Asia-Pacific Network for Sustainable Forest Management and Rehabilitation

Integrated Forest Ecosystem Management Planning and Demonstration Project in Greater Mekong Sub-region (Cambodia)

A report on current conditions of Community Forestry and its management

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1 Project Background

Damrey Chakthlork Community Forestry (CF) was established on 19 February 2013 following the declaration of Ministry of Agriculture Forestry and Fisheries. The committee of this community has commenced working with Forestry Administration since 23 July 2014. Damrey Chakthlork CF has developed its CF Management Plan with assistance of RECOFTC. Besides there are three documents available for this CF management, i.e. An Agreement on CF Management among Villagers, An Agreement on CF Management between Local FA and the Community, and A CF Management Plan generated with the assistances from local FA. However, conditions of forest stands are not well investigated, linkages between community and forest are not well analyzed, and actions to be taken are not specified and deployed in a concrete spot, which brought about difficulties to implement consistent and effective actions. With the aims to provide a comprehensive solution for improving the stand quality, increasing forest stocks, and enhancing its ecological services and product provisions, the management plan is generated through close cooperation among Chinese qualified planning institution Yunnan Academy of Forestry, IRD, local FA, and community. During the planning process, a full investigation of forest stands and land uses has been carried out, and a traditional uses of forest resources were surveyed, while existing agreements and management plan was used as an important background and reference.

2 Basic Information of CF Area

2.1 Location and scope of the area

The site chosen to implement CF management in this project is located in Dokpor Village, Krangdeivay Commune, Phnom Srouch District, Kampang Speu Province, Cambodia. The total area of this piece of community forest is approximately 1,452 hectares, which covers full area of CF of Dokpor Village. Of which, about 1,260 hectares is the area the villagers can access to collect non-timber forest products

(NTFPs). See figure 1-3.

