

COST ANALYSIS FOR A CDM-LIKE PROJECT ESTABLISHED IN CIANJUR, WEST JAVA, INDONESIA¹

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Abstract

This paper presents details of a 17.5 ha project involving smallholders in the Cianjur district. The objective is to assist in the planning and implementation of the Clean Development Mechanism (CDM) in Indonesia. The costs of project design and implementation are presented and the costs per tonne of CO₂ sequestered are estimated to range between \$9.69 and \$12.50. Lessons learned from project implementation and a survey of project participants are discussed and recommendations for future projects are presented.

Keywords: smallholder agroforestry, CDM, carbon sequestration costs.

Introduction

Indonesian forestry development is a part of national development policy directed at contributing to prosperity by maintaining sustainable forest functions on a continuous basis, opening business opportunities, and providing employment for members of communities surrounding forests, many of whom are poor.

At present, forest utilization in Indonesia depends mainly on wood as a source of national economic growth, while others forest benefits are being neglected. Such forest management, called "timber mining", depletes forests in terms of both quality and quantity. Purnama (2003) pointed out that the deforestation rate in Indonesia during the period 1987-1997 was 1.6 million ha/year, increasing to 3.5 million ha/year in 1997-2000. He predicted that the deforestation rate would increase further as a result of the introduction of regional autonomy.

By understanding the existing problems, private forestry has an opportunity to contribute to the fulfilment of community needs and increase the quality of life directly from selling wood, while also obtaining other benefits and environmental services.

There are several objectives for private forest management such as (i) to increase the use of critical land, (ii) to assist the community in providing wood for housing, industrial raw material and fuelwoods, (iii) to assist in cropping diversity for food security, and (iv) to increase the income of communities and, at the same time, improve water cycling, especially for communities living in protected uphill watershed areas.

¹ Working Paper CC13, 2004. ACIAR Project ASEM 2002/066, <http://www.une.edu.au/febl/Economics/carbon/>

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The development of private forests (a part of rehabilitation programs that represent one of five priority policies) may be able to benefit from the Kyoto Protocol, which coordinates efforts to reduce the level of greenhouse gas (GHG) emissions to the atmosphere. The Clean Development Mechanism (CDM), in particular, provides opportunities for Indonesia, which has abundant natural resources and needs to reforest bare and critical lands.

Forests are able to absorb carbon dioxide and other air pollutants, therefore research on carbon sequestration has received much attention. Indonesia is working on establishing CDM-like projects in several provinces, funded by JIFPRO (Japan International Forestry Promotion and Cooperation Centre). One of these projects is located in Cianjur, West Java, with a total area of 17.5 hectares. This project provides a valuable case study to help calculate the possible cost of carbon sequestration projects in Indonesia.

This paper aims to provide an understanding of the potential of CDM projects in Indonesia and therefore assist in the planning and implementation of CDM in the country. Specific objectives are: (i) to follow the initiation and establishment of a CDM-like project in Indonesia, (ii) to calculate carbon price using a cost approach, and (iii) to identify potential problems for implementation of CDM projects.

Research Location and Project Characteristics

Project Description

The CDM-like project was initiated by a basic understanding between the Directorate General of Land Rehabilitation and Social Forestry and a director of JIFPRO. The agreement allowed implementation of the project through the establishment of a private forest at the Cirumput Village in the Cugenang Sub-District, Cianjur District, West Java.

The implementers of the project are the Citarum-Ciliwung Watershed Management Agency (Balai Pengelolaan Daerah Aliran Sungai-BPDAS)³ in collaboration with the District Office of Forestry and Soil Conservation and other related institutions. The field implementers are local communities belonging to farmer groups.

The Government of Indonesia defines private forest as a forest owned by a community group or legal business, it is a man-made forest located outside of State forest areas. A private forest is characterized by: (i) its location is not necessarily in a compact area but may be scattered; (ii) the tree-planting model is not a dominant monoculture but an agroforestry system; and (iii) it consists of fast-growing species and crops that produce quick income for the owners.

A model plan was produced by BPDAS to provide technical and administrative guidance for the smooth operation of the project. The model plan is a form of strategic plan for private forest management. In addition to location, name and total area, the plan includes infrastructure requirements, socioeconomic aspects, and a schedule of main activities. The specific objectives of the plan are: (i) to guide the implementation

³ Formerly (before 2002) known as the Citarum-Ciliwung Land Rehabilitation and Soil Conservation Agency (Balai Rehabilitasi Laha dan Konservasi Tanah-BRLKT)

of private forest management in accordance with local biophysical, social and economic characteristics, and considering the needs of land owners for sustainable forest management (SFM), and (ii) to contribute to wood supply for community needs.

