriate due to fragile soil conditions, special figures which lowers the design standards are utilized.

The entire procurement was divided into 27 plots (15 plots for construction, 12 plots for equipment provision). The procurements were carried out in a turn of issuance of a letter related to prequalification inspection, prequalification inspection with documents, issuance of tender document, tender (participated by 78 companies, 2.9 companies/plot on average), inspection of proposals, contract signing; thus it is considered that proper pricing were ensured by sufficient competition.

Table 11: Project Contents by Component

Component	Contents
Facility construction	
Forest land development/ Model farms development	Installing embankment, 5 locations, 451ha in total Model farm development, 5 locations 10ha each
Water canal construction	2 locations 12.2km in length
Road/bridge	Road: 7 locations, 30.7km in length, Bridge: 4 locations
Forest fire monitoring station/tower	Monitoring towers, monitoring stations, wells, 12 locations
Health stations	5 location, 6 buildings, 27sickrooms
Primary schools	5 location, 6 buildings, 21 classrooms, desk/chair for students (315), desk for teacher (21), toilet booth (9), wells (3)
Equipment provision	
Forest land development	Excavators, pontoons (8), drainage pump for agriculture(12)
Forest fire prevention	Extinguishment pump and hose attached (6 sets), boats for transporting equipment (11 sets) radio communication stations、antenna, mobile radios, etc.
Timber processing	Wood dryer, belt sander, automatic dual sided plane board, finger joint processing system, tenon remover, wood processing equipment, dust collector system for wood processing
Medical equipment	a) Health stations (6 locations) Portable ultra sound inspector, equipment for urine analysis, nebulizer, electric inhalation equipment, electrocardiograph (ECG), X ray photographer, generators, etc. b) District hospitals (2 locations) Hand washing facilities for operation, anesthesia equipment, portable X ray photographer, endoscope for upper digestive canals, endoscope for large intestine, endoscope operation system, equipment for biochemical analysis, equipment for biochemical analysis, equipment for blood analysis, generators.

Source: JICA internal document.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The project cost for both actual and Exchange Note (EN) was 905 million yen; no difference between actual and planned amount was observed. The contents were 24% for design and procurement, 75% for construction and equipment provision (Table 12). Regarding equipment provision, as mentioned above, due to a strong Japanese yen, additional procurement was carried out by using the remaining balance and the further remaining balance were utilized for reimbursement[43]; no issue was observed in the process.

[43] Reimburse method: To the amount paid by the partner country from their own fund, after the payment of the same amount is recovered from the fund of aid agency (Source: JICA. 2003. Fund management and aid - a trend of

Table 12: Operation Cost by Component

Category	Total (million Yen)	%
Construction	416	46.0
Equipment	262	29.0
Design and supervision	34	3.9
Procurement representative	182	20.1
Re-inverse	7	0.8
Others	2	0.3
Total	905	100.0

Source: JICA internal document.

3.4.2.2 Project Period

The project period was 36 months from March 12, 2008 (date of EN contract) to March 11, 2011 as originally planned.

Both project cost and project period were mostly as planned. Therefore, efficiency of the project is high.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

(1) Plantationon on embankment, model farm development, forest fire monitoring facility and wood processing equipment

Operation and maintenance (O&M) for forest plantation on embankment and model farm development, excavators and pontoons, forest fire prevention facilities and equipment, wood processing equipment[44] are conducted by the Forest Company[45]. The Forest Company operates these activities as a company with sufficient personnel and decision-making with leadership; thus no institutional issue on the operation was found.

(2) Water canal

U Minh Ha National Park Service is in charge of O&M of water canals which is considered to be their ordinary tasks; thus no institutional issue on the operation was found.

(3) Roads and bridges

The Department of Transportation at DPC plans and implements O&M for road and bridges. The roads constructed by the project were located in two districts: U Minh (5 locations) and Tran Van Thoi Districts (2 locations).

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international cooperation and reformation of developing countries). In this project the activities equivalent to those in this project which started after the project initiation in the project area has been approved to be reimbursed. For the rural road development in U Minh Ha district (total budget US$10,967), 0.8% of EN amount was reimbursed.

[44] Operation and maintenance of forest fire monitoring towers/stations are conducted by the Forest Company (10 locations) and U Minh Ha National Park Service (2 locations). Repair of the facilities are carried out every three years.

[45] Based on institutional reform started in 2004, U Minh Ha Forest Company was formed by merging five Forest Fishery Enterprises. The Forest Company once became a national company with independent budget and became one member company limited in 2010. As of 2013, the Forest Company is being operated by 79 staff.

The roads in U Minh District are maintained by U Minh DPC and no problem is observed. However, the road in Tran Van Thoi District is entrusted to Commune People's Committee (CPC) Khanh Binh Tay Bac in Tran Van Thoi Region even though the width of the road is 2.5m[46]. Tran Van Thoi DPC did not participate in PMU. O&M by DPC should be carried out by Tran Van Thoi DPC. It is not clear how the O&M will be conducted.

(4) School facilities

A principal of each primary school makes an O&M plan of the school facilities. The plan is inspected by the Department of Education at DPC, and then sent to the Department of Education at provincial level for approval. The Provincial Department of Education makes an O&M plan of the year for the whole province based on the proposals made by each school. Each school implements O&M based on the approved provincial plan. Therefore, no institutional problem is observed.

(5) Health facilities and medical equipment.

Equipment provided to health stations and district hospitals are maintained by each health station and hospital with charges paid by patients. When equipment needs repair, the budget is applied to either DPC or the provincial Department of Health depending upon the amount needed for the repair. At district hospitals, equipment is checked every three months and a repair plan is made by each department[47].

Hence, no issue was found in institutional aspects of O&M.

3.5.2 Technical Aspects of Operation and Maintenance

(1) Embankment and model farm development

Regarding development of plantations and model farms, treatment against acidic water was not sufficiently conducted and remained as an issue. No particular issue was found regarding the operation of excavators since training was provided at the time of hand over.

(2) Equipment and facilities for forest fire prevention

Equipment and facilities for forest fire prevention is utilized by the Forest Company in their ordinary operation; therefore no technical issue was found.

(3) Equipment for wood processing

Training was provided by installers to the staff of the Forest Company; no technical issue was found in O&M of wood processing equipment.

[46] Roads are divided into provincial roads, district roads and commune roads by responsible organizations. The target roads of the project was commune roads (width 2.5-3.5m) intended to be used by motor bikes. DPC is responsible for roads whose width is larger than 2.5m.

[47] Depreciation period is eight years for each equipment.

(4) Water canal

Grass cutting and dredging are needed for maintenance of water canals. Grass cutting is carried out every year and dredging is conducted as needed. U Minh Ha National Park Service conducts the operation as their ordinary operation; thus no technical issue was found.

(5) Roads and bridges

At the road in Khan Hoa area close to the coast, the road was constructed 40-50cm higher as a measure to correspond to the sea level rising due to climate change[48]. However, in order to raise the road surface, the edge of a canal was cut and a part of the embankment collapsed; thus repair was needed. In 2013, 100 million Dong was spent to repair 36 locations of the road, but it was not sufficient. A technical issue was found when adaptation measures against climate change in road and dyke construction were introduced.

(6) Health facilities and medical equipment

Training on O&M of medical care equipment was conducted at the time of hand over by an installer and training for technical staff in change was conducted in Ca Mau and Ho Chi Minh City. Trainings are conducted as needed. Thus no technical issue was found.

(7) School facilities

O&M of school facilities are undertaken by private companies which were contracted by the Department of Education as a part of their ordinary operation; thus no technical issue was found.

Hence, regarding technical aspects of sustainability, no issue was found except for road and bridge construction.

3.5.3 Financial Aspects of Operation and Maintenance

(1) U Minh Ha Forest Company

U Minh Ha Forest Company became an independently managed national company in 2007 by merging former five Forest Fishery Enterprises. The Forest Company has already paid back all the debt prior to the merger and currently does not receive any fund from the government. The sales of the Forest Company in 2013 was 66.8 billion Dong, 90% of which is from the sales of Melaleuca. The financial status of the last three years is stable; having doubled its sales and profit in two years (Table 13). The annual budgets for O&M in 2013 are: 7,713 billion Dong for plantation on embankment, 40 million Dong for excavators, 160 million Dong for Pontoons, 180 million Dong for pumps, and 200 million Dong for forest prevention facilities. Thus no financial problem in O&M is judged to be present at the time of ex-post evaluation.

[48] In November 2011, Vietnamese government issued National Climate Change Strategy (Prime Minister Order 2139/QĐ-TTg). In the strategy, enhancement of river dyke system is a priority issue in order to prepare for the sea level rising by climate change.

Table 13: Financial Status of U Minh Ha Forest Company

Unit: 1 million Dong

	2011	2012	2013
Sales	32,072	51,669	66,820
Cost	28,937	48,994	60,851
Profits	3,135	2,675	5,969

Source: U Minh Ha Forest Company

(2) Water canals

U Minh Ha National Park Service repairs water canals in the dry season (grass cutting with budget of 145 million Dong/year) as O&M work for water canals is carried out as their regular tasks; thus no problem was observed in the maintenance.

(3) Roads and bridges

O&M for roads and bridges are compensated by tax imposed to motorbike owners and government budget[49]. The motorbike tax is collected by CPC who receives 20% of collected money for paying the cost of collectors, and give the rest (80%) to DPC. DPC uses the collected fund for O&M of the roads. There exist approximately 8,000 registered motorbikes in U Minh District; collected funds are approximately 5.6 million Dong[50]. At the time of ex-post evaluation, approximately seven million Dong/year is needed to maintain the roads in the district and the balance is paid by the government. Thus no financial problem was observed in road and bridge maintenance.

(4) Health facilities and medical care equipment

O&M budget for medical care equipment is maintained by the payment of patients and budget of the government[51], thus no financial problem was observed.

(5) School facilities

O&M budget for school facilities is paid by the budget allocated to DPC which is approx. 3 billion Dong annually. In case of shortage in the budget, the Department of Education at DPC applies to the Provincial Department of Education. Proposals for maintenance of school facilities are prepared by schools which received the support by the project. The budget is not sufficient but allocated as occurs in the most places.

3.5.4 Current Status of Operation and Maintenance

(1) Melaleuca plantation on embankment

The Melaleuca planted on embankment is growing steadily for five years after the planting.

[49] Amount of tax are 100,000 Dong/year for motorbikes with engine larger than 100cc, 50,000 Dong/year for those with engine less than 100cc.

[50] Amount of tax payable as motorbike tax is about 800 million Dong. Within the amount, 640 million Dong is used by DPC and about 30% are unpaid tax (450 million Dong).

[51] The budget of 46 million Dong/bed is annually allocated to a hospital. U Minh District Hospital has an annual budget of 4.6 billion Dong for 100 beds.

(2) Model farms

No crop cultivation is being carried out in four model farms out of the five farms developed by the project because of damages caused by wild rats. The lands for the model farms were converted into Acacia plantation. Rice and corn are being cultivated in the remaining one farm but the growth is not very well.

