

G-2 The Selection of Tree Species and Field Crops: Points Requiring Consideration

(1) The Selection of Tree Species and Field Crops

Tree species and field crops were examined for selection according to their suitability in the Project Area. They were evaluated in a comprehensive manner based upon studies of natural conditions (precipitation, atmospheric temperature, altitude and the soil quality), economic conditions (market demand, their marketability, transport factors and the extent to which they could be cultivated intensively) and other factors (their durability under conditions with no sunlight as well as their immunity to blight and insect infestation). The points of view of the region's inhabitants were also surveyed. Suitable tree species and field crops were identified based upon the above conditions in the Project Area.

In particular, with respect to being suitable for natural conditions, tree species and field crops were selected according to the following criteria.

- ① Their suitability to Schmit and Ferguson's "Type A" classification of climates, the "volcanic ash" classification of soil and the altitude of the Project Area, as described in Pedoman Agroforestry Dalam Perhutanan Sosial, Perum Perhutani, 1990. (The "Type A" classification refers to a climate where the ratio of the dry season, when precipitation is less than 60 mm per month, to the wet season, when the precipitation is more than 100 mm per month, is 0 - 14.3 percent; the dry season lasts for only 0 - 1.5 months.)
- ② Their suitability to the "B1" agricultural climate region, as described in Oldeman, L.R.'s An Agro-Climatic Map of Sumatra: Contributions from the Central Research Institute for Agriculture Bogor, No. 52, 1979. (The "B1" classification refers to areas where seven to nine months of the year are wet months with high humidity, when precipitation exceeds 200 mm per month, and less than two months during the year are dry when precipitation is less than 100 mm per month. According to this factor, there is enough water to allow paddy rice cultivation to be carried out with a dependence on rain and it is possible to cultivate dry-field crops throughout the year.)

(2) Necessary Points to Consider

In the Project Area, there are permanent markets set up in Kepahiang and Curup. There are also simple markets in other villages and these are open regularly, once a week. The principal roads connecting villages to the markets are paved and maintained relatively well. From, among other things, marketability and transport angles, it can be considered that

there is wide scope for the selection of crops which can be cultivated. The possibility to introduce new field crops such as mushrooms is high, but in introducing such crops, trial facilities for experimenting with their cultivation are necessary. Such things as home gardens and demonstration plots are required. Furthermore, accompanying an introduction of the merchandising agricultural and forestry products, and an introduction of the merchandising of processed goods and exportable crops, there is a degree of risk. Sufficient examination of the special character of each of the products is necessary before they are introduced.

Thorough caution must be taken in the selection of tree species and field crops where insect infestation can be expected.

G-3 Estimating the Harvest Volume After Planning

In the Republic of Indonesia, monitoring examinations of an increase in the harvest volume of tree species and field crops in the post-planning stage are carried out at demonstration plots and through conservation projects. There are many examples of increases in harvests after a development programme is begun. The effectiveness of a careful selection of tree species and field crops is evident in the volume of the harvests. In the post-planning stage, there is a difference in the growth of the volume of the harvest from year to year, from region to region and from one undertaking to the other, depending on such factors as the introduction of improved types of products, the development of technology to do such things as fertilize and prevent insect infestation, the influence of dry weather according to the year, and the degree to which businesses can carry out their plans when they face budgetary restrictions in any given year. There is a tendency to have lower yields of tree and crops after the end of business periods when there is a lowering in incentives for farmers.

In this study, yield estimates of tree and crops for successive years following the post planning period were made with reference to examples of an increase for yields of a maximum of five percent in areas enclosed with wood-fenced/strip planting, a maximum of ten percent for bench terraced areas and some ten percent with improvements in cultivation technology. The UP-UPSA natural resource conservation project model units in Air Bening Village of the Study Area and Kampung Melayu Village in the Project Area, as well as similar conservation project cases were examined. The results of this are shown in Table G-1.

Table G-1 Forecast of Changes Over Time in Tree and Crop Yields Following the Project

The percentage rate of increase in yields of trees and crops											
Number of years from the beginning of the project		1	2	3	4	5	6	7	8	9	10
Coffee fields	Wood-Fenced and Strip Planting	0	0	0.5	1	2	3	4	5	5	5
Farm land	Bench terraced	0	0	0	0.5	1	2	3	5	7.5	10
Coffee fields and farm land	Cultivation technology improvement	10	10	10	10	10	10	10	10	10	10

- Source: 1) Institutional Strengthening for Evaluation and Effectiveness of the Upper Solo (Wonogili) Watershed Protection Project. Project Planning and Implementation Unit, 1992
 2) Feasibility Study on Soil and Water Conservation Project for Uement Consultants Korea and Indonesia, 1988
 3) Results of survey in Pusat Penelitian Kopi dan Kakao, Jember, Dinas Perkebunan, agricultural extension centers and demonstration plots, etc.

