Republic of the Union of Myanmar

FY2015 Ex-Post Evaluation of Technical Cooperation Project
"Integrated Mangrove Rehabilitation and Management Project through Community Participation in the Ayeyawady Delta"

External Evaluator: Asako Takimoto, Global Link Management Inc.

0. Summary

This project (hereinafter referred to as "the Project") was implemented to contribute to sustainable management of mangrove forests and poverty alleviation of the community in the Ayeyawady Delta, Myanmar. To achieve the goal, the Project aimed to provide necessary technical cooperation to establish sustainable community forestry (CF) for local communities and officers of the Forest Department (FD). The Project's relevance was high. The activities were highly relevant to Myanmar's development plan, development needs, and Japan's ODA policy. The Project mostly enabled the target communities to sustainably co-exist with their mangrove forests at the time of the Project termination. Achieved situation was maintained when the ex-post evaluation was conducted. It was clear, however, it needed more time and procedures to increase the CF communities co-existing with mangrove and to enhance income levels of the communities through CF activities. Therefore, effectiveness and impact of the project were fair. The Project was suspended for almost a year due to damages caused by a Cyclone. Its plan was, however, revised after the incident and the Project's cost and period were both within the revised plan. Thus, efficiency of the Project was evaluated as high. At the time of the ex-post evaluation, related policy and institutional aspects and technical aspects for sustainability were high. FD was sequentially developing policies for sustainable mangrove forest management and CF promotion. Communities and FD officers targeted by the Project showed a certain amount of enhancement and they maintained their technical abilities. On the other hand, the FD budget for CF management and promotion was not sufficiently allocated. And it was not clear how the organizational mechanism inside FD to promote CF was going to be restructured by the regime change in April 2016. Consequently, sustainability of the overall project effects was considered to be fair.

In light of the above, the Project was evaluated to be satisfactory.

1. Project Description

Project Location

Planting mangrove seedlings in CF by community members

1.1 Background

Mangrove forests host a highly diverse ecosystem and provide multiple benefits: fuel woods and timbers, breeding grounds for aquatic animals, non-timber forest products, protection for soil erosion, and climate change mitigation through carbon sequestration. The Ayeyawady Delta area, over 0.2 million ha at the mouth of the Ayeyawady River, holds a precious mangrove forest. Extensive part of the forest is designated as reserved forests (RFs), which is a highly unique condition in whole Indochina. Nonetheless, forest degradation was becoming a serious issue in these large RFs. The government of Myanmar established these RFs in the beginning of the 20th century but the deforestation started in the 1950s. Logging for fuel woods and timber for self-consumption, charcoal production for mainly selling, alternation to paddy fields, shrimp/fish aquaculture, and salt farming were the major drivers of deforestation. Degradation of the RFs was significant by the 1990s. As a result, Ayeyawady Division Peace and Development Council banned logging of mangroves and charcoal production from mangrove forests of the RFs in 1993. FD was planting mangroves to reforest the RFs. FD also issued "Community Forestry Instruction (CFI)" in 1995 and promoted CF practices to encourage forest management by local communities. Nevertheless, the mangrove forests kept being deforested due to societal issues such as past nation-wide logging[1], alternation to paddy fields by over 0.2 million poor illegal residents inside the RFs, shrimp farming, timber logging, and lack of management and administrative capacities (including CF extension) of local governments and FD. By the time of the Project planning, as a result, the remaining forested area was less than 40% compared with that in the 1920s. It was estimated that the remaining mangrove forests would disappear by 2010 unless this rapid

[1] Under the past military regime, the national government pressured local government to increase agricultural production, which caused large-scale alternation of mangrove forests to paddy fields and massive deforestation.

deforestation were ceased[2]. If these mangrove forests were gone, residents inside the RFs would lose most of their basis of livelihood. JICA recognized the importance of the mangrove forest management and thus conducted a development study for three years since 2002. The study produced the Integrated Mangrove Management Plan (IMMP). The government of Myanmar requested a project to the Japanese government in May 2005, based on IMMP. The requested project was for capacity development of former FD of Ministry of Forestry (current FD of Ministry of Environmental Conservation and Forestry) and local communities in forest resource management and reforestation of the mangrove forests. IMMP consisted of Phase 1 for establishment of sustainable CF, Phase 2 for extension, and Phase 3 for maintenance and more extension. The Project was considered as a technical assistance for the Phase 1. Its Record of Discussion was signed in September 2006 and after the domestic preparation period from December 2006, the Project was implemented from April 2007 for 5 years.

1.2 Project Outline

Overall Goal		The mangrove forests are sustainably managed and poverty is alleviated among the communities in the Ayeyawady Delta[3]
Project Purpose		The communities and the mangrove forests co-exist in a sustainable manner in the selected areas[4] where project activities were implemented within the Ayeyawady Delta
Output(s)	Output 1	The selected communities practice environmentally and economically sustainable CF[5]
	Output 2	The management and the support system of the FD for CF is effective
	Output 3	Some silvicultural techniques for the rehabilitation and the management of the mangrove and its associated forests for the Ayeyawady Delta are established.
	Output 4	A coordination mechanism is established among key sectors to address the underlying causes of mangrove deforestation in the Ayeyawady Delta
	Output X[6]	(Additional output to address damages by the Cyclone Nargis in May 2008) Recovery from damage of Cyclone Nargis is promoted

[2] Source: Report of a preparatory study on the Integrated Mangrove Rehabilitation and Management Project through Community Participation in the Ayeyawady Delta.
[3] The mangrove forest in the Ayeyawady Delta comprises all RFs and other mangrove forests in 26 townships where there used to be forests.
[4] The Project targeted four RFs in three townships in broader sense. But JICA experts and FD mutually agreed the project sites where actual activities were conducted were the selected CF, Action Research Plantation (ARP) area, and six CF communities.
[5] In CFI, CF was legally defined as 1) afforestation of areas insufficient in fuelwood and other forest products for community use, and 2) planting of trees and extraction and utilization of forest products to obtain food supplies, consumer products and income. The Project recognized areas which fall under both definitions or d either one of them alone as CF. Meanwhile, the actual CF mechanism was "FD provides 30 years user rights to communities without a charge and communities manage the forest to gain benefits from them and to contribute to the forest conservation.
[6] Output X was added to the Project as emergency relief and recovery assistance for local communities who were severely hit by the Cyclone.

Total cost (Japanese Side)	705 million yen
Period of Cooperation	April, 2007 – March, 2013 (Extended period: April, 2012 – March, 2013 Suspended period due to the Cyclone: May, 2008 – December, 2008)
Implementing Agency	Ministry of Forestry, Forest Department (Ministry of Environmental Conservation and Forestry, Forest Department at the time of the Ex-Post Evaluation)
Other Relevant Agencies / Organizations	<Cooperating Agency> Myanmar Agriculture Service, Ministry of Agriculture and Irrigation, Department of Fisheries, Ministry of Livestock and Fisheries <Supporting Agency> Settlements and Land Records Department, Ministry of Agriculture and Irrigation
Supporting Agency/Organization in Japan	None
Related Projects	The Study on Integrated Mangrove Management through Community Participation in the Ayeyawady Delta(2002－2005) The Project for Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention in Ayeyawady Delta(2012－2017)

1.3 Outline of the Terminal Evaluation

The terminal evaluation of the Project was conducted from November 18 to December 8 in 2012, before the end of the Project in March 2013.

