Social Economic Survey of Epson Eco-Friendly Forest for Small-Scale CMD Project in South Kalimantan

By

Baharni [1)]
Kiyoshi Miyakuni [2)]
and
Yusuke Nakayama [3)]

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Japan International Forestry Promotion and Cooperation Center

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1) Laboratory of Policy, Economic and Social of Forestry,
Faculty of Forestry, Bogor Agriculture University, Bogor, Indonesia
2) Laboratory of Environment of Tropical Forest, Faculty of Forest Science,
Kyoto University, Kyoto, Japan
3) Japan International Forestry Promotion and Cooperation Center, Tokyo, Japan

Content

REPORT I

SOCIAL-ECONOMIC ASPECT OF EPSON ECO-FRIENDLY FOREST FOR FUTURE PROJECT AT BENTOK VILLAGE - SOUTH KALIMANTAN INDONESIA

(In Preparation of a Project Design Document Model for A/R-CDM Project in Indonesia)

By
BAHRUNI

BOGOR AGRICULTURAL UNIVERSITY
INDONESIA
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CONTENT

I. INTRODUCTION

A. Background

Seiko Epson Corporation (Epson) and Japan International Forestry Promotion and Cooperation Center (Jifpro) and Directorate General of Land Rehabilitation and Social Forestry, Ministry of Forestry of the Republic Indonesia desire to enhance relations and friendship between Indonesia and Japan. It's realized through a reforestation project at Bentok Darat Village, Bati-Bati Sub-District, Tanah Laut District, South Kalimantan Province, Republic Indonesia, and the project is known as "An Epson Eco-Friendly Forest for the Future"

The reforestation project is a symbol of Seiko Epson Corporation's awareness on environmental conservation on a local and global scale The reforestation project is carried out at deforested or denuded land of approximately 300 hectare, and it's accomplished for three years project operations, by implementation of agroforestry techniques.

Jifpro will develop a Project Design Document (PDD) Model for Afforestation/ Reforestation (A/R)-CDM Project, especially for small to medium sized environment protection forest. Jifpro considers that "Epson Eco-Friendly Forest Project" at Bentok Darat Village as the most suitable for project sample to collect all the relevant information.

B. Purposes

Socio-economic survey as a part of the survey of a Project Design Document Model for A/R-CDM Project in Indonesia by Jifpro's Team The purpose of the socio-economic survey to provide a supporting information that needed for preparation a Model of PDD Project that will be reported by Jifpro's Team, in detail as described below :

1. To describe project activities and analyze stakeholders participation
2. To collect and analyze socio-economic impact
3. To collect and analyze environmental impact

C. Socio-Economic Survey Method

Secondary and primary of socio-economic data are gathered through some documents and interview with stakeholders The data of project site condition, project design, project plan, implementation, monitoring sources from project documents, map, manual. General biophysical and socio-economic condition at Bati-Bati Sub-District and Bintok Darat village sources from statistical document and land rehabilitation and conservation of Tabanio watershed document and map

A focus group discussion for stakeholders is conducted, there are namely reforestation project manager and staff, non government organization that involved in the project, namely Bakti Alam Lestari (Bastari), communities of Bentok Darat as a participant (member and head peasant groups) and non participant groups of the project, a women group and a former head village of Bentok Darat. Discussion concentrates on community involvement, process of project planning and implementation, their comments and perception on project

II. DESCRIPTION OF THE REFORESTATION PROJECT SITE

A. Biophysical Condition

Location of reforestation project is chosen in accordance with a national criteria for land rehabilitation and soil conservation project which is prioritized on a critical land or watershed priority. Based on this criteria, project is placed on Apukan sub-watershed, Tabanio watershed at Bati-Bati Sub-District, Tanah Laut District, South Kalimantan Province Legal title of Epson eco-friendly forest project site is the state forest area Land use plan (recommended) at this reforestation project site is a protection forest, which is one among many kinds of protection area The existing land use is bareland, where grass especially *Imperata cylindrica* dominates the whole reforestation site.

Land use plan at Tabanio watershed is designated based on scoring of slope, land sensitivity (erodability), and precipitation intensity (erosivity) according to decree of the Minister of Agriculture No 837/Kpts/Um/11/1980, and No 688/Kpts/Um/8/1981, besides Act No 24/1992 and Presidential decree No 32/1990 are considered . It consists of three land use type, there is 1) protection area, 2) buffer zone, 3) cultivated area Land status at protection forest is determined by scoring of four factors, which is 1) land covered by forest crown, 2) slope, 3) erosion, 4) area or land management (Director General of Reforestation and Land Rehabilitation Letter No 412/V-RKT/1997). It comprises five categories, there are from not critical until very critical Tabanio watershed encompasses 340,000 ha, where is about 197,879 ha (58 %) become critical land based on those criteria's and critical land on Apukan sub-watershed about 12,832 ha (79 % of Apukan sub-watershed)

Tanah Laut District area has a critical land on site of protection forest covers 7,695 ha (16 % of protection forest) , around 692 ha critical land on other kind of protection area (13 %), and 41,071 ha (13 %) on cultivated area . Epson eco-friendly forest project 300 ha is a part of 7,695 ha critical land of protection forest at Tanah Laut District Table 1 shows a figure of land status and land use plan at Tanah Laut District

Table 1. Critical land at Tanah Laut District

No	Land status	Land use plan			Total area (ha)
		Protection area (ha)		Cultivated area (ha)	
		Forests	Other		
1	Not critical	10,251	1,046	64,751	76,048
2	Potential critical	18,929	1,752	140,759 54	161,440.54
3	Less critical	10,724	1,657	63,806.83	76,187.83
4	Critical	7,695	692	41,071 63	49,458 63
5	Very critical	0	0	0	0
	Total	47,599	5,147	310,389	363,135

Table 2. Land use plan and land rehabilitation pattern on Tabanio watershed,Tanah Laut District

No	Sub-Watershed	Sub-District	Land use plan (Recommended)	Technology recommended
1	Banyuhirang	Batı-Batı, Kurau and Cempaka	Protection area	Reforestation, natural succession, ravine and spring protection, gully plug, chek dam.
			Buffer zone (transition between protection and cultivated)	Same as at protection area, and firebelt, private forest, plantation (private and small holder), mixed garden
			Cultivated area· - Perennial	Same as at buffer zone, and afforestation, rotation planting, drainage.
			- Annual plant	Same as at perennial area, and strip cropping, contour cropping, terrace and water drop structure.
2	Apukan	Ibid.	Protection area / buffer zone	Same as at protection area, and firebelt
			Cultivated area. - Perennial	Afforestation, cover crop, contour cropping, forest plantation
			- Annual plant	strip cropping, rotation planting, chek dam, drainage

Source · Pattern of land rehabilitation and soil conservation on Tabanio watershed, 1997.

Land Rehabilitation and Soil Conservation Bureau Region VIII (Balai Rehabilitasi Lahan dan Konservasi Tanah Wilayah VIII) South Kalimantan Province has made a pattern of land rehabilitation and soil conservation for each land use type as a general guidance in rehabilitation design (Table 2).