G-4 Measures to Improve Coffee Production: a Social Forestry Approach

Trees play three roles in agricultural production. They:

- a) Improve the productivity of agricultural lands,
- b) Enhance animal husbandry, and they serve to
- c) Offer by-products for farming and income generation.

The social forestry development plan in the Project Area is aimed at providing the third role above. As examined under this paper, a large part of the population living in the Project Area is involved in traditional methods of coffee cultivation. Because of their involvement, increasing the volume of coffee produced and securing its stable growth are important incentives to encourage the participation of the local populace in the social forestry development plan.

The social forestry approach examined here is recognized to contribute to the improvement of coffee production through a technical study of research results without specific research undertakings of coffee cultivation, utilizing general data on coffee cultivation.¹¹

¹¹ Dr.Ir. Ika Rochdhatun Sastrahidajat, D. Ir. Soemarno D.S.M.S. (1991): *Budidaya Tanaman Tropika*
 P.S. Siswoputranto (1993): *Kopi Internasional dan Indonesia*
 Ir. Sri Njiyati, Ir. Dantri (1995): *Kopi Budidaya dan Penanganan Lepas Panen*
 Aksi Agraris Kanisuius (1974): *Bercocok Tanam Kopi*

(I) Natural conditions where coffee is cultivated in the Project Area

- ① Climate: The clearly dry season is short while the year to year change in precipitation levels during the dry season is marked.

As shown in section 3.1 of this paper, most of the areas in the Project Area receive more than 1,500 mm of precipitation annually; and there are many areas which receive more than 100 mm of precipitation a month throughout the year. It can be considered that there is no need to worry about insufficient levels of water for coffee production. However, the variation of precipitation, subject to wide fluctuation from year to year is marked. Dry years, when there is little rain and a parched climate, and years when the dryness is less severe during the dry season, and there is high precipitation, almost always alternate every other year. There is also the tendency to have especially dry years every three years.

It is said that *Coffea robusta*, cultivated by the large part of the populace, requires three to four dry months where monthly precipitation is less than 100 mm. Precipitation is the principal factor which determines whether the coffee plants flower, as rainfall has an effect on the water level within the plant. To be released from their dormant stage, the buds of coffee trees require dry conditions. When it is not dry, the plant flowers in an irregular way or, in an unusual phenomenon, does not flower at all. While the plant grows from the budding stage to the flowering stage, seven to eight days of rain in one to 1.5 months are ideal. Because rain can harden the pollen and hinder pollination, a period of about one month with no rain is required after the flowers bloom. On the other hand, when it is extremely dry and the dry period lasts for a long period, the plant will flower abnormally and may not bear fruit.

- ② Soil: Highly acidic soil is distributed widely and favorable lands, in terms of soil conditions for coffee cultivation, are limited.

It can be considered that soil conditions suitable for coffee cultivation are limited to the ACC I and AN I and AN II soil classes. (The most appropriate soil class is AN I.) (Refer to Table G-2.) Suitability is based on judgments made principally of soil acidity in the Project Area. The soil standards^{*2} originally deemed appropriate by the *Rejang* people, who form the dominant ethnic group in the Project Area, as passed down through customarily received tradition, can be thought to be farmland other than paddy fields, the characteristics of which resemble those of ACC I, AN I and AN II soil classes. These soils contain large basalt stones and have a thick black stratum. It can be thought that the traditional cultivation of coffee is widespread even on

^{*2} Departemen Pendidikan dan Kebudayaan (1977/1978): Adat Istiadat Daerah Bengkulu

inappropriate lands where soil conditions are not good because soil standards deemed appropriate through custom were not transmitted in centers of population and among increasing populations which had difficulty in securing appropriate lands (for example, among populations of people of other tribes, young social classes or people who immigrated spontaneously from other areas).

(2) Important problems with the coffee cultivation methods of people dwelling in the region

- ① Coffee production levels are unstable due to the every other year effect of flowering and fruition volumes of the plants.

It can be thought that one cause for the unstable levels of coffee production, and hence coffee cultivation income, aside from the fluctuation of coffee prices, is the year to year change in precipitation levels.

During years when there is much rain during the dry season, the amount of sun light is insufficient: the number of plants which flower decrease. The rain prevents the plants from receiving pollen and fruition levels go down. On the other hand, during years when there is little rainfall during the dry season, because conditions hampering fruition are less, the flowering and pollination of plants are promoted and it can be thought that the phenomenon of fruit in abundance is produced. It is said that even if there is an abundance of fruit produced, the coffee plant is not physiologically forced to drop its fruit. When there are not sufficient carbohydrates produced, carbohydrates stored in the trunk and branches of the tree are sucked upwards and the roots of the plant decay. As a result, the coffee trees lose their strength and their branches experience *die back*; the trees stop growing branches. The following year, the branches on which buds form become fewer in number and there is a decrease in the volume of fruit borne. When this *die back* process is repeated (alternate year), it can be thought that the tree age for fruition becomes shorter, due to an early decline in the tree's strength, and the life-force of the trees drops rapidly.

