Vietnam

Ex-Post Evaluation of Japanese Technical Cooperation Project
"The Rehabilitation of Natural Forest in Degraded Watershed Area in the North of Vietnam"

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0. Summary

This project aimed to develop silvicultural techniques for natural forest rehabilitation and, then, to apply these techniques to forestry sector policy and disseminate them in Hoa Binh province. The project reflects needs for technological development toward the rehabilitation of natural forest, in particular under the current situation where farmers play an important role in forest management. Therefore, the relevance of the project is high. As a result of project implementation, some effects were observed, such as, advancement in technical development and inputs in the guidance for afforestation activities in Program 661. On the other hand, dissemination outside of the project area did not attain its target. In the light of this, the effectiveness/impact of this project is fair. The inputs were appropriate, the project cost was within the plan and the period of cooperation was as planned. Therefore, the efficiency of the project is high. A national afforestation program is still on-going. However, the continuation of the On Farm Trial (OFT) activities and the dissemination of project results have faced a lack of funding in Hoa Binh province. Hence, the sustainability of the project effects is fair.

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

1. Project Description

Project Location


Indigenous Species planted by the Project

1.1 Background

Vietnam runs from north to south and covers a total area of 329,241 km^2. The climate varies depending on the region, and the country is home to a wide variety of forestry flora. Forest coverage in Vietnam has decreased over a long period of time due to the influence of Vietnam War and the strong demands for forest resources and agricultural land because of increase in population. By the 1990s, it had fallen below 30% of the total land cover. At that time, the Vietnamese government began to focus on forest rehabilitation and "The National 5 Million Hectare Reforestation Program" (known as Program 661[1]) was initiated in 1998. The program was designed to deal with not only the rehabilitation of forest resources but with many other issues to be tackled in mountainous areas (such as to lessen the occurrence of natural

[1] Called Program 661 as it was implemented based on the PM Decision No. 661/1998.

disasters, the cultivation of water resources, the protection of biodiversity, and poverty reduction).

While a former afforestation program, that is, Program 327, placed too much importance on plantation, Program 661 attached importance to the rehabilitation of natural forest as well as to plantation[2]. There were several technical tasks for the rehabilitation of natural forest within Program 661. In the past, forestation activities mainly used imported fast-growing varieties instead of Vietnam's indigenous tree species, and thus there was a wide developmental scope for such species to grow in terms of silvicultural techniques. In particular, it has been important to find technically and economically feasible techniques which could be used by local farmers and forestry workers in both afforestation and forest protection.

Under this background, the Vietnamese government requested technical assistance in order to promote Program 661 and to develop appropriate and economical silvicultural techniques for the rehabilitation of natural forest in 2000. JICA started its study on project formulation in 2001, followed by the implementation of this project, "The Rehabilitation of Natural Forest in Degraded Watershed Areas in the North of Vietnam" from October 2002 to September 2008.

1.2 Project Outline

Overall Goal		Sets of technology for natural forest rehabilitation developed by the Project are applied by policy makers and by end users.
Project Objective		Sets of technically appropriate and economically affordable measures for natural forest rehabilitation are developed that can be used by forest enterprises, watershed management boards, and extension workers.
Output(s)	Output 1	Information on existing techniques and policies in relation to natural forest rehabilitation and on techniques developed by the Project is compiled and disseminated in a timely manner.
	Output 2	Silvicultural techniques for natural forest rehabilitation in watershed area are developed through research and on-farm trials
	Output 3	Farmland management techniques in watershed area are developed for Song Da FE[3], Song Da WMB[4], extension workers of AFE[5] and local farmers to apply in their localities
	Output 4	Examples of silvicultural techniques for natural forest rehabilitation and farmland management techniques in watershed area are demonstrated for technical officers and local famers to apply in their localities.
	Output 5	Monitoring system is established for assessing the achievements of each Output and for deriving the lessons of each Output to attain the Project Purpose.
Inputs		Japanese Side: 1. Experts: 21 persons 6 persons for Long-Term, 15 persons for Short-Term 2. 29 Trainees received (counterpart training in Japan) 3. 17 Trainees for Third-Country Training Programs (total)

[2] Forest land is classified as protection forest, special-use forest and production forest. Development in protection forests is highly regulated for important functions such as the protection of water sources, windbreaks and arresting sand.

[3] The formal name was Son Da Forestry Enterprise.

[4] The formal name was Son Da Watershed Management Board.

[5] AFE stands for agricultural or forestry extensions.

	4. Equipment 47.4 million yen 5. Local Cost 129.5 million yen 6. Others (incl. dispatch of related missions) Vietnamese Side: 1. 57 Counterparts 2. Land and Facilities (experimental forest, project office) 3. Local Cost (VND 3,533 million)
Total cost	483.73 million yen
Period of Cooperation	October 2003 – September 2008
Implementing Agency	Department of Forestry/Ministry of Agriculture and Rural Development (MARD/DOF), Forest Science Institute of Vietnam (FSIV), Sub-DOF of Hoa Binh province (Hoa Binh Sub-DOF)
Cooperation Agency in Japan	Ministry of Agriculture, Forestry and Fisheries, Forestry Agency, Forestry and Forest Products Research Institute
Related Projects	None

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal

The terminal evaluation report mentioned the conditions for the achievement of the overall goal, and stated that there would be some positive impacts, once the project objectives were achieved. Participating farmers' awareness of the need for forest protection was relatively high and the dissemination of the project-implemented activities beyond the target communes was expected.

1.3.2 Achievement of Project Objective

The terminal evaluation report mentioned that the preparation of the recommendation report, which is an indicator of the project objectives, would be completed by the end of the project period because the recommendation report was to be based on existing reports on various project activities. A hands-on manual on techniques for the rehabilitation of natural forests, another indicator of the project objectives, would be completed as well by the end of the project period.

1.3.3 Recommendations

The terminal evaluation report describes the following short-term recommendations for up to the completion of the project in 2008, and long-term recommendations for post project completion.

- Short-term recommendations: Revision of the project road map and completion of the recommendation report, information sharing of project results, establishment of a management system for the demonstration forest, and the development of a hands-on manual

- Long-term recommendations: Application of techniques to Program 661 and the improvement of sustainability in OFT activities, experimental forests and demonstration forests (budget and staff allocation, etc.)