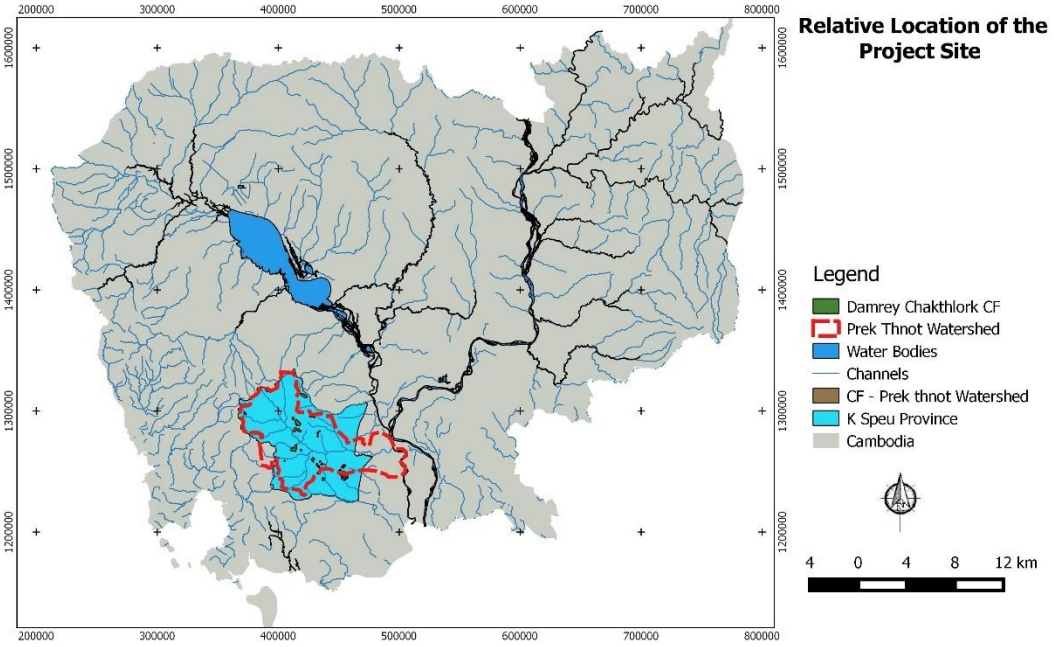

Figure 1 Location of the project site

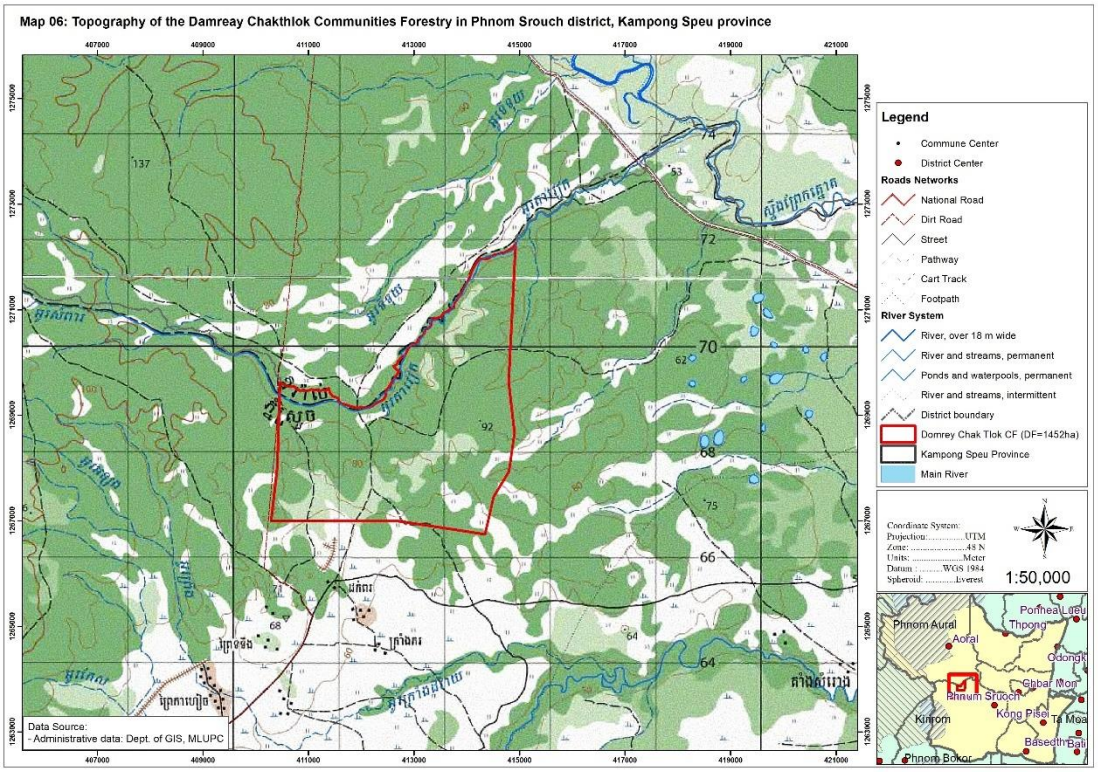

Figure 2 Location of the CF

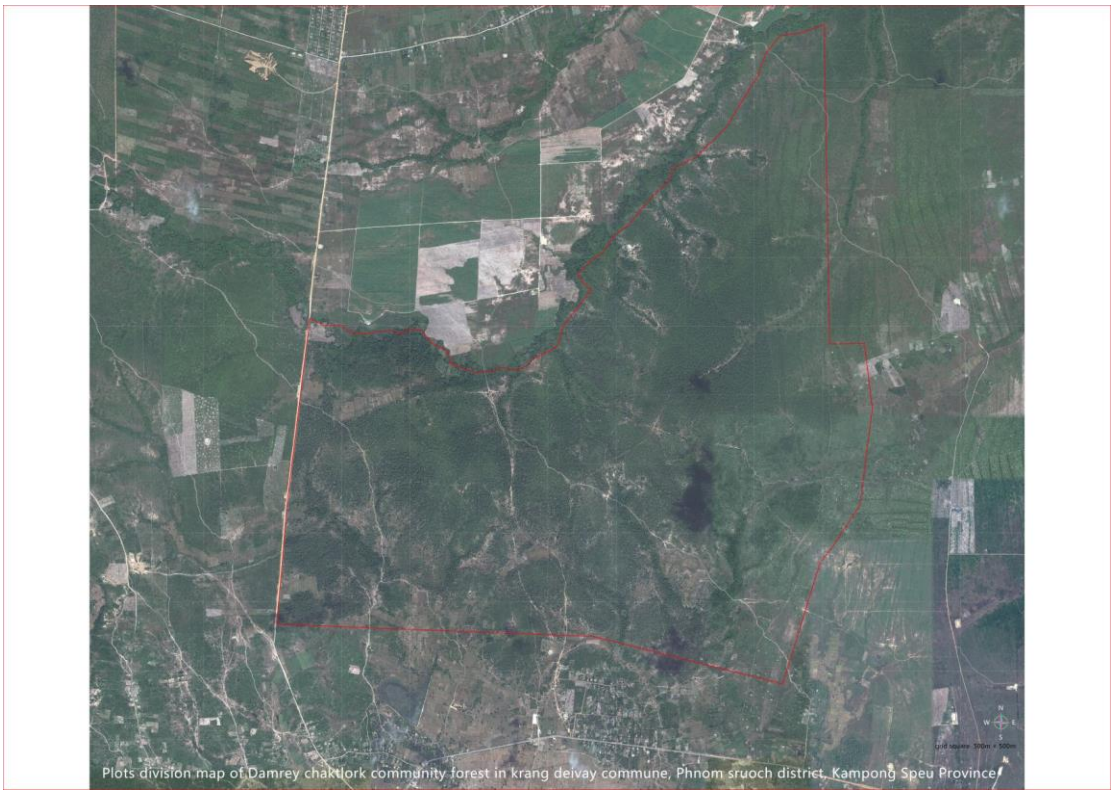

Figure 3 Current condition of CF

2.2 Socio-economic conditions

2.2.1 Villages and villagers

The project area covers two villages, the total household in both villages around Damrey Chackthork Community Forestry are 390 households with population of 1,599 (women 813). The majority of them are Buddhist.

2.2.2 Education and populations

Villagers are usually of low education level and lack of professional skills. The village has its own primary schools, offering education for the students in the villages for free charge. Middle schools are established in the commune. However, due to economic limitations, the general education level of the communities is still quite low and the education level of the male members is higher than that of the female members.

In terms of the population in the two villages by age, people older than 60 are 152,

age between 40-60 years old are 207, between 36-45 are 190, between 25-35 are 175, between 18-24 are 197, and between 0-17 are 678. Although the illiterate rate is not high and only 0.43%, more than half of the people between 45 and 55 years old did not have finished their formal education and only a small part of them have had graduated from primary school education; most of the people ranging between 20 and 39 years old had finished their primary school education but only a few have had junior high school education; almost all of the people younger than 20 have had some formal education and a considerable proportion of them have completed their junior school education and a few of them have achieved the college or university education level.

2.2.3 Main income sources

Limited to various degrees by geographical locations, natural conditions and cultural backgrounds, the economy of the villages is quite underdeveloped. On average, the net annual incomes of the villagers range from $1,200 to $2,500 per household. They are farmers and 67.5% of them are medium while 32.5% are poor in different levels.

The main income sources are from casual labor, rice, livestock, fruit and NTFPs. The labor price in local market is $5/day, and there are many factories and construction sites around, so it is easy for people to find casual job. The main crop of the community is rice, due to poor soil condition and lack of fertilizer, the yield of rice is relatively low which is 3,750 kg/ha. Annual yield per household is 2 tons, the price of rice in local market is $300/ton.

2.3.4 The other income-generating activities

Other casual incomes come from mango and mushroom. Mango is the main fruit for selling because there are transnational corporations near the community which not only set up 1,000ha mango plantation bases but also purchased from local farmers, the purchase price of fresh mango is $0.18/kg.

During rainy season, people go to surrounding forest to collect mushroom to sell to the market, such activities usually last for 2-3 months per year. The livestock fed by

household include cow, chicken and duck. Each household owns 2~3 cows and there are about 1,500 cows grazing around the community. One reason is there are lots of grass land transformed from degraded forest land where are good for grazing, another reason is the market price of beef is $7/kg which is higher than the price of other livestocks.

2.3.5 The main expenses for household

The daily expense of one household is about $60 to $200/month which covers necessaries, electricity, petrol, communication cost. Electricity line already reaches to every house, but not all the household could afford it, the poor households use kerosene for lighting and battery for mobile phone charging. Firewood is used commonly in the community for cooking since it can be picked free and easily from surrounding community forest.

The average size of one family in the community is 5 persons, the children who don't get married usually stay with their parent. Once they get married, each household can get 25m×100m homestead and 1.5ha rice land for free from the community, and then they will separate from their parent.

2.3.6 Road and transportation conditions

The community is about 38km far away from Kampong Speu Province and 28km from Phnom Sruoch District. The main transportation means of the community is motorcycle and tractor. Motorcycle is used for daily traffic and tractor for goods transport such as firewood and grains. A secondary road runs through the community and links to the main road to downtown, the distance from the community to the town is about 30km, but due to the road is in bad repair, it takes one hour by car. There is a simple gas station in the village for both diesel and gasoline. The price of diesel is $1.27/L and of gasoline is $1.45/L.

2.3.7 Healthy and medical conditions

There are a clinic in the village, a public hospital and a private hospital in the town. The farmers of the community who got minor disease usually went to the clinic, who got minor mild public hospital. All medical treatment of above three institutions should

be paid by farmers themselves. The charge of the private hospital is relatively higher than other two kind of medical institutions. The poor people who couldn't afford to treatment can apply for certification from local authority so they can get free treatment from public hospital. The sanitary condition of the community is at the lower middle level. There is no centralized garbage treatment and water purification system in the community. Garbage are littered. Rain water collected in big vats during rainy season is used for daily drinking water.

3 Current Conditions of Resources and Its Utilization

3.1 Current conditions

Damrey Chak Thlork is located in Phnom Srouch district, Kampong Speu province, a national permanent reserved forest and within Prek Thnot Watershed, one of the tributaries of the Lancang-Mekong basin. Poverty is common mostly in the northernmost part of Prek Thnot watershed. The downstream part is in the southeastern part of the watershed where most of the residential areas are located. This part is highly urbanized and the most are vulnerable to erosion and flooding. The risk to flooding increases as surface runoffs increase due to deforestation in the upland areas.

3.2 Distribution of main resources in the area

Damrey Chakthork community has five main areas including Chamkar Thorn, Darey Chak Tlork, Tropeng pring, Chros kess, and Sanva Pich. The resources distribution is as below:

Area	Area (ha）	Main Resources and Its Characteristics
Chamkar Thorn	146	Shrubs, rattan, sand soil, soil not fertile, harbor, reservoir, wildlife
Darey Chak Tlork	323	Shrubs, rattan, sand stone soil, wildlife
Tropeng pring	528	Shrubs and rattans, sand stone soil, soil not fertile, reservoir, wildlife and different tree species
Chros kess	409	Shrubs and rattans, sand stone soil, soil not fertile, waterfall,

		wildlife and different tree species
Sanva Pich（forest restoration area）	46	Cash tree forest area, rent to companies , pasture land, grape plantation since 2010

3.3 Assessment of current forest resources

The CF of Dokpor Village are tropical dry forests comprising of deciduous and evergreen tree species, such as *Dipterocarpus obtusifolius, Pterocarpus macrocarpus, Phyllanthus emblica, Antidesma ghaesembilla* in the tree/top layer, *Melienthes suavis*, *Diospyros ehretioides, Mesua ferrea, Memecylon edule, Catunaregam tomentosa* in the shrub layer, and *Curcuma alismatifolia, Scoparia dulcis, Ludwigia adscendens, Costos speciosus, Morinda tomentosa* in the herbaceous layer. Due to intensified harvesting during/after the civil war, reclaiming land for rice production by destroying forests, continuously cutting of big trees in normal times, and interrupted grazing, the community forest is degraded. There are some regenerated seedlings in the forest, but a big proportion of them are root suckers genetically deteriorated.

3.4 Land and soil condition

The land of CF is flat area with the slop less than 3 degree. This flat land is easier for machinery transporting, land preparation and planting. But it also has negative aspect, e.g. flooding and forming swamp in raining season which make planted trees get drowned. The soil is sand soil and not easy for water maintaining and the land fertility is poor.