According to results gathered from interviewing people involved with the study, in comparison with *Lana* coffee which was cultivated formerly, the branches of the *Mana* coffee plant, which has begun to be cultivated recently because of its large fruit size, begin to decay and the tendency is for the plant's fruition period to shorten to about five years. This phenomenon, of an alternate year repetition of this tendency, is thought to take place. The decrease in the abundance of fruit can be thought to be connected with the stability of the volume of coffee harvested.

- ② The volume of coffee produced decreases according to the increase in obstacles, including insect infestation and a growth of impediments due to inadequate nutritional levels.

Color discoloration and the decay of leaves can be observed on coffee plants cultivated in the Project Area as shown in Table G-3. As the immunity against blight and insect infestation of *Coffea robusta* is high, there are few outbreaks of damaging factors to the crop on a large scale. Planters are, however, very much concerned about the possibility of damaging factors as they fear drastic decreases in harvest volumes. The *die back* phenomenon as an alternate year effect as discussed above, and impediments to growth due to filamentous fungi or insufficient nutrition, are a cause of worry.

The soil in the Project Area is considerably acidic (about pH5) with one part being excessively so (about pH4). The level of exchangeable bases, substances capable of combining with acids to form salts, is low. Furthermore, the supply of organic matter in the soil is limited due to the pruning of branches during the pruning season and the cutting of trees during the felling season. These branches and trees are taken away to be used as firewood, while the surface of the ground is burned and cleared away at the renewal time for trees. On the other hand, weeds mostly belonging to the herbaceous plant family of Gramineae, with mat-type roots, grow in conflict with the many thin roots of the coffee trees which grow in the upper layers of the soil. Weeding is required habitually. And it is these conditions which trigger erosion. The surface soil is lost and necessary elements in the soil tend to be exhausted. The depletion of organic matter and the class of bases in the soil is rapid as only a small level of organic matter can be retained.

The field survey of people dwelling in the area indicates that the places known by inhabitants to produce low coffee yields are excessively acidic areas. The chemically low fertility of CM I, CM II, AC and ACC II soil classes tends to be scattered widely, as indicated in Table G-4 of this paper which examines elements which impede coffee growth in the Project Area. There is the possibility that there are nutritional deficiencies of potassium and nitrogen in some soil units (Dystric Leptosols) even in favorable AN I soil class zones. The withering of branches, in particular, is thought to relate to a shortage of potassium. The standard number of trees planted on one hectare of plantation land requires 135 kilograms of nitrogen, 34 kilograms of phosphoric acid and 145 kilograms of potassium chloride (potassium 60.9 kilograms), assuming that the supply of these elements is none except from the soil (the depth of the soil is supposedly 1.5 meters). In ANC soil zones where inorganic substance accumulations are presumed to be the highest, these elements will be depleted in about

44 years. For ACC I soil areas where the accumulation of effective phosphoric acid is estimated to be the highest, the elements will be depleted in about 54 years and in ACC I soil areas where the exchangeable potassium content is assumed to be the highest, depletion will take place in about 41 years. It is necessary to pay attention to the circulation of the bases. (Table G-5 refers.)

(3) Counter measures to improve coffee production through a social forestry approach.

1) Agro-forestry: the planting and management of shelter trees

- ① The stabilization of blooming trees and the volume of fruit borne depend on the effectiveness of shelter provided by sheltering trees.

The effect of shade provided by shelter trees is to reduce the number of flower buds, and as a consequence, the number of flowers blooming. However, shelter trees prevent the flowering of the tree beyond the ability of its leaves to assimilate nutrition and the absorption power of its roots during dry seasons when there is little rainfall. It is also possible that shelter trees prevent the *die back* phenomenon and also stabilize the annual range of fluctuations in fruition. In this respect, they make prevention possible to not waste nutritious substances stored in trees. As a result, shelter trees prevent a decrease of fruition during the following year and make yearly fluctuations in the volume of coffee produced smaller. On the other hand, when there is much rain during the dry season, the rain drops can hit the flowers directly and harden the pollen, diminishing the number of flowers pollinated. Trees to form a crown which can obstruct the rain are thus required. The number of shelter trees must be increased, but they must allow the level of light which hit the coffee plants to be maintained so that light saturation levels (of 10,000 - 20,000 lux) do not fall. (Reference is made to Section 5-3(1) 1) ③ and E-6 which shows the results of an examination of sunlight levels in the coffee cultivation area.)

- ② Planning the maintenance of organic matter in the soil surface to maintain the soil's productive strength.

As Fig. G-1 of this paper shows, there is the tendency for the volume of organic matter in the surface layer which fosters coffee cultivation to increase as the average height of sheltering trees grows and the soil surface becomes thicker. The more that the volume of organic matter in the soil increases, the stronger is its resistance to eclipse damaging elements. The richness of the soil contributes to prevent soil erosion. When soil erosion decreases, there is a decrease in nutrition lost and the supply sources of bases can be maintained.