2. Outline of the Evaluation Study

2.1 External Evaluator

Nobuyuki Kobayashi, OPMAC Corp. / Akinori Nishio, JAFTA

2.2 Duration of Evaluation Study

Duration of the Study: September 2011 – October 2012
Duration of the Field Study: November 24, 2011 – December 21, 2011 and
April 2, 2012 – April 14, 2012

2.3 Constraints during the Evaluation Study

Since some indicators on project effects could not be obtained, the assessment of the achievement of project targets depended partially on non-rigorous analysis. As financial data was based on hearings from the counterpart intuitions, it was difficult to prove the accuracy of these data. In addition to this project, other factors such as growth of overall economy also affect beneficiaries' livelihood. For this reason, it was difficult to assess changes in their livelihoods as project effect.

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

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance with the Development Plan of Vietnam

At the time of project planning (2003), the "Forest Development Strategy 2001-2010", which was the forestry sector's long-term plan, aimed at forest coverage of up to 43% by 2010. In Vietnam, forest coverage, which was 43% in 1943, dropped below 30% in the early 1990s due to the influence of the war and strong demands for forest resources and agricultural land, which came with an increase in population and unregulated development. Therefore, measures against forest degradation were one of the top priority areas in government policy. In the above "Forest Development Strategy 2001-2010" six priority programs were selected including a large scale forestation program, the National 5 Million Hectare Reforestation Program (5MHRP). With the Prime Minister's decision No. 661, 5MHRP was carried out (now known as "Program 661"), with the aim of achieving the forestation of 3 million ha of production forest and 2 million ha of special use and protection forests. While the previous afforestation program (Program 327) had placed importance on plantation, Program 661 attached importance on the rehabilitation of natural forest as well as on plantation. Out of a total 2 million ha afforestation of special-use forest and protection forest, natural regeneration is expected to reach 1 million ha.

At the time of project completion (2008), the forestry sector's most comprehensive developmental policy was the Forestry Development Strategy 2006-2020 (approved in February 2007), which aims at forest coverage of 47% by 2020[8]. In the strategy, productivity and quality, as well as nature conservation and biodiversity are regarded as the direction of forestation research. Also the poverty reduction in the main forest regions is taken into consideration as one of the most pressing social tasks. Continuous efforts towards the expansion of community forest management were also incorporated into the strategy.

Both at the times of project planning and completion, the sector plan aimed to increase forest coverage, and its policy on project completion reflected more of the social aspects of forestry. At the time of planning, it was considered that the project was to contribute to quality

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[7] ③: High, ②: Fair, ①: Low
[8] As of 2010, forest coverage is approximately 40% in the "Forest Protection and Development Plan in the 2011-2020 period".

improvement of forestation projects by applying the silvicultural techniques developed by the project into Program 661. The development of silvicultural techniques has been carried out through the project using indigenous tree species and through the OFT activities (forestation and income generation activities) of local farmers. These activities are in line with the direction of the Forestry Development Strategy 2006-2020. Therefore, the objective and the activities of the project are considered to be relevant to the development plan of Vietnam.

3.1.2 Relevance with the Development Needs of Vietnam

Vietnam experienced an improvement in forest coverage from the early 1990s, but fast-growing, foreign species such as eucalyptus and acacia were used for afforestation. It was more desirable to use indigenous tree species in order to maintain the quality of forests. At the time of the project planning (2003), however, existing silvicultural techniques was not organized and there were few opportunities to practice them. For this reason, the validity of these techniques was hardly proven. Farmers increasingly owned and managed production and protection forest and often conducted the management of special-use forest as the distribution of forest land progressed. In general, forest land belonged to the Vietnamese government but the distribution of forest land allowed formers to use the land for 50 years. In Hoa Binh province where the project site was located, distribution of forest land had been almost completed in the early-2000s. Farmers were playing a more important role in forest management but they did not have enough knowledge. Existing silvicultural techniques did not assume that farmers would use the techniques. At the time of project planning, there was a strong need to reorganize silvicultural techniques to utilize indigenous species and to develop silvicultural techniques at the appropriate level assuming farmers' practices. This project reorganized and tested silvicultural techniques on indigenous tree species and conducted OFT activities in which farmers participated. Thus, it is consistent with development needs.

At the time of project completion (2008), there was trend towards an improvement in forest coverage in Vietnam. Nevertheless, there was further need on improvement in the quality of forestation, as the portion of plantation forest lacking biodiversity was significant[9]. As mentioned in "3.1.1 Relevance to the Development Plan of Vietnam", sector policy continually supported community forest management. The National 5 Million Hectare Reforestation Program had a budget to subsidize farmers who managed forest land. This continuously created the need to use techniques which farmers could utilize. The project site was located in a mountainous area around a dam lake, and the land areas that could be cultivated were restricted. For this reason, long-term experts pointed out that it was necessary to form a practical approach for the use of limited land available and forest rehabilitation based on increased income from forestry products.

Hoa Binh province, with its easy access from Hanoi, was an appropriate location, as project design assumed the dissemination of the techniques developed by the project at the demonstration site at the time of project planning. At the time of project completion (2008), the Hoa Binh hydroelectric plant had a generation capacity of 1,920MW and accounted for more than 10% of the total capacity of Vietnam and, thus, the Hoa Binh dam played an important role. As forest protection around the Da River prevented inflow of sediments to the reservoir and protected the function of the dam, it was crucial to the economic welfare of the country. Thus, in terms of project location, the project had relevancy.

3.1.3 Relevance to Japan's ODA Policy

At the time of project planning (2003), Japan's Official Development Assistance Charter (cabinet approval in 2003) identified Asia as a priority area for support, and stated the importance of strengthening the Japan-Asia relationship through ODA, especially the

[9] The inspection of the project target areas at the time of the ex-post evaluation revealed that single species forestation using fast growing non-indigenous tree species was most common and the level of biodiversity remained low after the completion of the project.

prospective economic partnership with the East Asian region. The charter also listed "addressing global issues" as an important task, recognizing the need for international cooperation to deal with issues including environmental problems. Vietnam's Country Assistance Program was set out in 2000, and the environment was one of its five selected important areas. The aggravation of deforestation was listed as an issue in this area. The JICA Country Assistance Strategy included an assistance policy in the area of the environment, which focused on the protection and rehabilitation of forest along with the Country Assistance Program.