(3)Water canals

Water canal is not utilized in the rainy season. The canal was covered by grass and no local transportation is observed. In the dry season, the canal is utilized for firefighting: water for extinguishing and carrying equipment for firefighting when forest fire occurs.

(4) Forest fire monitoring facilities and equipment

Forest fire monitoring towers need maintenance; rust and damage were observed in some places. The towers are planned to be maintained every three years. They will be repaired soon since 2014 is the year for maintenance. No issue was observed for other equipment including pumps and radios.

(5) Equipment for wood processing

No problem is observed in wood processing equipment since it is sufficiently maintained (e.g. putting oil as needed).

(6) Roads and bridges

Cracking and damage to shrink were observed at some places on the road; thus maintenance is needed. Due to the fragile ground conditions of the roads constructed by this project, lower road design standards were applied with continuous maintenance with government budget. The conditions of the constructed roads are similar to the other roads in the vicinity; thus no issue was observed.

(7) Health facilities and medical equipment

Equipment provided to hospitals was utilized without any problem except for the following two cases. A bedside monitor was damaged (i.e. monitor screen and battery), and blood inspection device was replaced in October 2013. Since spare parts for the equipment needed to be ordered to Ho Chi Minh City. The order caused further delay for examining patients.

(8) School facilities

Mould on the wall, deterioration in windows, and cracks on floor were observed and they need maintenance work. As mentioned in the effectiveness section, the two wells out of the three installed in the schools were not functioning. At the school the well is utilized, and since electric power is not connected, the school had to purchase a generator for making the pumps function for the well. Local conditions to use the wells should have been well considered.

Fans installed in the class room needed repair three months after the instalment. Equipment

needed to be repaired was either bought or maintained at each school.

Melaleuca plantation showed steady growth and wood processing facilities is used without any problems, but the model farms were converted to plantation. The issues found in water canals, forest fire monitoring facilities/equipment, health station facilities and medical equipment, and school facilities are considered to have minor problems commonly found in the project area. Therefore, the current status of O&M was considered to be fair.

Thus, some problems were observed in institutional, technical, and financial aspects of sustainability, as well as current status of O&M for each component. Therefore, sustainability of the project effect is judged as fair.

4. Conclusions, Lessons Learned and Recommendations

4.1 Conclusions

The "Project for Empowerment to the Community Damaged by Forest Fire in Ca Mau Province" aimed to enhance the living environment and income generation of an entire local community at U Minh Ha Region in Ca Mau Province, one of the poorest areas in Viet Nam, which is currently experiencing difficult agricultural conditions including acidic soil as a result of a large forest fire. The project established forest plantation by installing embankment, model farm development, road and bridge construction, water canal construction, agricultural drainage improvement, infrastructure development supports including building construction and equipment provision for forest fire prevention, schools, and hospitals. The project was in line with development policy, development needs, and Japan's aid policy. However, an issue was found in the environmental consideration of the project planning and approach. Therefore, relevance was judged as fair.

Roads, bridge construction and facility enhancement for forest fire prevention and schools showed high level of income generation as well as improvement of living environment. Enhancement of hospital facilities and equipment showed fair effects on improvement of living environment through enhanced medical services, but wood processing equipment which is expected to show much higher income generating effects. On the other hand, the model farm development, water canal construction and agriculture pump for draining agriculture water did not achieve the objective. Considering the amount invested for each component, effectiveness and impact of the project as a whole is judged as fair.

The project was efficiently implemented with the involvement of local contractors as planned in the project budget and period; therefore, the efficiency was judged as high. However, minor problems were found in institutional, technical and financial aspects with regard to maintenance management; therefore sustainability of the effects created by the project was judged as fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Environmental impact assessment on acidic water on agriculture production and implementation of water quality monitoring

Negative effects by the project activities on the environment by producing acidic water as a result of the land development on acidic sulphate soil were not completely removed. The embankment of Melaleuca reaches 4,229 hectares; the possibility to have negative impact on agriculture and ecosystem in the surrounding areas cannot be denied. Environmental assessment by specialized agencies as well as continuous water quality monitoring by relevant agencies including Forest Company should be conducted.

(2) Allocation of government budget for repairing the buildings provided by the project and implementation of repairing

Roads and bridges, forest fire monitoring towers, and school buildings need maintenance; several years have passed since the instalment. However, budget for repair is not allocated sufficiently. The agencies responsible for O&M including Departments of Transportation, Education, as well as Forest Company should allocate sufficient budget and conduct the O&M work. Also at Tran Van Thoi District is expected to maintain the road constructed by the project in the district.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

(1) Environmental impact assessment and water quality monitoring based on the Guideline on Environment and Social Consideration

Negative impact on agriculture by the land development on acidic sulphate soil implemented in the project was not completely removed; thus negative impact on agriculture and eco-system in vicinity cannot be denied. Land under acidic sulphate soil is considered to be in an “Environmentally Sensitive Area” according to JICA’s Guideline on Environmental and Social Consideration. The size of the land development carried out by the project fall in the category of “Large-scale Development”. It is recommended to conduct environmental impact assessment followed by continuous water quality monitoring in the project under such condition.

(2) Effectiveness of poverty alleviation by tree planting scheme of short-term rotation

Melaleuca plantation on embankment is harvested in a short time (eight years after planting); the profitability is high. In addition the plantation requires unskilled labour for planting, harvest, and replanting; job creation and sustainable income generation effects were realized for local residents who have difficulty in obtaining jobs due to low education level. Furthermore, since Melaleuca is native species tolerant against acidic conditions, it fulfils local

demands because it can sustain the building by maintaining the shape for a certain time after hammered into the acidic soil. Thus, for the rural poverty area where forestry is a major industry and short term income is needed, the project proved to be effective in developing the plantation technologies suitable to the region and to produce a product with demand.

(3) Synergy effects of income generation and living environment enhancement in combination with rural road construction and enhancement of school, hospital facility/equipment in remote area

By providing a package of road construction with equipment provision of school/hospital at remote area only accessible by canal, the project produced not only economic effects by road construction, service enhancement for schools/hospitals, but also various synergy effects including: increased number of students at schools/hospital where road access was limited; living condition/income generation enhancement by time saving on commuting to schools/hospitals.

Thus, in a community development project the implementation in remote areas where road access is limited, the provision of road construction combined with enhancement of social infrastructure (schools and hospitals) as a package, the project can contribute to different needs in livelihood development and enhancement for the socially weak and poor rural residents.

Lao People's Democratic Republic

Ex-Post Evaluation of Japanese Technical Cooperation Project

"The Aquaculture Improvement and Extension Project Phase 2"

External Evaluator: Tomoo Mochida, OPMAC Corporation

0. Summary

The Project aimed to extend aquaculture techniques suitable for local conditions in the four target provinces (Oudomxai, Sayaboury, Savannakhet and Salavan) in the Northern, Central and Southern regions of Lao PDR. This was to be achieved by verifying and introducing adequate aquaculture methods according to the local conditions of pilot sites, improving the capacity of relevant people for aquaculture techniques and extensions, and strengthening the roles of relevant organizations and their collaboration mechanisms for aquaculture extension.

The Project matched the Laotian national development policy, its development needs as well as Japan's ODA policy, therefore its relevance is high. Generally speaking, all of the Outputs except the strengthening of the roles of relevant organizations and their collaboration mechanisms, were achieved by completion of the Project. In addition, an increase in fish production has been confirmed at both pilot and extension villages possibly thanks to the introduction of improved aquaculture methods and the quality improvement of fingerlings. However, although action plans for aquaculture development were worked out and basically agreed in the target provinces, the plans have yet to be approved by the relevant organizations for implementation. Furthermore, the consumption target of fisheries products as the Overall Goal was not achieved in the three provinces. Therefore, the effectiveness and impact of the Project are evaluated to be fair. While the efficiency of the Project is high because the Project cost and the period of cooperation were almost according to plan, the sustainability of the Project effects is fair as there are some minor problems in the policy and institutional aspects, the organization and in the financial conditions. In terms of the policy and institutional aspects, the Rural Aquaculture Promotion Package (hereinafter referred to as "RAPP"), a standard aquaculture promotion method, was approved by the Department of Livestock and Fisheries (hereinafter referred to as "DLF"), the Ministry of Agriculture and Forestry (hereinafter referred to as "MAF") but has yet to be put in practice. It is also considered that provincial and district offices are understaffed and operation and maintenance budgets are short.

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

1. Project Description

Project Locations

Fish pond in Oudomxai Province

1.1 Background

At the time of the ex-ante evaluation of the Project, fish and other aquatic organisms were the most important source of animal protein for the people of Lao PDR and the Government of Lao PDR was trying to increase production of fisheries products bearing in mind national food security. As the production of fisheries products through those caught in natural and man-made waters had already reached its maximum level, it was deemed indispensable to increase the provision of fisheries products through the development and extension of aquaculture. In Laotian rural areas, adequate aquaculture methods were yet to be disseminated and extensive fish farming was practiced so that productivity was low. This was due to insufficient fingerlings for aquaculture, the inadequate technical capability of extension staff for aquaculture technology and so on. Therefore, it was necessary to strengthen capacity in the aquaculture sector.

The Government of Japan conducted technical cooperation projects to assist in the establishment of appropriate techniques for aquaculture development and extension (including culture techniques, culture farm management techniques, as well as extension techniques), and capacity building for aquaculture extension. Under the Aquaculture Improvement and Extension Project Phase 1 (hereinafter referred to as “AQIP 1”), implemented from 2001 to 2004, facilities at the Namxouang Aquaculture Development Center (hereinafter called as NADC), which is under the DLF of MAF, were constructed and capacity building was carried out for the improvement of aquaculture techniques. Extension activities of NADC staff, and data collection regarding the situation of aquaculture throughout the country were also conducted. Consequently, a firm basis for aquaculture extension in rural areas was established. The Aquaculture Improvement and Extension Project Phase 2 (hereinafter referred to as “AQIP 2”) was a project that launched the extension of aquaculture in rural areas, making use of the cooperation outcomes attained during AQIP 1.

1.2 Project Outline

Overall Goal		Standard of living of rural fish farmers is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.
Project Purpose		Aquaculture suitable for local conditions is established in the 4 target provinces.
Outputs	Output 1	Adequate aquaculture methods are verified according to the local conditions of pilot sites.
	Output 2	The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved.
	Output 3	Fish farmers of the focal districts introduce improved aquaculture methods.
	Output 4	The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.
Inputs		Japanese Side: 1. Experts: 10 experts 0 for Long-Term, 10 for Short-Term 2. 18 Trainees received in Japan 3. 21 Trainees for the Third Country (21 for Thailand) 4. Equipment: 14 million Japanese Yen 5. Facilities: 18 million Japanese Yen 6. Local Cost: 64 million Japanese Yen <Laotian Side> 1. 36 Counterparts 2. Equipment: Truck, 4WD vehicles, Computers and etc. 3. Land and Facilities: 12 Ha of Land and Buildings 4. Local Cost: 645 million Kip[1] (=about 77 thousand US dollar) for operational cost
Total Cost		550 million Japanese Yen (JPY)
Period of Cooperation		April 2005 – April 2010
Implementing Agency		MAF/DLF
Cooperation Agency in Japan		Ministry of Agriculture, Forestry and Fisheries
Related Projects		AQIP 1 (Technical Cooperation), Livelihood Improvement Project for Southern Mountainous and Plateau Areas (hereinafter referred to as "LIPS") (Technical Cooperation), Dispatch of Japan Overseas Cooperation Volunteers, Provincial Aquaculture Development Program (Food and Agriculture Organization of the United Nations/ United Nations Development Programme, hereinafter referred to as FAO/UNDP), Provincial level Aquaculture Outreach project (Asian Institute of Technology, hereinafter referred to as "AIT")

[1] Kip is the unit of local currency in Lao PDR. The JICA exchange rate is 0.013Kip/JPY (January 2014).