For these reasons, the preservation of surface soil and the circulation of organic matter in the soil are important. The difference in factors which are dependent on the average height of the trees which shelter the coffee plants is thought to result from the difference in the volume of fallen leaves (the leaf volume) which corresponds to the number of years which pass from the planting and germination of the plants. The maintenance and increase of organic matter in the soil require the growth of *Kayu res* (*Gliricidia maculata*) (of Fig. G-1) and other shelter trees which remain even during the coffee tree renewal period.

The traditional coffee cultivation methods of the inhabitants of the area does not require flat surfaces, and the influence of letting lands lie fallow which accompanies the development of terracing is great because coffee is a tree crop. To maintain organic matter levels in the soil which are appropriate for coffee production, it is advisable to introduce methods which require limited working of the earth to preserve the surface of the soil and retain suitable organic substances.

2) Fertilization

Since it requires a long period of time before shelter trees have grown tall and a cultivation method is established to maintain the circulation of organic substances, fertilization of coffee trees is carried out to supply organic matter and salts which flow out or have been leached from the fields for cultivation and revive the strength of the trees. If the soil condition can be revived with fertilization, growth impediments or the alternate year effect diminish in number. Fertilization is considered to be useful in preventing harvests from diminishing or fluctuating.

3) The introduction of apiculture

From the results of the study described under (1) ①, during years when there is much rain during the dry season, pollination should be encouraged as rapidly as possible on days when there is no rain. Bee cultivation is being introduced to promote pollination during the flowering period when there is rain.

4) Improving access to technological information

A diffusion and publicity system concentrating on technical information needs to be established as described below.

① Technical standards appropriate for the area and its inhabitants

As the socio-economic cultural condition survey shows, because fertile land in the area is abundant, and the inhabitants are, to a large extent, spontaneous migrants, many inhabitants are careless in managing lands. Many spontaneous migrants are temporary farmers who give up lands as their productivity diminishes. In this respect it is desirable to establish technical standards which would reflect conditions in specific areas and coffee cultivation methods used. Fertilizing the land is costly where the soil is acidic. It is therefore necessary to establish low cost and labor-saving fertilizing systems. To prepare such systems and put them in operation, it is desirable to consider the chemical nature of soil acidity and the balance of elements in the soil. At the same time, enforcement of fertilization and cultivation tests through the application of a mixture of organic fertilizer and green manure is required. This should result in improved soils. With such improvements, the capability and number of staff responsible for specific areas should be enhanced. Technical information should be collected and disseminated more easily.

② Measures to counter damage caused by blight and harmful insects

Among countermeasures for damage caused by blight and insect infestation, measures against damage by fungi are costly and include the spraying of insecticide and the removal of damaged trees. In particular, with the growth of fungi, soil contagions spread rapidly as repeated coffee tree cultivation of the same species on the same ground is made. A long time can elapse before a serious outbreak becomes obvious. And when blight or insect infestation break out, the resulting damage is substantial. The effect of spraying insecticide can be minimal. Countermeasures are thus very important.

To avoid damage, it is desirable to organize a system for disseminating information. It should be possible to obtain information for ameliorating the soil in areas where growth is not disturbed (damage-contained soil) and in areas where growth is retarded easily. An information system for distributing sterilized saplings to replace damaged trees is also desirable. Market prices tend to fall when mutations take place in species from autogamy. It should be possible to maintain price levels, however, through lineage management with distributions of distinct lineage saplings.

Table G-2 Comparison of Suitable Factors for Coffee Cultivation and Soil Conditions in the Project Area

Soil Class	Suitability Factors ¹⁾											
	Physical Properties					Chemical Properties						
	Species	Soil Texture	Soil Hardness	Drainability	Water Retention	Effective Soil Depth	Acidity	Organic Content	Nitrogen	Calcium	Micro-Elements	
	C. arabica (Ca) C. robusta (Cr)	medium grain ²⁾	surface soil: soft	good	good	deep	pH(H ₂ O) pH(KCl) pH 5.2-6.2 ³⁾ pH 4.5-6.5 ⁴⁾	rich >1%	rich >3%	rich	rich	rich
AC		x	x	x	-	o	Ca Cr	o	o	-	x	-
ACCI		o	o	o	-	o	Ca Cr	o	x	-	x	-
ACCI		o	o	o	-	o	Ca Cr	o	o	-	x	-
CM I		o	o	o	-	o	Ca Cr	o	o	-	x	-
CM II		o	o	o	-	o	Ca Cr	o	x	-	x	-
CM III		o	x	o	-	o	Ca Cr	o	o	-	o	-
CM IV		x	x	x	-	x	Ca Cr	o	o	-	x	-
ANC		o	x	o	-	o	Ca Cr	o	o	-	x	-
ANI		o	o	(x)	-	o	Ca Cr	o	o	-	x	-
ANI		o	x	o	-	(x)	Ca Cr	o	o	-	x	-
LPR		o	x	o	-	x	Ca Cr	o	x	-	x	-
WS		x	o	x	-	x	Ca Cr	o	x	-	x	-