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

The evaluation concluded that the Project Purpose was expected to be achieved. The indicator a (see Table 1.) was mostly achieved and the indicator b was judged as “likely to be achieved” based on tentative results, interviews, and drafts of the Impact Survey and Capacity Assessment Survey that were ongoing at the time of the evaluation.

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

The indicator a. (see Table 2.) was expected to be achieved, while the indicator b was evaluated as “Not yet clear at the moment”. The indicator was about the increase of forested area. FD’s plantation plan and an upcoming project for mangrove rehabilitation by JICA planned at the time of the terminal evaluation were proof for the positive expectation. The indicator b (see Table 2.) was about income generation of the communities. The evaluation team didn’t find an existing useful data about income generation, although the interviews to the target communities showed the sign of income increase and found prospects to continue CF activities in the target communities. Thus,

Overall Goal was concluded as “partially expected to be achieved”.

1.3.3 Recommendations at the Time of the Terminal Evaluation

The terminal evaluation team recommended that the Project hold technical workshops on findings from Action Research Plantation (ARP)[7] and from damage and recovery survey. The purpose of the workshops is to examine lessons and utilize the knowledge for relevant organizations. The evaluation team made various recommendations for FD (as an implementing agency) to further develops its CF promotion agenda. The recommendations include institutional, legal, and financial measures. Also, following points were mentioned: 1) extension of CF activities outside of the target area based on the experiences from the six target villages, 2) follow-up on income generation activities of which the achievements were unclear to estimate, and 3) development of technical guidelines for FD to utilize outcomes of the Project in the future. JICA was recommended to take necessary coordination actions that enabled other JICA projects and donors / NGOs such as RECOFTC (The Center for People and Forests) to use outcomes, knowledge, and experiences from the Project.

2. Outline of the Evaluation Study

2.1 External Evaluator

Asako Takimoto, Global Link Management Inc.

2.2 Duration of Evaluation Study

Duration of the Study: October, 2015 – August, 2016

Duration of the Field Study: January 3, 2016 – January 15, 2016

March 13, 2016 – March 18, 2016

2.3 Constraints during the Evaluation Study

Six target villages of the Project were all located in a quite remote township/state from Yangon where the Project had a main office. It was difficult to cover all six villages during the field study of the ex-post evaluation. The evaluator directly visited two of the six villages to collect information on effectiveness and impact of the Project. Local consultants hired by the evaluator visited the rest of the villages and conducted a beneficiary survey and interviews to CF committees.

Financial information provided by FD was limited in amount, which made it difficult to judge financial sustainability. Also, data on mangrove forest coverage, logging, and

[7] In experiment level, various mangrove species were planted with using different methods and the growth patterns were recorded.

socioeconomic data of CF communities hardly existed. Thus, it was difficult to quantitatively evaluate achievements and impacts of the Project.

3. Results of the Evaluation (Overall Rating: B[8])

3.1 Relevance (Rating: ③[9])

3.1.1 Relevance to the Development Plan of Myanmar

Forest resource management by communities was a core of the Project and one of the top priorities in "Myanmar Forest Policy" published in 1995. CFI, published in the same year, stipulated community's usage and selling rights on timber and other forest products, provided that the communities manage the forests appropriately with CF practice. This usage right was never legally given from the state before. Also, Myanmar's National Forest Master Plan (2001-2031) listed RFs management and plantation as "activities which local communities should be involved". This was consistent with the Project purpose. None of these forest policy, CFI, and the master plan above was revised nor changed from planning stage to its completion, thus, the Project was highly relevant to Myanmar's development plan.

3.1.2 Relevance to the Development Needs of Myanmar

When the Project started, about half of the population residing in the Ayeyawady Delta area was landless poor. They were consuming mangroves unsustainably for timber and fuel wood because of their unstable incomes. FD was promoting participatory natural resource management but few officers had knowledge and experience for CF practice. FD was also solely in charge of mangrove reforestation under the Forest Policy even though the cause of the mangrove deforestation varied from timber harvesting, conversion to paddy fields, to logging for shrimp farming. No effective coordination was made with other agriculture/fisheries relevant governmental agencies. In addition, FD did not give land usage rights and planned harvesting rights for home-consumption of fuel woods to local residents at their plantation area. This caused local communities' illegal encroachment and degradation of the plantation area. All these issues suggested a strong demand for the Project's activities: capacity development in sustainable forest management and poverty alleviation of local communities.

The Delta area was also severely damaged by a Cyclone in 2008. UN/ASEAN team estimated 0.8 million houses were damaged, 0.6 million ha of agricultural land was flooded, and 138 thousand people were deceased or missing. The project sites and

[8] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[9] ③: High, ②: Fair, ①: Low

targeted villages were in the area where the damage was severe. Recovery from the damage was an urgent need after 2008. The damage caused by the disaster accelerated population growth and increased the need of timber for reconstruction, which led more to rapid deforestation of the mangrove. The Project aimed to address deforestation and degradation of mangrove forests and thus was consistent with Myanmar's development needs from planning to completion stage.

3.1.3 Relevance to Japan's ODA Policy

Japan's economic assistance to Myanmar had five priority areas when the Project was planned; 1) humanitarian support, 2) support for refugees and minorities, 3) counternarcotics, 4) support for democratization, and 5) economic reform. The Project tried to give more initiatives to communities to increase their incomes by managing and utilizing forest resources that used to be solely managed by the state. Thus, it fits to 4) democratization in a broad sense. Also, JICA's implementation plan for Myanmar stated "communities' participation in governmental administration" as one of the six assistance programs and the Project was a part of it.

3.1.4 Relevance to Appropriateness of Project Planning and Approach

Started based on the outcomes from IMMP, the Project went through some modifications of the plan including three revisions of PDM. It happened because of the addition of recovery activities from the Cyclone and narrowing down the number of the pilot CF villages. The biggest change was adding Output X after the Cyclone. The military regime at that time was institutionally not flexible to promptly receive assistance from overseas. JICA improvised an ongoing activity, the Project, to promptly provide disaster relief and recovery activities to the damaged communities. This addition of an outcome not only contributed to mangrove reforestation but also enabled Japan to quickly start the disaster recovery activities. And equipment provided under the Output X was continuously in use and the shelters built were used as model facilities for disaster prevention in Myanmar. The provision also became the basis of an ongoing mangrove rehabilitation project by JICA. Thus, these modifications were considered as appropriate.

An unexpected external factor (the Cyclone) forced the Project to modify and to add an additional Output. The change was to adjust to the unique situation of Myanmar and the addition was mainly for enhancing disaster prevention function. Thus, the change in the Project plan was appropriate.

In summary, the Project was highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. And the change in planning and approaches were conducted with possible and appropriate options. Therefore, its

relevance is high.

3.2 Effectiveness and Impact (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Achievement of Project Purpose

To achieve the Project Purpose "The communities and the mangrove forests co-exist in a sustainable manner in the selected areas where project activities were implemented within the Ayeyawady Delta" (Table 1), the Project set four outputs and another output was added to recover from damages to the mangrove forests after a Cyclone. Almost all five outputs except income generation activity in Output 1 were achieved at the end of the Project (see details in Annex).

Table 1 shows achievement of the Project Purpose at the end of the Project. Regarding the indicator a, "increase of forest coverage", the Project conducted CF management in 3,542 acres (1.433 ha) for the target of 3,550 acres (1.438ha). Thus, it was mostly achieved. For the indicator b "More than 80% of CFUG members consider CF useful", the assessment conducted by the Project found that over 80% of Community Forestry Users Group (CFUG) registered members understood functions of CF (sustainable production of forest products, legalize usage of mangrove forests and others) and considered CF useful.

