FEASIBILITY STUDY REPORT
FOR EAST KALIMANTAN PROVINCE
REFORESTATION PROJECT

SUMITOMO FORESTRY CO., LTD.

MARCH 2003

SECTION I

(1) Objectives and fundamental issues

‘1-1 Objectives

Sumitomo Forestry Co., Ltd, has been studying and reporting the future CDM projectinEase Kalimantan Province in Indonesia. In the Section I we point out our objectives as to complete the projection of the East Kalimantan Plantation Project and to introduce main issues relating to the removal by sink project and eventually we are going to complete something like project manual for the sink project by afforestation and reforestation activities.

‘1-2 The Kyoto Protocol and CDM Sink Projects

First of all, we make order of the present situation regarding the Kyoto Protocol and CDM sink project in and out of the country giving the spot light to COP7 and COP8.

‘1-3 Categories of Sink Projects

Based on the Kyoto Protocol, sink projects are limited to afforestation and reforestationactivities. Nest pargraphs are mentioning the categories of the concerning projects.

‘1-4 Issues and problems at the present time

‘1-4-1 Important Issues

From now, we discuss issues from the framework to details, because this chapter is aiming to manipulate working manuals for sink projects. A lot of issues have been discussed during a series of conference among the parties concerned, which are fundamental to implement actual projects. Followings are important subject that we have to take it consideration. Details are to be discussed in chapter 2.

‘1-5 Hearing to Experts

We had hearing from several experts. Their comments are highly instructive and helpedus promote our study. We extend our gratitude to the gentlemen.

Dr. Noriyuku KOBAYASHI Interviewed in January 2003
Sumitomo Forestry Co., Ltd. Technical Adviser PH.Doctor

Dr. Naoki MATSUO Interviewed in January 2003
Climate Experts Senior Research Fellow

Dr. Yasushi MORIKAWA Interviewed in January 2003
Professor Waseda University Ph. Doctor

Dr. Makoto INOUE Interviewed in January 2003
Assistant Professor Tokyo University Ph. Doctor

Dr. Rizaldi Boer Interviewed in January 2003
Professor Bogor Agriculural University, Indonesia, Ph. Doctor

2 Acceptance by Host Countries and Outline of the Project

This chapter studies acceptance by the host countries and outline of the project. Also it studies important issues now under consideration by the international negotiations.

‘2-1 Acceptance by host countries

‘2-1-1 Regulations and institutional aspects

the official stance and policies of the Government of Indonesia toward the Kyoto Protocol and the Clean Development Mechanism (CDM) including the “absorption by

sink" such as forest plantation projects were clear. They aim to obtain ratification for Kyoto Protocol as soon as possible and also to start preparation for CDM. They will develop legal aspects in to ratify the protocol and other related regulations as well as to establish institutional aspects. The Ministry of Forestry has not released any official statement on CDM nor implemented any official policies. According to our survey, however, we obtained suggestions that Government of Indonesia would decide to request separate funding for undertaking national CDM strategy study for forest component as issues related to this sector were sufficiently complex and require deeper attention.

Designated National Authority

Based on Kyoto Requirements, countries that can be participates in CDM projects are countries who has ratified the Kyoto Protocol and established a Designated National Authority. This Authority will register CDM projects. The Marrakech Accords is not prescriptive about the makeup, location or stakeholders to be included in the Designated National Authority. It is left to the discretion of the host country to best fit this within its current institutional structures.

The first National Strategy Study (NSS) proposed an institutional structure for CDM. For the purpose of this study, considering the existing regulations in forestry sector as well as other related sectors, alternative institutional setting is needed. One possible form of institutional structure is provided.

