

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 region¹ 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 embankment², 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.

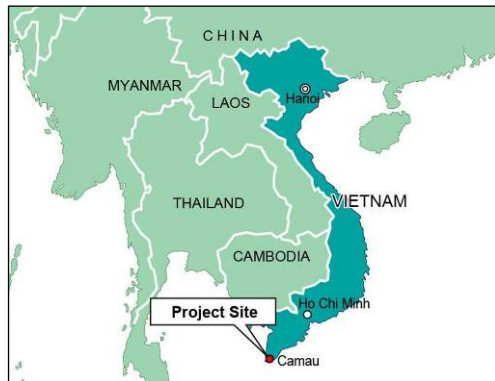
The project was efficiently implemented with the involvement of local contractors as planned in the project budget and period; therefore, the efficiency was judged as high. However, minor problems were found in institutional, technical and financial aspects with regard to maintenance management; therefore 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 Plan³ (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 soil⁴ which were not suitable to agriculture. Forest management mainly for Melaleuca⁵ (*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 soil⁶ 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, Myrtaceae 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 canals⁷. 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	<u>Contractors</u> 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	<u>Equipment Suppliers</u> 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	<ul style="list-style-type: none"> • 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 schedule⁹.

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 total¹⁰) 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

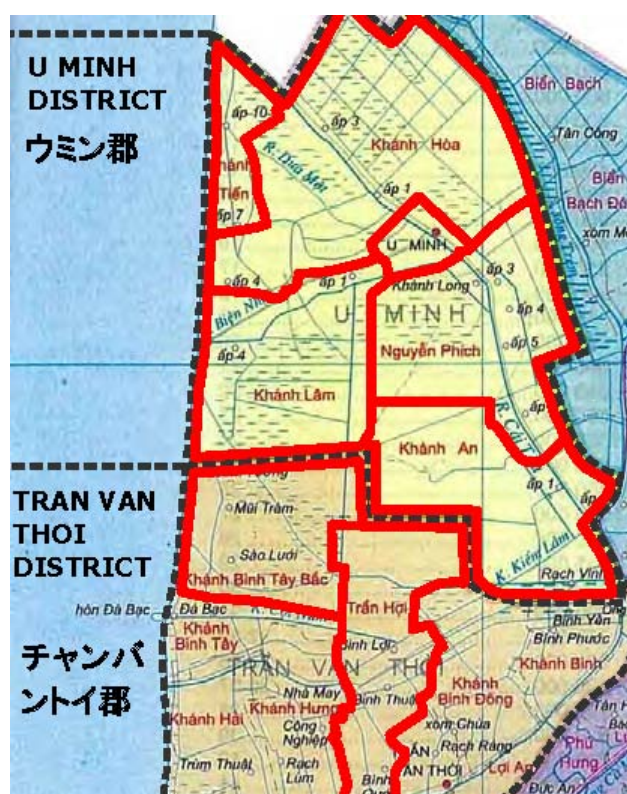


Figure 1: Survey Sites of Beneficiary Surveys

3. Results of the Evaluation (Overall Rating: C¹¹)

3.1 Relevance (Rating: ②¹²)

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 Province¹³, and also the main area affected by the forest fire in 2002. The region has acidic sulphate soil¹⁴ 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 effects¹⁵. Installing embankment and model farm development¹⁶ (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 development¹⁷. It was judged that the implementation under such conditions needed environmental impact assessment and monitoring afterwards.

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 Effectiveness¹⁸ (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 farm¹⁹ 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 rats²⁰.

At the time of the ex-post evaluation, the area of Melaleuca plantation on embankment was expanded to 4,229ha and excavators²¹ 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 prevention²².



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

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: \12,370,000²³ and \55,260,000²⁴ (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 30m³ 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 popular²⁵. 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 ha 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 Acacia²⁶ since August 2013. In 2014 800-1000m³ of Acacia²⁷ 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, 680m² 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 Breast 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 lives 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 of 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 Khanh 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 prices²⁹ 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 to the local people that were interviewed, the selling price of bananas increased by 20%.

hospital costs 92,000 Dong less in Khanh 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 motorbikes³⁰. 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 residents³¹.

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 construction³² and provision of equipment³³ 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 population³⁴; increase in school attending rate (from 97-99% to 99%); and students moving from neighbour schools for the improved facilities³⁵.

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 stations³⁶ 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 survey³⁷ 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)



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

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).

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 photographer	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 hospital³⁸ 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 home³⁹

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 construction⁴⁰.

(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 environment 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 standards⁴².

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 reimbursement⁴³; 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) Plantation 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 equipment⁴⁴ are conducted by the Forest Company⁴⁵. 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).

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 2.5m⁴⁶. 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 department⁴⁷.

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 change⁴⁸. 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 budget⁴⁹. 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 Dong⁵⁰. 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 government⁵¹, 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.