As described above, the project has supported the establishment and dissemination of silvicultural techniques in Asia through Japanese ODA.

This project has been highly relevant with the country's development plan development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness and Impact[10] (Rating: ②)

3.2.1 Project Outputs

The development of practical measures for natural forest rehabilitation was regarded as a project objective of this project. For this reason, in the assessment of "Effectiveness", the achievement of project objectives is based primarily on how much the development of techniques progressed. In order to clearly show the attribution from this project, this section analyzes what kinds of techniques were developed from the outputs.

3.2.1.1 Project Output

Five outputs were seen as direct project outputs. The followings are the outputs achieved upon completion of the project.

1) Output 1: Information on existing techniques and policies in relation to natural forest rehabilitation and on techniques developed by the Project is compiled and disseminated in a timely manner.

The project has built a database of silvicultural techniques in order to obtain related information more easily. Three indicators were established for Output 1 (1. building a database of existing techniques, 2. internet and publication release, and 3.updates of the project development techniques). Although there was a delay, all three indicators were attained by the end of the project, therefore it is considered that Output 1 was achieved.

The original plan was to build the web database by March 2005, however, the database was set up on the FSIV homepage in April 2006, and from then it was regularly updated to the end of the project. The database included documents on silvicultural techniques, project research results, activity records, and newsletters. In addition, a TV program to promote the project was produced and aired.

2) Output 2: Silvicultural techniques for natural forest rehabilitation in watershed areas are developed through research and on-farm trials.

The project developed silvicultural techniques through experiments. Three indicators were established for Output 2 (1. silvicultural experiments in all activity areas, 2. identification of silvicultural techniques for forest rehabilitation in Program 661, and 3. introduction of new techniques for seedling production). All three indicators were attained by the end of the project, therefore it is considered that Output 2 was achieved. A total of 30ha of experimental forest was achieved in 7 areas[11] between 2004 and 2005. In addition, the thinning of nurse trees and the

[10] For the judgment for Effectiveness, the findings in Impact are also taken into consideration in the rating.

[11] Experimental subjects were (1) planting indigenous tree species in bare land, (2) sowing seeds of indigenous tree species directly in bare land, (3) enrichment planting of poor and exhausted forest, (4)assisting natural regeneration, (5) mixing indigenous tree species with dendrocalamus, (6) planting non-timber tree species, and (7) under planting

plantation of *Melaleuca* were tested. Based on the experimental results, techniques applicable to Program 661 were withdrawn and approved at a review meeting in which the relevant parties were present. Finally, out of the silvicultural experiments, some techniques (such as the mixed plantation of *Tephrisua Cndida* and indigenous species, the enrichment[12] of indigenous species and the under-plantation of indigenous tree species in *Acacia* plantations) were chosen in the recommendation report[13]. Out of the OFT activities, some techniques (the plantation of *Michelia*, mixed plantation with foreign species and the earlier procurement of seedlings) were additionally selected. Seedling production techniques using air pruning and container trays were introduced explanatorily as a new technique[14]. Through the results of this improvement, methods for container tray materials were examined.

3) Output 3: Farmland management techniques in watershed areas are developed for Song Da FE, Song Da WMB, extension workers of AFE and local farmers to apply in their localities.

Photo 1:Goats introduced by the Project

The project carried out technical experiments in which local farmers participated to develop more practical techniques. Two indicators were established for Output 3 (1. OFT sites established in which over 250 households from 10 villages participated, 2. farmland management techniques identified from the OFT activities). Output 3 is considered to have been achieved, as it was confirmed that each indicator have been almost attained. As for Indicator 1, OFT activities were implemented in 5 communes and 10 villages, and a total of 1470 households had participated by 2007. As there was no data collected for newly participating households, the measurement of achievement was not strictly accurate. However, it was estimated that approximately 60% of the total households from the target villages participated (*See Table 1)*. OFT activities consisted of supporting activities, forestry activities and non-forestry activities (*See Table 2*). Supporting activities include study tours and training. The recommendation report mentioned that study tours were effective in improving the managerial capability of farmers and the attainment of new techniques. Most of the forestry activities involved plantation, but enrichment and supplemental planting were also carried out (*See Table 3*). For non-forestry activities, there was a high demand for animal husbandry[15] from local residents, and this took approximately 80% of the non-forestry activities budget. In home gardens, forage plants, bamboo and fruit trees were planted. As it takes a long time for farmers to obtain the benefits of forestry activities, non-forestry activities focused on activities that generate profits in a short period.

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of indigenous tree species in Acacia plantations.

[12] A technique of planting seedlings in thinly forested areas. This technique is utilized in natural forest.

[13] This project prepared the recommendation report for Program 661. Further details are mentioned in Indicator 1 of "3.2.2.1 Achievement of the Overall Goal."

[14] Air pruning and container trays are techniques that improve the growth of nursery trees, make the planting period more flexible and raise work efficiency.

[15] This project redefined farmland management techniques as ones to complement forestry activities and not to prevent forest rehabilitation in mountainous areas where arable land is scarce. Animal husbandly, the activity with less constraint from arable land, falls within this definition.