This increase of forest coverage was contributed by a reform of CF management support mechanism in FD (Output 2), an establishment of plantation techniques for mangrove forests management and extension (Output 3), and building a coordination mechanism among relevant sectors to address fundamental causes of mangrove deforestation (Output 4). These outputs made FD officers and local communities of the project target area recognize the importance of mangrove forests and led to more intensive CF management. Additionally, CFUG members understood the function and effectiveness of CF for sustainable mangrove management by practicing environmentally and economically sustainable CF (Output 1). Thus, it is confirmed that the Project largely achieved its purpose "co-existing of communities and mangrove forests in sustainable manner".

Table 1. Achievement of Project Purpose

Project Purpose	Indicator	Actual
The communities and the mangrove forests co-exist in a sustainable manner in the selected areas where project activities were implemented within the Ayeyawady Delta	a. By the Project end, mangrove forest coverage is increased by 3,550 acres (1,438ha)[10] in the selected areas where project were implemented (i.e. CF plantation, CF-Natural Forest Improvement Operation (NFIO), and ARP sites) from the base year 2009.	The Project implemented its activities in 3,542 acres (1.433ha) of the selected area as follows. Six targeted CF forests: 1,670 Former targeted CF forests[11]: 285 Action Research Plantation (ARP): 1,587
	b. At the end of the Project, among the registered members of all the target CF user groups (CFUGs) registered in 2011, more than 80% consider CF useful.	More than 80 % of registered CFUG members understood the function of CF and recognized CF useful.

3.2.1.2. Status of Outputs and Project Purpose at the Time of the Ex-Post Evaluation

Regarding Output 1 – environmentally and economically sustainable CF activities – at the time of the ex-post evaluation, some villages were conducting limited activities of their CF action plans compared with the time of the Project completion. Conditions of several CFs were worse than those at the beginning of the Project. Beneficiary survey and interviews suggested that each target village has a different CF management style and distribution of CF products, depending on its ethnic group composition and strength of social norm. Income generation activities in general did not show any significant progress at the time of the ex-post evaluation, while the plantation area seemed to be increasing. Thus, activities under Output 1 were mostly continued (Table 2).

[10] Both Project Purpose and indicators did not specify the quality of mangrove forests. Thus, this evaluation defined mangrove forests as any vegetated land with existing mangrove species.

[11] There were seven more selected CF villages at the beginning of the Project yet they were not re-selected at the Project revision in 2011 after the Cyclone. This area was pilot plantation forests managed prior to the Cyclone.

Table 2. CF management status of Six Targeted Villages at the Ex-post Evaluation

(As of January 2016)

Targeted Village	Number of household participated in CF ／Number of household in the village	CF area（in acre）	Types of CF: Supplementary plantation on existing mangrove forests / new plantation (in acre)	Survival rates of planted seedlings (%) (estimated average) ）	CF condition at the time of the ex-post evaluation
Kwa Kwa Ka Lay	31/157	202	Mostly new plantation	60	Most of CF area was abandoned shrimp farming pond (degraded area). Thus, the mangrove forest coverage increased as plantation took place (Details were not available since CF committee chairman had been out of town for long).
Nyaung Ta Pin	49/126	693	217/467	unknown	CF area was divided into patches and their management responsibility was distributed to each CFUG member which caused different levels of management in each member's lot. CF committee answered in its interview that the condition of CF worsened after the Project, but some patches improved its condition.
Thar Yar Kone	45/108	1051	Mostly on existing forests	60	Most of CF area was already mangrove forests. Recent illegal logging caused some part of the forests to be more degraded than those before the Project. Overall, however, the forest condition did not change much from the time before the Project.
Shwe Pyi Thar	80/120	50	20/30	50	CF condition was improved by effective conservation practices. This is because the CF committee chairman had a high organizing skill and disaster prevention function of mangrove was understood well among the community.
Gaw Du	56/183	50	36/14	80	Some neighboring community repeatedly encroached the CFs and cut mangroves for fuels to operate their large-scale fishing, which cause recent
Htaung Gyi Tan	37/249	157	60/97	95	

Targeted Village	Number of household participated in CF ／Number of household in the village	CF area （in acre）	Types of CF: Supplementary plantation on existing mangrove forests / new plantation (in acre)	Survival rates of planted seedlings (%) (estimated average) ）	CF condition at the time of the ex-post evaluation
					degradation. Also, CF was collectively managed which seemed to be more difficult compared with management by individuals.

Source: Beneficiary survey to CF committee

Output 2 was about CF management and support mechanism in FD. Many FD officers who were part of the Project were transferred to other areas, but some were still involved with CF promotion in the policy level. FD officers were still using training programs and guidelines developed by the Project. Technical support from these officers based on these programs and guidelines was essential for local communities to start CF activities. Technical guidelines for mangrove plantation technology developed from Output 3 by the end of the Project were used as training texts for local communities and FD officers (mainly field-level) at the time of the evaluation. Follow-up research on ARP plots was ongoing as well. The inter-agency coordination meetings set under Output 4 were not held after the Project because the meeting was to discuss the Project administration and relevant information exchange for CF promotion and mangrove conservation. Similar inter-agency meetings, however, were held since the Project completion to discuss land use law and revision of CFI. The democratic administration since 2011 was seeking solutions for these problems. (The democratic administration started many policy improvement and were promoting inter-agency policies compared with previous military regimes). Output X, recovery support from the Cyclone, provided various equipment and built disaster recovery shelters and seedling nurseries. These were all well maintained and continuously in use (See Annex in detail).

Two indicators of the Project Purpose were mostly achieved at the end of the Project and remained the same at the time of the ex-post evaluation. CFUG members recognized effectiveness of CF and continued CF activities within their capacities including expansion of their CFs. It was confirmed that communities and mangrove forests were somewhat co-existing even without the Project input.

3.2.2 Impact

Impact of the Project was analyzed through examining 1) updated status of the Outputs and Project Purpose, 2) achievement of Overall Goal, and 3) other impacts.

3.2.2.1 Achievement of Overall Goal

Table 3 shows the status of achievements of the Overall Goal's indicators.

Table 3. Achievement of Overall Goal

Overall Goal	Indicator	Actual
The mangrove forests are sustainably managed and poverty is alleviated among the communities in the Ayeyawady Delta	a. Mangrove forest coverage increases by 10,000acres (4,050ha) in the Target Area of the current Project (i.e. 4 RFs) within three years after the completion of the Project	There were no quantitative data available regarding mangrove forest coverage in CF area, thus it was difficult to evaluate the achievement of this indicator. FD reported 2,400 acre (approximately 971 ha) of mangrove plantation from 2013 to 2015 (Table 7). In addition, ongoing mangrove rehabilitation project by JICA planted 1,154 ha by the end of December 2015. FD recognized this plantation area as their official plantation as well. Judging from these data, the indicator was at least half achieved.
	b. Income levels of communities in the Target Area is improved than that of 2004	The beneficiary survey[12] conducted for the ex-post evaluation found eight households (7.3% of sample size) reported the increase in their annual incomes. Although this could be called as a progress, it was insignificant to call it as a clear impact.