Actually people manage their own land with appropriate ways, as such garden (homegarden, mixed garden) forest (multilayer trees), these known as agroforestry practices (Table 3). There are a few households still practise a slash and burn technique at shifting cultivation field Generally shifting cultivation field is at state land (state forest), and according customary rights community permitted to utilize that land, hence it could be common property

Table 3 Present land use at Bati-Bati Sub-District and Tanah Laut District.

No	Present land use	Bati-Bati		Tanah Laut	
		ha	%	ha	%
1	Wet paddy	5,766	24 5	52,758	14.6
2	Dry paddy	662	2.8	11,947	3.3
3	Homegarden	4,284	18.2	22,777	6 3
4	Mixed garden (multipurpose tree species)	896	3 8	30,159	8 4
5	Grassland (private land)	75	0.3	17,506	4.8
6	Swamp (not cultivated,)	4,712	20 0	52,264	14 5
7	Fish pond	16	0.1	4,800	1.3
8	Bareland (fallow)	200	0.9	12,906	3.6
9	Multilayer trees garden (private forest)	890	3.8	18,194	5.0
10	State forest (dominant vegetation· grass and shrub)	1,593	6.8	100,430	27 8
11	Plantation (rubber, sugar cane)	3,041	12.9	26,288	7.3
12	Other	1,380	5.9	11,116	3.1
	Total	23,515	100	361,145	100

Source: Bati-Bati Sub-District in Figures, 2001 Tanah Laut District in Figures, 1995.

Almost all wet paddy field is irrigated, consequently production result depend on climate condition, and soil condition as well Precipitation, temperature, humidity, and soil fertility are important

factors to influence agricultural yields. Precipitation and rainy day at Bati-Bati Sub-District are shown at Table 4.

Table 4. Monthly precipitation and rainy day

No	Month	Bati-Bati Station		Banjar Baru Station [1)]	
		Precipitation (mm)	Rainy day (days)	Precipitation (mm)	Rainy day (days)
1	January	270	20	373	22
2	February	290	18	274	18
3	March	271	17	232	18
4	April	137	12	301	17
5	May	250	17	198	10
6	June	164	12	121	12
7	July	55	4	91	9
8	August	90	5	75	16
9	September	73	6	92	6
10	October	116	10	158	11
11	November	279	17	167	15
12	December	347	17	325	24

1) . average of ten years measurment (1990-1999)
Source . Technical design of critical land rehabilitation on protection forest at Bentok Darat village, 2000.
Pattern of land rehabilitation and soil conservation on Tabanio watershed, 1997

B. Social and Economic Condition

Bati-Bati Sub-District covers 23,515 ha, where Bentok Darat Village is the largest part of Bati-Bati area, i e 4,000 ha (17 %), and population density at this village is 65 person/km2 Population growth rate of Bentok Darat village is 0.12 %, it comes from reproductive change or natural increase 3 person/1,000 population and net-migration – 2 person/1,000 population (Table 5).

Table 5. Bentok Darat village area and population

No	Area and population	2000	2001
1	Village area (ha)	4,000	4,000
2	Neighbors unity or rukun tetangga (unit)	12	12 [1)]
2	Population (person)	2,583	2,586
3	Difference between in and out-migration (person)	n a	-5
4	Difference between birth and mortality (person)	n.a	8
5	Households number (unit)	n.a	706

Source : Bati-Bati Sub-District in Figures, 2001
1) village is divided 14 neighbor unitys by year 2003
n a : data not available

Villagers move outside for some reasons, mostly for livelihood and higher education If assumed population structure by age at Bati-Bati Sub-District similar with Bentok Darat village, and then manpower is estimated approximately 1,685 or 65 % population (Table 6) Statistical data by year 2000 figures the number of student 25.8 % population, people job as peasant 23.7 %, trader or service 9 8 % and civil servant 0 6 % (total 34.1% population) According these data, then the number of unemployed of manpower is calculated around 135 persons (5.2 % population). Unemployed of manpower and underemployed such as peasant could be become labor supply or participants in project activities at Bentok Darat village.

Table 6. Population structure by age

No	Age structure (year)	Bati-Bati		Bentok Darat
		Person	%	Person
	0-14	9,337	32	829
	15-64	18,985	65	1,685
	>64	821	3	73
	total	29,143	100	2,586

Source : Bati-Bati Sub-District in Figures, 2001

Paddy, fruits, vegetables, latex, cassava, fuel woods etc are produced from paddy field, plantation and garden by peasants, and these are very important, because these products for household consumption

(subsistent) and commercial purpose (cash crop) Generally all wet and dry paddy yields are consumed by households; on the otherhand other products are sold for household income Gross product values of agricultural at Bati-Bati Sub-District are estimated Rp 23,378 billion/year, and population is 29,143 persons and then Rp 802,171/person/year (Table 7)

Table 7. Agricultural products and values at Bati-Bati Sub-District, 2001.

No	Agricultural products	Land productivity (ton/ha)	Yield (ton or unit)	Product Value [1] (Rp)
A	Annual crops and perennial			
1	Wet paddy	2.96	5,440.00	6,528,000,000
2	Dry paddy	1 82	227.00	272,400,000
3	Maize	4.79	2,561.00	1,024,400,000
4	Cassava	23.71	6,403.00	640,300,000
5	Sweet potato	9 60	48.00	24,000,000
6	Peanut	0.88	7.00	7,000,000
7	Soybean		-	-
8	Rubber latex	0 67	197.45	355,410,000
9	Coconut	0 15	10.90	10,900,000
10	Clove	0 10	20.95	94,275,000
11	Coffee	0.16	30.35	53,112,500
12	Cocoa	0 12	0 12	180,000
13	Jambu mete	0 29	1.75	6,125,000
14	Kapok	0.44	1.75	437,500
15	Candlenut	0.64	3.85	6,737,500
16	Sugar palm	0 53	11.75	17,625,000
17	Areca nut	0.99	0.99	1,485,000
	Sub-total A			9,042,387,500
B	Animal husbandry			
1	Cow		1,767	6,184,500,000
2	Buffalo		612	2,142,000,000
3	Goat		164	41,000,000
4	Pig		242	24,200,000
5	Sheep		41	10,250,000
6	Kampong chicken		22,641	452,820,000
7	Broiler chicken		413,430	4,961,160,000
8	Layer chicken [2]		1,251,077	417,025,667
9	Duck		5,116	102,320,000
	Sub-total B			14,335,275,667
	Total			23,377,663,167

Source : Bati-Bati Sub-District in Figures, 2001
1) estimated by current price, 2) estimated by egg value

There are three kinds industry operated at Bati-Bati Sub-District, namely foods and beverages 1 unit large scale and 15 unit household scale; wood processing includes 2 unit large scale and 4 unit small scale; and handicraft 1 unit medium scale, and nursery especially rubber seedling are exist at Bentok Darat village. These industries have made jobs available and absorb 113 persons labor force.

Income per year before reforestation project is estimated based on survey result of 100 peasants project participant, conducted by Riam Kanan Land Rehabilitation and Soil Conservation Bureau It's approximately Rp 3,672,000 ± 113,913/household/yr, with significance level 0.05, and average household member of 3,7 persons, then average income Rp 961,645 – 1,023,220/person/yr, this figure rather similar with gross products value of agriculture above .

III. DESCRIPTION OF REFORESTATION PROJECT ACTIVITIES

A. Objective and Project Design

There are three main objectives of the reforestation project, namely : 1) to improve the local natural environment condition 2) empowerment of local people 3) to contribute global warning mitigation and global environment conservation.