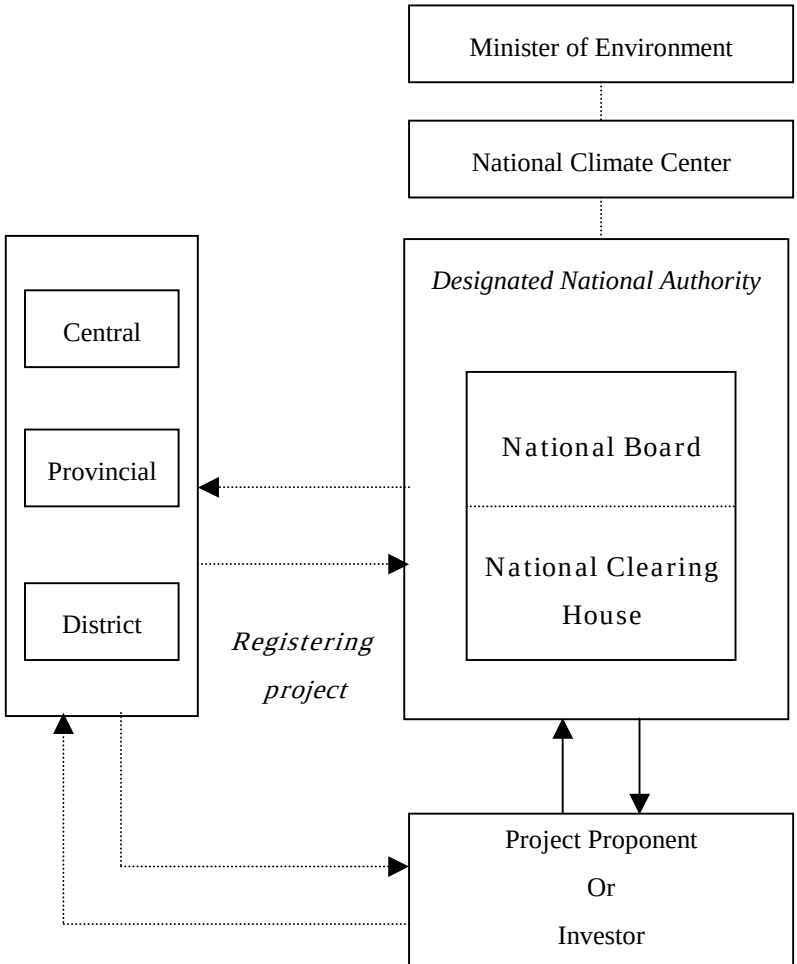


Figure 1. Possible structure for a Designated National Authority (DNA)

‘2-1-2 Ministry of Forestry

In Indonesia context, the definition of afforestation and reforestation are different from the Kyoto definitions. Reforestation and Afforestation are land rehabilitation program through planting trees in forest and non-forest area (private land). Forest and Non-Forest area are defined based on consensus made by related Departments, called TGHK (*Tata Guna Hutan Kesepakatan*, Forest Area by Consensus)[1]. These definitions do not have time dimension as those in Kyoto definition. Data on forest area back to 50 years ago may also not be available.

There is a possibility that 50 years ago most of area in Indonesia was still under forest. Thus, following the Kyoto definitions, type of CDM projects for Indonesia would be mainly reforestation (see Table 5). Area eligible for the activities are limited to area which are not forest since 31 December 1989, irrespective of location whether in forest or non-forest area of Indonesian definition.

3 Quantitative Volume of CO2

‘3-1 Calculation of CO2 volume by this project

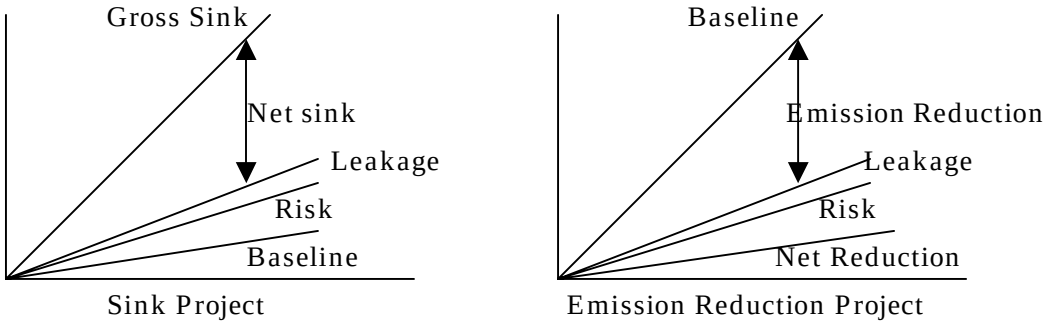
The volume of sink activity is calculated by following method;
Measurement of forest area by measuring the growth of the area
Convert from growth volume to carbon volume
Convert from carbon volume to CO2 volume