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of the Overall Goal at the time of the Terminal Evaluation

It was estimated that approximately 1,000 fish farmers at pilot villages and extension villages had increased fish production by more than 40 % during the Project cooperation period. In addition, based on the ideas and directions of the RAPP[2], a Provincial Aquaculture Development Strategy (hereinafter referred to as "PADS") was prepared under the Project and the direction of aquaculture extension at province and district levels was discussed and agreed in principle by the organizations concerned. It was confirmed that the Project Purpose had been achieved by promoting group aquaculture in addition to individual aquaculture, which had been planned at the initial stage of the Project.

1.3.2 Achievement of the Project Purpose at the time of the Terminal Evaluation

The average annual rate of increase in fish production at the pilot villages was 30 %. It was confirmed that there was the possibility of increasing the per capita consumption volume of fish[3] in the four target provinces to 22 kg/person/year, which is an indicator for the Overall Goal, by continuing to promote aquaculture from the time of the terminal evaluation. Positive impacts of aquaculture in rural areas were also recognized, including increases in cash income, contributions to the empowerment of women in rural areas through group aquaculture by Women's Unions (hereinafter referred to "WU"), the formation of voluntary networks of individual fish farmers, collaboration among different ethnic groups and the enhancement of awareness of mutual help among villagers.

[2] The RAPP is a standard aquaculture promotion method, which was prepared by the Project and officially approved by DLF in October 2009. Presented in the RAPP are a system for aquaculture extension in rural mountainous areas by establishing one pilot village in one cluster and assigning two Village Aquaculture Development Workers (VADW) at each pilot village, an approach to establish a system in a cluster and so on.

[3] To be precise, fish should be interpreted as "fisheries products that include fish and other aquatic organisms".

1.3.3 Recommendations at the time of the Terminal Evaluation

Recommendations	Response
(1) Intensive Support for Seed Producing Farmers (Recommendation for the Project): It was found that seed demand had been increasing in the target areas. During the remaining period, the Project should intensify its technical support for these seed producing farmers and groups. It is also recommended, where applicable, that a network of Village Aquaculture Development Workers is built (hereinafter referred to as "VADW[4]"). In addition, it is recommended that seed producing farmers are facilitated in availing themselves of financial sources such as the Agriculture Promotion Bank and other donors for constructing/upgrading hatchery facilities and equipment.	Technical support for seed producing farmers was continued during the remaining cooperation period of the Project. Especially in the plain areas, where Nasomnyai Village in Phiang District of Sayaboury Province is located, aquaculture-related activities are active and a network of seed producing farmers, including VADW, was established. At the time of the ex-post evaluation, the activities of seed producing farmers were also observed.
(2) Monitoring and Documentation of VADW Activities (Recommendations for the Project) The Project should closely monitor and guide their extension activities and document successful cases of both passive and active aquaculture extension in order to scrutinize the effectiveness of the RAPP.	A database of VADW, certified in 2009, was developed. The database shows information such as contact addresses, measures for livelihoods, aquaculture activities and the relevant facilities of each VADW. In the process of development of the database, the monitoring of VADW was continued.
(3) Formulation of Provincial Action Plans (Recommendation for the Project) Based on the PADS, a detailed action plan should be prepared by each target province. The plan should be authorized by local authorities. To the extent possible, the Project should provide assistance to local authorities in its formulation.	Although action plans for provincial aquaculture extension were prepared, it could not be confirmed whether or not the plans were approved by the relevant authorities in order to ensure implementation.
(4) Implementation of RAPP in the Cluster Approach[5] (Recommendation for DLF) It is recommended that DLF promotes implementation of the RAPP in the Project extension sites in coordination with concerned offices after the termination of the Project.	The facilitation and implementation of the RAPP within the framework of the cluster approach could not be confirmed with DLF. It was considered difficult to implement the RAPP without having assistance from donors.
(5) Promotion of Integrated Farming and School Aquaculture (Recommendation for DLF) It is recommended that future similar aquaculture projects incorporate aquaculture integrated with animal husbandry and agriculture, and school aquaculture.	Regarding integrated aquaculture, a combination of upland irrigated agriculture with aquaculture was mentioned under the area-based approach in "Strategy for Agricultural Development 2011 to 2020" prepared by MAF.

[4] Where staff and budgets of Governmental organizations for aquaculture extension were quite limited, it was necessary to encourage farmers to participate in aquaculture activities and set up an extension system with a Farmer to Farmer (FTF) approach in order to promote aquaculture extension in rural mountainous areas. Under pilot operations, well-motivated farmers were selected as farmers to carry out extension activities, out of which core farmers were screened and nurtured. Furthermore, in order to encourage core farmers to play more active roles in aquaculture extension, some core farmers were trained at NADC and certified as "VADW" by DLF after having been recognized that they had acquired sufficient capacity. Certification by the Central Government aimed to provide VADW with the status of official recognition.

[5] According to the terminal evaluation report, the Government of Lao PDR started adopting a cluster approach, which would group about 10 villages under one cluster, following the Prime Minister's decree in 2007. By putting villages in one cluster (a village group for development), the approach is regarded as a development method in which all development projects, including those in the fishery sector, are carried out in a cluster as a unit.

2. Outline of the Evaluation Study

2.1 External Evaluator

Tomoo Mochida, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: October 2013 – August 2014

Duration of the Field Study: January 7 – 31, 2014, March 22 – 29, 2014

2.3 Constraints during the Evaluation Study

The beneficiary survey was conducted through a sample survey at a total of nine villages, including both pilot and extension villages, in the target provinces. Statistics relating to aquaculture collected from different sources, information on production volume collected through the beneficiary survey and so on were found in part to be not consistent. This data, therefore, needs to be treated as a reference only.

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

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance to the Development Plan of Lao PDR

At the beginning of the Project, it was planned that the Project would contribute to the achievement of "reduction of poverty by half" and "food security", among the main objectives set out in the "Fifth Social Economic Five Years Development Plan (2001-2005)". "Poverty reduction" and "food security" were continuously given priority in the "Sixth Social Economic Five Years Development Plan (2006-2010)" at the completion of the Project. Fish have been and are an important source of nutritious animal proteins for the people of Lao PDR . Also at the time of the ex-post evaluation, DLF set a target to increase the annual per capita consumption of fisheries products, including fish and other aquatic organisms, to 22 kg/person/year in rural areas by 2020 (24 kg/person/year on a nation-wide average including consumption in urban areas) in "the National Strategy for Fisheries from the present to 2020-Action Plan for 2006 to 2010" (Table 1).

Table 1: Consumption Target of Fisheries Products

Unit: Kg/person/Year

Urban/Rural	2005	2010	2020
Urban	14	16	27
Rural	9 (8-10)	13	22
Average	NA	14	24

Source: Targets in 2005 have been quoted from the Project completion report. Targets in 2010 and 2020 have been quoted from "The National Strategy for Fisheries from the present to 2020 - Action Plan for 2006 to 2010" prepared by DLF.

Prior to the implementation of AQIP 1 and 2, AIT started "Provincial level Aquaculture Outreach project" in 1993 and FAO/UNDP also implemented the "Provincial Aquaculture

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

[7] ③: High, ②: Fair, ①: Low.

Development Program (1997-2000)". For example, the Project, supported by AIT, utilized experience gained in northeastern Thailand with some suitable adjustments being made for the conditions in Lao PDR. The project aimed to form a network among fingerling producing farmers (capacity development of farmers who carry out intermediate culture), focusing on the production and distribution of fingerlings. Making use of experience from these preceding projects, AQIP 2 was implemented for aquaculture extension in rural areas.

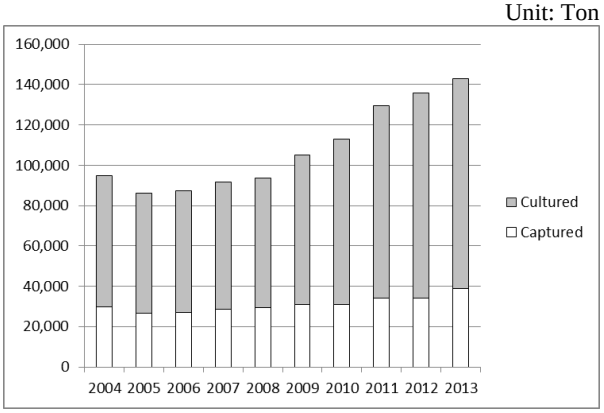
The relevance between the Project and the development policy of Lao PDR was high. The Project (AQIP 2) extended the results of AQIP 1, a preceding project, into rural areas in terms of fingerling production and appropriate aquaculture techniques and utilized experience from the projects assisted by other donors. The Project is also consistent with the development policies from a long-term viewpoint based on experience and approaches so far accumulated.

3.1.2 Relevance to the Development Needs of Lao PDR

At the beginning of the Project, the annual per capita fish consumption in Lao PDR was around 14 kg, the lowest level among countries in the Indochina region. Since mainly small scale farmers carried out aquaculture for home consumption in rural areas, the basic needs for low-cost aquaculture existed in the areas.

At the time of the terminal evaluation of the Project, the annual per capita fish consumption in Lao PDR still remained at the lowest level in the Indochina region. While consumption had exhibited a gradually-increasing trend, the supply volume from natural water was not expected to increase substantially for the trend of fisheries production, as shown in Figure 1. Therefore, there remained the basic need for aquaculture with low costs aiming at home consumption as well as at the generation of cash income. Thus, the Project is consistent with the development needs of Lao PDR.

Unit: Ton



Source: DLF

Figure 1: Trend of Fisheries Production in Lao PDR

3.1.3 Relevance to Japan's ODA Policy

According to "Japan's Official Development Assistance White Paper 2005", at the beginning of the Project, as the Association of Southeast Asian Nations (ASEAN) was working toward the formulation of an ASEAN community by 2020, the reduction of development disparities within the region and strengthening the unity of ASEAN were becoming some of the

most important issues. To rectify development disparities, Japan placed priority on the development of human resources and on the Mekong River Basin Development, which targeted the new ASEAN members (including Lao PDR) and Thailand.