As mentioned in "2.3 Constraints during the Evaluation Study", quantitative data to evaluate achievements of Overall Goal was not easy to obtain. The evaluation was based on limited data provided and results of the beneficiary surveys. The Project has achieved at a limited level of its Overall Goal because while forest coverage was in the process of achieving the target by increasing plantation by both CF and FD operation, income generation was observed at limited households.

Regarding the indicator a, given the time frame from the Project termination to the

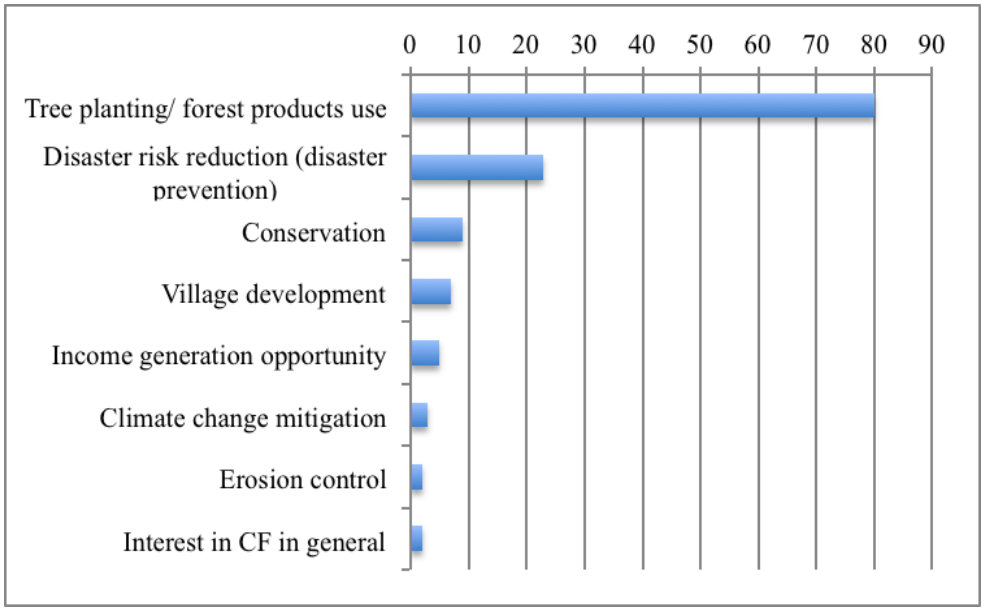
[12] The beneficiary survey was conducted to 109 individual CFUG members of the target villages and 30 non-CFUG members, 129 people participated in interviews to six CFUG committees, 17 FD officers including both CF task force members and non-members, and 8 people from relevant agencies (only from Department of Fisheries). Regarding villages, all "re-selected" six villages were surveyed to ask conditions before the Project so that the conditions after the Project could be compared and the impact of the Project could be evaluated. At the survey in the villages, on average 21.5 people (CFUG committee members and volunteers) per a village attended the group interviews. The interviews were to ask about ongoing discussion and activity plans of the CFUG. The survey sample for individuals was determined by using stratified random sampling, taking samples proportionate to the numbers of each CFUG members in six villages. The sample size was determined to gain 95% confidence interval with 10% error level significance. .

ex-post evaluation – only couple of years – was too short to recognize the impact, considering growth speed of common mangrove species. As for the indicator b, interviews at the time of the ex-post evaluation found that it was agreed by both sides at the initial stage that if CF activities were continued and planted mangroves grew well; forest products from CF would eventually contribute to the income generation of the communities. But it takes a long time for the mangrove to grow enough so that communities can harvest more than sufficient fuel woods or timber for their own consumption in order to sell them. Setting the overall goal, "achieving communities' poverty reduction by the time of the ex-post evaluation (three years from the Project termination)", was the expectation at the planning stage, which was evaluated as "too optimistic".

3.2.2.2 Other Impacts

The beneficiary survey found that many CFUG members thought they learned more about mangrove forests' effects and impacts on local environment through participating in the Project. As shown in Figure 1, 21 % of CFUG members stated disaster risk reduction as a reason to participate in CF, while 8 % said environmental conservation, and 5 % for prevention of soil erosion and climate change mitigation (they could select multiple answers for the question). Interviews and the beneficiary survey also suggested that the Cyclone increased communities' interests on mangrove forests because of its disaster relief function. Also, CFUG members recognized mangrove's positive effects such as biodiversity conservation (29 % of the members answered the increase of biodiversity was a positive effect of CF).

Unit: person



Source: Beneficiary Survey (sample size: 109)

Figure 1. CFUG members' Reasons to Participate in CF (Multiple answers)

In addition to an increase in mangrove species and forest coverage, the beneficiary study reported an increase in the number of aquatic animals (fish, crab, and shrimp). This suggested the Project was very likely to contribute to biodiversity conservation of the area. No negative impact was reported since the Project termination till the ex-post evaluation.

For the project purpose, both indicators were mostly achieved; the target amount of area was reforested and more than 80% of target community population recognized CF as useful. Overall goal, sustainable mangrove forest management and communities' poverty alleviation in the Ayeyawady Delta, has been achieved in a limited sense. This was because only about half the forest coverage target was reforested even though the increase was confirmed. Also, there were no comprehensive data about community's income level. Thus, it was impossible to quantify the scale of the Project achievement in terms of income generation. According to the beneficiary survey, eight households (7.3% of the sample) reported an average increase of approximately 8,000 yen in their annual incomes. Interviews and beneficiary survey, however, suggested that it would need more time and trials for the Project to contribute to general income generation of entire local communities. As such, since this Project has to some extent achieved the Project Purpose and Overall Goal, effectiveness and impact of the Project are fair.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

Planned inputs and actual spending were summarized as able 4 below.

Table 4. Comparison of planned and actual inputs

Inputs	Plan (June 2006)	Revised Plan (November 2008)	Actual (March 2013)
(1) Experts	Short-Term: No MM were mentioned in the planning document. Only stated one relatively longer-term expert and others with specific missions as necessary.	Budgets were allocated to nine experts and their areas of responsibilities were mentioned in the new plan	17 Short-Term (133.4 MM)
(2)Trainees received	No number mentioned	1 person to participate in Country Focused Training.	13 persons
(3) Equipment	Only a cost of car (8 million yen) was mentioned	7.7 million yen (cost of equipment for provision and equipment accompanied by expert dispatch)	21.8 million yen GIS software, satellite images and information, GPS devices, generators, boats for disaster recovery, and others.
(4) Local Activity Cost	Not mentioned	113 million yen	171 million yen (Local cost supported by the Project)
Japanese Side Total Project Cost	450 million yen	712 million yen	Total 705 million yen
Myanmar Side Operational Expenses	1. Counterpart personnel and increase of the number of CF task force members 2. Budget allocation for the project (20, 000 US dollars equivalent per year) 3. Project office	Not mentioned	1. Counterpart personnel 2. Project office 3. Local cost: 299.14 million Myanmar kyats[13]

MM stands for man month.
Source: Information provided by JICA

3.3.1.1 Elements of Inputs

(1) Experts

Area of expertise of the short-term experts were: chief advisor (relatively long-term mission), community forestry, agroforestry, participatory community development, mangrove forestry, GIS, forest technology, land use planning, silvicultural extension,

[13] About 23 million yen. At the end of the Project, 0.077 JPY = 1 Myanmar kyats, monthly average exchange rate on March 2011.

research and extension, marketing, aquaculture, and project coordination.

Because of the political situation at the time of implementation, all Japanese experts had to be based in Yangon. They had to file entry permits to the Project area every time for the fieldwork.