Reforestation project framework should be set up to assure to achieve project objectives above. This project is established with two strategic approaches, firstly technical approach, in replanting context; secondly social approach for community involvement in the project; therefore adjustment between forestry and community interest is needed Although the reforestation project is on the state land, community could have access to the forest, and it's possible under community forestry program (hutan kemasyarakatan), based on the regulation by the decree of the Minister of Forestry No 31/2001.

The management of reforestation project will invite local NGO to cooperation in community facilitation, such as to bridge communication between project and community, to arrange stakeholders meeting, as facilitator at the meeting, to identify problem faced by participant and their interest or comment, to inform forestry and environmental policy, etc

Agroforestry technology is applied for reforestation project implementation at the field, therefor several trees species combination planted according certain layout. Species composition is divided two categories, there are 1) tree for timber forest product and multipurpose tree species (MPTS) for non-timber forest products, 2) annual crops or agriculture. Trees species, these are *Swietenia macrophylla*, *Peronema canescens* and *Paraserianthes falcataria*, occupy 70 % and multipurpose trees species around 30 % of the reforestation project area, whereas annual crops can be grown as tumpangsari

S macrophylla is dominant tree species, planted with spacing 6 m x 2 m at center part of the reforestation area, and spacing of *P canescens* 6 m x 6 m, planted as hedge row, *and P falcataria* as green firebelt planted in two rows with spacing 2 m x 3 m at outer line of the reforestation are.

Multipurpose tree species consists of durian, citrus (jeruk), and breadfruit (sukun) and nephelium (rambutan) are planted in three rows between *P falcataria* and *S macrophylla*, with spacing 6 m x 4 m.

The reforestation project implementation was scheduled three years for 300 ha, and around 100 ha targeted each year. According to technical design, area for *S macrophylla and P canescens* covers 204,11 ha; which approximately 156,801 seedlings *S macrophylla* and 19,644 seedlings *P canescens* are needed; and 5.89 ha for green firebelt (*P falcataria*) with 19,554 seedlings, and 90 ha for MPTS with 52,800 seedlings will be prepared (Table 8).

Table 8. Allocation of planted area by species, and materials requirement of the reforestation project at Bentok Darat village.

No	Description	Year 1	Year 2	Year 3	Total
1	Area (ha) ·	100.00	100 00	100.00	300.00
	a. S. macrophylla and P.canescens	67.76	68.12	68.23	204.11
	b P. falcataria	2 24	1.88	1 77	5.89
	c. MPTS	30.00	30 00	30.00	90.00
2	Seedling (piece) :				
	a S. macrophylla	52,267	52,267	52,267	156,801
	b. P canescens	6,548	6,548	6,548	19,644
	c. P falcataria	6,518	6,518	6,518	19,554
	d. MPTS ·	17,600	17,600	17,600	52,800
	d.1. Breadfruit (sukun)	4,400	4,400	4,400	13,200
	d.2 Durian	4,400	4,400	4,400	13,200
	d.3. Nephelium (rambutan)	4,400	4,400	4,400	13,200
	d.4 Citrus (jeruk)	4,400	4,400	4,400	13,200
3	Fertilizer. nitrogen, phosphor, potassium (kg)	20,000	20,000	20,000	60,000
4	Herbicide (litter)	6	6	6	18
5	Pesticide (package)	1	1	1	3

Source . Technical design of critical land rehabilitation on protection forest at Bentok Darat village, 2000

Land and forest fire is a major risk in reforestation project, therefore firebelt will be contructed, which is two type of firebelt, firstly vegetation,and it's called green firebelt, secondly road and path, that are called yellow firebelt. There is designated a fire watch tower contraction to detect early fire accident.

B. Project Implementation

Balai Rehabiltasi Lahan dan Konservasi Tanah, Riam Kanan Banjar Baru (Barito Watershed Management Unit) responsible to implement the reforestation project, and a project organization has been developed to operate the project at the field Project personnel have adequate qualification or experiences to manage the project, they have educational background in forestry, trained in forestry-technical aspect, extention method, some expeciences in land rehabilitation and conservation planning, and involved in field operation; however, they have no enough experiences in social aspect. NGO "Bastari" performs community empowerment, to facilitate and communicate between social economic functions and ecological functions.

Project site had planned and mapped by project design team that responsible to Head Barito Watershed Management Unit, but it is modified in implementation, caused by project participants request that they will face a difficulties in maintenance at site condition such as steep or hilly, far from water source and settlement, besides, there is land claimed by a few villagers Land claimed by villagers and uncomfortable area approximately 20 ha are excluded or enclaved. It is necessary to avoid land conflict and reduce the risk or uncertainty of the forest existence at the future Realization plantation is only 270 ha; hence the project management should find and discuss with villagers about the alternative area to fulfill 300 ha targeted (Table 9)

Prolonged drought condition during the reforestation project operation, especially on June until October, is hard for plantation activities, there is some obstacle such as wild fires occurrence, difficulties in watering, and weeding etc The project management should use water pump for watering the plants but water supply from river was very limited, hence, probably did not reach all planted area and it isn't enough for water absorption by plants. The average survival rate of *P falcataria* and MPTS respectively 58.83 % and 55 73 %, on the contrary survival rate *S macrophylla* is 71 71%, which indicate not all species able to adapt with drought Weighted average survival rate of all species around 80 34 %, and then there is predicted only 165,322 trees (612 trees/ha) able to grow at the field until accomplishment of three years the reforestation project operation.

Table 9. Physical achievement of the reforestation project activities in three years operation at Bentok Darat village

No	Items	1st year	2nd year	3rd year	Total
1	Land preparation and planted	100	100	70	270
2	Seedlings preparation (piece)	76,385	76,385	58,080	210,850
	a. Trees (S. macrophylla, P.falcataria)	58,785	58,785	45,760	163,330
	c MPTS (durian,nephelium, breadfruit,citrus)	17,600	17,600	12,320	47,520
3	Plantation (trees)	74,544	74,544	56,680[1)]	205,768
4	Maintenance .				
	1st year plantation	100	100	100	300
	2nd year plantation		100	100	200
	3rd year plantation			70	70
5	Survival rate (%) :			79 32[2)]	80.34[3)]
	a S.macrophylla	82.24	61 19		71.71
	b. P falcataria	55.72	61 95		58.83
	c. MPTS	58.29	53 17		55.73
6	Infrastructure .				
	a Forest road : width 6 m (km)	1	1	1	3
	b Firebelt width 4 m (km)	1	1	1	3
	c. Fire watch tower . heigth 6 m (unit)		1		1
	d Bridge: length 8 m,width 1,5m (unit)		1	1	2

Source : report on monitoring and evalauation the reforestation project 2001 and 2002 project annual operations report, 2001,2002 and 2003

1)Estimated by ratio number of seedling preparation and plantation of 1st and 2rd year

2)Data on Survival rate by species not available

3) Estimation weighted average survival rate all species

Athough the project manajemen had contructed firebelt, wild fires had burned 0 75 ha and 7 ha of 1st year plantation, and 20 ha of 2nd year plantation. Wild fires sources from cigarette and matches that thrown when some body across the project site. Frequency of fire accident is 6 times in three years, and it had happened on September and October. Based on these data, estimation a crude probability fire accident is around 0 56 %, and crude probability reforestation area burned approximately 10 28 %, or every 1 % fire accident could burn potentially 18 36 % plantation area, and then expected value of secured are become 240 ha.