Table 1: Number of household participating in OFT activities

	FY 2004		FY 2005		FY 2006		FY 2007		Average	
	Total HH	Participating HH	Total HH	Participating HH	Total HH	Participating HH	Total HH	Participating HH	Total HH	Participating HH
Number of HH	276	195	705	464	741	331	749	480	618	368
Participation %	71%		66%		45%		64%		59%	

Source: Expert's project completion report

Table 2: Outline of OFT activities

Category	Activities	Cost*	%
Supporting Activities	study tours, training, veterinary medicine and tool kit	USD 15,257	6%
Forestry Activities	seedling production, afforestation, enrichment, supplemental planting	USD 78,327	29%
Non-forestry Activities	agriculture, animal husbandry, small infrastructure, provision of equipment, micro credit, etc.	USD 178,328	66%
	Total	USD 271,912	100%

Source: Expert's project completion report
Note: * Total amount from April 2004 to March 2008

Table 3: Breakdown of forestry activities

Type / Amount	Plantation	Enrichment	Supplementary Planting*	Total**
Area Planted (ha)	183	49	NA	232
Number of Trees	286,395	35,355	53,176	374,926
Amount in USD	56,043	12,312	9,972	78,327

Source: Expert's project completion report
Note 1: * including planted trees for home gardens
Note 2: ** Total from April 2004 to March 2008

As for Indicator 2, as means of income generation, the project reconsidered farmland management techniques as complement forestry activities, which do not prevent forest rehabilitation in mountainous areas where arable land is scarce. This approach is based on the idea that creating a means of livelihood which does not rely on the land itself is essential, when farmers become the main actors in forest management in mountainous areas. "Core non-forest activities for the improvement of livelihoods" was put together, as verified were increased revenue opportunities and improved financing through non-forestry OFT activities during the implementation of this project. As a result, the recommendation report selected animal husbandry as a desirable activity because animal husbandry was relatively free from problems of land restriction and seasonality

4) Output 4: Examples of silvicultural techniques for natural forest rehabilitation and farmland management techniques in watershed areas demonstrated to technical officers and local famers so that they can be applied in their localities.

The project prepared demonstration forest to show the techniques for natural forest rehabilitation to visitors. Three indicators were established for Output 4 (1. the creation of 93ha of demonstration forest, 2. reaching out to 110 households participating in the demonstration forest, 3. a total of 500 visitors to visit the demonstration forest). At project completion, Indicator 1 was attained, Indicator 2 was considered to be almost attained, and for Indicator 3, a

steady number of visitors was confirmed although the exact number was not collected. It was considered that Indicator 3 had been practically attained. However, it should be noted that the establishment of the demonstration forest requires a long period and needed to be commenced from an early stage of this project. For this reason, the demonstration forest displayed conventional techniques collected and reorganized by this project and, hence, the demonstration effects of this project (the experimental forest and the OFT activities) were limited. The 93ha demonstration forest was created in the Dan Chu commune outside of Hoa Binh between 2004 and 2006. The site was easily accessible from Hanoi City. During the project, 125 households participated in the demonstration forest[16]. Participating farmers were given training in plantation and forestry techniques. By the time of the terminal evaluation (May 2008), there had been approximately 300 visitors (of which 133 were foreigners) to the site. Because there were various ways to arrange site visits, the accurate number of the visitors was not available, however continuous visitors to the site had been observed[17].


Photo 2: Demonstration Forest

5) Output 5: Monitoring system is established to assess the achievements of each Output and to derive lessons of each Output to attain the Project Purpose.

The project created an overall implementation roadmap and planned the monitoring based on it. Two indicators were established for Output 5 (1. periodical monitoring reports, and 2. derivation of lessons for every output). Monitoring was carried out but it did not show progress as originally planned. As the achievement of the output took a long time, it was difficult to obtain project feedback from the assessment of output. Because of this, it was impossible to derive lessons for each output from the roadmap. For this reason, monitoring activity was reported in the biannual progress report for JICA along with that for regular practice of other technical cooperation projects.

3.2.1.2 Achievement of Project Objectives

In order to measure the achievement level of the project objective ("Sets of technically appropriate and economically affordable measures for natural forest rehabilitation are developed that can be used by forest enterprises, watershed management boards, and extension workers"), three indicators were established. The following is the achievement status for each indicator.

1) Indicator 1: By 2008, the recommendation report on methods for the application of silvicultural techniques for natural forest rehabilitation and farmland management techniques in watershed areas had been submitted to Program 661.

Based on the results of each trial of OFT activities and the demonstration forest, the report intended to establish practical and comprehensive systematized techniques while adding technical feasibility, as well as economic and social incentives, to cease slash-and-burn agriculture. As the recommendation report was completed in August 2008, this indicator reached its target.

The recommendation report introduced the results of various activities and drew out promising techniques and a proper direction for sector policy. As the recommendations were based on actual practices, they presumably had validity. Except for those activities which

[16] The response from Hoa Binh province Sub-DOF stated that the participating households numbered 105. However, strictly speaking, some parts of households were counted as one, and there is no change in the total demonstration area.

[17] According to a hearing with the People's Committee of the Dan Chu commune, there were approximately 100 visitors annually at the time of the post-ex evaluation.

farmers could start voluntarily (such as income generating activities), the implementation of recommendations required support from the government sector. It would have been preferable for the report to have assessed what kinds of organizations and institutions were required for these recommendations to be implemented continually.

No problems related to technical feasibility were pointed out at the hearings with counterpart institutions. However, it was pointed out that no clear understanding was shared among related personnel on the issues to be solved on existing techniques for natural forest rehabilitation or on approaches to these issues. This interfered with the focus of experiments and OFT activities. For example, both cost efficient techniques through a reduction in manual labor (smaller planting holes, small-scale production of seedlings, etc.) and high cost techniques with the use of the container trays were experimented with. The recommendation report also introduced both cost-saving and expensive techniques. While the direction for plantation costs was not clearly shown, the report contained methods for utilizing both silvicultural techniques and farmland management techniques.

2) Indicator 2: By 2008, a manual had been prepared on hands-on techniques for the sets of silvicultural techniques for natural forest rehabilitation and farmland management in watershed areas targeting local technical officers and farmers.

Based on the results of experiments and OFT activities, the manual had been prepared as approximately 200 pages booklet by the end of the project and thus this indicator reached its target. The manual is an easy to carry, and it includes not only silvicultural techniques but also guidance on non-forestation issues such as animal husbandry. In a hearing with the Da River Watershed Management Board, it was pointed out that swine breeding includes something not appropriate in the current situation, however other aspects (participatory approach, planting techniques and fruit cultivation) were acknowledged.

3) Indicator 3: 80 technical officers from FE, WMB, and AFE learn new techniques through technical seminars.

By the time of terminal evaluation (May 2008), a total of 81 technical officers had participated in seminars on the new techniques developed by the project. This indicator reached its target. In September 2006, a seminar where the results of OFT activities were shared was conducted in Hoa Binh province. Of 50 participants 45 were technical officers. Another technical seminar was conducted in March 2008 targeting related organizations and local staff. Of 76 participants, 36 were technical officers.