3.5 Utilization on CF resources

Forests are important resources for villagers as their subsistence. Forests provide the villagers with firewood, timber and materials for making farming tools. NTFPs from forests improve villagers' life quality on one hand and on the other hand increase their incomes by selling to the markets.

3.5.1 Timber products

Every year, most of the families will need some timber for repairing houses or constructing new ones, but the demand for timber is not large Since villagers are only allowed to use the timber wood for poles of house construction. Before cutting trees the villagers must report to the village and get approved by CF Management Committee (Council).

The local villagers are very interested in some tree species for the poles for their house construction, such as *Pterocarpus macarocarpus, Sindora glabra, Dalbergia cochinchinensis, Shorea robusta,* and *Cassia siamea.* They use the forest resources in the following aspects: house construction, road building, fences, furniture, tools for farming etc.

The Participatory Rural Appraisal (PRA) data in the year 2013 indicated the annual consumption of timber is 100m^3, 200 logs of wood and 1,500 pieces of fence.

3.5.2 NTFPs collection

Forests bring rich NTFP resources to villagers, who have been living here for generations, have the habit of gathering and making a living out of these resources. Each year, the amount of NTFPs of various kinds collected by the villagers from the forests is up to 10 tons. The CF area is open to local people for NTFP collection, like wild fruit, bamboo shoot, yam bean, mushrooms, wild vegetables, insects, bee honey etc., but mainly for daily use rather than trade. For the mushroom collection, they can collect 2-3 times per year and about 5-10kg per household per day. Besides the mushroom collection, the other annual consumption related to NTFPS mainly are wild fruit(600kg/year), wild vegetable(3000kg/year), herb medicine(2700kg/year), bamboo shoots(2200kg/year), yam beans(500kg/year), and insects(red ant 1150kg/year).

3.5.3 Fuelwood

Firewood is the major consumption of forest resources in the community, total amount of fuelwood consumed by the villager family is about 585m^3 each year, varying from 1.4 to 1.7 m^3 per household depending on the family size, the number of domestic

animals kept, the type of stoves use, the availability of alternative energy sources and family habits. The total consumption of charcoal is about 500kg per year by the community. The local villagers are permitted to collect dead trees and dry branches for fuelwood use and only for households themselves. Normally the consumption of fuelwood use by each household is about 1 stair (1.2m*1.2m*1m) per year.

3.5.4 Cattle grazing

There are more than 1000 cattle in and around the CF area. The CF area is open to villagers for cattle grazing. Since cattle raising is main income source for most of village households, cattle population has increased to almost the carrying capacity of CF which lead to over browsing of young regeneration and forest degradation.

3.5.5 Holly land (15 ha for praying for rain)

The Community forest has beautiful scenery spots and unique forest landscapes. There is a holly land inside the CF, caused by soil erosion, covering an area of 15ha, it is commonly used by people from outside the villages for praying for rain.

3.5.6 Consumption of forest products and NTFPs

Types and amount of forest products including NTFPs consumed in the community is listed as following table.

No.	Products	Consumption per hh	Average consumption per person
1	Wood	100m^3	125 m^3/person/year
2	Fuelwood	1382 bales	865 bales · person/year
3	Charcoal	500kg	313kg/person/year
4	XX Log	800 plants	500 plants · person /year
5	Mushroom	6000kg	3752kg/person/year
6	Fence	1650 poles	1032poles · person/year
7	Wild fruit	600kg	375kg/person/year
8	Bamboo shoot	2200kg	1376kg/person/year

9	Medicine	2700kg	1689kg/person/year
10	Sweet potato	650kg	407kg/person/year
11	Wild vegetable	3000kg	1876kg/person/year
12	Red ants	1150kg	719kg/person/year

4 Current Status of CF management

Due to remote and out-of-the-way location, the village is suffering from inconvenient transport conditions and poor access to information. The villagers are universally poorly educated. The traditional way of life and production of the villagers (using energy-consuming stoves, free-ranging of domestic animals) has a heavy reliance on the forest resources. Irrational exploration and utilization of the forest resources have resulted in highly degraded collective forests and depleted resources availability and constituted great threats to the forest resources and biodiversity of the area.

4.1 Existing planning areas

Damrey Chakthork community set the management plan projected to the year of 2030. It was published in January 2016 and focused on 5 main areas including Chamkar Thorn, Darey Chak Tlork, Tropeng pring, Chros kess, and Sanva Pich. The total area is 1,452ha， of which 45.42 ha is farm land, and 1,260ha is the area that people can access to collect NTFPs.

4.2 Management and decision-making procedures

Currently, Community Forest Management Committee has been established in the community, which exercises provisional power for the CF management in the area. The director is in charge of overall management; the concrete management tasks are delegated to the Committee members. There are totally 11 members, of which, one director, one vice director, one finance personnel and seven members. The members

take their responsibilities for the patrolling in CF. In decision-making procedures, the decisions or instructions are passed over from level to level (i.e. from villagers to members of committee then to the Committee).

4.3 Boundary management

The boundary of the CF follows some small paths inside the forest and is approved by the local government. So far, boundary poles and signboards have been set up around the CF area (1,452ha).

The demarcation and patrol of community forests bring a signal to declare the identity of CF, which will put a foundation to strengthen the management of CF. Besides preventing CF from encroachment, boundary poles and signboards increase villagers' awareness of forest conservation.

4.4 Existing regulations for the CF management

There are three documents available for this CF management, i.e., An Agreement on CF Management among Villagers, An Agreement on CF Management between Local FA and the Community, and a CF Management Plan generated with the assistance from local FA. However, conditions of forest stands are not well investigated, linkages between community and forest are not well analyzed, and actions to be taken are not specified and deployed in a concrete spot, which brought about difficulties to implement consistent and effective actions.

4.5 Current Organization for the CF Management

In general, the CF is managed under Administrative office which composed of local FA, Coordinator/international/National Consultancy and Community Forest Management Committee. While the Community Forest Management Committee is formed by one director, one deputy director, one secretory, one financial staff, and seven members.

5. Major problems Faced by CF Management

Community forests were disrupted historically by land encroachment, cutting, grazing, and collecting, forest fire, soil erosion, forest degradation etc. To prevent CF from those disturbances, actions of demarcation have been listed in the existing management plan of CF since it was formulated. It is, however, not conducted because of lack of funds.

5.1 Threats from population increase

Increase in population will inevitably result in a reduction of available land resources and a greater demand for timber and fuel woods and thus present ever increasing pressure on the CF and forest resources.

In year 2013 the total population of CF area is 1599 while the population increase rate in the Kampong Speu Province is 190%, which will give the threats to the forest resources consumption.

5.2 Ecology

Their traditional way of life and production has a heavy dependence on and often results irrational uses of the forest resources. The villagers usually do not have adequate conservation awareness.

5.3 Encroachment

There are some farmlands inside the CF for generations, since the boundary of CF is very clear the encroachment of forest land occurs in the area because of various farming activities.

5.4 Forest fire

Forest fire is the biggest threat faced by CF. Forest fires mainly result from

villagers' burning of seasonal agriculture farmland from east of the CF area since there are some blocks of rice paddy land scattered in between the forest. During the growing season, the farmers like to burn the grass and weeds for land preparation, besides they think in this way the burning will help provide with fertilizer for the soil and more new grasses can be made for feeding their cattle as well. The forest fires give high impacts on the CF management and destroy the biodiversity resources and ecosystem integrity of the CF.

5.5 Free grazing

Due to historical reasons, villagers living in the community regard the CF as their natural pastures and free grazing in the forest is quite common. Cattle is the major domestic animal the villagers often herd in the forests. Data from interviews indicated that more than 1000 heads of cattle were kept in the community. Free grazing in the forests not only causes damages to the forest vegetation and reduces forest biodiversity but also causes shortage of food sources for wildlife, as well as the impacts on forest natural regeneration.

Free grazing or overgrazing destroys the vegetation type and damages some small and young seedlings for their natural regeneration in the CF.