Firebelt constructed doesn't works effectively, caused by grass (*imperata cylindrica*) grows rapidly recover the yellow firebelt with fuel materials, moreover fuel materials of grass abundant at the surrounding area and a few villagers is still practice slash and burn technique in land preparation of shifting cultivation Besides firebelt contruction; the project management increases prevention to minimize fire risk through fullday patrol by 4-6 personell during Agust-October "fires season", extention about fire prevention to the peasants and develop project participant mobilization on fires supression also

C. Stakeholders Participation and Comments

Stakeholders of the reforestation project consists of forest dweller or community of Bentok Darat village, the Ministry of Forestry, Barito Watershed Management Unit and the reforestation project management, NGO Bastari, district government and local forestry agency, and Epson, Jifpro as well.

Epson provides funding for reforestation project, and the Ministry of Forestry as the executing agency, and Barito Watershed Management Unit responsible to implement the project activities. The parties agreed to establish the project through planning, operation and evaluation mechanism, where, operation plan should be approved by Epson and Jifpro, and the operation result is reported and submitted by the executing agency to Jifpro Although the reforestation property belongs to the Minstry of Forestry, but any parties have access and entry to reforestation property for purposes of observation, training and /or research, as well as local community access to the reforestation benefits or services.

NGO "Bastari" had been elected among local NGO's to participate in the project operation especially in social aspect of the project, based on the Bastari's competence to conduct facilitation of community organization development and participation Bastari has sufficient experiences in several activities such as forest peasant group development, facilitation development of forest for foods reserve and facilitation of community organization development in community forest project.

Responsibility of Bastari is defined in a contract agreement between the Reforestation Project Management and Bastari, and then Bastari prepare guidance activities of facilitator of community empowerment to make an achievement quality assurance. The role of Bastari is quite significant to encourage community participation, through approaches of information canalization, perceptions and interests' consolidation or harmonization among stakeholders, guidance, and communication with other stakeholders

Scope of community organization development is reduced only for directly circumstance related with the project implementation. Peasant organization of the reforestation project participant is established

into two groups, then each group divided into five small peasant groups (sub-group), and each sub-group comprises of 10 members. This peasant organization is structured in related with the project works; where, sub-group designated a working group responsible of project activities realization on 10 ha plantation area By this configuration, commitment and consensus related with attitude and activities among participants are easily build, and monitoring, evaluation of participants responsibility, rights, quality and quantity activities result, are easier also.

The reforestation project at Bentok Darat is a prospective community forest, which each participant allocated 1 ha, and participant will manage and get benefits from the forest, but nowadays community Bentok Darat has not possessed community forest concession yet; because there is a certain prerequisite and procedure that should be followed to get a concession from Bupati or Wali Kota according a decree of the Minister of Forestry No 31/2001. Villagers speak their desire to access of timber forest product from the reforestation area at future, in a meeting that NGO facilitation; nevertheless the reforestation project management has not authority to allows their request; for the time being, this issue had not been arranged in this project.

Communities participate at planning and implementation, meanwhile increase capacity their selves through learning by doing process. Community have build criteria's, who candidate the project participant through consensus in the meeting at the village; those are 1) high motivation, 2) willing and able to work hardly, 3) permanent inhabitant, 4) land dependent or poor, 5) resident near to the project site, 6) married men or women prioritized (it arise from women group, their argument is married man/woman has responsibility of his/her family life).

Recruitment project participants is processed through multilevel meeting, firstly meeting at hamlet (dusun), secondly meeting at village level. The result of dusun meeting is a list of candidates from dusun; those will be brought to village meeting. At village meeting, the list from dusuns are collected and then re-arranged based on those criteria's, and a decision is made through discussion to reach an agreement, as the result 100 peasants from Dusun Imban, Alam Subur and Karya Sentosa are decided.

All participants are peasant, which have a skill in cultivation, and have practiced agroforestry technology such as mixed garden and multilayer trees It means there is no new technology delivered from the reforestation project to communities Training and extension are more aimed to increase awareness, pay attention or concern about environmental damages and handling the problems together, while technical guidance at field is purposed to make sure that technical design is implemented properly.

The reforestation project management distributes project information and at the same time collects some comments from stakeholders through·

1) Revealed at participants meeting

2) Informed when coordination and consultation with other institution
3) Information canalization by NGO Bastari
4) Informal meeting with head peasant group, coordinator a working group
5) Spread information by leaflet

Comments and requests received by the project management could be consulted with Head Barito Watershed Management Unit, which is a decision maker of overall project implementation; and then, the project management's responses informed again to stakeholders by those ways above Every comment or request could be considered and to be taken counter actions, based on :

1) The management authority
2) National and regional regulation which related with forestry and environmental
3) The project framework that approved by Jifpro
4) Needs to achieve project target

If requests comply or beyond legal frameworks or reasonable necessary for project target and objective achievement, are permitted and taken into project operation, otherwise are refused and should be explained clearly.

Table 10 Stakeholders participation and comments

No	Items	Participant	Non-participant
1	Meeting attendance	regular	not regular
2	Request :		
a	Other species proposed	rubber	rubber, teak, ginger
b	Equipment	grass cutter machine, small tractor	n.a
c	Access and controll	plantation pattern, quality of fertilizer, seedling quality and prepared on time, need more herbicide, budget transparance, timber, community forest concession	timber

Source · result of socio-economic survey at Bentok Darat village, 2003

Participants request about rubber for MPTS on 3rd year plantation is accepted, but it had not been planted; although there was not any reason stated clearly. Non-participants request about ginger can not be realized, because they don't have access to the land According point of views of forestry and environmental aspect, ecological benefits and non timber forest products are emphasized on the reforestation project, therefore teak isn't chosen, predictable situation at future, and teak forest will be felled for timber production Plantation pattern changed, where MPTS are not planted at outer rows or border line plantation area, but MPTS mixed with main tree species (*S macrophylla*), and species

compotition not changed 70. 30. Other requests are allowed and implemented; except small tractor and more herbicide can not permitted, caused by budget constrains; while access for timber production and community forestry are out of his authority and should follow certain procedure (Table 10).

IV. IMPACTS OF THE REFORESTATION PROJECT

Environmental impacts assessment (EIA) should be carried out for every project that make environment disturbance potentially Forestry and plantation development are related closely with utilization and management of ecosystem, especially natural production forest and forest plantation, where negative impacts could be occurred. With this background a decree of the Ministry of Forestry and Plantation No 602/Kpts-II/1998 about EIA in forestry sector is issued Land rehabilitation, soil conservation, reforestation and afforestation projects are aimed to make environmental improvement or negative environmental impacts abatement, therefore EIA are not emphazised or obligated when those projects operation. In this context, why EIA at the reforestation project at Bentok Darat had not been conducted yet On the other hand, when those projects are purposed to produce certaint goods and/or services; although is begun with replanting or reforestation, EIA should be done.