(2) Trainees Received

From FD and other relevant governmental agencies, 13 participants attended training programs in Japan and 10 attended in technical exchange program (23 in total).

Table 5. Training Programs and Participants

Training Program	Participants
Conservation and Sustainable Management of Mangrove Ecosystems	4 Range officers[14], staff officers (field level)
Seminar on Forest Management Policy-Sustainable Forest Management with Collaboration of Local Government and Community	1 Assistant Director of Ayeyawady Division, 1 Director of Planning and Statistic Division
Environmental Education for Sustainable Development-Conservation of Coastal Eco-systems for Lives of Local Communities	4 Range officers
Roles of Forests in Natural Disaster and Revival of Forests and Forestry	1 Director of Planning and Statistics Division
Technical Exchange Program	
Technology Exchange Program 2008 “Melaleuca Plantation Technologies”（in Viet Nam）	1 Field Project Manager, 1 Staff officer、and 3 Range officers
Technology Exchange Program 2009 “CF Activities and Aquaculture in Delta Area” (in Thai)	2 officers from Department of Fishery, 1 Staff officer of FD, 1 Range officer, and 1 research center officer

Source：Information provided by JICA

(3) Counterpart from Myanmar Side

Throughout the Project, 22 management personnel (central office or division/state level) and 87 technical personnel (township level) participated in the Project activities. Only one personnel was assigned to the Project as a full-time staff and all others had their responsibilities in different works of FD. Transfer was common in FD and only four FD officers had more than two year consecutive involvement with the Project.

(4) Inputs from Myanmar Side

Myanmar side provided 299,141,000 Myanmar kyat (about 23 million yen)[15] in total

[14] Officers in the field level (generally called field officer or forester).
[15] At the time of the Project termination. 0.077 JPY = 1 Myanmar kyat. Average exchange rate of March 2011.

to the Project. The input included office spaces, facilities, lands for APR, direct cost such as seedlings for plantation (131,309,000 Myanmar kyat), and indirect cost such as salary for relevant officers (167,832,000 Myanmar kyat).

(5) Others

Baseline survey in the Project sites, CF impact study during the Project, baseline survey and resource assessment in target villages, and impact survey and capacity assessment in target villages were subcontracted[16] during the Project.

3.3.1.2 Project Cost

The original Project budget was 450 million yen. But budgets for disaster recovery activities after the Cyclone, for recovery of mangrove forests and disaster risk prevention, and for re-doing some CF activities destroyed by the Cyclone were added and the revised budget became 712 million yen. Normally the actual cost is compared with the original planned cost, but considering the additional inputs after the Cyclone, comparison was done between actual cost and the cost of the revised plan. Actual cost was 705 million yen that was lower than planned (less than 99%).

3.3.1.3 Period of Cooperation

The original Project period was 60 months (5 years) from April 2007. The Cyclone in May 2008, however, hit the Project site and caused serious damages to locals, mangrove forests, and local government agencies. It resulted in a suspension of the Project for 8 months since May 2008. In January 2009, the Project plan was revised based on a damage assessment and disaster recovery survey. Activities for livelihood recovery of local communities and for enhancing risk prevention ability of mangrove forests through supplementary plantation and reforestation were added. The project period was extended for a year, thus the Project period after the revision was 72 months, and the actual period was as planned (100%).

As above, both the project cost and project period were mostly as planned. Therefore, efficiency of the Project is high.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

At the time of the ex-post evaluation, FD was developing “Integrated Coastal

[16] Subcontract survey also included a recovery assessment after the Cyclone and satellite imaginary analysis of the project sites.

Resource Management Initiative" as an overall policy to manage the whole coastal area of Myanmar including the Project area. CF was a major part of the land use and going to be promoted. Political support related to CF for the Project activities included revising CFI and was getting better than expected at the time of the Project termination. This trend seemed to be continuing. Table 6 shows FD has an actual plan and specific targets for mangrove plantation.

Table 6. Plan for Plantations and Natural Regeneration[17] by Forest Department in Divisions and State Where Mangrove Forests Exist (2016-2019)

(unit: acre)

Fiscal Year	Ayeyawady Division		Taninthayi Division		Rakhine State	Total
	Mangrove Plantation	Natural Regeneration	Mangrove Plantation	Natural Regeneration	Mangrove Plantation	
2016	900	150	100	95	100	1345
2017	900	150	100	195	50	1395
2018	400	150	40	150	50	790
2019	400	150	40	150	50	790
Subtotal	**2,600**	**600**	**280**	**590**	**250**	**4,320**

Source：Information provided by FD

Meanwhile, as mentioned in the impact analysis above (Table 3), illegal logging was a serious obstacle to grow mangroves within CF. Residents of neighboring communities of CF encroached into CF and cut mangroves for their fishing boats' fuel and other consumption. This slowed down the growth of mangroves and caused delay in income generation activities which depended on forest products. Both FD and CF communities were trying to prevent the illegal logging by patrolling. But even if they captured the loggers, penalty fees for the illegal logging was so low that it did not reduce illegal logging. More than several FD officers and CFUG members shared the opinion that the current laws to control the illegal logging was not enough.

Although the illegal logging issue should be dealt at the policy level, political sustainability for CF promotion and mangrove conservation is in general high.

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

FD, as an organization, needs CF support mechanisms in all levels, especially in the field level, directly supporting local communities (including controlling illegal logging).

[17] A process by which woodlands are restocked by trees that develop from seeds that fall and germinate in situ, not by planting.

According to FD, CF National Working Group[18] was formed in 2014, consisting of relevant governmental agencies, international/national NGOs, Civil Society Organization (CSO). Discussion in this group led to an establishment of CF unit, a section to promote CF inside FD. The units were set in district office level as well as central FD office in Nay Pyi Daw. More units were planned to be set in township levels. Also, according to FD's coming 5 year plan (2016-2020), Division of Mangrove Conservation are about to be established inside FD. Twelve full-time officers (Director and others) were to be assigned and about 158 FD officers would involve in the work of this new division. The 5 year plan stressed that this division would be in charge of coordination among relevant agencies, local communities, private and international organizations in terms of mangrove conservation. Promoting mangrove management by local community was emphasized as another major agenda of this division.

During the Project, few action were taken to prevent illegal logging because this issue involved interests of many governmental agencies such as Department of Agriculture, Fisheries agency, Development agency, and others. According to interviews to FD, more effective inter-agency coordination was expected to take a place in the near future to address cross-sectoral issues. This is because the new administration was planning to consolidate many governmental agencies which reduced inter-agency tensions and make inter-agency coordination easier.