In addition, four priority areas of assistance were identified in "JICA's Country Assistance Program for Lao PDR". These were: human resource development, basic human needs (hereinafter referred to as "BHN"), agriculture and forestry, and infrastructure and energy development). This Project matched three of the four priority areas, i.e., human resource development, BHN and agriculture. In particular, regarding agriculture, "sustainable agriculture and rural development in harmony with natural environments" was regarded as a priority area for assistance. The Project was found to be consistent with the assistance policy of the Japanese Government that made the regional development of Mekong a priority. The Project also acted under two cooperation programs (food security and the promotion of village development), which JICA was continuing under its priority areas. Thus, it matched the assistance policy of Japan and JICA towards Lao PDR.

3.1.4 Appropriateness of the Project Plan and Approaches

The four target provinces of the Project are located in the northern, central and southern regions of Lao PDR and are characterized by different climatic and living conditions. Instead of carrying out the Project at all the villages at once, activities of the Project were firstly verified at 12 pilot villages and then extended into 54 extension villages, based on the results at the pilot villages. This kind of phased approach, which verifies aquaculture methods suitable to various local conditions and extends the methods, was evaluated to be efficient and effective. However, the cooperation period for the extension phase was relatively short and the inputs were quite limited compared to those of the pilot operation phase. Furthermore, the four target provinces are geographically distant in both northern and southern regions of the country. This arrangement seems to have made it difficult to ensure broader as well as deeper dissemination of Project effects beyond the extension villages within the respective provinces.

In light of the above points, the Project is considered to have been highly relevant to development policy and development needs, as well as to Japan's ODA policy, although there is some room for improvement in terms of approach. In conclusion, its relevance is high.

3.2 Effectiveness and Impact[8] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

1) Output 1: Adequate aquaculture methods are verified according to the local conditions of pilot sites.

In the Project Activities, pilot villages were identified, operation and management plans for pilot sites were prepared and put in practice, and methods for seed production and grow-out culture were improved[9].

Indicator 1-1: Manuals on aquaculture techniques suitable to local conditions are prepared.

A total of six technical manuals for methods such as tilapia culture method and common carp culture method were prepared and an additional two manuals were in preparation at the time of the terminal evaluation of the Project[10]. At the survey of the ex-post evaluation, conducted three years after the completion of the Project, some manuals and guidelines were missing while the distribution of others was not confirmed. However, it is assumed that the manuals, or their drafts, were utilized to a certain extent in the process of achieving Output 1.

Indicator 1-2: Production of fish culture by target farmers in pilot villages increase by more than 40% on average.

During a three-year period from 2005 to 2008, it was estimated that the average production volume of fish at pilot villages had increased by 122 % at the time of the terminal evaluation. Nine out of 12 pilot villages achieved an increase in fish production of more than 40%. The beneficiary survey[11] conducted at the time of the ex-post evaluation revealed the trend of fish production per household as shown in Figure 2. At all the pilot villages, the average fish

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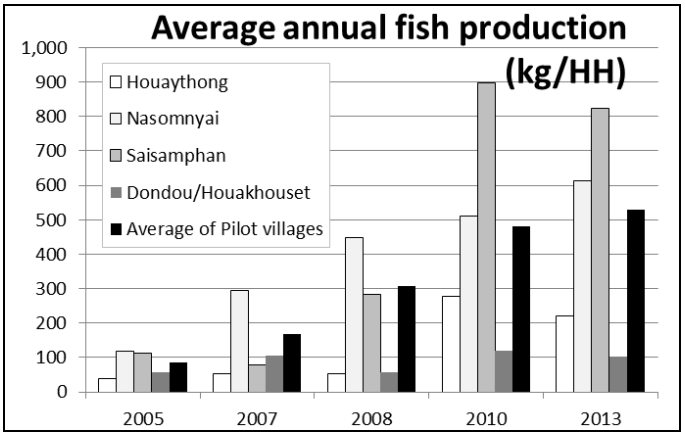
[8] Sub-rating for Effectiveness is to be included with consideration of Impact.

[9] According to former JICA experts, under the Project, joint experiments on aquaculture were carried out with Japanese universities (Tokai University and the University of Tokyo), the Japan International Research Center for Agricultural Sciences (JIRCAS) and FORCOM. Through these collaboration activities, the skills of counterparts at provincial and district levels were upgraded and the activities at NADC became widely known to donors and research institutes.

[10] According to the Project completion report and former JICA experts, two manuals (catfish and puntius), which had been under preparation at the time of the terminal evaluation, had been finalized as the "manual on seed production of catfish and puntius" by completion of the Project.

[11] During the ex-post evaluation, instead of surveying all the households at pilot and extension villages, a sample survey was conducted at two villages per province, one pilot village and one extension village, with the cooperation of PLFS in each province. During the monitoring survey carried out in 2009, 20 to 30 households were interviewed at each village. Out of the list of interviewees in 2009, 15 households, which were available for the interview on the day when enumerators visited the village, were chosen and their cooperation with the survey was requested. In cases where the number of interviewees did not reach 15 per village, farmers from another village where the Project was implemented were selected for the interview. As a result of the survey conducted in January 2014, 120 households were chosen from nine villages, five pilot villages and four extension villages. The average number of family members subject to the survey was 4.9 persons per household and the total number of family members was 586, out of which the number from Lao Loum was 398 (67.9%), that of Lao Theung 58 (9.9%), that of Lao Sung 63 (10.8%) and that of Hmong 67 (11.4%).

production volume per household in 2010 had increased by much more than 40%, if compared with that in 2005. Considering both the results at the terminal evaluation and the ex-post evaluation, it can be said that this indicator has been fulfilled.



Source: Data in 2005 from the terminal evaluation report. Data in 2007 and 2008 from the monitoring survey report of 2009. Data in 2010 and 2013 from the beneficiary survey at the time of the ex-post evaluation.
Note : The number of households that answered about fish production volume is different from year to year.

Figure 2: Average annual aquaculture production per household in the four pilot villages surveyed

There were some villages and fish farmers that experienced a decrease in fish production in some years. During the interview at the ex-post evaluation, a number of reasons for the decrease were pointed out. They were, among others, occurrences of floods and thefts, a decrease in the number of fingerlings released by aquaculture farmers in ponds, the practice of extensive aquaculture, a shortage of water and a switch to paddy fields from ponds and so on. Interviews with farmers revealed that some farmers had decided to grow commercial crops like tabacco, which would grow under less restricted conditions, in place of aquaculture which requires constant water management[12]. Meanwhile, there were some villages that recorded an increase in fish production. A number of reasons was pointed out. They were, among others, an application of new techniques, stocking of a larger number of fingerlings, stocking of better quality-fingerlings, improvement of ponds and so on. In addition, many farmers applied compound feeds for fisheries, which was considered to be the main factor behind the improvement of productivity.

Indicator 1-3: More than 60% of target farmers in pilot villages are well motivated to continue aquaculture at the time of termination of the pilot operation.

According to the monitoring survey[13] carried out in August 2009, at 10 out of 12 pilot villages, all the fish farmers showed their intention to continue aquaculture. Even at the remaining two villages, most of the farmers (76% - 89%) intended to continue aquaculture like the farmers at other villages. When asked if they would change the level of aquaculture production in the future in the beneficiary survey conducted at the ex-post evaluation, all of the 120 households surveyed said that they intended to “expand the level of production”.

[12] According to a former JICA expert, aquaculture used to be just one of the alternative economic activities in which farmers were engaged in rural areas of Lao PDR. If aquaculture was carried out as part of farmers’ economic optimization processes, fish production could be substituted for other economic activities in some years. In this case, fish production would not necessarily increase linearly every year.

[13] “Monitoring survey of the project” prepared under the Project in August 2009.

Considering both the results of the sample survey in 2009 and the survey results at the ex-post evaluation in 2014, it can be assumed that this indicator was fulfilled at the time of Project completion.

2) Output 2: The capacity of relevant persons such as target farmers, province / district extension staff and staff of Provincial Aquaculture Stations (hereinafter referred to as "PAS") regarding aquaculture technology and extension is improved.

In the Project Activities, training programs and materials were prepared taking into consideration the conditions of localities, trainings were conducted for technical and extension staff at provincial and district levels, and target farmers and the functions of PASs were strengthened.

Indicator 2-1: More than two staff members of each PAS can train district staff and farmers.

Indicator 2-2: More than two staff members of each Provincial Livestock and Fisheries Section (hereinafter referred to as "PLFS") can make provincial aquaculture plan and give necessary guidance for aquaculture extension to PAS and District Agriculture and Forestry Office (hereinafter referred to as "DAFO").

Indicator 2-3: More than two staff members of each DAFO can give guidance to farmers.

Indicator 2-4: At least one target farmer at each target village becomes the VADW well motivated to extend aquaculture to other farmers.

At the time of the terminal evaluation, it was confirmed that Output 2 had been accomplished based on the results of the self-evaluation for capacity improvement of the staff members concerned at each provincial and district office. In addition, DLF issued certifications to VADW after their completion of a series of training courses. At the time of the ex-post evaluation, it was found that some staff members continued to carry out activities at the same offices while others, who had improved their capacities under the Project, had moved to the extension section of Provincial Agriculture and Forestry Office (hereinafter referred to as "PAFO") or to other offices related to aquaculture development under PLFS. In some cases, they had been promoted to management of the concerned section and were supervising the operations of that section. In other cases, staff members of Local Government offices, who had upgraded their capacities during the cooperation period of the Project, were mobilized as instructors on other relevant projects. In consideration of the extension approach from Farmer to Farmer (hereinafter referred to as "FTF"), VADW were expected to play a role under the Project, which would complement the functions of Local Government offices. At the time of the ex-post evaluation, the number of VADW more or less remained unchanged (the number

slightly decreased)[14]. According to interviews with VADW, there were few cases where VADW were actively involved in technology transfer beyond their own villages. However, it was confirmed that they had provided technical advice mainly within their own villages in response to the needs of other fish farmers.

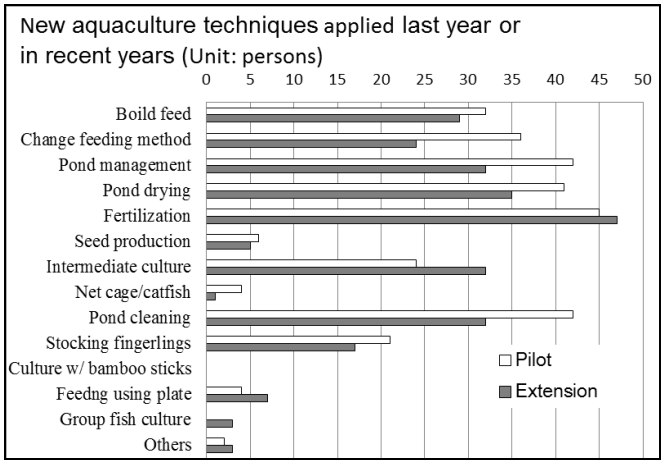
Since it is considered that the aquaculture techniques and extension capacity of concerned personnel have been utilized, it can be assumed that this indicator was fulfilled at the time of Project completion.

3) Output 3: Fish farmers of the focal districts introduce improved aquaculture methods.