The reforestation project operations for three years, many species trees and perennial crop had been established, it's expected grow become a health forest ecosystem at the future. There are ecological, economic, social and cultural linkages in the forest ecosystem establishment, even in it's existence. Environmental and social economic impacts are happened as consequence of those characteristics, according anthropocentric view, whether positive or negative impacts influence directly or indirectly human life. In this survey through rapid assessment, social economic and environment impacts of the reforestation project at Bentok Darat are analyzed as follow

A. Social and Economic Impacts

The reforestation project impacts on social economic are identified based on question what, why, how much, how long the benefits local people got or costs (losses) local people paid Based on the reforestation project activities described above; identification of the impacts of the project are as follow:

1) Indigenous peoples

2) Land tenure and land use
3) Food production and access to fuelwood, grazing and other forest products
4) Local employment
5) Income and village economic dynamic
6) Local institutional strengthening, included social integrity

Impact on indigenous people· Local people, who live in Bentok Darat village, are Banjar and Java tribes, Banjar tribe can be categorized indigenous people, because the community is one of sub group of Dayak ethnic, who live spread over all Kalimantan island Java people came to Kalimantan spontaneously by their selve long time ago, and some of them came by transmigration program for better livelihood. At Bentok Darat village most of Banjar tribe live at old hamlet such as Kerasik and Imban, and Java people at new settlement such as Alam Subur and Karya Sentosa, both of them live in harmony, they have equal rights and responsibilities. There are no impacts of reforestation project for indegenous people in context of social conflict, discrimination and violence of another tribe, outsite people, and the reforestation project management.

Participants of the reforestation project are around 51 % Banjar and 49 % Java people, selected according by criterias that they build and agreed together at village meeting. Impact of the project to village people directly related with project activities such as farmer organization development and forest establishment, the kind of impacts described below.

Impact on land tenure and land use: The reforestation project area is in the state forest land, although according customary rights, local people access to forest land for grazing and shifting cultivation, but national law about land tenure is understood and accepted well by villagers, land tenure should be approved by official note. Before the project start, there were five households utilized the land for buffalo grazing, and they claimed a small part of land in project site, in spite of with out an official note, but they demanded area for buffalo grazing available. The project management consider and respect their customary rights and need, and then that land is excluded out of the project area (part of 20 ha enclave), therefore is not abandoned land after project start, they could access to utilize the enclave area as grazing field (annex 1).

The presence of reforestation project at Bentok Darat village have not influenced neither land tenure nor land use off the project site, because they have a variety land use in agroforestry model, such as mixed garden, multilayer trees garden, rubber small holder, and dry field paddy also, and receive some benefits from ecologycal and economic functions, therefore it isn't necessary to change land use type.

Food production and access to fuelwood, grazing and other forest products: Since more than 50 years ago, land around village deforested, the area covered by imperata, and shrub dispersed on the small area. Timber and non timber forest products couldn't be produced, only a little opportunities for local people get benefits from deforested area.It is why, there is neither illegal logging nor hunting (reforestation project activities have not influenced illegal logging and hunting).

Before project start, the area covered by imperata grass, and utilized for grazing by few villagers. Peasants harvest wet paddy 1.5 ton/year and dry paddy 0.79 ton/year from their own paddy fields, where 95-99 % these products for subsistent, only 1-5 % available sold to local market (annex 1). The reforestation project is designated for agroforestry, there is available space for crop, but all participants are peasant, they grow paddy, vegetable and other cash crop on their own land, therefore only very small part of project area (estimated around 20 %) utilized for agriculture plant such as chili and dry paddy, dry paddy production from project site is estimated 97 2 ton/year (20 % x 270 ha x 1.8 ton/ha). After project each participant gets additional food production (dry paddy) around 0.972 ton/year, and beside dry paddy, at future time they will harvest fruits 4,187 (7,520 planted MPTS x 55.7 % survival rate) amount of breadfruit, durian, nephelium and citrus. These impacts are categorized moderate importance, because of it is a possibility to increase a proportion of products for commercial purpose, and increase their income.

Before project start, there was not available fuelwood that can be collected by local people from the project site, because of no forest stand on that land Villagers usually gather fuelwood from their own agroforest especially mixed garden, rubber plantation and shrubs Before and after reforestation project, their average consumption are relatively similar or constant around 0 83-1.25 m3/month/household, and their need of fuelwood have been enough supplied from these sources.

Before project start, there were eight buffalos owned by five households, grazed on the project site. Most villagers collect foliage from homegarden,mixed garden, and grasland, distance is about 100-500 m from their resident. Those five household grazed their buffalo on the project site, by burning the grassland along September – October, at least once a year approximately 0.5-1 ha each household, and it was usually conducted simultaneously with shifting cultivation activities. After reforestation project, they could continue to graze their buffalo at enclave area

Impact on local employment· The reforestation project implementation with manual activities, because small scale project, labors available in village or sub-district, and communities have skill in agroforestry technology practices. There is available job for 100 persons, around 14 % total households or 0.59 % manpower, and the role of job opportunity is additional activities, because they

still have time after they work at their farm Although this impact generates other impacts; but less amount; hence, category of employment is less important for Bentok Darat village communities.

Impact on income and village economic dynamic: Additional income is driven impact from employment, participants receive earning from their work in many activities. Although some time project activities did not worked by participants selves, when they weren't enough time to finish their own business; then other villagers (non participants) worked for them, on contract basis with the project management. Estimation of participant's income by 2003 (after project) Rp 10,373,000/yr/household, if assumed inflation rate 10 %, their income by 2000 (before project) Rp 3,672,000/yr/household become Rp 4,887,432/yr/household, there is increasing income about Rp 5,486,000; where, approximately 30 %, impact of the reforestation project, 70 % of other sources.

Further economic impact through village economic activities, peasant spends his money for household need, and based on the structure of his expenditure, its estimated marginal propensity to consumption locally around 40-37 % (Annex 1) Money injection from additional income flows in the village market, and contributes to village economic dynamic, through economic-multiplier effect, approximately Rp 795,748,000 (3.40 % agriculture-products value at table 7). It's predicted only in short time, this impact will flow away around 2-3 years Actually budget potential of the reforestation project could be spent locally approximately Rp 811 million (44 % grand total project expenditure), it is included seedling purchasing from supplier out site of village. Additional income and economic multiplier effect are categorized less-moderate important impacts (Table 11)

Table 11. Prediction of the reforestation project impact on employment, income and village economic.

No	Items	1st Year	2nd Year	3rd Year	Total
1	Employment (persons)	100	100	100	100
2	Budget spent locally (Rp 1,000)	54,393	212,230	234,698	501,321
3	Potential spent locally (Rp 1,000)	154,299	335,244	321,148	810,691
4	Grand total project expenditure	661,830	641,625	581,096	1,884,551
5	Ratio no 2/no 4	8	33	40	27
6	Ratio no 3/no 4	23	52	55	44
7	Additional income (Rp 1,000/person)	544	2,122	2,347	1,671
8	Economic-multiplier effect (Rp 1,000)	86,338	336,873	372,536	795,748

Exchange rate: 1 Rp = 0.0137 Yen (2001), 1 Rp = 0.01156 Yen (2002), 1 Rp = 0 01393 Yen

Impact on local institution strengthening: It is less important at this time,because of peasant organization establishment is a beginning phase of local institutional development, they learn to achieve an agreement to build the rules and trust each other, but it's restricted only for the project

implementation This organization is still weak to arrange a broad social economic aspect, such as increase environmental knowledge and awareness, perception and attitude changing in fire prevention, slash burn practices, and more over this organization existence at future after the project finish is uncertain, caused by no common interest against This expectation will be happened if no follow up process or action about community forestry concession on the forest that resulted. It means doubt about sustainability of forest, or even development it self; it means sustainable development included sustainable forest management are influenced strongly by institutional setting.