Notes 1) o: suitable; x: unsuitable; (x): unsuitable but ignorable due to other favourable factors.
 2) Fine grain if the water retention is not good. Coarse grain if the drainability is not good.
 3) Can grow with a low pH value but growth may be hindered if the physical properties are unfavourable.
 4) Unsuitable for coffee growth if the pH value is higher than 6.5.
 5) -: difficult to judge as the observation/measurement results are not conclusive.
 6) The following documents were referred to in the compilation of the table.
 Dr. Ir. H. Ika Rochdjatun Sastrahidajat, Dr. Ir. Soemarno D. S. MS (1991): Budidaya Tanaman Tropika
 P. S. Siswoputranto (1993): Kopi Internasional dan Indonesia
 Ir. Sri Najiyatir, Ir. Danarni (1995): Kopi Budidaya dan Penanganan Lepas Panen
 Akak Agraris Kamisius (1974): Bercocok Tanam Kopi

Table G-3 Estimated Relationship between Symptoms of Growth Impediment and Causes for Coffee Trees

(Unit: %)

Cause (Estimated)	Symptoms									
	Change of Leaves					Change of Branch/Stem			Change of Fruit	
	Yellowing	Purple Browning	Orange/White Spot	Defoliation	Partial Death Brown Spot	White Spot	Dead	Rotten	Dead	
Nutrient Deficiency (excl. Micro-Constituents)										
Nutrition deficiency										
N	○									
P	○	○								
K	○ leaf margin	○ spotty			○					
Mg	○ between veins									
Fungi										
Penyakit mati muda	○									○
Penyakit akar coklat	○			○			○			○
Penyakit akar hitam										
Penyakit karat duan	○			○						○
Penyakit busuk buah									○	
Penyakit pucuk mati	○			○						○
Penyakit mati ujung										
Nematodes										

Notes (1) The symptoms of damage by harmful insects are not included here as the field survey failed to firmly establish the relationship between specific types of damage and the locational conditions.

(2) The relationship between the symptoms and causes are estimated based on the following documents.

Henry D. Foth (1984): Fundamental of Soil Science, Seventh Edition

Dr. Ir. H. Ika Rochdjatun Sastrahidajat, Dr. Ir. Soemarno D.S.M.S. (1991): Budidaya Tanaman Tropika

Ir. Sri Nijiyati, Ir. Danru (1995): Kopi Budidaya dan Penanganan Lepas Panen

Aksi Agraris Kanisius (1974): Bercocok Tanam Kopi

Pinus Lingga (1995): Petunjuk Penggunaan Pupuk

Table G-4 Sample Analysis of Quantity of Main Coffee Elements Preventing Growth in the Project Area

(Unit: %)

Sample Collection Point	OP3 ²⁾ Selamat Sudiaj'o			OP13 ²⁾ Airpikat			OP14 ²⁾ Dusum Sawah			
	Leaves	Branches	Trunk	Leaves	Branches	Trunk	Leaves	Branches	Trunk	
Soil Division of Collection Point	ACC II (ACF)			ANI (Lpd)			Anc (ANu)			
Symptoms of Growth Prevention										
Leaf discoloration										
Yellow	○			×			×			
Purple-brown	×			○			○			
Branch and trunk alteration										
Spots (orange, white)	×			×			×			
Dying (branches)	×			○			×			
Dying	○			○			○			
Element	Critical Minimum Value ¹⁾ (Leaves)			Critical Minimum Value ¹⁾ (Leaves)			Critical Minimum Value ¹⁾ (Leaves)			
N	1.16	—	—	1.71	1.61	1.31	3.22	1.41	1.31	0.91
P	0.08	—	—	0.21	0.04	0.14	0.05	0.04	0.27	0.31
K	0.26	—	—	0.22	0.26	0.22	0.91	0.26	0.24	0.24

Note 1) According to M. N. Clifford, K. C. Wilson et al./Coffee (1985)

2) Analysis was consigned to Bengkulu University, Agriculture Department, Soil Research Unit