In the Project Activities, villages and farmer groups were selected for the introduction of the outputs of pilot operations and training. Expansion operations and monitoring activities were carried out.

Indicator 3: At least 600 target farmers (extension villages) apply improved methods in 8 focal districts.

At the time of the terminal evaluation, based on the monitoring survey results in 2009, it was reported that the number of fish farmers who had applied aquaculture techniques introduced by the Project, had reached more than 1,000 households in all the extension villages (it had been estimated that the number would be about 80% of fish farmers at the extension villages). In the beneficiary survey conducted at the time of the ex-post evaluation, farmers were asked whether or not they utilized improved aquaculture techniques. Out of 120 farmers at nine villages, more than 80% answered that they had utilized at least one of the new aquaculture techniques. The types of improved techniques depend on the areas and farmers: however, as shown in Figure 3, widely-utilized aquaculture methods include boiled feeds, improvement of the pond management, pond drying, fertilization, pond cleaning and so on, techniques which require a lower amount of investment, even among

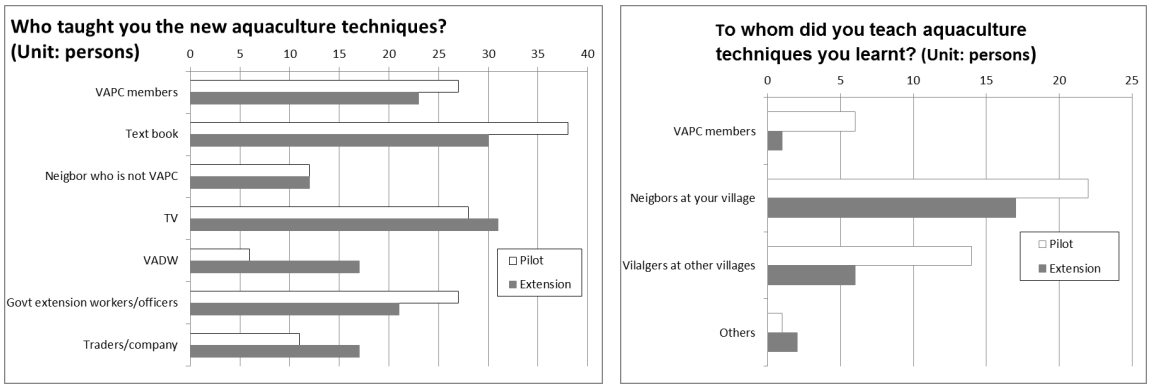


Source: Beneficiary Survey at the Ex-post Evaluation

Figure 3: Aquaculture techniques recently used

[14] However, there are provinces other than the target provinces of the Project where farmers have been newly certified as VADW. Two VADWs were certified in Vientiane province after the completion of the Project. In another JICA-assisted technical cooperation project called LIPS, 10 farmers were certified during the first half of LIPS. According to former JICA experts, these VADW were also trained at NADC and later certified by DLF. Furthermore, according to DLF, one Village Veterinarian Worker (VVW) was trained at each village. The accumulated number of VVW has reached 12,000. There is a plan to let VVW gain some experience and practice in aquaculture in the future.

low-cost techniques.



Source: Beneficiary Survey at the Ex-post Evaluation
Note: With regard to the question "who taught you the new aquaculture techniques?", the number of respondents who answered VADW was small. There is a possibility that they knew the VADW by their personal names but not by their title (i.e., VADW).

Figure 4: Channels of technology transfer

With regard to the channels of technology dissemination, the pilot villages and extension villages shared some similar characteristics (Figure 4). Channels through which techniques had been introduced were textbooks, members of Village Aquaculture Promotion Committees (hereinafter referred to as VAPC[15]), government officials and so on. Some farmers seemed to have adopted aquaculture practices by copying them from neighboring, progressive farmers. There were few cases where interviewees had taught other farmers, but technology transfers were also made to neighbors other than VAPC and to farmers at other villages.

In terms of the production volume of fish and productivity, a comparison was made between farmers who recently used aquaculture techniques and those who did not. Based on the results, it was inferred that the aquaculture techniques had made a contribution to a productivity increase. So far as the results of the beneficiary survey at the ex-post evaluation are concerned, it can be seen that aquaculture techniques introduced in the Project were utilized, contributing to a productivity increase. Therefore, coupled with the results of the terminal evaluation, it is clear that Output 3 had been accomplished at the time of Project completion.

[15] VAPC is a committee consisting of 10 to 20 members such as fish farmers, leaders of a village, members of WU aquaculture groups, etc. Their aim is to promote aquaculture as part of village activities as a whole. VAPC were established at all the pilot and extension villages. At the pilot villages, core farmers, after further screening, were certified as VADW. One of the requirements to becoming VADW is a recommendation by VAPC.

Column: Fish farmer at an extension village in Savannakhet province

Fish farmer A at Nonsa At village carries out aquaculture at two small fish ponds within a very short distance from his own house. When the external evaluator dropped by his house at the end of March 2014, a small amount of water remained at the bottom of a pond with an estimated surface area of 300 m^2 (Photo shown below). Meanwhile, there was no water in a second pond with an estimated surface area of 150m^2. Soil cracks were found on the dried bottom of the latter pond. Despite his age, 83 years old, the farmer vigorously responded to the interviews. There are five family members in his family. They cultivate paddy fields once a year, raise cows and chickens, and carry out small trade as well. For Family A with a daughter working at a government office, aquaculture is a small business for family consumption.

In June, when the rainy season starts and the volume of water increases, they start stocking fingerlings in the ponds. Around that time, trucks loaded with bags containing fingerlings from Savannakhet town travel from village to village with loud speakers, informing villagers of sales of fingerlings. Famer A stops the truck to purchase fingerlings. Prices depend on the size of fingerlings. A bag with 30 to 40 fingerlings costs 10,000 Kip, and they buy about 300,000 Kip worth of them. According to Farmer A, they enjoy fish over six to seven months from August, two months after fingerlings were released (considering their production volume, they cannot be eating fish every day; however, as they can catch fish at ponds nearby their house, they must have found this convenient especially during the busy agricultural season). Aside from the purchase cost of fingerlings, they spend 100,000 Kip on fish feeds. This means that they make a total cash investment of 400,000 Kip in their small aquaculture operation. If they purchased fish at the local market, 400,000 Kip would disappear within one week or so. However, if they invest the same in aquaculture and eat the outputs from the operation, the benefits last over several months, bringing them a sense that they are saving money.

Farmer A said he participated in a seminar organized by the Project in 2009 and learned how to prepare boiled feeds by using rice brans and vegetables. The fertilization of ponds by using buffalo dung, etc. was also taught by a farmer from another village. The fish seem to be healthier with boiled feeds and the production volume appears to have increased to 100 kg per year at present from 50 to 60 kg in the past.

4) Output 4: The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.

In the Project Activities, assistance was given for the preparation of aquaculture development strategies in the target provinces, as well as for action plans of the Project after its cooperation period. Seminars were also held on the action plans.

Indicator 4-1: Related organizations approve a collaboration agreement defining duties of each organization.

According to the terminal evaluation report, the Government of Lao PDR was promoting the introduction of the cluster approach in which about 10 villages were integrated into a village cluster. This was based on the Prime Minister's Decree of 2007. In line with the Government policy MAF was implementing to establish Agricultural and Forestry Technical Service Centers (hereinafter referred to as TSC) at provincial and district levels based on the Agricultural and Forestry Minister's Order of 2008. At the terminal evaluation, it was found that in this situation it was difficult to exchange any sort of written collaboration agreement under the leadership of

the Project since the TSC system was a new regime of the Government[16]. At the interviews during the ex-post evaluation, it was not confirmed to what extent this indicator had been fulfilled.

Indicator 4-2: The Project makes recommendations for sustainable development of aquaculture in Lao PDR.

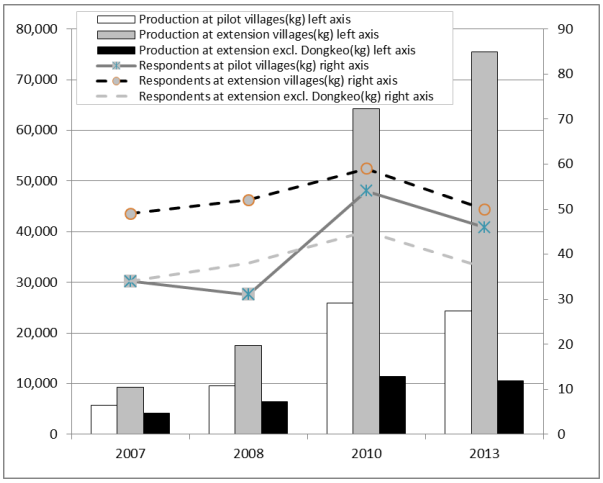
According to the terminal evaluation report, the Project had drafted the RAPP as a technical package for aquaculture extension in rural area in April 2009. It was then officially authorized by DLF after some necessary adjustments. Since the RAPP adopted the cluster approach with the idea of "One cluster, one pilot village" and "Two VADW at one pilot village", this indicator 4-2 has been fulfilled.

Based on the above points, the evaluation is that achievements of Output 4 were limited.

3.2.1.2 Achievement of Project Purpose

1) Indicator 1: 720 fish farmers (120: pilot villages, 600: extension villages) increase their fish production by more than 40% on average by applying improved aquaculture methods in 4 target provinces.

According to the Project completion report of March 2010, at the pilot villages, more than 511 fish farmers applied at least some improved aquaculture techniques/methods and more than 337 (61%) of them improved fish production by more than 40%. Aquaculture techniques/methods which had been improved through the pilot operations, were introduced at 54 extension villages. More than 1,004 fish farmers applied these techniques/methods in these villages and more than 653 (65%) of the farmers improved fish production by more than 40%.



Source: Monitoring survey report in 2009 and beneficiary survey at the ex-post evaluation

Figure 5: Annual Fish Production at Pilot Villages and Extension Villages
(Number of interviewees, *n*=120)

[16] The reason why the collaboration agreement could not be made was not known. For aquaculture extension, DLF and NADC are involved in aquaculture extension at the national level, PAFO and PAS are engaged at the provincial level, and VAPC collaborate at the village level. A collaboration agreement is expected to clarify the duties and roles of each organization. However, as the cluster approach that grouped about 10 villages in one cluster was being introduced, it is assumed that the content of the collaboration agreement might have been seen as not necessarily consistent with the cluster-based development method.

In the beneficiary survey at the ex-post evaluation, volumes of fish production at fish farmer households were examined at nine villages, five pilot and four extension villages, in the four provinces. As shown in Figure 5, the production volume in 2010 at the nine villages was 6.0 times as large as that in 2007, 3.8 times as large if the production volume at Dongkeo village is excluded. The survey results can thus be treated as evidence that fish production had increased at the time of Project completion although it was a sample survey at selected pilot and extension villages. In any case, it can be seen that indicator 1 was fulfilled.