5.6 Illegal logging

Many tree species in the CF are with high economic values. Some local villagers and outsiders illegally cut these trees tempted by economic benefits.

5.7 Open area/severely degraded forest need to be reforested

There about 25% of the community forest land is severely degraded areas and open areas which is so degraded that forest regrowth has not occurred and which is now

mostly occupied by grasses and shrubs resulting from excessive and damaging timber exploitation. Forest fire in dry season coming from Forest Economic Concession in the east of CF is another major reason. This result in serious water and soil erosion in raining season. The area needs to be restored by tree plantation establishment, which will increasing vegetation caver, reduce erosion and generate economic income from fuel wood and timber production, and NTFPs collection.

5.8 Lack of seedling and silviculture technology

There are some regenerated seedlings in the forest, but a big proportion of them are root suckers genetically deteriorated. Besides, the villagers have no sufficient knowledge on tree species for seedling raising and lack of silviculture technology and experiences on tree planting.

5.9 Lack of maintenance on regenerated forest

Most of CF area is regenerated secondary forest. Land occupied by woody regrowth that has developed on a site after an earlier disturbance of forest fire, logging and shifting cultivation. The site now has been dominated by Dipterocarpus species. Besides, some rose wood specie as Pterocarpus macrocarpus, Dalbergia cochinchinensis, Sindora glabra, and Cassia siamea are scattered with certain amount in the CF. these high value timber trees has big potential to become income source for villagers in future if these trees were well managed. However, their current growth performance is not desirable with 2 major problems of:

1) Uneven density. The valuable trees are not evenly distributed in the forest. Some are closely growing together, with spacing of less then 1m, which lead to strong internal competition.

2) Poor trunk shape. The trees are growing under natural condition, has no management e.g. appropriate pruning and density control, most of the trees has curving poor trunk shape and short under branch height which greatly deducted timber value.

Therefore, the quality of valuable tree species is too low to become new income source, and need to be maintained to improve its quality.

5.10 Insufficient village economic development

The village is far from the market and poor transport conditions have made the villagers difficult to sell their products. Due to irrational structures, their economic sources are quite limited.

5.11 Lack of conservation awareness on forest resources

The traditional way of life and production has a heavy dependence on and often results irrational uses of the forest resources. The villagers usually do not have adequate conservation awareness.

The villagers have to protect their CF is because the government have announced that if the area becomes a farmland and it will be given to other villages for management. If the case happens they will never get the CF back again.

6 CF Management Action Plan

6.1 Significance

Community forest is an inevitable component of national vegetation in Cambodia and plays an important role in Mekong watershed maintenance. Forestry administration at all levels and local governments are aware of the significance of CF management. CF is not managed in a very good manner currently because of lack of fund, awareness, and sound plan. The project aiming to improve CF management needs to start with an

integrated management plan. While guiding the actions in targeted CF, the management plan produced in this project will hopefully become a template for other CF planning, so as to enhance CF management in Cambodia and even in the whole Mekong watershed.

The designing and implementation of the CF management action plan has an opportunity for solving some of the practical problems faced by the villagers, as well as good for the improvement of CF management. With the concern and common efforts of local governments, villagers, management departments, the implementation of the CF management action plan activities will help to raise the living standards and conservation awareness and change the attitudes of the local people, reduce the villagers' dependence on forest resources, restore the regenerative capacity of the collective forests, improve forest quality and increase the habitats of the wildlife so as to effectively conserve the forest resources and biodiversity and eventually integrate forest conservation and social economic development of the communities.

6.2 Objectives and Strategies

6.2.1 Overall Objectives

To conserve the original forest ecosystems of CF, its abundance of biodiversity and key biological features, enhancing its ecological services and product provisions.

6.2.2 Specific management objectives

(1) To ensure sound natural resource management to support sustainable use of NTFP for forest community;

(2) To protect natural resources from exploration and illegal logging or forest fire;

(3) To contribute to poverty reduction in forest community through sustainable management approach.

6.2.3 General strategies adopted for improvement of CF management

In view of the present management status of Damrey Chakthlork CF, it is imperative to improve and perfect the management approaches and means and to reinforce the efforts on CF management, the following strategies related to management objectives are identified:

Management Objective 1: To ensure sound natural resource management to support sustainable use of NTFP for forest community

Strategy 1: Strengthening boundary management

Strategy 2: Zoning (Mapping for resources management and uses)

Strategy 3: Strengthening the management of CF natural resources and NTFPs

Strategy 4: Conservation awareness building

Management Objective 2: To protect natural resources from exploration and illegal logging or forest fire

Strategy 5: Improvement of patrolling system

Strategy6: Restoration of Severely Degraded Forest

Strategy 7: Restoration for the Degraded Area/Open Area

Strategy 8: Forest quality improvement

Strategy 9:Strengthening forest fire prevention

Management Objective 3: To contribute to poverty reduction in forest community through sustainable management approach

Strategy 10: Strategy 3: Formulation on Ecotourism Development Plan

Strategy 11: Increasing income sources

7 Management Activities

Management Objective 1: To ensure sound natural resource management to support sustainable use of NTFP for forest community

Strategy1: Strengthening boundary management

Activity 1.1 Field survey for demarcation

The boundary of CF has lawful status according to the approval of the government.

Over the years, because of damage of boundary poles, the original boundary of the CF needs to be confirmed and ratified. Besides, some new boundary poles need to be increased for the strengthening of boundary management. The demarcation should be conducted jointly by local Community Forest Management Committee Members, IRD and international experts.

The IRD invites the international experts and with the participation of the members from local Community Forest Management Committee to carry out field survey in the CF and check the boundary. Based on the data collection from field, a sketch map will be made for the demarcation. The boundary poles to be installed should be marked on the map.

Timeframe: The first year of the project

Site: CF area

Implementer: local community，IRD staff, and international experts

Proposed Budget: $ 5,950。

International consultancy: International Travel: $ 2000 （1000/person×2persons); Food and lodging: $ 1350 ($ 225×3 days× 2person); travel expense of project staff: $ 1600 ($ 80/day× 10days ×2persons); vehicle rental: $ 1000 ($ 100/day ×10 days)

Activity 1.2 Make and install poles and billboard

Make clear the boundary of the CF and protect the CF according to the law and regulations.

The CF is going to be demarcated through establishment of billboards and cement poles. Billboards will be established in strategic locations to inform the public of the boundary of the CF, on which the map of CF will be concluded. Cement poles are installed at the boundary of CF. The ground total of boundary poles to be installed is about 100. The installation will be conducted by community members.

Boundary poles will be made of cements and iron stick, and coded in numbers with

color paint. A total of approximately 100 poles will be installed at the boundary of CF clockwise. The billboard will be implemented in the area where are at high risk of being encroached. Approximately 2 billboards (change contents from opposed warning to friendly advice) will be installed in strategic areas.

The installation of the billboards and boundary poles will be conducted by the CF members. The project will provide a budget for the design of the billboards and production of boundary poles.

Timeframe: The installation will be conducted on the first year of the project.

Site: CF boundary area

Proposed Budget: $ 6,900

Cost of cement poles(including installation): $ 4500(100 posts× $ 45); cost for billboards: $ 800(2billboards × $ 400/unit);travel expense: $ 6800($ 80/person× 2 persons× 10 days)

Activity 1.3 Formulate and print CF Management Action Plan

Under the goal of enhancing ecological services and product provisions, the CF Management Plan of Dokpor Village will follow the principles of combining modern forestry management theories with the reality of CF management practices, integrating experts' view and local residents' opinions.

Based on full understanding of forest conditions, management status, and willingness of management, the CF Management Plan of Dokpor Village will be formulated by using participatory approaches. Especially group discussions will be regularly carried out with the participation of various stakeholders and experts. At the end, the Plan should be approved by external expert committee and accepted by the local villagers.

Timeframe: The first year of the project

Site: CF community

Participants: IRD project staff, experts, community members, villager Representatives

Proposed budget: $ 60,984

Management Action Plan formulation: $ 60,984 ($ 42/ha×1452ha)

Strategy 2: Zoning (Mapping for resources management and uses)

Activity 2.1 Survey current conditions of CF and its management

Current conditions of CF are crucial to generate a sound management plan. Investigation covers the current conditions both inside the forests and outside the forests.