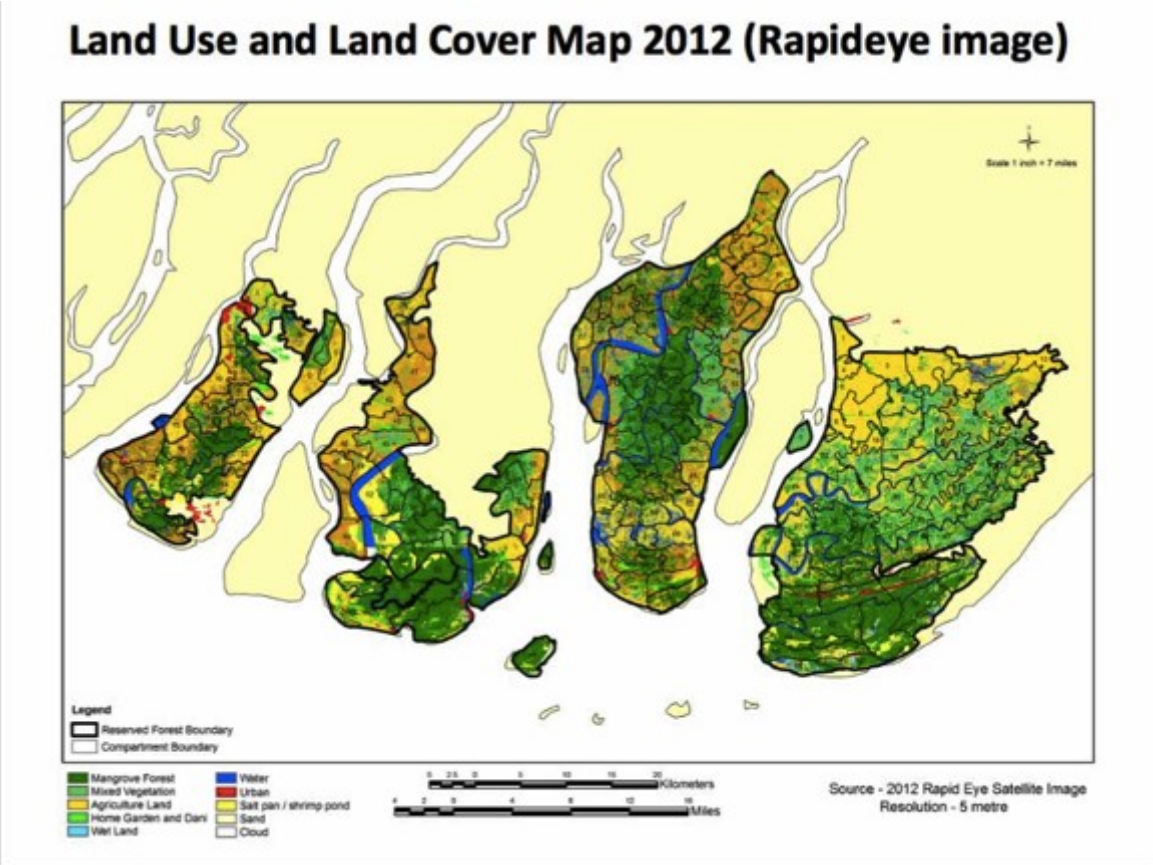
Although an improvement in the future was expected, support to local communities and illegal logging control were both challenges for FD. Thus, organizational sustainability was evaluated to be limited.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

At the time of the ex-post evaluation, it was confirmed the technical knowledge of FD officers about mangrove's silvicultural techniques and CF management were maintained through trainings and workshops. It was clear in the interviews that field level FD officers were technically confident to provide trainings on mangrove seedling production and basic plantation techniques to local community. The Project developed a silvicultural guideline summarizing the necessary techniques for this technical support. Using the guideline, FD was intermittently providing workshops for CF and mangrove management to its officers. Sustainability was thus secured to provide technical assistance to CF communities. Also, GIS section of the FD kept collecting land use data

[18] Official members of the CF National Working Group were: FD, Attorney –General Office, Department of Fisheries, General Administrative Department, Mining Department, Agriculture Land management & Statistics Department, international and international and NGOs and CSOs.

and renewing the map information based on the satellite imaginaries and relevant technical assistance provided by the Project (Figure 2.). For the target communities, CFUG members received enough technical trainings to build their own nursery and was reported to implement plantation by themselves. Thus, it is confirmed technical sustainability of the Project is secured.



Source: Information from FD

Figure 2. Map of the Project Area (4 RFs) Produced by FD GIS Section After the Project Completion with Utilizing Satellite Imaginary and Technology

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effect

Financially, FD's budget allocation for CF management was considered to be insufficient. It was not possible to acquire detailed budgetary information of FD at the ex-post evaluation. Yet interviews to relevant FD stakeholders suggested that monitoring for CF activities and illegal logging control were under-budgeted at the time of the ex-post evaluation. Meanwhile, Deputy Director of FD referred that a new division for mangrove conservation and management were planned to be established in the fiscal year of 2016 at the first field visit of the evaluation. CF units were sequentially placed from

state/division level to district and township levels. Thus, the prospects of budget increase in CF and mangrove management looked promising.

Table 7 showed the FD data in plantation from 2007 to 2015. Mangrove planation started since 2013. The annual plantation area was largest in 2013 and gradually decreased. This is because the budget and human resources also need to be allocated to maintain the planted forests and does not mean the total budget for mangrove reforestation and conservation was decreasing. Also, Table 6 showed that FD was planning to increase the area of mangrove plantation and natural regeneration in the fiscal year of 2016. In summary, an improvement in budget allocation for mangrove conservation was expected because FD is planning financial measures soon or in the near future. Yet there was some uncertainty since the new administration took the place during the ex-post evaluation and had not fully disclosed their financial plans at that time. Thus, the financial sustainability is evaluated to have minor problems.

Table 7. Actual Cost of Different Types of Plantation by Forest Department
(2007 – 2015)

（Budget：Million Myanmar Kyat*, Area: acre)

Fiscal year**	Commercial Plantation		Watershed Plantation		Industrial Plantation		Fuel wood Plantation		Mangrove Plantation		Total	
	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
2007	31850	1838	17200	568	4760	14	5250	260	0		59060	2679
2008	38900	2231	16150	533	11	0.03	4950	245	0		60011	3009
2009	38150	2765	12500	516	0		4550	278	0		55200	3558
2010	34250	2470	550	23	0		2265	138	0		37065	2631
2011	26500	1918	800	33	0		1700	104	0		29000	2055
2012	13550	978	850	35	0		1000	61	0		15400	1074
2013	13325	1660	575	43	0		0	0	1100	103	15000	1806
2014	7100	1112	300	29	0		0	0	600	70	8000	1211
2015	3850	659	350	37	0		0	0	700	88	4900	784
Total	207475	15630	49275	1816	4771	14	19715	1085	2400	262	283636	18807

Source： Information provided by FD

*1 Myanmar kyat = approximately 0.09 Yen（JICA exchange rate, March 2016)

**Myanmar's fiscal year starts from April 1st and ends on March 31st next year.

In total, some minor problems have been observed in terms of the organizational and financial sustainability, while technical and related policy and institutional aspects looked promising. Therefore, sustainability of the project effects was fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project was implemented to contribute to sustainable management of mangrove

forests and poverty alleviation of the community in the Ayeyawady Delta, Myanmar. To achieve the goal, the Project aimed to provide necessary technical cooperation to establish sustainable CF for local communities and officers of FD. The Project's relevance was high. The activities were highly relevant to Myanmar's development plan, development needs, and Japan's ODA policy. The Project mostly enabled the target communities to sustainably co-exist with their mangrove forests at the time of the Project termination. Achieved situation was maintained when the ex-post evaluation was conducted. It was clear, however, it needed more time and procedures to increase the CF communities co-existing with mangrove and to enhance income levels of the communities through CF activities. Therefore, effectiveness and impact of the project were fair. The Project was suspended for almost a year due to damages caused by a Cyclone. Its plan was, however, revised after the incident and the Project's cost and period were both within the revised plan. Thus, efficiency of the Project was evaluated as high. At the time of the ex-post evaluation, related policy and institutional aspects and technical aspects for sustainability were high. FD was sequentially developing policies for sustainable mangrove forest management and CF promotion. Communities and FD officers targeted by the Project showed their certain amount of enhanced and maintained technical abilities. On the other hand, the FD budget for CF management and promotion was not sufficiently allocated. And it was not clear how the organizational mechanism inside FD to promote CF was going to be restructured by regime change in April 2016. Consequently, sustainability of the overall project effects was considered to be fair.