Column: Trial classification of villages surveyed

The speed and extent of aquaculture extension vary among the pilot and extension villages as found at the time of the ex-post evaluation. On the one hand, at Dongkeo village (Lao Loum) in Oudomxai Province, at a location in the center of the town, the size of ponds is comparatively large and irrigation facilities are relatively well-developed, although it is still difficult to cultivate paddies twice a year. On the other hand, Houayxam-O village (mainly Lao Sung) is located in a highland area and the size of ponds is comparatively small. The reasons for the differences in levels of fish production are floods, thefts, methods of feeding, the number of fingerlings being released, input volumes of compound feeds for fisheries and so on. Moreover, other things that can affect the differences are the differences between ethnic groups (Lao Loum, Lao Theung, Lao Sung), the sizes of aquaculture ponds being affected by the amount of investment and accessibility to water sources, and the number of households that sell fish, which is also related to accessibility to markets. Although there are some villages where large variances in fish production volume are found, even within the village, the villages surveyed could be categorized into the three types: "the commercial aquaculture type", "the home consumption with diversification of cash income sources type" and "the home consumption type" as shown in Table 2 below. At the villages classified into "the commercial aquaculture type", the average size of aquaculture ponds and the production volumes are large and the ratio of fish farmers who sell fish is high. In the villages classified into "the home consumption type", the average size of aquaculture ponds and the fish production volume are small and the ratio of fish farmers who sell fish is low.

Table 2: Characteristics of Villages where the Beneficiary Survey was conducted

Type and Province	Village	2010			2013			Production and Change	Characteristics		
		No. of Respo-ndents	Ave. Area, (m^2)	Ave. Produc-tion (kg)	No. of Respo-ndents	Ave. Area, (m^2)	Ave. Product, (kg)		Ethnic Group	Size of Ponds	No. of farmers who sell fish
Commercial aquaculture											
Oudomxai	Dongkeo	14	4,060	3,779	13	4,569	4,992	Large Increase	Loum	Big	Many
Home consumption with diversification of cash income sources											
Sayaboury	Nasomnyai	15	3,560	510	15	3,627	612	Moderate Increase	Loum	Big	Many
Savannakhet	Saisamphan	15	4,160	897	15	3,320	823	Moderate Decrease	Loum	Big	Mid.
Salavan	Phao	18	2,317	322	10	2,424	483	Slight Increase	Loum	Mid.	Mid.
Home consumption											
Oudomxai	Houaythong	12	1,833	279	10	1,000	221	Slight Decrease	Theung	Small	Less
Sayaboury	Houayxam-O	13	939	232	13	1,062	239	Slight Increase	Sung & others	Small	Less
Savannakhet	Nosa At	15	1,937	171	14	1,261	186	Slight Increase	Loum	Small	Less
Salavan	Dondou/ Houakhouset	12	1,477	121	6	908	102	Slight Decrease	Loum	Small	Less

Source: Beneficiary Survey at the Ex-post Evaluation
Note: Many ethnic minorities live in Houaythong and Houayxam-O villages.

The average and median values of fish sales and the cost of the main inputs such as fingerlings, feeds and medicines for fish production are compared in Table 3 below, in accordance with the classified types in Table 2 above,. In "the commercial aquaculture type", investment was made in many inputs, as evidenced from the costs of fingerlings and feeds. In both "the commercial aquaculture type" and "the home consumption with diversification of cash income sources type", large gaps between average and median values were observed, implying that inputs by some farmers were quite large. On the other hand, in "the home consumption type", both sales and costs were limited.

Table 3: Sales and Cost of Fish Production by Type in 2010 and 2013

Unit: Million Kip

Type	Average/ Median	Fish Sales		Cost of Fingerlings		Cost of Feeds		Cost of Medicines	
		2010	2013	2010	2013	2010	2013	2010	2013
Commercial aquaculture	Average	55.9	79.0	5.4	8.3	18.6	33.7	0.5	0.9
	Median	18.0	25.2	3.0	6.5	2.5	5.0	0.1	0.2
Home consumption with diversification of cash income sources	Average	9.6	10.7	1.2	1.0	2.9	2.7	0.2	0.2
	Median	3.0	3.6	0.5	0.4	0.2	0.3	0.0	0.0
Home consumption	Average	1.3	0.5	0.3	0.2	0.1	0.1	0.0	0.0
	Median	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0

Source: Beneficiary Survey at the Ex-post Evaluation

Based on what is described in the above column, it can be inferred that the rapid increase in fish production in recent years resulted largely from an increase in inputs (including improvements in the quality of fingerlings[17]) as well as an expansion of fish ponds, which made it possible to increase the inputs[18]. Accordingly, in order to verify the relation between improvements in aquaculture techniques and productivity increase, responses made by those in the "the home consumption type" were examined for comparison, as the volume of inputs was limited in this type. As shown in Table 4 below, differences in the average productivity between farmers using aquaculture techniques and farmers not using the techniques can be inferred. Based on the above points, it was considered that a causal relationship between the application of aquaculture techniques and increases in fish production, which is the Project Purpose, could be assumed.

[17] According to the beneficiary survey, out of 120 respondents, 114 answered that they would feed Tilapia. 111 persons common carp, and 102 persons puntius or golden carp. When the external evaluator visited pilot villages, it was learned from VADW that they used compound feeds made in the People's Republic of China and Thailand.

[18] Former JICA experts explained the background to the wide dissemination of aquaculture, pointing out factors such as: (1) the utilization of compound feeds, (2) the utilization of vacant land for aquaculture ponds after soil was excavated for the construction of roads; (3) the wide recognition by farmers that aquaculture could become a good business; and (4) the high demand for fish.

Table 4: Comparison between farmers using aquaculture techniques and farmers not using the techniques

	Respondents (persons)		Average Production (kg/household)		Average Area of Pond (m^2/household)		Average Productivity (Kg/m^2)	
	2010	**2013**	**2010**	**2013**	**2010**	**2013**	**2010**	**2013**
Farmers who used aquaculture techniques	36	33	234	225	1,608	1,189	0.23 (0.029)	0.23 (0.021)
Farmers who did NOT use aquaculture techniques	16	10	122	111	1,413	711	0.15 (0.024)	0.17 (0.037)

Source: Beneficiary Survey at the Ex-post Evaluation

Note: Values in parentheses are standard errors. Assuming that a random sampling was conducted, the differences in average productivity between farmers who used aquaculture techniques and farmers who did not use aquaculture techniques in 2013 was not statistically significant, at a level of 0.1 (10%) (z value = 1.518). However, the differences in average productivity in 2010 was statistically significant, at a level of 0.01 (1%) (z value = 2.185). The number of farmers who did not use aquaculture techniques but produced fish decreased from 16 in 2010 to 10 in 2013. Accordingly, the standard errors in 2013 increased.

2) Indicator 2: Aquaculture development plans are prepared at province and district levels.

According to the Project completion report, DLF examined the draft RAPP prepared under AQIP 2 in light of the Fisheries Law enacted in July 2009 and in October of that year approved the RAPP as a standard method for aquaculture extension and promotion in rural and mountainous areas. Based on the RAPP, provincial aquaculture development plans were prepared for the four target provinces, through collaboration between DLF, NADC, PAFO, PLFS and DAFO, at workshops conducted in February 2009, the third year of the Project. It is not known whether or not district-level aquaculture development plans were prepared. Since DAFO staff also participated in the workshops, it can be presumed that district-level plans were also prepared. Moreover, PLFS of each target province and DAFO in each prioritized district also prepared detailed two-year action plans for activity plans after the Project completion. However, it has not been confirmed whether the action plans had been approved by relevant authorities.

In light of the above, it can be considered that indicator 1 of the Project Purpose was fulfilled with the target values set for both pilot and extension villages being reached. However, indicator 2 was only partly fulfilled. Although the provincial aquaculture action plans as well as PADS based on the RAPP had been prepared and agreed in principle by the relevant organizations by the time of the terminal evaluation, the approval of such plans by the relevant authorities, which was needed in order to put the plans in practice, had not been confirmed

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

1) Indicator 1: Fish consumption[19] of 22 kg/person/year by rural people in 4 target provinces.

The consumption data for fisheries products obtained from PLFS in each province is shown in Table 5. The data shows that the target consumption volume set for the Overall Goal, i.e., 22 kg/person/year, was not achieved in some provinces although there is room for improvement in the reliability of the data. On the other hand, the consumption volume of fisheries products was monitored at the pilot villages and an increasing trend of consumption was confirmed, as in Table 6. The monitoring results of 2009 and those at the time of the ex-post evaluation in 2014, which were obtained by applying similar methods as used in 2009, were those at the pilot villages. Therefore, they cannot be compared simply with the provincial average of consumption volume. However, it can be assumed that consumption volume in 2014 had been generally increased compared with that of 2009.

Table 5: Per capita consumption of fisheries products including fish and other aquatic organisms in the target provinces

Unit: kg/person/year

Province	2008	2009	2010	2011	2012	2013
Oudomxai	-	-	-	-	13.5	14
Sayaboury	-	24.2	22.2	27.0	17.0	12.9
Savannakhet	15.7	16.5	16.9	16.7	18.5	17.3
Salavan	18.0	19.0	19.0	23.0	23.0	25.3

Source: PLFS in each Province
Note 1: "-" means no answer.
Note 2: Reasons behind decreased productions in Sayaboury are not known.

Table 6: Monitoring results for consumption of fisheries products

Unit: kg/person/month

Province where the pilot villages are located	Monitoring results from October to November 2009				Monitoring results from January to February 2014			
	No. of Samples	Average		Median consumption of fisheries products	No. of Samples	Average		Median consumption of fisheries products
		Consumption of fisheries products	Consumption of fish only			Consumption of fisheries products	Consumption of fish only	
Oudomxai	7	2.7	2.1	2.3	6	5.4	5.1	4.2
Sayaboury	6	2.8	2.3	2.4	6	3.3	2.7	3.3
Savannakhet	6	2.7	2.2	2.5	6	5.8	4.5	4.1
Salavan	6	3.6	3.3	3.2	6	5.6	3.9	5.1
Average in the target villages	25	3.0	2.5	2.5	24	5.0	4.0	3.9

[19] To be precise, fish should be interpreted as "fisheries products that include fish and other aquatic organisms".

Province where the pilot villages are located	Monitoring results from October to November 2009				Monitoring results from January to February 2014			
	No. of Samples	Average		Median consumption of fisheries products	No. of Samples	Average		Median consumption of fisheries products
		Consumption of fisheries products	Consumption of fish only			Consumption of fisheries products	Consumption of fish only	
Aquaculture famers	16	3.3	2.9		22	5.2	4.2	
Non-aquaculture famers	9	2.3	1.7		2	3.3	2.5	

Source: 2009 data from the Project completion report 2014 data from the monitoring results at the time of the ex-post evaluation.

Note: At the time of the ex-post evaluation, farmers whose consumption volume of fishery products had been monitored in 2009 were requested to record their daily consumption volume of fishery products over one month from January to February 2014. The total number of farmers monitored was 24 from 12 pilot villages. Based on the monitoring data, a monthly consumption volume was calculated in the same manner in which the consumption volume had been calculated in 2009 [20].