B. Environmental Impacts

It's difficult to identify environmental impact from small reforestation project in short time. Long time ago before the project start, it had been a critical land, unproductive, dominated by imperata. Wild animal such as *Neofelis nebulos* (macan dahan), *Nycticebus coucang* (kukang), *Pongo pygmaeus* (orang utan) or *Manis javanica* (tenggiling) are not life at here against, they left or hunted along time ago Forest establishment is expected to recreates their habitat, especially aves group. From biodiversity side, there are good, because of species compotition are diverse, and trees species used, have been adapted with local environment.

According communities perception there is positive impact such as water supply, climate change, especially fresh air, and it has been growing a hope for a success of reforestation effort at here, it was shown by good impression from local government, and other parties when they were at reforestation field. Importance scale of these impacts is similar with impact on social economic, these environment impacts are a good beginning, for always maintained for future.

V. CONCLUSION

The reforestation project (an epson eco-friendly forest for future project) is small scale project in a sub-watershed, therefore positive impacts are less importance, but these are potentially increase if the scale larger. This project faces several problems in the context of sustainability development or CDM-project related with risk and sustainability it self, specifically: 1) the rules of communities' access and control to the forest at future has not been completed. It's an important notice here, conservation effort without social economic benefits for people dwelling forest, is difficult to raise supporting and awareness, 2) on the project site and the surrounding area, is vast with imperata

grasses that inflammable; therefore quality of fire prevention improved necessarily, included social culture approaches also.

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Annex 1. Interview result of social economic aspect of the reforestation project at Bentok Darat village year 2003.

No	Items	Participant	Non-participant	Weighted average
1.1	Tribe	Java, Banjar	Java	
1.2	Household member	3.3	6.0	4.7
2.1	Land title			
a	Private land /sigel etc (ha/household)	2.3	1.0	1.7
b	State or comman land (ha/household)	2.5 (0.5-7 km from resident, off project site)	1.2 (1-7 km from resident, off project site)	1.8
	Total land ownership	4.8	2 2	3.5
2.2	Land use before and after project :	similar	similar	
2.3	Abandoned land after starting project	no	no	
3.1	Agriculture production :			
a	Wet paddy (kg/household/yr)	1,333	1,700	1,517
b	Dry paddy (kg/household/yr)	800	780	790
3.2	Production purpose :			
a	Wet and dry paddy	95-99 % for subsistence	95-99 % for subsistence	
b	Rubber	100 % for commercial	100 % for commercial	
c	Candlenut, durian, petai (parkia speciosa),coffee, nephelium	99 % for commercial	99 % for commercial	
d	Vegetables,chili, ginger, , breadfruit, banana, jackfruit	90-99 % for subsistence	90 % for subsistence	
4	Fertilzer .			
a	Urea (Nitrogen)	18	100	59
b	TSP (triple super phosphate)	37	50	43
c	KCl (Potassium Chloride)	20	50	35
5	Amount of fertilizer before and after project	similar	similar	
6.1	Herbicide	3.67	n.a	
6.2	Amount of herbicide before and after project	similar	similar	
7	Pesticide	seldom	seldom	
8.1	Livestock:			
a	Cow	2	1	2

b	Goat	6	-	3
c	Kampong chicken	9	15	12
8 2	Amount livestock before and after project	similar		similar
8 3	Location of collecting foliage	homegarden,mixed garden,grassland (distance < 500 m from resident)		homegarden,mixed garden,grassland (distance < 100 m from resident)
8.4	Hunting	no		no
9.1	Fuel consumption after project .			
a	Fuelwood (m3/month)	0.83	1.25	1.04
b	Kerosene (litter/month)	13.33	30 00	21.67
9.3	Amount fuel before and after project	similar		similar
9.4	Location of collecting fuel wood	mixed garden (distance < 300 m from resident)		mixed garden,rubber plantation,shrub (distance < 1 km from resident)
10	Income at present (Rp/yr/household) :			
a	Wages (from rubber plantation, epson project)	4,266,667	6,150,000	5,208,333
b	Products (rubber latex)	4,640,000	3,160,000	3,900,000
	Products (paddy,livestock, fruits,vegetables)	1,466,667	3,250,000	2,358,333
	Total income	10,373,333	12,560,000	11,466,667
11	Expenditure (Rp/yr/household)			
a	Consumption (foods)	1,648,000	n.a	1,648,000
b	Fuel/energy	240,000	n.a	240,000
c	Education	1,100,000	n.a	1,100,000
d	Transportation	700,000	n.a	700,000
e	Health	100,000	n a	100,000
f	Social activities	283,333	n a	283,333
	Total expenditure	4,071,333	n a	4,071,333
12	Participation and request ·			
1	Meeting attendance	regular		not regular
2	Request :			
a	Other species proposed	rubber		rubber, teak, ginger
b	Equipment	grass cutter machine, small tractor		n.a
c	Access and controll	plantation pattern, fertilizer		timber

		quality, seedling quality and prepared on time, need more herbicide, timber, community forest concession	
13	Impacts of project .		
	Positive impacts :	job opportunities	
		income	village economic
		organization strengthening	social integrity
		climate. fresh air,CO_2	climate· fresh air
		water supply	water supply
	Negative impacts ·	no	no

Annex 2. Project expenditure spent locally by project activities (Rp/1,000)

No	Items	1st year	2nd year	3rd year	Total
1	Seedling purchasing	99,906	123,014	86,450	309,370
2	Land preparation,and plantation (excl.material and equipment)	12,791	122,045	106,025	240,861
3	Maintenance 1st year	36,485	44,895	25,200	106,580
4	Maintenance 2dn year		36,490	41,993	78,483
5	Maintenance 3rd year			56,580	56,580
6	Camp/hut	-	8,800	4,900	13,700
7	Firebelt construction	5,118	5,110	5,000	15,228
8	sub total (2-7)	54,393	212,230	234,698	501,321
9	sub total (1-7)	154,299	335,244	321,148	810,691
10	Grand total project expenditure	661,830	641,625	581,096	1,884,551
11	Ratio 8/10	8	33	40	27
12	Ratio 9/10	23	52	55	44
13	Additional income/person	544	2,122	2,347	1,671
14	Economic-multiplier effect	86,338	336,873	372,536	795,748

Exchange rate : 1 Rp = 0.0137 Yen (2001), 1 Rp = 0.01156 Yen (2002),1 Rp = 0.01393 Yen