In regards to the project objectives, each indicator was achieved.

3.2.2 Impact

The project objectives are the development of practical measures for natural forest rehabilitation. The development of practical measures itself does not produce clear benefits. However, the utilization of practical measures would generate benefits after project completion. For this reason, this criterion shows actual use of the measures. Value judgments for “Effectiveness and Impact” are based primarily on use of the measures.

3.2.2.1 Achievement of Overall Goal

In order to measure the level of achievement of the overall goal: “Sets of technology for natural forest rehabilitation developed by the Project are applied by policy makers and end users”, three indicators were established. While Indicator 1 deals with policy makers’ application of the developed techniques to policies, Indicators 2 and 3 deal with prospective users’ use of the developed measures in Hoa Binh province. The following is the achievement status for each indicator.

1) Indicator 1: By 2009, the recommendation report submitted by the Project has been reviewed by MARD/DOF for application to Program 661.

A part of the recommendation report was referred to upon the establishment of policy direction for Program 661. The report included the plantation cost of the demonstration forest (VND 12-33 million per ha) and emphasized that an increase in the investment amount is necessary. At the time of the ex-post evaluation, forestation cost showed an upward trend. PM Decision No. 164/2008/ increased investment in forestation of special-use forest from VND 6 million/ha/year to VND 10 million/ha/year. The recommendation report also introduced various kinds of demonstration forest models with different ratios of fast growing and indigenous tree species. Mention was also made of the experiment of planting acacia trees one year prior to the indigenous tree species[18]. In line with the recommendation report, plantation guidance for protection and special-use forests under Program 661, which was a part of Document No. 1992 of MARD/2008, alternated the ratio of fast growing and indigenous tree species that had been fixed. In cases where the soil condition of protection forests is not ideal, the planting of fast growing trees is encouraged 6 to 12 months prior to the planting of the indigenous tree species. It was proven that these techniques accelerate growth and increase the survival rate.

2) Indicator 2: By 2010, the techniques developed by this project were applied to 80% of new plantation areas and areas of new highly-assisted natural regeneration were being established annually in the 20 communes.

The practical manual "A manual on hands-on techniques" (mentioned in 3.2.1.2 Achievement of Project Objectives 2), was distributed to 20 communes under the jurisdiction of the Da River Watershed Management Board in 2010. The manual has also been used as reference material by staff in a branch office of the Da River Watershed Management Board. According to the Da River Watershed Management Board, afforestation with *Canarium Album* and *Dendrocaramus Membranaseues* and soil improvement are frequently referred to in the manual. Although it is difficult to provide an accurate judgment, as data on the plantation areas within the 20 communes was not obtained and the definition of the technical adaptation presumed by the project was not clear. The below are details of the plantation area of the protection and production forests in Hoa Binh province for reference[19]. Based on interviews with Hoa Binh sub-DOF, the selection of tree species, mixture and density are in line with the aforementioned guidance for Program 661 (Document No.1992 of MARD/2008). These are reflected in the annual program for implementation. If the protection forest is considered as the adopted area for the developed techniques, since the above 611 program guidance was adapted for the protection forests, the project has presumably been applied to 20-30% of the overall Hoa Binh province. As Program 661 ended in 2011, plantation areas have declined in general.

Table 4: Planted area for Protection and Production Forests

Unit: ha

Year	2008	2009	2010	2011
Planted Area for Protection Forest (A)	787.90	1,092.90	1,670.15	80.94
Planted Area for Production Forest (B)	3,070.80	2,996.80	3,483.16	372.35
Total (A)＋(B)	3,858.70	4,089.70	5,153.31	453.29
(A)/((A)+(B))	20.4%	26.7%	32.4%	17.9%

Source: Hoa Binh Sub-DOF

[18] It should be noted that in the recommendation report, this technique (the planting of fast growing trees 6-12 months prior to the indigenous tree species) is not selected as a recommended technique. There are other techniques with a faster growth rate which were experimented with simultaneously. However, it is easier to implement this method.

[19] According to a hearing with Hoa Binh province Sub-DOF, no forestation of special use forest has been carried out since 2005.

3) Indicator 3: By 2010, the number of households in the 20 communes applying the techniques developed by the Project had reached 700.

This project financed OFT activities during project implementation. The terminal evaluation recommended that, in order to improve sustainability, both DARD and sub-DOF in Hoa Binh province allocate budget for the continuation and dissemination of OFT activities. Upon completion of the project, however, no budget for the dissemination of OFT results had been distributed and attempts to support technique introduction were not being made. Although it was expected that the project would produce effects within Hoa Binh province, the dissemination of developed techniques has been facing budget restrictions. Given that the techniques were introduced in five communes where this project implemented (participating households: 368 HH/year at average and 480 HH/year at maximum), it is concluded that this indicator did not reach the target (20 communes, and participating households 700 HH). In regards to non-forest OFT activities, the activities themselves were barely continued as they were beyond the responsibility of Hoa Binh province Sub-DOF (agriculture and animal husbandry). Nothing more than a public meeting between the Da River Watershed Management Board staff and staff of other organizations was conducted.

Although the overall goal was partly achieved for target indicator 1, the achievement of indicator 2 was difficult to assess and that of indicator 3 was less than the plan because of a lack of funding. Therefore, the overall goal was only partially achieved.

3.2.2.2 Other Impacts

The results of the interviews with project officials and surveys from OFT participating farmers suggested the following positive impacts. No negative impact was observed on the natural and social environments during the site survey and hearings.

(1) Continuation of livelihood activities in the OFT target areas

A questionnaire survey for farmers participating in OFT activities[20] revealed that approximately 90% of the participating households "continued" or "continued to some extent" with OFT activities at the time of the ex-post evaluation (*See Table 5*). After completion of the project, farmers participating in OFT activities received official technical support for both forestry and non-forestry activities, but no financial support (*See Table 6*). Interviews with OFT participants revealed that income generating activities (animal husbandry, bamboo cultivation, etc.) continued in many cases. Animal husbandry is considered to be relatively easy for participating farmers to continue as land-use constraints are not severe, and it is easy to carry it out along with natural forest rehabilitation and receive cash within a short time period. At the time of the ex-post evaluation, farmers participating in OFT continued to raise goats and cattle, however, swine husbandry had been discontinued due to disease in many households. In a good practice that income from non-forestry activities supported the implementation of forestry activities, a farmer earned cash by breeding goats provided by the project and with it purchased seedlings of indigenous tree species for afforestation. Before the implementation of this project, he was engaged in shifting cultivation. At the time of the ex-post evaluation, he reduced 'slash and burn' cultivation area and reduced his farmland improving productivities by the use of fertilizer.