‘3-2 Concept of sink CO2

Sink CO2 is unique concept to LULUCF project in the Kyoto Protocol. Total sink volume is all the volume acquired by this project, from which baseline volume and risk and leakage volume is to be deducted as following formula.

Gross sink volume – baseline volume – risk volume – leakage volume = Net sink volume

‘3-2-1 Illustrative view of sink project in comparison with emission reduction projects



‘3-3 Approach to grasp sink volume

Following three type of approaches are available

Approach	Contents
Sink volume classified by types	Available by reforestation types and area types by grasping growth data for each area through natural conditions including climate , soil, etc.
Sink volume project by project base	Understand growth by analyzing similar types of projects for past data. Adequate study on the same condition is requied.
Hybrid of above two methods	Combining above two approaches. Actually this approach is most seemingly realistic.

‘3-5 Monitoring

4 Baseline

A base line of reforestation project is carbon stock in the project area if its project did not exist. Therefore, quantity of project carbon sink is difference between actual carbon storage and the base line. Based on our survey at site, we determined the three cases of baseline.

‘4-1 Results

Based on our study, we estimate following three types of baseline.

	Forest type	Baseline
1	No biomass or very scarce biomass is observed. This type is also objects for afforestation and reforestation projects.	Nothing
2	Deteriorated secondary forest with sparse surviving trees forming principally bush type forest. This type is seemingly objects for afforestation and reforestation projects.	Relatively rich secondary forest with many surviving trees. Future growth is predictable. This type is seemingly objects for forest preservation projects and/or forest management.
3	Secondary forest with sparse trees and deteriorated but richer than type 2. Suitable for both forest management and afforestation and reforestation.	This baseline is acquired by averaging minimum storage quantity 24 carbon ton per hectare.
4	Relatively rich secondary forest with many surviving trees. Future growth is predictable. This type is seemingly objects for forest preservation projects and/or forest management.	0.78 carbon ton per hectare per year. This baseline is acquired by averaging minimum storage quantity 24 carbon ton per hectare per 30 years into yearly average and the subtracted by risk rate 2.5% per year.

‘4-2 Definition of Baseline and important issues

We studied and analyzed that the method of distribution of relatively large trees with dbh≧30cm in the project secondary forest is effective by aerial photograph for the purpose of classification of forest types in setting a baseline in larger area.

‘4-3 Monitoring

Monitoring is to be implemented by measuring changes of carbon storage both aboveground and underground. In expanding to larger scale of area, estimation of each forest types by utilizing remote sensing is effective. We also studied accurate warranty and collecting method of data and its expense.

5 Indirect Impacts and Leakage

‘5-1 Results of leakage

Our results are as follows;

	Area	Items	Study	Results
L e a k a g e	Inside the boundary	Slash and burn	Interview to local people	Nil
		Illegal loggins	Interview to local people	Nil
		Firewoods	Interview to local people	12,535CO2-ton/30year 417.8CO2-ton/year
		Housing material	Interview to local people	4.9CO2-ton/30year 0.2CO2-ton/year
	System boundary	Emission by vehicles	Exist. Transportation distance.	31.7CO2-ton/30years 1.1CO2-ton/year
		Emission by light vehicles	Exist. Transportation distance.	124.8CO2-ton/30years 4.2CO2-ton/year
		Emission by heavy vehicles	Exist. Transportation distance.	0.1CO2-ton/30years 0.1CO2-ton/year
		Emission by land clearing	Nil	
		Emission by fertilizer	To be discussed	
		Emission by tending works	Exist. Transportation distance.	300CO2-ton/30years 10CO2-ton/year
		Emission by logging works	Exist. Transportation distance.	2.5CO2-ton/30years 0.1CO2-ton/year
		Emission from chainsaws	Exist. Transportation distance.	Little
		Emission by transportation	Exist. Transportation distance.	
		Total leakage		13,000CO2-ton/30years 433.3CO2-ton/year