The total area of the project is 17.5 hectares divided into two phases. The first phase established 10 ha (in 2000/2001) and involved 54 farmers. The second phase established 7.5 ha (in 2002/2003) and involved 14 farmers. The land-use plan consisted of a mix of annual crops, seasonal crops and mixed cropping. Financing for the project (a total of Rp 136,233,500) was provided by Home Direct Co. Ltd, Japan, through a grant. The money was distributed through JIFPRO.

The location of the project is as described below:

- Block : Barulega (10 ha) and Lulumpang (7.5 ha)
- Village : Cirumput
- Sub-district : Cugenang
- District : Cianjur
- Province : West Java
- Sub-Watershed : Cisokan
- Watershed : Citarum

The total area of the project is 17.5 hectares. Elevation ranges between 1,100 -1,200 m above sea level and the slope is 10-45 %. The soil type is andosol with a depth of soil solum of 30 cm and is categorized as fertile land. The land degradation level is classified as medium. The income of people in the region ranges from Rp. 350,000 to Rp. 650,000 per month, with an average of Rp. 400,000 per month.

Project Initiation Process

The project activities are conducted through a serial management process consisting of planning, actuating, controlling and reporting. Planning follows a participatory approach through farmer groups and is directed by a field forestry officer from the Land Rehabilitation and Soil Conservation Agency (BRLKT). The model plan is designed by active participants and involves adjustment of the level of technology used with the following considerations: local capacity, local labour, added value and other benefits. Suitability in terms of biophysical aspects, community aspirations, and soil and water conservation is also considered.

Before field implementation, training of farmers was conducted through a participatory approach, following the Participatory Rural Appraisal (PRA) principles. The objective of the training program was to increase the capacity (willingness and capability) of the participants to enhance the probability of success of the project.

The controlling process of the project was conducted by BPDAS through field inspections. The controlling process included monitoring and evaluation. Evaluation included physical and financial aspects as well as documentation of any problems raised in the field.

Reporting consisted of a preliminary report (working plan at the early stage of the project), monthly progress reports (including physical and financial aspects), mid-term and final report. The monthly progress reports were delivered periodically to the

BPDAS Citarum-Ciliwung and the DG of Land Rehabilitation and Social Forestry, in the Ministry of Forestry.

Research Method

Data Collection

Primary data was collected regarding stakeholders' perceptions of CDM-like projects to sequester carbon. Cost structures were also collected from farmers, who have their own private forest. Secondary data were obtained from the Forestry Provincial Office, District Office of Forestry and Soil Conservation, Citarum-Ciliwung Watershed Management Agency, Sub-District Office, and the Farmer Group. The respondents were chosen through a purposive sampling method, 24 people were interviewed as shown in Table 1.

Table 1. Number of Respondents Interviewed from Various Stakeholder groups

Types of Stakeholders	Number of respondents
District Office for Forestry and Soil Conservation (Dinas Perhutanan dan Konservasi Tanah)	1
Citarum-Ciliwung Watershed Management Agency	2
Farmers	19
Head of Farmer Group (Kelompok Tani)	2
T o t a l	24

Data Analysis

Collected data were categorized using a descriptive method and then analyzed in accordance with the paper objectives. A cost approach was used to calculate the carbon price as explained below:

$$Ce = \sum_{i=1}^n C_i = C_1 + C_2 + \dots + C_n$$

where: Ce = Total cost for project establishment

C1 = Cost for designing a model plan

C2 = Cost of seedlings

C3 = Cost of tree planting

C4 = Cost of tree maintenance

C5 = Cost of dam building

C6 = Cost of a gully plug construction

C7 = Cost of farmer training

C8 = General costs

Results and Discussion

The effectiveness of the participatory planning approach was validated by the survey team by interviewing people involved in the project. Eighty percent of respondent (21 people) stated that they obtained information from the BRLKT and the rest obtained information from the head of the village. All respondents pointed out that the training was very useful for them to increase their knowledge and to help them cultivate their land properly. The evaluation results of the project implementation are presented in Table 2.