In light of the above, the Project was evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) Control illegal logging of mangroves

Budget for field level officers to patrol more often for illegal logging such as costs for boats and fuels should be increased from next fiscal year. A cause of illegal logging is usually a complex socio-economic issue. It is important for FD to collaborate with other relevant governmental agencies to control the illegal logging.

2) Enforce penalties of illegal logging and search for alternatives

In the new land use law that was under reforming during the ex-post evaluation, prevention of illegal logging should be addressed clearly. The legislation should be realistic to cover current flaws. Also, alternatives to reduce the demand for illegal logging such as promotion of fuel-efficient stove should be explored.

3) CF promotion

To increase the area of CF, budgetary allocation in the field such as costs for technical workshops and travel budgets for officers to visit communities are imperative. This allocation led to necessary technical support for CF setting and enhancing CFUG activities (formulating management plans, conducting inventories, following-up on implementation of CF management plans, and others). The number of officers of the CF unit should be also strengthened as much as possible. Chain of command in CF units should be simple and clear and the information exchange meetings among different field offices should be held periodically.

4) Mangrove plantation and management of planted forests

Mangrove plantation needs to be continuously supported in and outside CF areas. Management of these lands after the plantation should be strengthened. Using satellite imaginary and other geographical information, it is important to understand where mangrove forests are more threatened for degradation/deforestation and to find and conduct countermeasures.

4.2.2 Recommendations to JICA

Through succeeding projects and other assistance, JICA is suggested to provide assistance to Myanmar government regarding the suggestions above to follow-up the sustainability of the Project effects including effects of the rehabilitation project conducted after this Project. Specifically, 1) policy support for complex issues such as land use and natural resource management to address deforestation and forest degradation by illegal logging, 2) technical support for geographical information collecting and processing for land use map and others, and 3) support for community's livelihood improvement and disaster prevention.

4.3 Lessons Learned

1. <u>Setting appropriate targets and selecting appropriate inputs and approaches</u>

When community's poverty is causing overuse of forest resources as this Project, income generation for the community could be an effective method to reduce the overuse. The communities, however, need to learn not only techniques of the income generation activities but also business skills to continue feasible business based on in-depth market research and knowledge and experience for sales. Income generation is a complex challenge which should be dealt as a project on itself. Insufficient time and inputs were spent since the Project dealt with the income generation as one of the activities of its five outputs. In addition, the Project included some unrealistic CF activities as mentioned in

the analysis of the Project's impact. It was possibly because the project planning was based on a development study conducted prior to the Project, and the plan tried to cover all elements suggested in the study. If comprehensive and relevant business inputs are difficult due to the limit of the project size and concept or limits in implementing agency and target area, balancing the inputs with clear priority such as capacity building of counterparts for forest conservation is necessary.

2. Consideration for local social setting in case of using community's participatory approach

The Project took participatory approach to work with communities. As mentioned in the Impact section, however, each target village has unique CF rules and approaches. These affected the Project activities turn-outs and follow-up situations such as degree of mangrove forest conservation. For example, Shwe Pyi Thar, one of the six targeted villages shown in Table 3, had a relatively well grown mangrove forests and damages from illegal logging was minimal. This is because the CFUG had a leader with an excellent organization skill and was motivated to promote CF. The Ayeyawady Delta hosts many emigrants from other areas who are major part of the population. In places like this, traditional social norm for natural resource use hardly exists. Consequently, it is expected that participatory approach would be more challenging and takes time to work compared with communities with more traditional common land use rules. As such, it is important to study strengths of social norms, ethnic and cultural characteristics of the communities, and social structure at the project planning stage. Then the approaches to foster ownerships should be sought after to conduct a project with community-based forest resource management.

3. Action planning with consideration of political restriction

As mentioned in the "3.3.1.1. Elements of inputs", all Japanese experts were stationed in Yangon, while coordination and liaison meeting with FD central office and other relevant agencies were needed in the capital, Nay Pyi Daw. Also, most activities of Output 1, 2, 3, and X were field based, yet the experts had to reside in Yangon and apply for an entry permit every time. This caused great difficulty to communicate and collaborate for both Japanese experts team and FD counterparts in all levels of offices. This suggests that if the Japanese side's activity area was restricted due to an existing political situation, it would be important for the experts and counterparts to have a detailed agreement of each side's roles in field, local municipality, and central levels. Periodical revision of the agreement for further mutual understanding and modification of activities for collaboration are crucial.

4. Setting quantifiable project purpose, overall goal, and indicators

At the ex-post evaluation, most of indicators of the Project Purpose and of the Overall Goal were not monitored and the quantitative data to evaluate them were difficult to collect. “Forest coverage” and “community’s income level” were both indicators to quantify the Project effects, but the data for these indicators is hard to be measured and takes a long time to be collected and cost to be measured. It was also unclear who, when and how the data collection would be implemented. To avoid similar problems, both sides (especially the counterpart side) should set quantifiable purpose and indicators and should agree on how to gain the data when the activities were planned. Alternatively, the project plan can include activities to monitor achievements of the indicators. And technical assistance to collect relevant data can also be provided.

Annex : Achievements of the Outputs (upon the Project completion) and Follow-up Status of the Outputs (at the time of the ex-post evaluation)

Output	Indicator	Achievement Status
Output 1	1a. By September 2011, all the CF Management Plans of the CFUSGs, reselected in March 2011, are developed/updated.	Achieved : Six target villages were reselected in July 2011 and all the CF management plans were approved and certifications were issued. Status at the ex-post evaluation : No change since it was already achieved.
	1b. By the end of the Project, organizational capacity of the Management Committee of all target CFUSGs reaches the 3rd level (meaning that they achieve more than half of the fulfillment) of the evaluation rating composing of five achievement levels set by the Project.	Achieved: Tentative results of an impact survey and a capacity assessment for CFUGs showed that all villages had technical expertise that is related to organizational ability above the target level. Status at the ex-post evaluation : Management Committees continued to show their interests in CF. The beneficiary survey found that most of the committee members considered CF as useful and wished to continue CF and their meetings were being held as often as was during the Project.
	1c. The certified CF Management Plans (i.e. CF plantation and NFIO) of all the target CGUSGs reselected in 2011 are implemented according their annual plans.	Achieved : Certified CF Management plans were implemented by each village. Status at the ex-post evaluation : Until the end of the Project, each target village was implementing activities following the management plan. Only part of the management plans were followed due to difficulties of controlling illegal logging in all villages except Shwe Pyi Thar.
	1d. By the Project end, more than 1,460 acres (591 ha) of mangrove forests are rehabilitated and managed by the CFUSGs reselected in 2011 based on the certified CF Management Plans, including CF plantation and NFIO when applicable.	Achieved : CFUG rehabilitated and managed 1,670 acre of mangrove forests from 2009 to 2012. Status at the ex-post evaluation : No quantitative data were taken after the Project. The beneficiary survey asked the condition of mangrove forests in CF – whether it's degraded, nearly same, or improved compared with the condition before the Project. Two villages among six answered the forest condition was "improved". This is because their CF lands were previously non-vegetated area such as illegal fishing pond. But mangroves were planted by the Project and it was covered by vegetation at the time of the ex-post evaluation. CF lands of other four villages were somewhat vegetated or held some mangrove trees even before the Project. Plantation and conservation of the forests were conducted there. After the Project, the frequency of FD officers' patrol and follow-up were down due to the limited budget. This led to an increase of illegal logging inside CFs, and the conditions of CF were either same or worse than those before the Project, according