Report II

Results of the survey in the SEIKO-EPSON Eco-friendly forests

Kiyoshi Miyakuni
Kyoto University

I. Description of the survey sites

1. Land use

Table 1 History of land use and classification

Year	Land use and classification
1980's	The site (project site) was covered by grassland (Anang) Governor took initiative to enhance grazing in this area For example, supply of calves. (Aryadi)
1989	Alang-alang was always eaten by cattle and cannot grow taller. (Dodi)
1990	Permission for grazing was canceled (Anang) PT. Haspram started operation. (Area· 200ha) The present project area was not included. (Anang, Dodi) Cacao, rubber was planted by PT. Haspram. (Dodi)
1991-92	Cattle were moved to other area (Kecematan Jorong) (Anang, Dodi)
1994	Rubber seedlings were planted on their land (at present project area), but failed because of drought Seedlings were supplied by local government (DINAS Perkubunan) (Anang)
1999	PT. Haspram stopped its operation Bridgestone started operation (Area 6,100ha)
2000	From January, planting of rubber by Bridgestone started (Anang, Dodi)

Note. (Anang) → According to Mr. Anang (former village head. 1984-2001)
(Dodi) → Mr. Dodi (BPDAS)
(Aryadi) → Mr. Aryadi (BASTARI)

2. Land tenure

(1) 30 persons had rights to land admitted by the village head (Ketua Desa) before the project started All holders of the rights had participated to the project (Anang)
* Mr. Dodi did not notice about the rights in the project site, but he admitted that there were some farmers who claim the rights to land around the project site (Some farmers asked to exclude their land from project area. See Table 4).
(2) 6 families were living in the project area (Dodi, Anang) They cultivate the land In the year of 2003, they opened their farms (by slash and burn method), but the area was outside the project area.

3. Grazing

(1) Cattle grazing around the present project site had already reduced drastically in the year of 1991-92 after cancellation of grazing permission (Anang) and not by the Epson project. (See Table 1)

Starting PT Haspram's operation also affected reduction of grazing Village people were afraid of disturbing PT Haspram's farm (cacao and rubber). This was one of the factors for stopping grazing (Anang)
(2) Nowadays, cattle are grazed within the enclosure. (Except some villagers graze buffaloes beside the project area.) Forage is collected from their own or Bridgeston's rubber gardens.

4. Fuel, firewood

(1) According to respondents (Table 6), firewood was main source of fuel. Kerosene was also utilized but only played supplementary roles (but there was some exception.)

(2) Firewood are collected from their own and Bridgestone's rubber garden. Sometimes they are collected around their house or along the road in the village

(3) The Epson project did not cause any disturbance for firewood collection because the project site was grassland.

II. Stakeholders involvement to the project

1. Procedures

Table 2 Procedures before and after starting the project

Year	Activities
1999	Preparation of proposal by DINAS Kehutanan Kabupaten Tanah Laut BASTARI already involved in the prepation. (Aryadi) Feasibility study by JIFPRO 3 alterative locations (Dodi) Informal meeting with village people (Dodi) Explanation of the project to village head (Mr. Anang). (1) Explanation of the plan (2) Meeting. 2 times for selecting participants * Conditions for participating the project (Dodi) i. Living near the project site (Dodi) ii. Villagers heavily depending on agriculture (Dodi) iii. Male (Dodi) iv Poor (Aryadi) v. Person with higher motivation (Aryadi)
2000	Formal meeting with village people (December) (Dodi)

Note. (Dodi) → Mr. Dodi
(Aryadi) → Mr. Aryadi

2. Requests from stakeholders

Table 3 Requests from stakeholders before starting project

Stakeholder	Requests		How the requests were built into the plan of project? (or why the request was ignored?)
	To whom	What kind of requests?	
BASTARI (BATARI conducted survey to clarify local demand)	Ministry of Forestry (Jakarta)	Proposal for giving rights of managing planted forests to local people.	No answer
Village people	Project	(1) Facilities to carry seedlings (including road) (2) Countermeasures to avoid wildfire (3) Introducing rubber (4) Increase of wage· same level as Bridgestone, or Upah Minimum Regional (regional minimum wage) (5) Arrangement and allocation of planted trees (Pola tanaman, tree species)	(1) Road was repaired. The small bridge in front of entrance of the project site was enlarged → Cars and trucks can enter the site. (2) Supply of oil drums to store the water, a water pomp. Establishment of firebelt on the boundary of the project. (3) At first not accepted, but for the 3rd year, introduced. (4) Not accepted (5) Already implemented
Local forestry officer (Kepala DINAS Kehutanan Tanah Laut)	Dodi	Introducing Kimiri trees for the project (Because of its growth and demand of local people)	Already accepted. BASTARI consulted with local people, and after their acceptance, the request was introduced in the project.
Governer	Dodi	Introducing Sengon trees for the project	Already included in the project planning

Table 4 Requests from stakeholders after starting project

Stakeholder	Requests		How the requests were built into the plan of project? (or why the request was ignored?)
	To whom	What kind of requests?	
BASTARI	BTR, UGM	Research about death of top bud of Mahogany	The report has not been received yet.
Project participants	Project	(1) Change of boundary of the project site Reason: i.The site was too steep and far. ii. Some villagers claim their rights to land (2) Supply of fry (fish) (3) Delay of seedling supply (some participants had already received seedlings, but others had not received yet.) (4) Agroforestry (Tumpangsari): planting ginger, chili , peanuts between Mahogany trees (5) Building water reservoir (6) Continuation of the project	(1) Already accepted. (2) Not accepted (4) Already accepted by Mr. Dodi Some participants had already planted chili and other crops between Mahogany trees. (5) Not accepted because water pump and drums were already suuplied.
Survey from project participants (October, 2003)	Project	(1) Better quality for fertilizer (2000) (2) Herbicide (2003) (3) Mahogany seedlings for MPTs' site	(1) (2) (3) Already accepted and supplied

III. Social effects of the project

1. Training

Table 5 Training

Participants	Number of participants	Type of training	Organizer	Y ear
Project participants	25 persons	Fire prevention Enhance technology and knowleage for forestry, etc.	BPDAS (fund from Epson)	2000
Project participants	30 persons	Enhance technology and knowleage for forestry, etc	BPDAS (Mr. Suhardi) (fund from BPDAS)	2001

IV. Other effects of the project (Include environmental effects)

1. Controlling wild fire

(1) After the project started, occurrence of wildfire was reduced. This, however, did not result only from Epson project Bridgestone has established rubber plantation adjacent to the project site Watching by the security guard also affected reduction of wildfire. (Anang, Dodi)

(2) Role of Epson project for fire controlling (Dodi)

i. In the dry season, a guard was employed Wages were paid using fund from Epson (Rp.20,000/day)

ii. Notice to participants not to throw away cigarette.

2. Utilization of fertilizer, herbicide

Other effects

V. Problems regarding uncertainty of the project

Under this project, communication between project participants, NGO and local forestry office seems to be smooth Requests from project participants were often collected by NGO staffs and brought to local forestry office

There, however, are some problems regarding uncertainly of the project

1. Tree tenure

Mahogany was chosen because of the quality of wood It means that the project participants (or other stakeholders?) expected the harvest of planted trees although the project site was included in 'Protected Forest' In the 'Protected Forest', there is no right of harvesting timber for local villagers but the participants were anticipating the share from expected products It can be one source of conflict between the government and project participants.

Although the project was called "social forestry", the participants can be placed as only 'wage labor' for plantation because no rights to planted trees (except fruits from MPTs). Participants also regard the project as one of working opportunity to get wages Fuelwood and forage are supplied rubber gardens and other area around their residents. Without additional funding, keeping participants' incentives to maintain the forests seems to be difficult.