Table 2. Evaluation of project implementation

Evaluated Aspect	Satisfied (%)	Dissatisfied (%)	Remarks
Involvement in the project	67.0	33.0	(a)
Benefits of the project	100.0	0.0	
Involvement in project planning	50.0	50.0	(b)
Acceptance of farmers' aspirations	100.0	0.0	
Distribution of material for cultivating the land	80.0	20.0	(c)
Benefits of tree planting	100.0	0.0	

Source: Primary Data from Survey (2004)

Notes, dissatisfaction was caused by: (a) (i) not enough money, (ii) the product has not yet been harvested; (b) the selection process (they chose the most outspoken farmers); (c) insufficient level of inputs provided.

The first phase of the project established 10 ha (in 2000/2001) and involved 54 people with land areas ranging from 0.02 - 0.05 ha. The average landholding was 0.185 ha. The land-use plan was 1.06 ha of annual crops, 1.64 ha of seasonal crops and 7.30 ha of mixed cropping. The second phase of the project established 7.5 ha (in 2002/2003) and involved 14 people with land areas ranging from 0.25 - 2.50 ha. The average landholding was 0.536 ha. The land-use plan consisted of 2.5 ha of annual crops, 2.0 ha of seasonal crops and 3.0 ha of mixed cropping.

Table 3. Agroforestry Systems Used in the CDM-Like Project

Type	Agroforestry System
A	Suren + Chilly
B	Suren + Carrot + Cauliflower + Chilly
C	Suren + Coffee
D	Suren + Coffee + Mahogany

Source: Primary Data from Survey (2004)

Agroforestry Systems used

The selection of agroforestry systems was very limited with the combination of Suren (*Toona surenii*), Coffee, Mahogany (*Switenia macrophylla*), and crops under the trees as shown in Table 3. Farmers tried to add some trees in their own land such as rambutan (*Nephelium lappaceum*), alpukat (*Persea aemricana*), pala (*Myristica fragrans*), pisang (*Musa spp.*), and jengkol (*Pythecellobium jiringa*). Most of the additional trees are multi-purpose tree species and produce outputs that can be harvested every year and may produce monthly income while waiting to harvest the main trees.

Most of the land cultivated in the project is owned by the government (known as tanah Gege) and distributed by the head of the village. The average land owned by farmers in the project ranged from 0.185 ha to 0.536 ha per person. Five respondents (24 %) used rental land, ranging from 300 m² to 0.12 ha, with a land rental payment of Rp 1,500,000 per ha per year.

Establishment Costs

The establishment costs for the CDM-like project were divided into two parts: material cost and labour cost. The total establishment costs for the 10-ha phase and 7.5-ha phase were Rp. 41,430,000 and Rp. 37,067,500, respectively, as shown in Table 4.

Table 4. Establishment Cost for CDM Like Project (10 ha and 7.5 ha)

Cost Description	10-ha Phase (1999/2000)	7.5-ha Phase (2001/2002)
Materials		
- Planting	21,610,000	24,987,500
- First Year Tree Maintenance	2,740,000	1,500,000
Total Materials	24,350,000	26,487,500
Labour Cost		
- Planting	13,550,000	9,430,000
- First Year Tree Maintenance	3,530,000	1,150,000
Total Labour	17,080,000	10,580,000
Total Cost	41,430,000	37,067,500
Cost per Hectare	4,143,000	4,942,300

Source: BRLKT (2001c; 2002c)

The cost per hectare for the 7.5-ha phase (Rp. 4,942,300) was higher than for the 10-ha phase (Rp. 4,143,000) because of the higher cost of seedlings. The price of suren and mahogany seedlings in 2001/2002 was four times higher than the price in 1999/2000 (see Appendix tables 6 to 9 for details on material and labour costs).

When calculating the cost of carbon sequestration through tree planting, it is appropriate to cover the costs of all supporting activities (Table 5). The total cost for establishing the 17.5 ha CDM-like project was Rp 136,233,500 or about Rp. 7,784,770 per hectare. The amount of carbon sequestered in the CDM-like project is expected to be similar to the amounts in Tasikmalaya agroforestry systems reported by Ginoga et al. (2004), which ranged between 19.50 and 25.15 t C/ha. Therefore, the estimated cost per tonne of carbon ranges between Rp. 309,534 - Rp. 399,220. Using an exchange rate of Rp 8,700 per US Dollar results in carbon costs of between US\$35.60 and US\$ 45.90 per tonne. Since one tonne of biomass carbon is equivalent to 3.67 tonnes of CO₂, these costs correspond to between \$12.50 and \$9.69 per tonne of CO₂ sequestered.