Forest investigation will be carried out with the methods of sample plot investigation and management zoning. Management conditions will be investigated by interviewing and collecting second-hand information/materials.

An investigation and planning team will be organized with the participation of qualified Chinese forestry planning experts, IRD professionals, local FA staff, and villagers. The Chinese expert will be the team leader to guide the whole process and responsible for bringing in knowledge and techniques for CF planning.

Timeframe: The first year of the project

Implementation site: CF area

Budget: $ 10,350.

International consultancy: International Travel: $ 2000 ($ 1000/person×2 persons); Food and lodging: $ 3150 ($ 225×7 days× 2person); travel expense of project staff: $ 3200 ($ 80/day× 20days ×2persons); vehicle rental: $ 2000 ($ 100/day ×20 days)

Activity 2.2 Zoning mapping to improve CF management

To assess human activities in the CF, such as grazing activities, the population of livestock and impact of grazing on the CF; NTFPs collection, forest resources uses,

farm land inside the CF. With the technical support from institutions and experts mapping for zoning, including restoration area, protection area, pasture land etc. aimed at regulating the grazing activities in the CF and helping the local community to practice reasonable grazing, which will contribute to the resources use management and forest conservation in the CF.

With the participation of members from Community Forest Management Committee, invite technical institutions and experts to carry out investigation on the distribution of vegetation, timber tree species, fuelwood tree species, pasture land area, NTPFs etc. Resources distribution map making based on the data collected.

Timeframe: The first year of the project

Site: CF area

Implementer: IRD, local community, International experts,

Budget: $ 4,130

International consultancy: International Travel: $ 2000 ($ 1000/person×2 persons); Food and lodging: $ 1350 ($ 225×3 days× 2person); travel expense of project staff: $ 480 ($ 80/day× 3days ×2persons); vehicle rental: $ 300 ($ 100/day ×3 days)

Strategy 3: Strengthening the management of CF Natural resources and NTFPs

Activity 3.1 Establish Forest Resources Joint Forest Management (JFM) mechanism

The JFM can be emerged as an important intervention in management of CF resource. Small village groups with the participation of Community forest committee members, villager leaders, villagers and technical staff from relevant institutions can be organized to protect CF resources through collective action. The JFM system seeks to develop partnerships between local community, villagers and forest departments for sustainable management and joint benefit sharing of CF.

To organize regular meeting per year aiming at cooperation and communication in deal with the problems concerning resources management based on the results from patrolling and monitoring in order to discussion solutions for the improvement of the mechanism.

Timeframe: During the project period, once per year

Site: CF community

Implementer: Community forest committee, IRD

Participants: Village leaders, villagers, staff from relevant institutions

Budget: $6800

Travel expense of project staff: $1600($80/day*2days*2persons*5times); Travel expense of the participants from relevant institutions $5000 ($100×2days× 5persons×5times); Materials preparation: $200

Activity 3.2 Training on sustainable way for NTFPs collection

Efforts shall be made to avoid depletion of NTFP resources resulting from excessive collection and to achieve sustained uses of the forest resources, besides strengthening publicity, it is necessary to invite experts or the villagers who have good indigenous knowledge to compile manuals on sustainable collection and exploitation of NTFPs.

To organize a training workshop, experts will be invited to train the villagers on sustainable way for NTFPs collection and disseminate these technologies on better using NTFPs.

Timeframe: once a year in first 3 years of the project

Site: CF area

Implementer: CF community, IRD

Budget: $7260 ($2420 × 3 years)

Travel expense of project staff: $320($80/day*2days*2persons); travel expense for trainer (2 experts): $1500, food & lodging $400 ($200/day*2days*2persons)

Training Materials preparation: $200

Activity 3.3 Participatory Resources Assessment

Data collected during patrolling and monitoring must be analyzed to be used for the improvement of regulation for the CF management.

One-day Workshop can be organized by the Community Forest Management Committee collaboration with the support of IRD and relevant technical institutions, the villagers will be invited in the workshop in order to better understand the actual situation of the CF and its changes result from their utilization and management.

During the workshop, the facilitator will make report on the current status of CF resources based on the information from their daily patrolling, the usage of different resources, including pasture land, timber, soil erosion, tree cutting, fuelwood and NTFPs collection, forest fire etc. Based on the report, the participant can be divided into small groups for discussion on different topics and give their ideas on how to improve the management. After discussion, one person from each group will be invited to give plenary for their discussion result. Based on the result from the workshop, the important resources list with focus on can be prepared for Participatory Resources Monitoring.

Timeframe: The first year and the fifth year of the project

Site: CF area

Implementer: CF Community

Participants: IRD staff, technical staff from relevant institutions, the experts can be invited when necessary

Budget: $1560 for 2 times

Travel expense of project staff: $ 960 ($ 80/day× 3days ×2persons*2times); vehicle rental: $ 600 ($ 100/day ×3 days*2times)

Activity 3.4 Participatory Resources Monitoring

To organize villagers participate in monitoring on resources use. Villagers can be divided into small groups to do the monitoring on key timber tree species, NTFPs

collection, fuel wood harvesting, grazing and forest fire etc.

Based on the selected targets from Activity3.3, each group can be consisting of 3-5villagers depending on their interests. They together to do the monitoring on the target species, especially focus on the key species which are faced with serious threats, getting to know their ecology and trends, as well as their changes in populations etc. Recording should be made on the monitoring.

Monitoring recording table:

Table 1: Abundance of resources

Date	Name of recorder	Place	Species	Method + time spent	Results	Observations

Table 2: Abundance of wildlife

Date	Name of recorder	Place	Species	Method + time spent	Results	Observations

Table 3: Specimen collection

Date	Place	Collector	Species	Specimen number	Photo number

Table 4: Resource use

Species	Parts used	Subsistence amount	Marketed amount	Income

Table 5: Wildlife damage

Date	Place	Wildlife	Type of damage	Amount of damage	Value loss	Photo number

Timeframe: Long-term

Site: CF area

Implementer: CF community

Budget: $2000 for organize meeting and tasks distribution

Strategy 4: Conservation awareness building

Activity 4.1 Conservation awareness publicity

The children will be the masters of the villages in the future and therefore they should be the priority target group for education on forest conservation, and they also can transfer the information to their parents. The activity can be carried out cooperating with the local school to publicize the importance of conserving forest resources and biodiversity. Books, pictures and posters on forest resources and biodiversity can be purchased for the school students.

Timeframe: long-term

Site: CF area

Implementer: CF community, IRD, School students

Budget: $1000, Materials making and purchase of books

Management Objective 2: To protect natural resources from exploration and illegal logging or forest fire

Strategy 5 Improvement of patrolling system

Activity 5.1 Purchase of equipment for patrolling

The purpose is to implement patrolling efficiently.

The community forest management committee has its patrolling system which needs to be improved and strengthened according to the local transport condition, the changing situations and seriously implemented. The regular patrolling must be made, filling in forms and writing reports. Purchase of some necessary equipment is needed, according to the number of patrollers, like boots, camera, interphone in order to better implement the patrolling and monitoring on CF resources management.

Timeframe: The first year of the project

Site: CF area

Implementer: CF community

Budget: $3000

Activity 5.2 Patrol the CF

The community will be supported in their patrol works of the area. This includes patrolling the CF areas particularly the restoration plots from stray animals and illegal cutters.

Assistance will be provided to the community on patrol works considering that the CF does not yet provide steady income.

The community members will submit periodic report on the patrol operations. A camera with GPS will be provided to the community. They will be required to take pictures of any interesting features that they observed in the area. These include forest fire, illegal cutting encroachment and other forms of forest disturbance. In addition, the pictures will be taken on wildlife that are observed in the site. Before handing the camera with GPS, the community will be trained on how to use it. The photos in the camera will be copied by the Project Staff. The geo-tagged photos will be stored in the computer. These will then be uploaded and stored in the GIS. A regular report will be generated indicating the result of the patrol operation of the community members (i.e. trend of the transgressions and observation of wildlife).

Participants: The patrol operation will be conducted by the CF Management committee. The processing of the geo-tagged images will be conducted by the project staffs.