[20] At the time of the ex-post evaluation, a survey was conducted with OFT participating farmers (a total of 124 people) in the 10 communes where OFT activities were implemented.

Table 5: OFT activities at the time of the ex-post evaluation

Type of Activities		Continued	Continued to some extent	Not much continued	Not at all continued	Do not know	Not valid	Total
Forestry	Respondents	54	55	12	1	0	2	124
	%	43.5%	44.4%	9.7%	0.8%	0.0%	1.6%	100.0%
Non-forestry	Respondents	54	40	19	6	1	4	124
	%	43.5%	32.3%	15.3%	4.8%	0.8%	3.2%	100.0%

Source: questionnaire survey for the ex-post evaluation

Table 6: Official assistance for continued activities at the time of the ex-post evaluation

Type of Activities	Type of Support		Official Assistance Available	Official Assistance Not- vailable	Total
Forestry	Technical	Respondents	88	36	124
		%	71.0%	29.0%	100.0%
	Financial	Respondents	1	123	124
		%	0.8%	99.2%	100.0%
Non-forestry	Technical	Respondents	90	34	124
		%	72.6%	27.4%	100.0%
	Financial	Respondents	2	122	124
		%	1.6%	98.4%	100.0%

Source: questionnaire survey for the ex-post evaluation

(2) Application to other programs and technical trainings

The hearings with counterpart organizations confirmed that the techniques developed by this project were applied to other programs and technical training. A part of the practical manual, which is mentioned in Indicator 2 of "3.2.1.2 Achievement of the Project Objectives", is also applied to afforestation activity (forestry activities for forest products in production and protection forests) supported by a poverty reduction program (as known as the 30a program[21]). In addition, some of the techniques developed by the project (afforestation with indigenous species, enrichment methods, etc.) are applied to projects supported by other donors. Program 661 and forest ranger training have also used the plantation techniques and enrichment methods developed by the project.

This project has somewhat achieved its objectives, therefore its effectiveness/impact is fair. In regards to the project objectives, indicator 1-3 was achieved. As for the overall goal, the number of beneficiaries could not be expanded as the dissemination of OFT activity results has been obstructed due to budget deficits.

[21] Carried out based on the Resolution 30a/2008.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

Inputs	Plan	Actual Performance
(1) Experts	· 3 persons for Long-Term · TBD after the commencement of the project for Short-Term	· 6 persons for Long-Term · 15 persons for Short-Term
(2) Trainees received	Field(s) of training: TBD after commencement of the project	Field(s) of training: silvicultural techniques, forest management, rural economy, agricultural products marketing, etc.
(3) Third-Country Training Programs	Field(s) of training: TBD after commencement of the project	Field(s) of training: participatory forest management, silvicultural techniques
(4) Equipment	Office equipment, equipment for research, equipment for nurseries, vehicles, etc.	Office equipment, equipment for research, equipment for nurseryies vehicles, etc.
Total Project Cost	Approx. 500 million yen	483.73 million yen[22]
Total Local Cost	N/A	24.69 million yen[23]

3.3.1.1 Elements of Inputs

An increase in the number of long-term experts was due to rotation, and there was no additional field added from the time of planning[24]. Shot-term experts were sent to 13 fields during the project period[25]. The skills of these experts were related mainly to forestry, and no expert on animal husbandry was sent, even though this was the main component of non-forestry OFT activities. However, it should be noted that staff from the livestock related division of the Hoa Binh province Department of Agriculture and Rural Development (DARD) implemented livestock disease prevention trainings for farmers in the target communes of OFT activities, and supplemented the otherwise insufficient inputs. Because the input amounts and budget were not clearly established at the time of project planning, it was difficult to compare the planned and actual inputs. However, the counterpart organization concluded that the quality of input (experts and provision of equipment) was generally appropriate in light of the project scope. Nevertheless, it was pointed out that some found it confusing to see differences of opinions among experts, as there were many short-term experts sent to the project. At the time of project planning, it was planned that the demonstration forest would be on public land within Dan Chu commune of Hoa Binh province. However, the land had already been distributed to local farmers and there was no appropriate public land left, except for the supplementary planting plot (18ha). For this reason, an invitation was extended to farmers interested in participating in the demonstration forest. The forest was created on land where long-term rights of use were owned by those farmers who agreed to conduct forest management after plantation and to accept restrictions on logging.

3.3.1.2 Project Cost

The total project cost was lower than planned (97% of the original plan). The approximate portions of administration, OFT activity and demonstration forest over local cost were 30%, 30% and 20%, respectively, and these were the main expense items[26]. Since approval of the

[22] Based on internal documents in JICA

[23] Calculated based on the monthly currency exchange rate (143.06VND/JPY) during the project.

[24] The assignment areas for long-term experts were Chief advisor / Natural forest rehabilitation, Silvicultural technique development, and Participatory forest management / Project coordinator.

[25] The assignment areas for short-term experts were Planning of research and OFT (silvicultural technique development), ditto (Forestry soil), ditto (community-based forest management), Silviculture (planning of research), Seedling and nursery experiments, Economic analysis, Non-timber forest products, Soil analysis, Silvicultural technique, Silvicultural technique / Natural regeneration, Distribution and marketing, Planning-monitoring-evaluation, and Farm household economic analysis

[26] Based on the project termination report.

project by the Vietnamese Prime Minister's Office was delayed until May 2005, the Vietnam counterpart fund was not distributed in 2003 and 2004. Therefore operating costs (such as travel expenses) which were supposed to be paid by the Vietnamese were borne by the project.