Table 5. Description of Financial Support for CDM-Like Project

Financial Description	10-ha Phase (1,000 Rp)	7.5-ha Phase (1,000Rp)	Total cost (1,000Rp)
Measurement and production of model plan	1,930.00	1,930.00 ^a	3,860.00
Seedling Provision	9,460.00	17,825.00	27,285.00
Tree Planting	26,140.00	16,592.50	42,732.50
Tree Maintenance	6,710.00	2,650.00	9,360.00
Watershed Support Building	5,120.00	5,070.00	10,190.00
Gully Plug Making	1,153.00	5,120.00	6,273.00
Farmer training	13,150.00	4,383.00 ^b	17,533.00
General costs	9,500.00	9,500.00 ^a	19,000.00
Total Cost	73,163.00	63,070.50	136,233.50

Source: BRLKT (2000; 2002a; 2002b; 2002c)

Note: a) Data were not available and the same figure of 10 ha is used as an assumption for 7.5 ha.

b) Data were not available and one third of the figure (10 ha) is used because the number of farmers involved in 7.5 ha project is one third of the total of farmers involved in 10 ha project.

Problems in Project Establishment

According to Dinas PKT Cianjur (2001), private forest establishment in the Cianjur District has faced three main problems, namely: (1) lack of tree management, (2) lack of product processing and marketing, (3) poor capacity building.

Problems reflecting the lack of tree management include (i) seedlings are obtained from the cabutan (taken out directly from the forest), (ii) the quality of seedlings is very poor, (iii) insect attacks are not properly overcome, and (iv) tree maintenance is not well conducted.

Problems reflecting the lack of product processing and marketing include (i) logs are harvested too early, (ii) wood is sold in "log" form, (iii) there is no wood-preservative and semi-processing industry, (iv) transportation cost is high, and (v) wood and wood products are locally marketed.

Problems reflecting poor capacity building include (i) the presence of forestry farmer group is not utilized optimally, (ii) some farmers have a poor understanding of wood administrative systems, and (iii) the role of the farmer group is not significant for helping its members.

Particular problems raised by respondents to the CM-like project regarding establishment of the project were: (i) selection of agroforestry system, (ii) inequality of land distributed to farmers, (iii) insufficient level of fertilizer, and (iv) non-optimal use of the land. Respondents were not sure who determined the land distribution and how it was done.

The tanah gege is not equally distributed equally among members of the farmer group. Usually, the village elite obtain larger plots of land than other farmers. Some of the farmers have to rent the land.

The amount of fertilizer given by the project was not sufficient, especially for the second stage of the project (7.5 ha). The cost of tree maintenance for 7.5-ha phase (Rp. 2,650,000) was 2.5 times lower than the tree maintenance cost for the 10-ha phase (Rp. 6,710,000). It is generally recommended that tree maintenance be conducted for three years after planting (this is a normal procedure in forestry activities), this produces better tree growth, better crop (planted under trees) productivity, and increased soil nutrient levels.

The agroforestry systems applied is not flexible enough for farmers to get additional income during the project implementation. Farmers had to look for additional sources of income. Most (70 %) of respondents were still relying on other jobs for additional income to support their families. The other activities included farm workers, small-shop keeper, trader, building construction worker, and motorcycle driver. This suggests that the small plots do not provide enough income.

Lessons Learned For Better Implementation of CDM-Like Project

Participatory Planning

For successful project implementation, participatory planning should be done properly by inviting multi-stakeholders. Choosing a credible person as community representative is a determining factor for the success of active participatory in project planning process. Another factor is the selection of a good facilitator to manage the group meetings.

Establishment of Farmer Groups

Often, farmers work individually and they establish a group when the presence of a project supplies an opportunity. Therefore, it is a good idea to check for the presence of a farmer group before implementing the project. The establishment of the group (if not available) is very important and is the first thing to be done.

Capacity Building of the Farmer Group

After creating the farmer group, the next step is the improvement of farmers' skills and knowledge in the subject matter related to the project activity. Various activities can be conducted for capacity building, such as: (i) training, (ii) field demonstrations, (iii) study tours, (iv) forestry-extension activities, and (v) field discussions with the relevant experts.