Timeframe: The regular patrol operation will be conducted throughout the project.

Budget: $ 4800

$ 4800 for labor-patrol works (48months× $ 5/person-day×2 persons/patrol× 10 patrols/month)

Activity 5.3 To set up Patrolling and Monitoring Reporting system

Based on monitoring and patrolling recordings(data/information collected by pictures and writings), reporting system should be made.

The report should give a description of CF area, general socio-economic condition, present the monitoring results, the benefits from the monitoring activities as well as the problems encountered during the implementation, and what should be done to solve these problems. A working plan for next year also should be made based on the monitoring results. The concrete questions the Patrolling and monitoring team intends to answer in their report are as below:

- Are populations of resources and wildlife declining?
- Are habitats of wildlife degrading?
- What are the causes?
- What may be the solutions?
- Do the management actions and conflict management lead to conservation (of CF)?
- Are there increased benefits to local people from sustainable natural resource use and conflict management?
- Is awareness improved?
- Is capacity & knowledge improved?
- Are relationships improved?

Timeframe: Every year at the end of the year during the project implementation Implementer: CF community

Budget: $ 5,000

Strategy 6: Restoration of Severely Degraded Forest

Activity 6.1 To establish fuel wood plantation

To reduce the pressure of the villagers on the forest resources in getting fuelwood, fuelwood plantations will be practiced in Severely Degraded Forest. 56ha of fuelwood in the eastern area of CF is recommended. The seedlings will be provided by local FA

and the villagers are paid for planting trees.

Recommended species: *Cassia siamea, Acasia mangium, Eucalyptus sp.*

For original forest, dominant trees with straight trunks in the tree layer will be remained, while small trees, shrubs and weeds under remnant trees are cleared out. The size of pit for planting is 40×40×30 cm. The density for planting is 1×2 m, which means a total of 15,000 seedlings or 5,000 seedlings per hector or per block. (i.e. at 5,000 seedlings/ha) required. Each pit is applied with 50g of compound fertilizer. A technical manual for firewood plantation management in the CF will also be produced at the end of the project. Field planting will be carried using 1-year-old seedlings.

Soil preparation: Based on the restoration design, site clearance and soil preparation will be carried out in each type of targeted forestlands in specific standard and requirement.

Planting requirements: Seedling planting is crucial to establish restoration models, so as to guarantee the success of the project. The activity will go through backfilling of soil, application of fertilizers, planting of seedlings, weeding and maintenances of plantations.

(1) Seedlings for planting should keep in an even size and go beyond at least 1 year old;

(2) Seedlings are accurately allocated and properly planted in a specific block and row or column according the design;

(3) 100g basal compound fertilizers are applied according to the design for each tree species and each block.

Maintenance requirements:

⑴ Check the survival rate of afforestation after 1-2 months, and carry out enrichment immediately if trees are found to be withered.

⑵ Weeding and Cultivation: As tropical zones have high temperature and large humidity, and the survival and growth of seedlings may be negatively affected by weeds and shrubs, so tending control after afforestation should be reinforced. Keep weeding for 1-3 years after afforestation, and keep tending for 2~3 times per year, once in the

early, middle and late rainy season respectively. Carry out tending and weeding once in September-October in the afforestation year, and tending and weeding once in April-May and October-November in the 2nd and 3rd year respectively. Appropriate ground cover is reserved during weeding to improve the ground temperature and humidity, and promote growth of trees. Adopt strip or hole tending, the strip is 1m wide, and the hole is 1~1.5m. Noxious weeds are climbing vines are eradicated, while benign weeds and shrubs not in holes are kept. During tending, earth up the root with the loose soil, and use the eradicated weeds for mulching on the planting spots, so as to reduce surface moisture vaporization, increase organic matters and inhibit growth of weeds. Don't hurt the stem, twig, leaves and root system of young trees during weeding, cultivation and ploughing, so as to avoid diseases of trees and keep the preserving rate.

(3) Fertilization. Apply compound fertilizer (15:15:15) 200g/tree annually in the first 3 years before raining season (early May), 25-40 cm apart from stem accordingly.

Responsible Party:

Soil preparation, planting and maintenance will be organized by the community, with the technical guidance from staffs, some working tools will be handled by the CF management team with the assistance from village chief and other villagers.

Timeframe:

The restoration design will be carried out at the beginning of the project. Soil preparation will be implemented at the dry season before planting. The maintenance will be started right after the planting, and will last for at least 3 years.

Site: eastern side of CF area 56ha (see figure 4)

Budget: $ 1700/ha

- Labor for site preparation: $ 300/ha;
- Supplies and material (fertilizer, tool, pesticides) for planting and maintenance: $ 200/ha;
- Labor for planting: $ 300/ha

- Labor for maintenance(3 years): ＄900/ha (300/ha.year)

Strategy 7 Restoration for the Degraded Area/Open Area

Activity 7.1 Timber Tree Plantation in open area

To reduce the pressure of the villagers on the forest resources in harvesting timber, 183 ha of timber plantation in the degraded area/open area of CF is suggested. The seedlings will be provided by local FA and the villagers are paid for planting trees.

Recommended tree species for Open area: *Cassia siamea* ×*Dipterocarpus intricatus* and *C. siamea* ×*D. obtusifolius*

In this area, it is planned to plant with native valuable timber tree species of *Cassia siamea* × *Dipterocarpus intricatus* and *C. siamea* ×*D. obtusifolius.* Each tree species is planted with a total area of 1 hectare. Planting density for above tree species is 3×3 m, respectively. That means seedlings of each tree species required is 1,111seedlings. A total of 210,000 seedlings are required in the degraded area/open area.

Soil Preparation:

Based on the restoration design, site clearance and soil preparation will be carried out in each type of targeted forestlands in a specific standard and requirement. Remain original small trees and shrubs, the land will be prepared with pit holes with a size of 40×40×40 cm.

Planting requirements:

Seedling planting is crucial to establish restoration models, so as to guarantee the success of the project. The activity will go through backfilling of soil, application of fertilizers, planting of seedlings, weeding and maintenances of plantations.

(1) Seedlings for planting should keep in an even size and go beyond at least 1 year old;

(2) Seedlings of each species are accurately allocated and properly planted in a specific block and row or column according the design;

(3) 100g basal compound fertilizers are applied according to the design for each

tree species and each block.

Maintenance requirements:

(1) Check the survival rate of afforestation after 1-2 months, and carry out enrichment immediately if trees are found to be withered.

(2) Weeding and Cultivation: As tropical zones have high temperature and large humidity, and the survival and growth of seedlings may be negatively affected by weeds and shrubs, so tending control after afforestation should be reinforced. Keep weeding for 1-3 years after afforestation, and keep tending for 2~3 times per year, once in the early, middle and late rainy season respectively. Carry out tending and weeding once in September-October in the afforestation year, and tending and weeding once in April-May and October-November in the 2nd and 3rd year respectively. Appropriate ground cover is reserved during weeding to improve the ground temperature and humidity, and promote growth of trees. Adopt strip or hole tending, the strip is 1m wide, and the hole is 1~1.5m. Noxious weeds are climbing vines are eradicated, while benign weeds and shrubs not in holes are kept. During tending, earth up the root with the loose soil, and use the eradicated weeds for mulching on the planting spots, so as to reduce surface moisture vaporization, increase organic matters and inhibit growth of weeds. Don't hurt the stem, twig, leaves and root system of young trees during weeding, cultivation and ploughing, so as to avoid diseases of trees and keep the preserving rate.

(3) Fertilization: Apply compound fertilizer (15:15:15) 200g/tree annually in the first 3 years before raining season (early May), 25-40 cm apart from stem accordingly.

(4) Pruning. It is necessary to have appropriate pruning to trees with quite many low branches such as *Dalbergia spp*., the lateral branch is thick and strong, so the trunk growth will be promoted. Cut off lower lateral branches as well as diseased, weak and overcrowded branches. Cultivate trunks with good shapes based on pruning for many times.

Responsible Party:

Soil preparation, planting and maintenance will be organized by the community,

with the technical guidance from project staffs, and some working tools will be handled by the CF management team with the assistances from village chief and other villagers.