		to the beneficiary survey (Table 3).
	1e. By the Project end, all the CFUSGs reselected in 2011 start to gain profit from CF activities determined in the certified CF Management Plans and/or income generation activities supported by the Project.	Not yet achieved : Not all CFUGs had a prospect to gain profits from income generation activities. And the profits were not yet earned. Status at the ex-post evaluation : The beneficiary survey found that eight households, 7.3 % of the sample size, had increases in their incomes. Among them, six households are from Nyaung Ta Pin and a household each from Kwa Kwa Ka Lay and Thar Yar Kone. According to the survey, there were households that reported to harvest the fuelwoods from their CFs (both individual case and collective case). In two villages out of six target villages, crab and shrimp catch were reported and the CFUG members were planning to try new income generation activities with using CF (ex. crab fattening and duck breeding).
Output 2	2a. By the end of the Project, capacity of 80% of technical members of CF Task Force[19] engaged in the Project more than two years reaches the 4th level (meaning that they achieve more than 75% of full fulfillment) of the evaluation rating composing of five achievement levels set by the Project.	Achieved : Capacity of FD officers were categorized into two: technical capacity and core capacity. A study for these capacities of target officers (10 technical members) showed that more than 80% of them reached over the 4th level in both capacities. Status at the ex-post evaluation : Most of the targeted CF task force members were transferred to other areas after the Project. It was impossible to conduct the same type of capacity assessment. The transfer issue was, however, expected already during the Project. To keep the built capacities, a Standardized Operational Procedures (SOP) as a technical manual was formulated and used for FD officers training.
	2b. On average, more than 80% of all registered members of the CFUSGs[20] reselected in 2011 give the highest or medium rate on three-level rating about "degree of understanding", "degree of applicability", and "degree of satisfaction" of the CF extension they received.	Achieved : More than 98% households of the targeted six villages (298 households) gave more than medium rate. Status at the ex-post evaluation : Most of FD's support for CFUG were technical support until the certification of CF, at the beginning of the process. Thus FD's support was minimal for existing CFUG such as supply of seedlings. Yet, interviews suggested that the communities received these extension services.
	2c. By the Project end, a training program for CF for mangrove forest, including materials, is developed based on the existing ones for confirmation by the Director	Achieved : The training program was at the end incorporated to the SOP as a training material. Status at the ex-post evaluation : The SOP was being used extensively for CF training to FD officers (especially field level). Field officers used it to provide support for CFUG creation,

[19] CF task force technical members were field project manager and field officers of each field (staff officers, range officers, deputy range officers, and foresters)
[20] Same with CFUGs member.

	General (DG) for further action (in English & Myanmar).	inventory of the lands, and mangrove plantation.
	2d. By the Project end, Standardized Operational Procedures (SOP) for CF for mangrove forest is developed based on the existing SOP of the FD (i.e. Departmental Instructions and CFI) for confirmation by the DG for further action (in English & Myanmar) .	Achieved : The SOP was finalized in March 2013. Status at the ex-post evaluation : Same as the status in 2c above.
Output 3	3a. By the Project end, a technical report on Action Research (AR) for mangrove are prepared (in English and Myanmar).	Achieved : The technical report was finalized in March 2013 and completed as a technical report. Status at the ex-post evaluation : Each township's FD officers were in charge of management and preservation of AR test sites by the time of the ex-post evaluation. They were conducting periodical patrolling.
	3b. By the Project end, technical guidelines for field-level FD staff on rehabilitation and management of mangrove forests, which are developed based on AR findings, are published (in English and Myanmar).	Achieved : Technical guideline was finalized in March 2013. Status at the ex-post evaluation : Field foresters and target communities were using the guideline according to the interviews.
Output 4	4a. By December 2011, an inter-agency coordination meeting is organized by the FD.	Achieved : The meetings were held in November 2011 and October 2012. Status at the ex-post evaluation : No change since they were achieved.
	4b. Land use information of the Target Area is updated based on the satellite images of 2007, 2009 and 2012.	Achieved : Land use map and a poster of land use information were made based on satellite imaginaries of 2007, 2009, and 2012. Status at the ex-post evaluation : Achieved. Based on this output FD was developing updated maps (Figure 2).
	4c. The updated land use information is shared at the inter-agency coordination meetings for discussion.	Achieved : Land use map and land use information were presented and distributed at the inter-agency coordination meetings held in November 2011 and October 2012. Status at the ex-post evaluation : The inter-agency coordination meeting for the Project was not held since the end of the Project. However, inter-agency Land Use Policy Committee and CF National Working Group were established around the time of the Project completion. At these meetings FD was leading discussions regarding land use and other issues that need inter-agency

		coordination.
	4d. Seminars to promote synergy among the relevant sectors are organized annually.	Achieved : Eight seminars for mangrove management and one technical workshop were held. Status at the ex-post evaluation : Same as the status of 4c above
	4e. A donor/NGO coordination meeting for the Target Area is organized by the FD once a year.	Achieved : In total four meetings were held at Labutta District and Pyapon District in fiscal years of 2011 and 2012. Status at the ex-post evaluation : Same as the status of 4c above
Output X	Xa. By March 2009, a hazard map of the Target Area is developed based on the latest satellite images (2009) for distribution to the local communities.	Achieved : The hazard map was completed in March 2009, and the revised version was produced in February 2013. Status at the ex-post evaluation : Utilized till the end of the Project, but no change since then.
	Xb. By March 2010, a report on damage & recovery survey on the communities in the Target Area is prepared.	Achieved : The results summary of the survey was incorporated into the Project report. Status at the ex-post evaluation : Utilized till the end of the Project, but no change since then.
	Xc. By March 2010, Centre for CF Extension & Nursery in each RF is rehabilitated.	Achieved : Provision and delivery of the equipment were delayed due to some external factors. Four centers for CF extension and nursery were rebuild by July 2010 Status at the ex-post evaluation : Each township's FD office were continuously using the centers as their camps (branch offices). Field level FD officers (foresters and range officers) were stationed in these camps. The centers can be used with fees by NGOs and other organizations working with FD for mangrove conservation. This made the centers significant economic assets since FD's budget allocation to the field offices was often not enough. Although they were not yet used by communities as shelters for disaster prevention, neighboring communities recognized the shelters as refugee centers if the next natural disaster strikes such as Cyclone. When a cyclone was forecasted in 2015, it was reported that communities came around the shelters.
	Xd. In 2009 & 2010, materials necessary for disaster recovery or prevention work are provided to the FD and the Cooperating Agencies based on the needs.	Achieved : All the materials and equipment considered to be needed at that moment were provided within the fiscal year of 2010. Status at the ex-post evaluation : Utilized till the end of the Project, but no change since then.

	Xe. By December 2011, a report on recovery condition of mangrove vegetation (2008-2010) is prepared.	Achieved : The technical report finalized in March 2013 included this data and the analysis results. Status at the ex-post evaluation : Utilized till the end of the Project, but no change since then.