3.3.1.3 Period of Cooperation

The project period was as planned (100% of the original plan). As the dispatch of experts in charge of silvicultural technique development was delayed for more than 6 months, the selection of experiments for the experimental forest was impeded. However, with the support of short-term experts with some knowledge of forestation, other long-term experts from different fields were able to take charge of this task temporarily. The database on the FSIV website (related to Output 1) was completed in April 2006, which meant one year of delay.

The inputs were appropriate for producing outputs and achieving the project objective, and project cost and period of cooperation were as planned, therefore efficiency of the project is high.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy towards the Project

The long-term plan of the forestry sector at the time of the ex-post evaluation was the "Forestation Development Strategy 2006-2020". As mentioned in "3.1.1 Relevance to the Development Plan", the above strategy regarded poverty reduction as one of the social tasks in forest areas. It adopted trials on the continuation of community forest management and its expansion in the policy for management of forest and forestland. The strategy does not clearly mention the use of indigenous tree species in forestation programs, but biodiversity is considered as one of the most important tasks in forestation research. An afforestation method focuses more on biodiversity than on existing mono-cultural forestation which depends on non-indigenous tree species.

Program 661 was extended until the end of 2011, and a new forestry program, based on the "Forest Protection and Development Plan for the period 2011-2020", will be launched in 2012. The 30a program also implements a forest rehabilitation program focused on poverty reduction and applies community forest management to forest protection[27].

The proposal for "forest rehabilitation based on the participation of local residents" from the recommendation report is in line with the policy of the forestry sector. From the point of view of biodiversity, research on the use of indigenous tree species is also expected to be given higher priority. The techniques developed by the project are generally in line with sector policy. There are further opportunities for the techniques developed by the project to be applied to specific issues.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

As for the institutional structure of the forestry sector pre and post project implementation, the biggest change was that the Vietnam Forest Administration (VNFOREST) was established under MARD. This structure change has not harmed the sustainability of the project. On the other hand, Hoa Binh Sub-DOF remains in charge of forestation and forest management. Considering that the number of its staff has slightly decreased, while the number of staff in Da River Watershed Management Board who supports farmers remains at similar level, it can be concluded that afforestation according to the guidance of Program 661 and the thinning of the demonstration forest can be conducted in Hoa Binh province. However, further activities for the dissemination of developed techniques in Hoa Binh province might be difficult. The following is the roles of the counterpart organizations in forestry administration at the time of the ex-post

[27] Under the 30a program, a subsidy is granted when the public administration and local residents agree on a forest protection and management contract, and when the local residents patrol the forest and strictly observe the rule of no firing, etc.

evaluation.

(1) VNFOREST

After the completion of the project, DOF was merged with the Forestry Protection Department (FPD) in 2010 and VNFOREST was established. VNFOREST supervises the responsibilities of the former DOF (forest management with an emphasis on afforestation, use and development of forest land) and the former FPD (forest protection and the enforcement of laws relevant to the forestry sector). VNFOREST sets out policy directions on the development and dissemination of silvicultural techniques through regulations and planning.

(2) FSIV

There has been no change in the administrative role of FSIV since the planning phase of this project. At the time of the ex-post evaluation, FSIV carried out research and training on forestry techniques under the supervision of MARD.

(3) Hoa Binh Sub-DOF

There has been no change in the administrative role of Hoa Binh Sub-DOF since the planning of this project. At the time of the ex-post evaluation, Hoa Binh Sub-DOF which lays under DARD, was preparing annual afforestation program and making budget proposals. It is in charge of both long-term and short-term strategies and of coordination within the province according to sector policy set by VNFOREST. Although a single administrative organization takes charge of both forestation and forest protection at central government level, these two areas are not merged at provincial level. In addition to the above, other divisions of the province take charge of non-forestry OFT activities (agriculture and animal husbandry). This is an issue for the further dissemination of the results obtained from OFT activity. In Hoa Binh Sub-DOF, the number of staff had decreased from 17 in 2008 to 15 at the time of the ex-post evaluation.

(4) Da River Watershed Management Board

The Da River Watershed Management Board is in charge of the forestation and forest management of the Da river watershed. The board provides technical guidance to local farmers who have the right to use the forest or who are commissioned with forest management. Before afforestation, the board makes agreements with farmers who have the right to forest use, demarcates afforestation areas and prepares an afforestation program within its jurisdiction. As it is farmers who actually practice afforestation and forest management, the board gives them advice on activities such as plantation and thinning. The board took over the two forestry public corporations in 2007 and expanded its territory to cover Hoa Binh city and four other regions (Da Bac, Mai Chau, Tan Lac, Cao Phong) that are located in the Da river watershed. At the time of the ex-post evaluation, there were 33 staff members (of which 22 were technical staff).

3.4.3 Technical Aspects of the Implementing Agency

Upon achievement of the overall goal (technical application for policy decision makers and end-users) after completion of the project, (1) the dissemination of techniques in the neighboring communes of Hoa Binh province, and (2) the effects on sector policy of the demonstration forest, succeeding research and the database are considered to be important in the achievement of the project effects. The staff of Hoa Binh Sub-DOF, Da River Watershed Management Board and FSIV play a vital role in this dissemination. For this reason, the project trained them in a wide range of silvicultural forest management techniques during the implementation phase. At the same time, farmers who managed the demonstration forest received training on planting techniques and nurturing. Skill maintenance for the above counterparts and farmers in charge of the demonstration forest after completion of the project has included the following:

- ✓ FSIV Staff: since the FSIV staff are researchers, their technical skills are maintained through participation in other, similar projects (the JICA technical corporation project "A Sustainable Forest Management Project in the North Western Water Resource Areas", etc.) rather than through formal training.

- ✓ Hoa Binh province Sub-DOF staff: staff frequently receive training on regulatory matters from MARD as they are in charge of the administration of afforestation and forest management. Training on monitoring and evaluation was carried out once with the support of a foreign donor.

- ✓ Da River Watershed Management Board: although trainings on silvicultural techniques are implemented, these trainings are infrequent. The number of participants is rather limited.

- ✓ Farmers in Charge of the Demonstration Forest: there is no exclusive support for farmers in regards to forest management. However, the Da River Watershed Management Board advises them on thinning techniques.

After completion of the project, training opportunities for counterparts has been limited in general and yet they are still provided to some extent for the maintenance of skills in routine tasks.