Timeframe:

The restoration design will be carried out at the beginning of the project. Soil preparation will be implemented at the dry season before planting. The planting will be carried out at the first year of the project after the completion of the operation plan. The maintenance will be started right after the planting, and will last for at least 3 years.

Site: CF area 183 ha (see figure 4)

Budget: $ 1145/ha

- Labor for site preparation: $ 200/ha;
- Supplies and material (fertilizer, tool, pesticides) for planting and maintenance: $ 100/ha;
- Labor for planting: $ 200/ha
- Labor for maintenance(3 years): $ 645/ha (215/ha.year)

Activity 7.2 Timber Tree Plantation in Moderate Stand

54ha of valuable timber trees plantation establishment in the CF is recommended. The seedlings will be provided by local FA and the villagers are paid for planting trees.

Recommended tree species:

Pterocarpus macrocarpus and *Dalbergia cochinchinensis*

The management of moderately degraded sites will involve mixture plantation management using rosewood tree species such as *Pterocarpus macrocarpus* and *Dalbergia cochinchinensis.*

For the site preparation, vigorous high-value trees with straight trunks will be maintained while untargeted trees will be cleared out in the moderately degraded forest.

The seedlings of premium timber (*Dalbergia* and *Pterocarpus*) will be planted at 4m×4m. This will require a total of 33,750 rosewood seedlings (at 625 seedlings/ha).

Soil Preparation:

Based on the restoration design, site clearance and soil preparation will be carried out in each type of targeted forestlands in a specific standard and requirement.

Planting requirements:

Seedling planting is crucial to establish restoration models, so as to guarantee the success of the project. The activity will go through backfilling of soil, application of fertilizers, planting of seedlings, weeding and maintenances of plantations.

(1) Seedlings for planting should keep in an even size and go beyond at least 1 year old;

(2) Seedlings of each species are accurately allocated and properly planted in a specific block and row or column according the design;

(3) 100g basal compound fertilizers are applied according to the design for each tree species and each block.

Maintenance requirements:

(1) Check the survival rate of afforestation after 1-2 months, and carry out enrichment immediately if trees are found to be withered.

(2) Weeding and Cultivation: As tropical zones have high temperature and large humidity, and the survival and growth of seedlings may be negatively affected by weeds and shrubs, so tending control after afforestation should be reinforced. Keep weeding for 1-3 years after afforestation, and keep tending for 2~3 times per year, once in the early, middle and late rainy season respectively. Carry out tending and weeding once in September-October in the afforestation year, and tending and weeding once in April-May and October-November in the 2^{nd} and 3^{rd} year respectively. Appropriate ground cover is reserved during weeding to improve the ground temperature and humidity, and promote growth of trees. Adopt strip or hole tending, the strip is 1m wide, and the hole is 1~1.5m. Noxious weeds are climbing vines are eradicated, while benign weeds and shrubs not in holes are kept. During tending, earth up the root with the loose soil, and use the eradicated weeds for mulching on the planting spots, so as to reduce surface moisture vaporization, increase organic matters and inhibit growth of weeds. Don't hurt

the stem, twig, leaves and root system of young trees during weeding, cultivation and ploughing, so as to avoid diseases of trees and keep the preserving rate.

(3) Fertilization. Apply compound fertilizer (15:15:15) 200g/tree annually in the first 3 years before raining season (early May), 25-40 cm apart from stem accordingly.

Responsible Party:

Soil preparation, planting and maintenance will be organized by the community, with the technical guidance from foresry staffs, and some working tools will be handled by the CF management team with the assistances from village chief and other villagers.

Timeframe:

The restoration design will be carried out at the beginning of the project. Soil preparation will be implemented at the dry season before planting. The planting will be carried out at the first year of the project after the completion of the operation plan. The maintenance will be started right after the planting, and will last for at least 3 years. The monitoring on plant annual growth increment will be conducted annually after rainy season.

Site: CF area 54ha (see figure 4)

Implementer: CF

Budget: $ 630/ha

- Labor for site preparation: $ 120/ha;
- Supplies and material (fertilizer, tool, pesticides) for planting and maintenance: $ 50/ha;
- Labor for planting: $ 100/ha
- Labor for maintenance(3 years): $ 360/ha (120/ha.year)

Strategy 8 Forest quality improvement

Activity 8.1 Tending, thinning and enrichment planting for valuable timber trees in dense forest

Silviculture treatment will be taken in dense forest in order to improve forest quality of valuable timber trees. Overly crowded or clustered trees, such as *Dipterocarpus*, rosewood tree species, etc., should be thinned, and root sprouted suckers of *Dipterocarpus* species should conduct tending. For enrichment planting in forest gap, tree species such as *Pterocarpus macrocarpus*, *Dalbergia cochinchinensis*, and *Diptercarpus* species will be planted.

The management of forest ecosystem in Dense Forest is mainly tending, thinning and enrichment planting, so as to speed up the succession progress of forest community and exert its due functions.

Technical Parameters:

(1) Thinning the overly crowded or clustered trees, such as *Dipterocarpus*, rosewood tree species, etc., so as to keep the spacing in 4×3m;

(2) Tending on the root sprouted suckers of *Dipterocarpus* species, through which each cluster will be kept with a top edge and the strongest sprout seedling;

(3) Enrichment planting in forest gap with an area more than 15 m^2, using tree species such as *Pterocarpus macrocarpus*, *Dalbergia cochinchinensis*, and *Diptercarpus* species. The planting density is 3×3 m;

(4) Tending on naturally regenerated rosewood saplings such as *Pterocarpus macrocarpus* and *Dalbergia cochinchinensis*, through clearance of surrounding shrubs and application of 100 g of compound fertilizer for each sapling. The estimated number require 500 seedlings/ha.

Enrichment planting:

It is useful to supplement biological diversity by reintroducing certain key species to hasten the process of natural recovery. Enrichment planting is one of the appropriate choices.

The method of enrichment planting is that gaps are opened up in the canopy and seedlings of the desired species are planted into them. The size of the canopy opening would need to be adjusted to match the tolerances of the species being under planted. This approach allows some gradual harvesting of the original plantation species, which

provides income. It also ensures that a protective forest cover, protects the watershed and excludes weeds. The extent to which further canopy openings are created will depend on ecological and economic circumstances.

The forest land used for enrichment planting is natural regenerated secondary forest where some native tree species have recovered in some sense with average high of 6-7m. Plantation model will be scattered cluster planting (group planting), of which 5 trees are planted in group with the spacing of 1- 2 meters between each tree

The diameter of each planting group is around 6m. The advantage of group planting is that planting place of the tree groups can be selected at less dense site in the forest, which minimized disturbance from plantation activity, remained largest original vegetation, and at the same time sufficient sun light can reach new planted trees in windows of the forest. In addition, 5 trees in one group can support each other and is in favor of natural pruning for trees to form a straight stem.

Area Covered: This activity will cover 1,094 hectares (see figure 4).

Responsible Person: The activity will be conducted by the CF members with the assistance of the project staffs.

Timeframe:

The activity will be carried out at the first year of the project. The maintenance will be started right after the planting, and will last for at least 3 years. The monitoring on plant will be conducted annually after rainy season.

Budget: ＄630/ha

- Labor for site preparation: ＄120/ha;
- Supplies and material (fertilizer, tool, pesticides) for planting and maintenance: ＄50/ha;
- Labor for planting: ＄100/ha
- Labor for maintenance(3 years): ＄360/ha (120/ha.year)

Strategy 9 Strengthening forest fire prevention

Activity 9.1 construction of fire-break path

As mentioned before that forest fire is the biggest threat faced by CF. Forest fires mainly result from villagers' burning of seasonal agriculture farmland and company's Concession from east of the CF area. Even though, community has made great efforts to prevent forest fire through village regulation and patrolling, forest fire still happened frequently from east CF in dry season. This is the main reason why forest quality is poor in eastern part of CF.

Eastern part of CF is key area for preventing forest fire. An 10 meters wide and 4.9 km long fire-break path is planned to be constructed mainly under the bases of old tractor pathway from north to south by using excavator to widen pathway and clean the grass in both side of pathway before dry season. After the fire-break path is constructed, the fire from farmland and concession outside east CF could be prevented in certain degree. the fire-break path needs to be maintained every year mainly to clean dried vegetations.