Table G-5 Estimated Accumulation of Chemical Elements in the project Avca

Grouping	Soil class	Horizon/Depth Weight (t/ha)		All C		All N 2)		Inorganic N	Replaceability P ₂ O ₅	Replaceability K	Replaceability Ca	Replaceability Mg
		0-5 (cm)	5-15 (cm)	0-5 (cm)	5-15 (cm)	0-5 (cm)	5-15 (cm)					
Arenosols	A	810	810	36.5	36.5	4.05	4.05	0.041	0.0030	0.08	0.41	0.12
	B	3,690	9,990	159.8	253.8	12.92	34.97	0.129	0.0083	0.94	2.20	0.45
	+	4,500	10,900	196.3	290.3	15.97	39.02	0.170	0.0113	1.06	2.51	0.57
	+	1,120	1,120	32.5	32.5	5.60	5.60	0.056	0.0130	0.26	0.94	0.65
ACC I	A	3,240	1,440	29.2	11.0	2.88	2.88	0.063	0.0496	0.41	3.46	1.34
	B	3,300	2,560	61.4	45.4	10.08	8.48	0.121	0.0695	1.18	6.32	1.90
	+	630	630	18.9	18.9	2.21	2.21	0.022	0.0025	0.07	0.36	0.18
	+	3,690	9,990	159.8	253.8	12.92	34.97	0.129	0.0083	0.94	2.20	0.45
ACC II	A	450	450	30.8	30.8	2.48	2.48	0.025	0.0015	0.07	0.20	0.19
	B	2,870	7,770	96.1	260.3	8.61	23.31	0.085	0.0055	0.20	1.70	0.97
	+	3,320	8,220	127.0	291.1	11.09	25.79	0.111	0.0100	0.28	2.48	1.17
	+	715	715	7.9	7.9	2.86	2.86	0.029	0.0028	0.07	0.24	0.24
C.M. I	A	1,840	1,840	82.8	82.8	5.52	5.52	0.055	0.0103	0.09	0.82	0.15
	B	2,430	8,730	14.6	52.4	4.86	17.46	0.049	0.0058	1.08	1.70	0.30
	+	4,270	10,570	57.4	135.2	10.38	22.98	0.104	0.0203	1.16	2.48	0.34
	+	2,160	2,160	168.5	168.5	292.68	292.68	2.927	0.0095	0.20	2.21	2.21
C.M. II	A	1,840	1,840	82.8	82.8	5.52	5.52	0.055	0.0103	0.09	0.82	0.15
	B	2,430	8,730	14.6	52.4	4.86	17.46	0.049	0.0058	1.08	1.70	0.30
	+	4,270	10,570	57.4	135.2	10.38	22.98	0.104	0.0203	1.16	2.48	0.34
	+	2,160	2,160	168.5	168.5	292.68	292.68	2.927	0.0095	0.20	2.21	2.21
C.M. III	A	1,840	1,840	82.8	82.8	5.52	5.52	0.055	0.0103	0.09	0.82	0.15
	B	2,430	8,730	14.6	52.4	4.86	17.46	0.049	0.0058	1.08	1.70	0.30
	+	4,270	10,570	57.4	135.2	10.38	22.98	0.104	0.0203	1.16	2.48	0.34
	+	2,160	2,160	168.5	168.5	292.68	292.68	2.927	0.0095	0.20	2.21	2.21
Andosols	A	1,000	1,000	88.0	88.0	6.00	6.00	0.060	0.0046	0.05	1.01	0.10
	B	1,190	4,050	54.0	180.0	13.50	45.00	0.135	0.0265	0.07	0.13	0.03
	+	2,190	5,050	142.0	268.0	19.50	51.00	0.195	0.0316	0.12	1.14	0.33
	+	780	780	26.5	26.5	4.68	4.68	0.047	0.0012	0.07	0.57	0.46
Immature soils	A	2,400	9,600	16.8	67.2	4.80	19.20	0.048	0.0001	0.11	0.81	0.87
	B	2,400	9,600	16.8	67.2	4.80	19.20	0.048	0.0001	0.11	0.81	0.87
	+	1,190	1,190	2.4	2.4	8.33	8.33	0.043	0.0002	0.22	0.37	0.41
	+	3,890	9,750	77.0	98.1	3.96	12.29	0.040	0.0210	0.25	0.22	0.96

① Work layer ② Nutrient absorption ③ Depth ④ Assumption

1) Average values in each stratum obtained from analysis in the soil investigation were used