‘5-2 Survey to local residents

Indirect and associated impacts are the influence which the project can offer to the area and carbon fixing. We surveyed the area by direct questioning and analysis method. According to our survey, we found following four leakage;

Slash-and-burn agriculture
Firewood
Housing material
Illegal logging

The project boundary should be set inside of the system boundary which indirect and associated impacts offer to the site. We made examples of setting project boundaries and quantitative volume of relating leakages.

Monitoring can be implemented by selecting initial factors including land-use, infrastructure, population, change of number of households, statistics of occupation and wages, by classifying immediate causes and remote causes and identifying emerging places inside and outside the site.

6 Risks

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7 Project planning and feasibility

Feasibility Study and Evaluation

(1) We made feasibility study of a project. As for forest management, we studied following items; area, planted species and area, growth and harvest year, cost and income, risk, project period. We selected *Acacia mangium*, *Gmelina arborea*, *Duabanga moluccana Parateriantes falcataria, Tectona grandis, Swietnia macrophyla, Peronema canescence* and *Dipterocarpaceae* for the purpose of sawn timber, plywood and fiber-board raw materials. Planting will be implemented 2,000ha in the first year and 4,000ha in 2nd and 3rd years totally 10,000ha for the first three years. Plantation cost include planting, tending, felling, clearing and transportation. Logging year, logging conditions and sales conditions should be considered. Management cost includes personnel, depreciation, capital for reforestation, and other conditions include exchange rate, capital, loan, dividends and payment schedule. We introduced such indications to evaluate feasibility of the project as a rate of break-even point, the break-even year of a cumulative deficit, loan payment years, investment amount per carbon storage.

(2) We studied the project as a CDM project. Firstly we worked out a baseline, considering risk evaluation of insects/pest and forest fire. We calculated carbon storage volume by using growth estimation of trees and finally worked out net carbon storage volume by subtracting baseline. Carbon release at the time of harvesting is negative count.

(3) We made simulation by each baselines and accounting systems as Table-B;

(4) Since quantity scale of the baseline heavily reflects to carbon storage by the project, it is considerably important to set a proper and accurate baseline with wide scope and careful survey in connection with forest types, geographical and meteorological conditions.

(5) We studied carbon accounting system. This is an issue when the project counts in the

carbon credit are obtained from the project. We know that more than 3 types of methods have been already introduced.
The income by way of carbon storage can be an incentive for the project. Our simulation shows large difference in feasibility between the case of carbon storage income and otherwise. In particular, our simulation shows it grows to be a remarkable incentive when it is more than US$50 per carbon ton.

(6) According to our simulation, there are a lot of differences by each carbon accounting system. The ton-year accounting method is fit for such CDM projects as forest preservation as well as industrial plantation projects. The advance ton-year method works as an incentive for such CDM projects that need initial investment for early stage whether they are preservation projects or industrial plantation projects. Average accounting method is fit for such CDM projects as industrial plantation that repeatedly continue planting and logging.

(7) We estimated that 358,880 carbon ton would be fixed by the project case 1 for 30 years. It means 1.2 carbon ton per hectare per. Following Table-C shows the results by three cases.

(8) Quantitative volume of CO2 sink

	30years	Yearly	Per 1ha yearly	1-10years	11-20 years	21-30 years
Including logging as minus	1,358,959	45,299	4.53	555,224	413,253	390,482
Excluding logging as minus	5,827,940	194,265	19.43	682,395	2,856,009	2,289,537
TCER	2,050,442	68,348	6.83	532,762	1,609,342	-91,662