2) Contribution of the Outputs and the Project Purpose to the Overall Goal

At the time of the ex-post evaluation, it was confirmed that the two-step extension approach for Outputs 1 to 3 had been carried out in an effective and efficient manner as evaluated in the terminal evaluation. It is thought that these activities had contributed to an improvement in the living conditions of small-scale aquaculture farmers (especially the afore-mentioned “home consumption type”), which was the Overall Goal of the Project. This was manifested in increases in fish production thanks to the extension of aquaculture techniques, as seen from indicator 1, which examined the extent to which the Project Purpose had been achieved.

However, regarding Output 4, although the Project proposed the RAPP for sustainable aquaculture development in Lao PDR and DLF approved this as a standard aquaculture extension and promotion method in rural and mountainous villages, it was considered that the consent to the RAPP among the relevant organizations had not been accompanied by sufficient human and financial resources to back up the broader extension of aquaculture techniques beyond the target districts and villages of the Project. Likewise, this can be also applied to indicator 2 of the Project Purpose. Although the aquaculture development action plans were prepared and agreed in principle among the relevant organizations, it was not confirmed whether or not the plans had been approved by the relevant authorities for implementation. In the four target provinces, an institutional set-up has yet to be worked out to ensure an extension

[20] Although the time schedule from stocking of seed fish to harvesting of fish varies from area to area, seed fish are generally stocked in June. The capture and consumption of cultured fish then start from October and continue over several months thereafter. Accordingly, during the period from June to September, farmers tend to consume purchased fish. In and after October, the consumption of cultured fish tends to increase since the harvesting time for agricultural products starts and farmers can save time required for catching fish. Since the acquired channels and consumption patterns of fish are different according to the season, it is not possible to annualize for comparison monthly consumption data which has been obtained through monitoring the volume in a specific month. However, since the measure of acquiring fish from October to November is found to be more or less similar to that from January to February, it is considered that a comparison of the monitoring results of the two periods on a monthly basis will be possible.

of the Project results.

3.2.2.2 Other Impacts

1) Gender mainstreaming

The terminal evaluation report pointed out that the Project had proactively tried to involve rural women in various aquaculture-related activities through training, field guidance and monitoring activities. At the ex-post evaluation, it was found that group aquaculture activities by WU had been suspended at the two villages visited by the external evaluator[21]. Although the WU aquaculture groups rented aquaculture ponds during the Project cooperation period, the groups had to suspend aquaculture activities after the completion of the Project as the aquaculture ponds had to be returned. The impact of the Project has therefore been found to be somewhat limited.

2) Formulation of a network of progressive farmers

The Project has fostered the development of a network of progressive aquaculture farmers with shared use of seed fish and brood stock, joint procurement of machines and information-sharing. At the time of the ex-post evaluation, it was confirmed that seven seed producers had formed and maintained a group with support from the Project in Sayaboury province. The advantages of forming such a group were pointed out as: (i) price-setting for sales; (ii) exchange of information on technology; (iii) enhancement of sales capacity; (iv) having body to receive support from the Project; and so on.

Photo 1: Seed production by a seed producers' group in Phiang district of Sayaboury province supported by the Project. For example, the group raises seed fish of Indian Carp for three months and sells them at 400 Kip/fingerling (equivalent to about 5 Japanese Yen).

Photo 2: A carp captured at a VADW aquaculture pond in Xai district of Oudomxai province. It weighted 2.5 kg after having been fed for about two years. The carp was sold at the farm-gate price of 25,000Kip/Kg to a visiting trader.

[21] During the ex-post evaluation, questionnaire-based or interview surveys were conducted to VAPC at 12 pilot and 53 extension villages. Out of 65 villages which responded to the surveys, there were two villages where WU maintained group aquaculture activities.

Group activities, including WU activities, continue as long as the minimum conditions for forming a group, such as the securement of aquaculture ponds by the group, are satisfied or while the benefits/incentives for forming a group, such as the activities of seed producers, are shared. In this regard, group activities have contributed to the sharing of information on technology, the enhancement of women's self-reliance, and so on.

3) Enhancement of friendship and mutual help among villagers

Collaboration among different ethnic groups and an enhancement in the sense of mutual help among villagers were confirmed at the time of the terminal evaluation. The Project supported the establishment of VAPC at the target villages. VAPC were established in order to prevent aquaculture development from undermining the economic balance within a community and triggering potential conflicts in society[22]. The aim was to implement activities (for example, technical guidance of VAPC to the group aquaculture of WU and low-income groups of farmers) that would benefit a village as a whole, including non-aquaculture farmers, without limiting support only for the benefit of aquaculture farmers. However, at the target villages visited by the external evaluator at the time of the ex-post evaluation, the group activities of VAPC and WU were found to be in low gear[23].

As described above, through the implementation of the Project Activities, Output 1 (verification of adequate aquaculture methods), Output 2 (capacity improvement of relevant people for aquaculture technology and extension) and Output 3 (introduction/use of improved aquaculture methods by fish farmers) have been achieved, but there has only been limited achievement of Output 4 (development of a collaboration mechanism among relevant organizations for aquaculture extension). With regard to the Project Purpose, the achievement of indicator 2 (preparation of aquaculture development plans at provincial and district levels) has been partially realized, while indicator 1 (increase in fish production by fish farmers at pilot and extension villages) is considered to have been fulfilled. The achievement of the Overall Goal is only partial as some provinces have not yet reached the target. In terms of impact, networking between progressive aquaculture farmers has developed in Sayaboury province, but group aquaculture activities were less active so that impacts were found to be limited. The Project has somewhat achieved its Objectives, and therefore its effectiveness is fair.

[22] Based on interviews with a former JICA expert.

[23] On the other hand, there were some VAPC that were engaged in such activities as sharing information on technology and experience, and using project-assisted equipment together. According to answers to the interviews and the questionnaire, about half of VAPC provide technical supports to their members and about one-fourth of VAPC jointly use equipment such as pumps.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

Inputs	Plan	Actual Performance [Note]
(1) Experts	➢ Resident-type 3 persons 3 resident-type experts: chief advisor/aquaculture techniques, extension/training, rural development/coordinator ➢ Short-term experts: brood stock management, seed production, participatory development, gender mainstreaming, improvement of agriculture system and others including experts from a third county	10 short-term experts: 10 fields such as training/brood stock management/seed production, aquaculture technique 1/extension, aquaculture technique 2/rural development/market survey, chief advisor, gender mainstreaming/life improvement, participatory development, early level development, planning of aquaculture facility, improvement of agriculture systems, strengthening regional networks. Out of 10 short-term experts, 3 experts (i.e., training/brood stock management/seed production, aquaculture technique 1/extension, and aquaculture technique 2/rural development/market survey) repeated their short-term assignments throughout the cooperation period of the Project. It is considered that their assignments correspond to resident-type experts of the plan. Total number of men-months: 150 MM
(2) Trainees received	Fields of training:	Fields of training: fresh water aquaculture, gender mainstreaming and others. One to six trainees were received per training session and a total of six training sessions were implemented. Gender mainstreaming in the fishery sector was also taken up as a topic aside from fresh water aquaculture, fish disease prevention and the hygienic handling of cultured fish. No. of Trainees: 18 trainees
(3) Third-Country Training Programs	Fields of training: Third country training in Thailand	Fields of training: fresh water aquaculture Third country training in Thailand: 21 trainees
(4) Equipment	Equipment: Vehicles for training and monitoring, equipment for seed production, equipment for aquaculture and others	Equipment: Minibus, motorcycles, computers and others Total: 14 million Japanese Yen
(5) Provision of Facilities	Equipment for seed production, facilities at PAS	Facilities relevant to aquaculture in NADC, PAS, etc.: 18 million Japanese Yen
(6) Local Operational Cost	Supplement for operational costs	Costs for training and seminars, costs for routine technical guidance, costs for the preparation of textbooks for extension and others: 64 million yen (support for local costs)
Total Project Cost	Around 550 million yen	Around 550 million yen
Inputs from the Government of Lao PDR	Assignment of C/Ps, staff in charge at province/district levels, assignment of provincial technical staff and district extension staff, allocation of budgets, facilities for the Project Total Cost: Unknown	Assignment of 36 C/Ps, other equipment, etc. (1 truck, 3 units of 4WDs, 1 minibus, 2 motorcycles, 3 personal computers, 1 printer and others), land (12 Ha), building, operational cost 645 million Kip (equivalent to about 77,000 US$) Total Cost: Unknown

Note: Actual performances are based on the terminal evaluation report in 2010.

3.3.1.1 Elements of Inputs

1) Dispatch of experts

One short-term expert was dispatched from a third country, Thailand, for fishery extension and the development of feeds in addition to Japanese experts.

2) Domestic training

Domestic training sessions were carried out for aquaculture technology at NADC and PAS, as well as site visits at pilot villages and field training at PAS and DAFO. By the time of the terminal evaluation, a total of 58 Local Government staff members, 260 farmers at pilot villages and 718 farmers at extension villages[24] had participated in such training.

3) Provision of machinery, equipment and facilities

Experimental ponds and facilities, etc. were also constructed and/or rehabilitated at NADC.

Photo 3: Training facility at an aquaculture station in Salavan province

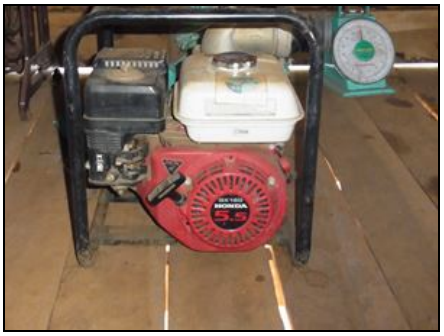


Photo 4: A pump provided by the Project (Dondou village in Savannakhet Province). It is being utilized jointly by members of VAPC. Farmers other than VAPC members are also able to use it on a fee paying basis.

4) Points for improvement with regard to the Inputs

At the time of the preparatory study, it was recognized that most adequate aquaculture methods needed to be extended with consideration to regional characteristics when a nation-wide extension of aquaculture technologies was to be undertaken. This was because local geographical and climate conditions were found to differ greatly depending on the area. Accordingly, as the first step before moving on to a country-wide scale, technology transfer was conducted in the four provinces where the local conditions were found to be different. While the routine technical guidance by Project staff was highly appreciated, both time and money were required for travel among the different target provinces, which were distantly located in both the north and south regions of the country. Based on the results of the interviews conducted during the ex-post evaluation, it would be considered efficient as well as effective if technology transfer were conducted with consideration to the different characteristics of the localities within further selected province(s) instead of four provinces located far apart in the north and south regions. Areas with different local conditions could be identified even within a smaller number of target province(s). Moreover, by narrowing down the number of target provinces, the number of relevant people participating in training within an area would increase. It would be also easier to set up networks among those concerned. Compared with the inputs for the pilot villages,

[24] The training period was one day for 415 out of 718 farmers.

those for the extension villages, such as the number of training opportunities and support for equipment and seed fish, were quite limited and the cooperation period was also shorter. These points could be somewhat improved if the number of target provinces were decreased.