2) Inorganic nitrogen / Assuming total nitrogen = 0.01

the total nitrogen value was used

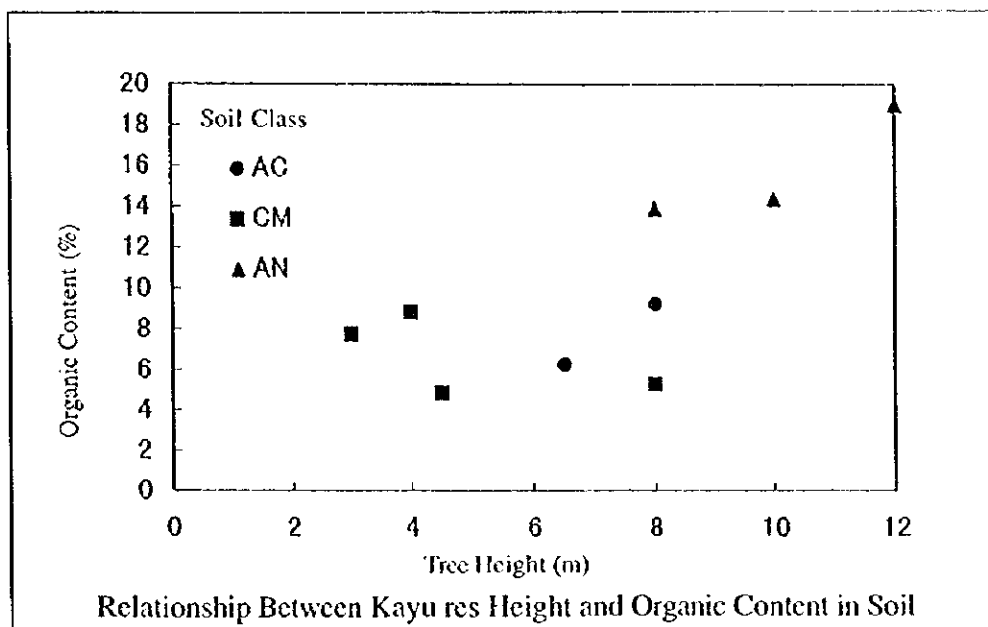
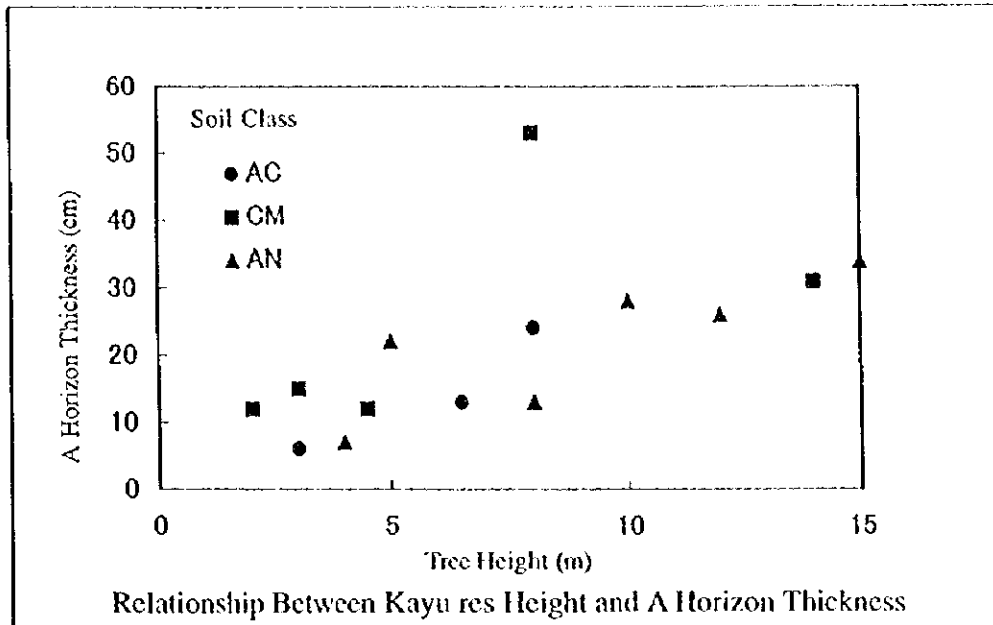


Fig. G-1 Relationship Between Sheltered Tree Height and Soil Thickness and Organic Substances Content on Coffee Cultivation Land at the Soil Survey Point

G-5 Project Area, Number of Trees to be Planted and Breakdown of Trees to be Planted by Work Item in National Forest and Private Land

Table G-6 Planned Land Areas Concerning the Project in National Forest and Private Land

Work			Planned Area	
National forest	Social Oriented Rehabilitation	Planting of useful species (1,597 ha)	Altitude 900 m or less	930 ha
			Altitude 901-1,500 m	637 ha
			Altitude 1,501 m or more	30 ha
	Social Oriented Border tree planting			30 km
Private land	Agro-Forestry Complex Development (Existing)	Upper tree planting (24,809 ha)	Altitude 900 m or less	20,542 ha
			Altitude 901-1,500 m	4,267 ha
		Soil conservation measures (6,330 ha)	Wood-fenced	6,150 ha
			Wood-fenced and strip planting	180 ha
	Agro-Forestry Complex Development (New)	Tree planting (2,145 ha)	Altitude 900 m or less	1,775 ha
			Altitude 901-1,500 m	370 ha
		Soil conservation measures (545 ha)	Wood-fenced	530 ha
			Wood-fenced and strip planting	15 ha
	Conservation plantation development			418 ha
	Dry crops field improvement: bench terrace formation			1,442 ha
	Check dams			16
Riparian afforestation			205 ha	