Timeframe: fire-break path construction in the first year of the project under the condition of sufficient budget. Otherwise, it can be done in 2-3 years depending on the budget available. The maintenance of the fire-break path needs to be conducted every year.

Site: 4.9km in eastern CF area (see figure 4)

Implementer: CF community

Budget:

- Path construction: $ 19,600 ($4000/km×4.9km)
- Maintenance cost: $ 7,350/year ($1,500/km×4.9km)

Activity 9.2 Fire prevention publicity on safe use of fire during farmland preparation and dry season in the CF

Print and deliver publicity materials to educate people entering the forest and

regulation on the safe use of fire. Compile manual and audio-visual materials on safe use of fire for farmland preparation and burning outdoors, aiming at reducing the threat from fire use by people.

Signing forest fire prevention contracts with the farmers and companies who have their land in and around the CF in order to control the forest fires resulting from their burning. Put up fire prevention regulation posters in the local communities. Strengthening fire use and patrolling along the boundary and inside forest.

Timeframe: The first year of the project

Site: CF area

Implementer: CF community

Budget: $2000 Materials and contract preparation, posters making

<u>Management Objective 3:</u> To contribute to poverty reduction in forest community through sustainable management approach

Strategy 10 Formulation on Ecotourism development plan

Activity 10.1 Formulation of community ecotourism development plan

Currently, a block of soil erosion area (15ha) in the CF mainly used by the people outside the village for pleasure and praying for rains. In order to combine income generation and conservation, it is suggested to develop ecotourism planning. To develop ecotourism in the CF, scientific planning must be made so as to make rational uses of the local resources, push forward local economy and promote CF management, part of income from the ecotourism development can be used as the conservation fund to support the CF resources management.

To formulate tourism planning, a team will be set up, with members from the Community Forest Management Committee, IRD, relevant technical institutions. A workshop will be organized and International/national Consultants will be invited to train the team in tourism planning and guide for the formulation.

Site: CF area

Implementer: CF Community

Technical support: IRD, technical institutions, Consultants

Budget:$ 3,900

travel expense of project staff: $ 2400 ($ 80/day× 15days ×2persons); vehicle rental: $ 1500 ($ 100/day ×15 days);

Strategy 11 Increasing income sources

Activity 11.1 Formulation of community enterprise management regulation (resource using, source of labor force, marketing, benefit sharing)

There are some enterprises and companies around the CF area, sometimes the different stakeholders use the CF resources more or less. In order to regulate the management on CF resources, it is necessary to formulate the regulation for the CF resources use.

A workshop will be organized and the relevant stakeholders need to be invited to the workshop. During the workshop, the facilitator can introduce the purpose of the workshop and the importance for the formulation of the management regulation.

The participants can be divided into small groups(5-6peoples each group), each group can discuss the resources they use , the consumption, the impacts on CF and suggestions for improve the management or the way to use. After discussion a plenary will be given. Based on the discussion results, the writing team will formulated the regulation for the community enterprise management.

Timeframe: The first year of the project.

Site: CF area

Implementer: CF community

Technical support: IRD

Budget: $4330

Workshop preparation: $100; Travel expense of project staff: $480 ($80*3days*2persons); Food for the participants $2250 ($50*3days*15persons); Formulation of the regulation: $1500 ($100*3days*5persons)

Activity 11.2 Wild culture of animals

Due to the decreasing of wildlife resources, it is increasingly difficult to hunt wild animals. And human demand for these animal products is growing faster than supply from nature. More important, people's awareness and legislation on wildlife protection is strengthened. These have prompted people to reconsider how to protect wildlife species while wildlife product can be legally utilized. The best way to get use of wildlife products legally is domestication or wild-culture of animals in our case.

The size of CF is 1,452 ha, which is big enough to conduct wild culture of economic animals, e.g. Wild boar, honeybee etc.

The site condition chosen for wild culture of boar require fenced relative open forest with good light, low bushes, less tall trees.

Site: fenced open forest in CF and close to village

Implementer: CF community

Activity 11.3 Wood carving

Plenty of wood especially hard wood materials can be produced in CF every year from forest tending and thinning, and some villagers have the skills for wood carving. In order to increase the local villagers' income source, it is suggested to purchase some small machines, tools for wood products processing and they can sell it to tourists in the market.

Organization: Carving team can be organized in the community and Local Experts for carving will be invited to train the team. The carving machines can be purchased to distributed to the team.

Timeframe: The first year of the project

Site: CF community

Implementer: CF community

Budget: $3600

Local experts travel expense: $600 ($300 × 2persons), Food & lodging:

$3000($150 × 10days × 2persons)

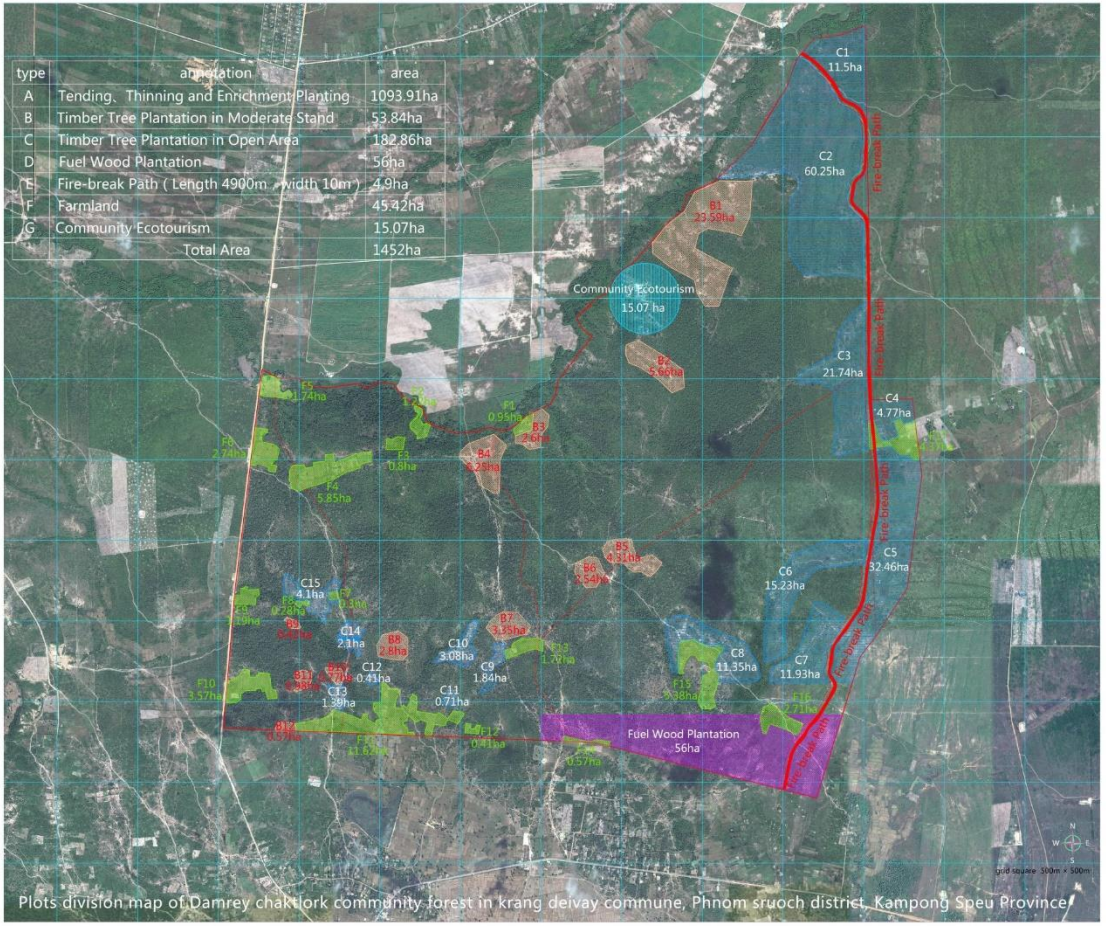

Figure 4 CF Management Plan Map