Good Communication During Project Implementation

The communication process is very important for running the project well. First, the project should get the permission from related government institutions. Second, the project manager should do a project presentation or socialization of the project into a multi-stakeholders meeting in order to get inputs from the forum. Last, the project should take into account the feedback from these meetings to improve the whole-project cycle and performance.

During field implementation the project should provide technical persons to answer the farmers' questions and solve their problems as they occur. The project manager should also come to the location to get a perception of the atmosphere of the project and the real situation of project activities.

Project Monitoring and Evaluation

Monitoring is defined as the continuous assessment of the intervention and its environment with regard to the planned objective, results, activities and means. Whereas evaluation is a systematic and objective assessment of the project design, implementation and outcomes (DIDC, 1997). Monitoring enables a project manager to review progress and to propose action to be taken in order to achieve the objectives. Monitoring identifies actual or potential successes and failures as early as possible and facilitates timely adjustments to the operation. Generally, evaluation performs two functions: (i) it is a learning tool to improve future project implementation, and (ii) it provides a basis for accountability. In some cases, monitoring and evaluation are grouped as one important activities in a project cycle (its abbreviation is money).

Summary and Recommendations

The total cost for establishing the 17.5 ha CDM-like project was Rp. Rp 136,233,500 or about Rp. 7,784,770 per hectare. The largest portions of total cost were for (i) tree planting, (ii) seedling provision, (iii) general costs, (iv) farmer training, and (iv) watershed support building, in descending order. In terms of carbon sequestration, these costs correspond to between US\$12.50 and US\$9.69 per tonne of CO₂. These costs are high, considering that the BioCarbon Fund of the World Bank quotes prices between \$3 and \$5 per tonne of CO₂. However, from a development standpoint, other environmental and social benefits must be considered. In general, the implementation of the CDM-like project in the Cianjur District appears to be substantially beneficial for preventing soil erosion, maintaining the water catchment, protecting crops planted under trees, improving farmers' skills and knowledge, and increasing income of farmers involved in the project.

The problems identified in this study, regarding the establishment of the CDM-like project are: (i) selection of agroforestry systems, (ii) inequality of land distributed to farmers, (iii) insufficient level of fertilizer, and (iv) non-optimal use of the land. This compares with general problems identified in previous reports.

It is recommended to take into account five important elements for successful CDM-like project implementation in the future, namely: (i) participatory planting, (ii) farmer group establishment, (iii) capacity building of the farmer group, (iv) good communication, and (v) good monitoring and evaluation. It is also recommended to use high-quality seedlings for tree planting in order to obtain better wood and high quality wood products. Otherwise, farmers will be disappointed with the low value of the wood products after waiting for 3-15 years to harvest.

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Appendix

Table 6. Material Cost for CDM-Like Project (10 ha)

No.	Description	Unit	Quantity	Cost/Unit (Rp)	Total Cost (Rp)
I.	Material Cost				
1.	Border Marking Pole	PCs	40	500	20,000
2.	Tree Supporting stick	PCs	16,500	40	660,000
3.	Project Identity Name	Unit	1	1,900,000	1,900,000
4.	Working Kit	Unit	1	1,220,000	1,220,000
5.	Agriculture Tools	Package	1	750,000	750,000
5.	Fertilizer				
	- organic	Kg	20,000	125	2,500,000
	- non-organic	kg	1,500	2,800	4,200,000
6.	Seedling Price				
	- Suren	stem	14,000	250	3,500,000
	- Mahagony	stem	2,000	250	500,000
	- Coffee	stem	4,000	1,365	5,460,000
7.	Pest Control (insecticide)	Liter	9	100,000	900,000
	<i>Total Cost I</i>				<i>21,610,000</i>
II.	1 st Year Maintenance Cost				
1.	Fertilizer and insecticide	package	1	1,500,000	1,500,000
2.	Enrichment Planting	stem	3,300	300	990,000
3.	Working tool and equipment	package	1	250,000	250,000
	<i>Total Cost II</i>				<i>2,740,000</i>
	Total Cost I + II				24,350,000

Table 7. Material Cost for CDM-Like Project (7.5 ha)