3.3.1.2 Project Cost

The planned cost of the Project on the Japanese side was about 550 million Japanese Yen. The actual Project cost was about 550 million Japanese Yen. The Project cost therefore was as planned (100% if compared with the planned cost).

3.3.1.3 Period of Cooperation

The planned period of cooperation was five years from March 2005 to March 2010 and the actual period was five years. The period of cooperation was therefore as planned.

As for pilot operations relating to Output 1, the duration was extended by one year in order to strengthen the functions of pilot villages, although it was originally planned that completion would be made by the third year of the cooperation period[25]. Other activities were implemented almost according to plan.

Both the Project cost and the period of cooperation were as planned. Therefore, the efficiency of the Project is high.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy towards the Project

In "the Seventh Five-year National Socio-Economic Development Plan (2011-2015)" (hereinafter referred to as "the Seventh NSEDP"), the accomplishment of the Millennium Development Goals (MDGs) including poverty reduction is listed as one of the overall goals while support to rural development is mentioned as a measure for poverty reduction. In the Seventh NSEDP, the target volumes were set for meat and fish production as part of economic development in the agriculture and forestry sector. Therefore, the Project is consistent with the Seventh NSEDP.

On the other hand, under the Project, the RAPP including a certification system of VADW, was prepared in consideration of the cluster approach, part of the rural development policy of the Government of Lao PDR[26]. However, as mentioned before, the actual implementation of the

[25] According to the former JICA experts, while fish raising activities will go through one cycle per year, it is necessary to conduct experimental tests at least three times in order to verify the appropriateness of techniques to be introduced. Accordingly, such verification usually takes a period of three years. At the same time, in order to further examine the suitability, it is also necessary to use several aquaculture ponds in different conditions. These experimental tests are considered to have required a longer time for the pilot operations.

[26] The cluster approach aims to improve people's access to public services by setting up a cluster, consisting of several villages, within a district and by establishing TSCs at the respective clusters (Mid-term evaluation report in January 2008). According to the mid-term evaluation report, in order to disseminate the results of the Project

RAPP, as expected under the Project, had not been confirmed at the time of the ex-post evaluation. Thus, sustainability from the institutional aspect is limited.

3.4.2 Institutional and Operational Aspects of the Counterparts

At the time of the terminal evaluation, some concerns were raised on the stability of future extension activities at provincial and district levels due to a chronic shortage of human resources. At the time of the ex-post evaluation, substantial improvement in the situations observed during the terminal evaluation[27] had not been seen. Some VADW continued to produce fish seeds and carry out intermediate culture after the termination of the Project while others temporarily suspended seed production, for example due to increasing competition with other retailers of fish seeds and so on. As far as the Project areas are concerned, no fish farmers were newly promoted to VADW. Some problems have been observed in the institutional and organizational aspects of the extension activities.

3.4.3 Technical Aspects of the Counterparts

It was found that many respondents to the beneficiary survey conducted during the ex-post evaluation had been utilizing the aquaculture methods improved by the Project. The aquaculture methods extended by the Project were found to be easily adopted by farmers and, therefore, technical sustainability is considered to be high.

3.4.4 Financial Aspects of the Counterparts

The ex-post evaluation confirmed that the budgetary allocation for the extension activities of aquaculture was quite low, especially at the provincial and district levels. The external evaluator found the maintenance of the facilities to be inadequate at the PAS he visited. Some problems were observed in the allocation of maintenance budgets. The financial conditions of the counterpart agencies were considered to be limited for ensuring the extension of aquaculture. Meanwhile, even at the time of the terminal evaluation, it was also pointed out that provincial and district offices faced chronic shortages of financial resources and that it was possible that there would be a negative impact on the stability of extension activities by extension workers. Under such circumstances, the FTF approach by core farmers and VADW was expected to complement the extension activities of Local Government offices.

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efficiently, it was found necessary to take into account the cluster. For instance, the report cites a possible case in which VADW disseminates aquaculture techniques within a cluster through TSC. Meanwhile, at the time of the ex-post evaluation, a development policy called Sam Sang was introduced. Under the Sam Sang policy (three build-scheme), the Government promotes development by building up villages as development units, districts as strong integration units and provinces as strategic units.

[27] DLF established the Department of Fisheries (DOF) in 2012, but the number of staff members working at the department is limited. On the other hand, organizational reform was going on at the time of the ex-post evaluation, including that of institutional arrangements such as the new establishment of the Department of Agriculture Extension and Cooperatives (DAEC) under MAF. (Sufficient information on the contents of reform had not been obtained at the time of the ex-post evaluation.)

In conclusion, some problems were observed in the policy and institutional aspects, and the organizational and financial aspects of counterparts. In order to ensure an extension of aquaculture techniques despite chronic shortages of human, as well as financial, resources at Local Government offices, capacity development for core fish farmers, VADW and fish seed producers was carried out under the Project with the FTF approach. During the ex-post evaluation, it was found that the extent of technology transfer by VADW had been limited. However, VADW and seed producers played a complementary role in the extension activities of the Government and many fish farmers continued to make use of low-cost and low-risk aquaculture techniques, which contributed to an enhancement of productivity. It has been seen that the effects of the Project are sustained through incorporation of measures, based on the incentive mechanism for farmers, which are expected to play a complementary role in Government services. Thus, the sustainability of effects generated by the Project is evaluated to be fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project aimed to extend aquaculture techniques suitable for local conditions in the four target provinces (Oudomxai, Sayaboury, Savannakhet and Salavan) in the Northern, Central and Southern regions of Lao PDR. This was to be achieved by verifying and introducing adequate aquaculture methods according to the local conditions of pilot sites, improving the capacity of relevant people for aquaculture techniques and extensions, and strengthening the roles of relevant organizations and their collaboration mechanisms for aquaculture extension.

The Project matched the Laotian national development policy, its development needs as well as Japan's ODA policy, therefore its relevance is high. Generally speaking, all of the Outputs except the strengthening of the roles of relevant organizations and their collaboration mechanisms, were achieved by completion of the Project. In addition, an increase in fish production has been confirmed at both pilot and extension villages possibly thanks to the introduction of improved aquaculture methods and the quality improvement of fingerlings. However, although action plans for aquaculture development were worked out and basically agreed in the target provinces, the plans have yet to be approved by the relevant organizations for implementation. Furthermore, the consumption target of fisheries products as the Overall Goal was not achieved in the three provinces. Therefore, the effectiveness and impact of the Project are evaluated to be fair. While the efficiency of the Project is high because the Project cost and the period of cooperation were almost according to plan, the sustainability of the Project effects is fair as there are some minor problems in the policy and institutional aspects, the organization and in the financial conditions. In terms of the policy and institutional aspects, the RAPP was approved by DLF but has yet to be put in practice. It is also considered that provincial and district offices are understaffed and operation and maintenance budgets are short.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) Support for group aquaculture

As there were concerns about a possible enlargement of economic disparity between aquaculture farmers and non-aquaculture farmers due to implementation of the Project, attention was paid under the Project to social aspects through the promotion of group aquaculture. However, group aquaculture by WU and low-income farmers' groups, both of which were assisted by the Project, produced only limited results. In supporting group activities, the implementing agency should study the requirements for and the conditions in which group activities operate before judging both whether or not support should be extended and the ways in which support should be provided. For example, regarding the promotion of aquaculture activities by WU, user rights for aquaculture ponds which will form a basis of group activities, and the qualification of group leaders are two important factors for the enhancement of sustainability. Therefore, prior to the commencement of assistance, it is necessary that the implementing agency examine critical aspects such as whether or not a group in question has been provided with continuing user rights for aquaculture ponds and whether or not group leaders are equipped with the sufficient leadership capacity to carry out group activities.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

1) Targeting based on the categorization of aquaculture farmers

Right after the commencement of the Project, a baseline survey was conducted at candidate pilot villages in order to examine the appropriateness of the villages as pilot sites. At candidate extension villages also, a survey was carried out in order to study their adequacy as extension villages. Pilot and extension villages, which were targeted under the Project, were placed in various social as well as natural environments. It is understood that these aspects would influence factors such as the scale of aquaculture, production volumes, and sales volumes at markets. Among the aquaculture farmers supported, some farmers carry out relatively larger-scale commercial operations while others implement small-scale aquaculture practice for home consumption. While aquaculture activities will possibly spread rapidly amid changes in socio-economic conditions, it is thought that support can be more effective if targets for assistance are narrowed down and consensus is formed in advance with regard to which category of villagers or villages are targeted under the Project (for example, the placement of priority on villagers or villages characterized as "home consumption type").

2) Confirmation of the economic incentives of farmers who are expected to transfer technology under the Project

Under the Project, demonstration was made of the effectiveness of the FTF approach, which was intended to transfer technology from farmer to farmer, for example like technology transfer from VADW/core aquaculture farmers to aquaculture farmers. For sustainable operation of the FTF approach, the existence and scale of the economic incentives with which farmers transfer technology are important factors to consider. For example, if VADWs are engaged in fish seed production and intermediate culture, it is expected that they will actively transfer aquaculture technology to nearby farmers in order to expand their sales channels for fish seeds. In this case, it is necessary to know whether or not the competitiveness of VADW against other retailers of fish seeds might be comparatively altered in response to changes in the surrounding environmental conditions including communication methods such as use of mobile phones among farmers, and transport infrastructure such as access to roads. It is also necessary to confirm the operating environment of aquaculture at farm households where the technology is to be transferred, taking into account the possibility of enlarging aquaculture ponds and ensuring continuous water access.

3) Narrowing-down of target provinces and the establishment of Project offices in rural areas:

The technical cooperation Project was implemented in broad areas located in the north and south of the country while the Project office was set up at a training, research and development institute in the nation's capital. During the cooperation period of the Project, Project staff frequently visited the target areas, monitored the Project Activities and transferred technology. As a result, the duration of activities per visit to rural areas had to be shortened. Although the outcomes of the research of the institute could be utilized effectively by establishing the Project office at the institute, activities in rural areas, including capacity improvement for Local Government staff working closer with farmers, would be enhanced by selecting target areas for the Project and establishing Project offices in the target rural provinces (alternatively, shifting the functions of the Project office to the rural provinces gradually during the cooperation period of the Project). In addition, by geographically bundling areas closer together for the Project, it would be easier to formulate a network among relevant people and organizations within the same areas.

4) Selection of appropriate indicators that adequately reflect the characteristics of the Project in the Project Design Matrix (hereinafter referred to as "PDM"):

It was intended that the Project would mitigate the enlargement of economic disparities within a village by promoting group aquaculture based on the experiences gained through the activities of the first half of the cooperation period. However, indicators such as an increase in

fish production volume were simply selected for the PDM and new indicators, which would make this concept of the Project more concrete, were not incorporated as indicators corresponding to the Outputs and the Project Purpose. Therefore, it is necessary to choose indicators that match the Outputs and the Project Purpose which were aimed to be achieved through the Project. For instance, the number of non-aquaculture farmers who participate in the group aquaculture and changes in the fish production volume through group aquaculture could be considered as candidates for such indicators.