3.4.4 Financial Aspects of the Implementing Agency

At the time of the ex-post evaluation, the budget for Program 661, the financial situations of FSIV and the Hoa Binh province Sub-DOF, and financial support for the farmers in charge of the demonstration forest were as follows:

(1) Budget for Program 661

Budget allocation for Program 661 since project completion has declined since its peak in 2010 (*See Table 7)*. As mentioned above, the Program 661 ended in 2011 and a new forestation program based on the "Forest Protection and Development Plan for the period 2011-2020" will be launched from 2012. The hearing with VNFOREST and Hoa Binh Sub-DOF revealed that VND 15 billion out of the overall budget for Vietnam (VND 1,200 billion) will be distributed to Hoa Binh province in 2012 as the succeeding program budget. The budget for afforestation declined because of the gap between the two programs.

Table 7: Budget for Program 661

Unit: VND

	2008	2009	2010	2011
Program 661	1,200 bn	1,200 bn	1,500 bn	700 bn
To Hoa Binh province	20.1 bn	35.2 bn	41.4 bn	18.0 bn

Source: interviews at VNFOREST and Sub-DOF

(2) FSIV Research Budget and Database Maintenance Budget

Sufficient budget for the continuation of the experimental forest was allocated and data (diameter, breast height, tree height, bole height, etc.) has been consecutively collected. However, budget allocation for succeeding research is limited and there is no budget for database maintenance. Although the database is open to the public, there has been no database update since the completion of the project and flaws (such as the impossibility of downloading attached materials) have been found.

(3) Hoa Binh Sub-DOF

At the time of project completion, it was recommended that DARD and Sub-DOF in Hoa Binh province allocate budgets for the expansion of OFT activities and the management of the demonstration forest. However, these had not been allocated at the time of the ex-post evaluation. For this reason, the conducting of afforestation activities in accordance with the guidelines for Program 661 has been a major means for the dissemination of the techniques developed by the project.

(4) Local Farmers In Charge of the Demonstration Forest

At the time of the ex-post evaluation, farmers are in charge of the management of the demonstration forest. Visitors continually come to the demonstration site. A living standards improvement program was provided to the farmers in charge of the demonstration forest during project implementation, but no further financial support exclusively targeting these farmers has been available since project completion. Even for Acacia, one of the fast growing species, it takes more than five years from planting to harvesting. Therefore, there is no forestation income during this period, although there is a constant workload for forest management. Since the demonstration forest is categorized as a protection forest, logging is restricted and farmers can barely earn an income. This is an issue in the management of the demonstration forest.

For the sustainability of the project effects, financial constraint is an issue to be solved. Afforestation is expected to be implemented on a certain scale. However, budget allocation for activities except for afforestation (the maintenance of the database, OFT activities, management of the demonstration forest) for the use of developed techniques has been very small. FSIV faces difficulties in allocating budgets to succeeding research and database maintenance. Even before the completion of Program 661, there was no budget to sustain and disseminate the OFT activities in Hoa Binh province. In addition, financial support for the farmers in charge of the demonstration forest has been very limited.

Some issues have been observed in the structural and financial aspects of the implementing agency, therefore, sustainability of the project effects is fair. This project assumed two project effects after its completion: (1) application of developed techniques to policies and (2) practice of developed techniques in Hoa Binh province. The sustainability of the later effect has issues to be concerned.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to develop silvicultural techniques for natural forest rehabilitation and, then, to apply these techniques to forestry sector policy and disseminate them in Hoa Binh province. The project reflects needs for technological development toward the rehabilitation of natural forest, in particular under the current situation where farmers play an important role in forest management. Therefore, the relevance of the project is high. As a result of project implementation, some effects were observed such as advancements in technical development and inputs in the guidance for afforestation activities in t Program 661. On the other hand, dissemination outside of the project area did not attain its target. In the light of this, the effectiveness/impact of this project is fair. The inputs were appropriate, the project cost was within the plan and the period of cooperation was as planned. Therefore, the efficiency of the project is high. A national afforestation program is still on-going. However, the continuation of the OFT activities and the dissemination of project results have faced a lack of funding in Hoa Binh province. Hence, the sustainability of the project effects is 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) Harvesting the demonstration forest

Financial support for the local farmers in charge of the demonstration forest management is very limited. This issue cannot be ignored, as it has increasingly become a burden. Some of the fast growing species can be logged today. Hoa Binh Sub-DOF, Song Da WMB conducted the site survey of the thinning of households and sent documents to concerning agencies. The relevant organizations (Da River Watershed Management Board, Hoa Binh province Sub-DOF, etc.) need to continue this effort and to process administrative procedures necessary for logging as promptly as possible in order to make sure that the local farmers can earn income at an earlier stage.

Planted acacia trees sometimes decay after 10 years, and therefore it is necessary to harvest them and re-afforest the demonstration forest before this happens.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

(1) Defining issues to be solved by the development of techniques

The target of this project was “Sets of technically appropriate and economically affordable measures for natural forest rehabilitation to be developed that can be used by forest enterprises, watershed management boards, and extension workers”. However, the questions of which economic efficiency should be stressed, or in which geographical areas the techniques should be applied, were not clearly addressed. For this reason, it was difficult to agree on a specific subject for technical development and it was also difficult to focus on activities along with some of the specific tasks. If technical development is set as a project goal, the areas and its directions are to be refined, and it is desirable that issues are identified and shared among key stakeholders at an early stage with a good attention to a variety of local needs.

(2) Involvement of relevant government agencies

This project regards dissemination of the results from OFT activities in the Hoa Binh province as a path to realize project effects, and included a deputy director of DARD in Hoa Binh province, which was in charge of agriculture, forestry and animal husbandry, as one of the counterparts. Among OFT activities, farming and animal husbandry saw a strong demand during project implementation, but the relevant agencies in charge of these activities were not sufficiently involved. The dissemination of results has faced difficulties as non-forestry OFT activities are not within the responsibility of the counterpart agencies. Forest management by farmers requires various activities beyond those relating to forestry. It is desirable that, in consideration of activities to be implemented after project completion, the necessity of involving relevant government agencies and that of selecting a counterpart from these agencies are regularly assessed during project implementation.