Some participants want to start tumpangsari (planting chili, peanuts and ginger between mahogany trees) and already admitted by the project This could be one factor to strengthen the relationship between participants and the established forests.

The project certainly will improve the ecological conditions of the area because of conversion of grasslands into forests. It seems that village people around the project site have not heavily

depended on the grasslands after stopping cattle grazing. Negative social impact by the project was very small.

2. Other problems or requests

(1) Because of drought, after preparing planting holes and seedlings, planting could not be conducted.

(2) Death of bud (Mahogany): UGM (Gajahmada University) conducted investigation and research, but the project has not received the result yet

(3) Weeding: fund is enough only for once a year. At least, weeding should be conducted two times a year. (Dodi)

VI. Results of interview to project participants

Table 6 Summary (Interview to project participants)

	Respondent A 25 years old Family. 5 persons	Respondent B 45 years old Family: 3 persons (Moved to this village 8 years ago.)
Land tenure	He owns private land in his village (holds land rights in his village)	He occupies land in Protected Forest
Agriculture Trees	5 years before, he started planting fruit trees.	He had planted fruit trees on the land in 1999
Rice production	Wet paddy field only (before/after project) Enough for self-consumption	Before project. Dry paddy → After project: Wet paddy Enough for 4~5 months' consumption
Utilization of chemical	Fertilizer, pesticide and herbicide were used. (no changes of chemical utilization before/after the project)	No chemical utilization
Grazing and hunting	Decrease in number of cattle No hunting	Increase in number of buffaloes No hunting
Fuelwood	Firewood was collected from his own farm (including rubber garden) No shortage in source of firewood	Firewood was collected in Gridgestone's rubber garden and around his house (Protected forest) No shortage in source of firewood
Building material	Bought from sawmill	Collected from forest near the project area (Protected forest)
Source of income		Quit gold mining
Expenditure	No significant changes in expenditure	
Wild fire	No damage by wildfire	
Requests to the project	Increase of wage Planting chili between Mahogany trees (tumpangsari) Supply of more fertilizer (Urea, SP), increase of quality of fertilizer	

No significant changes in forest use

Except: Respondent B stopped dry paddy cultivation and gold mining.

Before the project started, they had already started planting fruit trees on their land

Appendix

Respondent A (Kelompok 2)

1. Information about the respondent

Race. Banjar
Age. 25 years old
Member of forest farmer (Joined in the project from the 2nd year)
Family: Father, mother, wife and one child (5 persons)

2. Land tenure and utilization

Name of the title (including letter from village head)	Area	Location (in or out of project site)	Land use	
			Before project (vegetation type, main species)	After project (vegetation type, main species)
Tanah Segel (Private land)	2ha	Village area (Outside project area)	Vacant land (forest) until 1997. 5 years before, started planting Rambutan, Durian 1.5ha Mango (already dead, not suitable) 1 5ha	Same
Surat keterangan kepunyaan (State land, letter from village head)	2ha	Village area	5 years before, starting planting	Same as above

Before the project, he had already planted fruit and rubber trees in his land
No abandoned land after starting project.

3 Agriculture
(1) Wet paddy field

	At present	Before project
Area and location	0 5ha on private land	Same (Area)
Harvest	100 kaleng (with rice husk) (Enough for self consumption)	
Selling rice	Selling 25 kaleng Price· Rp.15,000/kaleng (August)	

Note: According to the respondents, 1 kaleng = 16 kg

(2) Dry paddy field
No dry paddy field

(3) Fertilizer and pesticide

	Type	Purpose	Purchased from
Fertilizer	Urea, SP, KCl	For wet paddy	Purchased by himself
Herbicide	Roundup		
Pesticide	Matador		

Changes after project: Utilization of fertilizer and herbicide for the Project
Other than this, no change in utilization of chemical.

4. Grazing and hunting

(1) Decrease in number of cattle

Before project	After project
Cattle 7 fowl	Cattle 2. collect weed (forage) outside project area fowl

(2) No hunting (before/after project)

5. Fuelwood and building material

	Before project	After project
Source of fuel	Firewood (main) and kerosene	No change
Location for collecting firewood	His own farm (including rubber garden). 2 ~ 3 kilometer from his house	
Building material	Bought from sawmill	

6 Income

Source of income	Amount
Project activities	Rp.300,000/month
Selling rice	Rp 375,000/year (Rp 15,000 x 25 kaleng)
Pepo (Labu)	Not sold in 2003 (but pernah dijual)

After project, no decrease for income

7 Expenditure
No impact on expenditure

8. Requests to the project
Improvement of quality of fertilizer (2000) → Accepted

9. Wild fire
Firebelt. Before project—already implemented
Training for preventing fire
Training course in 2000 and 2001. One of their topics was to prevent wildfire.
Other measures to prevent fire
(1) Handy spray
(2) Conventional equipment for distinguish fire (Pakapak, Pemukul api)
Trees planted by him: not affected by wild fire.

Respondent B (Kelompok 2)

1. Information about the respondent

Race. Banjar
Age: 45 years old
Member of forest farmer

Moved to this village 8 years ago
Family: Wife and a child 1 (3 persons)

2. Land tenure and utilization

Name of the title (including letter from village head)	Area (m2,ha)	Location (in or out of project site)	Land use	
			Before project (vegetation type, main species)	After project (vegetation type, main species)
Inside protected forest	1.5ha	Inside project area (5 munites from his house)	Wet paddy	Wet paddy Durian, rubber (planted in 1999) (Area: 0 5ha)
Inside protected forest	160 trees	1 hour from his house		Durian, Kemiri (planted in 2000). After planting dry paddy, seedlings were planted.

3 Agriculture. He quitted dry paddy cultivation after project.

(1) Wet paddy field

	At present	Before project
Area and location	0.25ha on his land (at project site, Protected forest)	No wet paddy field
Harvest	40 kaleng. Enough for 4 months	
Buying rice	2 kaleng/month (Rp.35,000/kaleng)	

(2) Dry paddy field

	At present	Before project
Area and location	No dry paddy field	Out side present project area (Protected forest) (1 hour from his house)
Harvest		About 35 kaleng

2 years' rotation (Rotation of three location). Slashing alang-alang grassland.
At present, durian and kemiri trees are planted.

(3) Fertilizer and pesticide
No fertilizer and pesticide was used

4 Grazing (and fish culture)

Before project	After project
Baffaloe 1	Baffaloes 3 (grazed in project area) Pond for fish culture beside his house

5 Fuelwood and building material

	Before project	After project
Source of fuel	Firewood (main) and kerosene	No change
Location for collecting firewood	Bridgestone's rubber garden, around his house	
Building material	Bought from sawmill Forest near the project area	

6. Income

At present

Job	Wage
Project	Rp.300,000/month
Gold mining	Rp.300,000 (until 2003)

Before project

Job	Wage
Road construction	Rp. 15,000/day (4 years before, 1999)
Gold mining	Rp 300,000/month (until 2003)

7 Expenditure

No significant change in amount of expenditure

8 Requests to the project

Improvement of quality of fertilizer (2000) → Accepted

<Preferred trees>

Teak (Senon)

Mahogany (Selamat)