No.	Description	Unit	Quantity	Cost/Unit (Rp)	Total Cost (Rp)
I.	Material Cost				
1.	Border Marking Pole	PCs	30	500	15,000
2.	Tree Supporting stick	PCs	16,500	40	660,000
3.	Project Identity Name	unit	1	2,000,000	2,000,000
4.	Working Kit	unit	1	1,325,000	1,325,000
5.	Agriculture Tools	package	1	350,000	350,000
5.	Fertilizer				
	- organic	Kg	15,000	100	1,500,000
	- non-organic	kg	243,75	2,800	682,500
6.	Seedling Price				
	- Suren	stem	9,000	1000	9,000,000
	- Mahagony	stem	2,000	1000	2,000,000
	- Coffee	stem	5,000	1,365	6,825,000
7.	Pest Control (insecticide)	Liter	6.3	100,000	630,000
	<i>Total Cost I</i>				<i>24,987,500</i>
II.	1 st Year Maintenance Cost				
1.	Fertilizer and insecticide	package	1	1,500,000	1,500,000
2.	Enrichment Planting	stem	-	-	-
3.	Working tool and equipment	package	1	500,000	500,000
	<i>Total Cost II</i>				<i>1,500,000</i>
	Total Cost I + II				26,487,500

Table 8. Labor Cost for CDM-Like Project in Cianjur (10 ha)

No.	Type of Activities	Quantity	Working Day (WD)	Cost/WD (Rp)	Total Cost (Rp)
I	Planting				
1.	Field preparation and road inspection	10 ha	250	10,000	250,000
2.	Tree marking and area cleaning	16,500 stems	150	10,000	1,500,000
3.	Hole making	10 ha	250	10,000	2,500,000
4.	Working kit making	1 unit	25	10,000	250,000
5.	Seedling transportation	10 ha	100	10,000	1,000,000
6.	Planting and re-planting	10 ha	240	10,000	2,400,000
7.	Maintenance and fertilizing	10 ha	100	10,000	1,000,000
8.	Pest and insect control	10 ha	100	10,000	1,000,000
9.	Project identification name making	1 unit	20	10,000	200,000
10.	Supervision	6 man month	6	200,000	1,200,000
	<i>Total I</i>				<i>13,550,000</i>
II.	First Year Maintenance				
1.	Field clearing	10 ha	40	10,000	400,000
2.	Weeding and Drainage Making	10 ha	40	10,000	400,000
3.	Fertilizing	10 ha	40	10,000	400,000
4.	Seedling transport	10 ha	50	10,000	500,000
5.	Enrichment planting	10 ha	20	10,000	200,000
6.	Building maintenance of technical and land conservation	2 units	43	10,000	430,000
7.	Supervision	6 man month	6	200,000	1,200,000
	<i>Total Cost II</i>				<i>3,530,000</i>
	Total Cost I + II				17,080,000

Table 9. Labor Cost for CDM-Like Project in Cianjur (7.5 ha)

No.	Type of Activities	Quantity	Working Day (WD)	Cost/WD (Rp)	Total Cost (Rp)
I	Planting				
1.	Field preparation and road inspection	7.5 ha	150	10,000	1,500,000
2.	Tree marking and area cleaning	16,500 stems	100	10,000	1,000,000
3.	Hole making	7.5 ha	138	10,000	1,380,000
4.	Working kit making	1 unit	75	10,000	750,000
5.	Seedling transportation	7.5 ha	50	10,000	500,000
6.	Planting and re-planting	7.5 ha	50	10,000	500,000
7.	Maintenance and fertilizing	7.5 ha	500\	10,000	500,000
8.	Pest and insect control	7.5 ha	100	10,000	1000,000
9.	Project identification name making	1 unit	30	10,000	300,000
10.	Supervision	10 mm	10	200,000	2,000,000
	<i>Total I</i>				<i>9,430,000</i>
II.	First Year Maintenance				
1.	Field clearing	7.5 ha	25	10,000	250,000
2.	Weeding and Drainage Making	7.5 ha	20	10,000	200,000
3.	Fertilizing	7.5 ha	20	10,000	200,000
4.	Seedling transport	7.5 ha	20	10,000	200,000
5.	Enrichment planting	7.5 ha	15	10,000	150,000
6.	Building maintenance of technical and land conservation	2 units	15	10,000	150,000
7.	Supervision	-	-	-	-
	<i>Total Cost II</i>				<i>1,150,000</i>
	Total Cost I + II				10,580,000