Table G-7 Number of Trees to be Planted

National forest	Work		Planned Area	Species and Numbers of Trees		Total Number of Trees	Remarks
	Social Oriented Rehabilitation	Planting of useful species		Altitude 900 m or less	Altitude 900 m or less		
			930 ha	Mahogany (200 trees/ha), Damar mata kucing (200 trees/ha), durian (20 trees/ha), Aren (20 trees/ha), jengkol (20 trees/ha), Petai (20 trees/ha), Kemiri (20 trees/ha)	465,000		
		Altitude 901-1,500 m	637 ha	Merkusi pine (200 trees/ha), Damar mata kucing (200 trees/ha), apokat (30 trees/ha), Melinjo (30 trees/ha), Kemiri (40 trees/ha)	318,500		
		Altitude 1,501 m or more	30 ha	Merkusi pine (1,660 trees/ha)	49,800		
	Social Oriented	Border tree planting	30 km	Salak (1 tree/10 m), Pinang (1 tree/10 m), Aren (1 tree/50 m)	6,600		
Private land	Agro-Forestry Complex Development (Existing)	Upper tree planting	20,542 ha	Durian (5 trees/ha), Aren (5 trees/ha), Jack fruit (5 trees/ha), Petai (10 trees/ha), Kayu bawang (5 trees/ha), Kayu manis (70 trees/ha), Lamtoro (33 trees/ha)	2,732,086	* Weighted average	
		Soil conservation measures	4,267 ha	Apokat (15 trees/ha), Melinjo (15 trees/ha), Kayu manis (70 trees/ha), Lamtoro (33 trees/ha)	567,511	* Weighted average	
		Strip planting	180 ha	Kayu manis (1 tree/2 m), Kayu res (1 tree/1 m)	270,000	10 m intervals on average	
Agro-Forestry Complex Development (New)	Tree planting	Altitude 900 m or less	1,775 ha	Durian (5 trees/ha), Aren (5 trees/ha), Jack fruit (5 trees/ha), Petai (10 trees/ha), Kayu bawang (5 trees/ha), Kayu manis (70 trees/ha), Lamtoro (300 trees/ha)	710,000		
				Coffee (robusta) (1,600 trees/ha)	2,840,000		
		Altitude 901-1,500 m	370 ha	Apokat (15 trees/ha), Melinjos (15 trees/ha), Kayu manis (70 trees/ha), Lamtoro (300 trees/ha)	148,000		
		Strip planting	15 ha	Coffee (robusta) (1,600 trees/ha)	592,000		
		Soil conservation measures		Kayu manis (1 tree/2m), Kayu res (1 tree/1m)	22,500	10 m intervals on average	
	Conservation plantation development		418 ha	Bamboo (100 trees/ha), kapok (100 trees/ha), Kayu res (1,600 trees/ha)	752,400		
	Riparian afforestation		205 ha	Bamboo (200 trees/ha)	41,000		
	Total				9,515,397	6,083,397 excluding coffee	

Table G-8 Breakdown of Trees to be Planted by Work Item

(Unit: trees)

Work Species	National Forest				Social Oriented Border tree planting	Private Land						Riparian afforestation	Total	
	Social Oriented Rehabilitation					Agro-Forestry Complex Development (Existing)			Agro-Forestry Complex Development (New)					Conservation plantation development
	900 m or less	901- 1,500 m	1,501 m or more	0		900 m or less	901- 1,500 m	Vegetation belt	900 m or less	901- 1,500 m	Vegetation belt			
Aren	18,600	0	0	0	600	102,710	0	8,875	0	0	0	0	130,785	
Salak	0	0	0	0	3,000	0	0	0	0	0	0	0	3,000	
Pinang	0	0	0	0	3,000	0	0	0	0	0	0	0	3,000	
Durian	18,600	0	0	0	0	102,710	0	8,875	0	0	0	0	130,185	
Jengkol	18,600	0	0	0	0	0	0	0	0	0	0	0	18,600	
Kemiri	18,600	25,480	0	0	0	0	0	0	0	0	0	0	44,080	
Melinjo	0	19,110	0	0	0	0	64,005	0	5,550	0	0	0	88,665	
Jack fruit	0	0	0	0	0	102,710	0	8,875	0	0	0	0	111,585	
Apokat	0	19,110	0	0	0	0	64,005	0	5,550	0	0	0	88,665	
Petai	18,600	0	0	0	0	205,420	0	17,750	0	0	0	0	241,770	
Kapok	0	0	0	0	0	0	0	0	0	0	41,800	0	41,800	
Merkusi pine	0	127,400	49,800	0	0	0	0	0	0	0	0	0	177,200	
Bamboo	0	0	0	0	0	0	0	0	0	0	41,800	0	41,800	
Mahogany	18,600	0	0	0	0	0	0	0	0	0	0	0	186,000	
Kayu bawang	0	0	0	0	0	102,710	0	8,875	0	0	0	0	111,585	
Damar mata kucing	18,600	127,400	0	0	0	0	0	0	0	0	0	0	313,400	
Kayu res	0	0	0	0	0	0	180,000	0	0	15,000	668,800	0	863,800	
Kayu manis	0	0	0	0	0	1,437,940	298,690	124,250	25,900	7,500	0	0	1,984,280	
Lamtoro	0	0	0	0	0	677,886	140,811	532,500	111,000	0	0	0	1,462,197	
Subtotal ..	465,000	318,500	49,800	6,600	2,732,086	567,511	270,000	710,000	148,000	22,500	752,400	41,000	6,083,397	
Coffee (robusta)	0	0	0	0	0	0	0	2,840,000	592,000	0	0	0	3,432,000	
Total	465,000	318,500	49,800	6,600	2,732,086	567,511	270,000	3,550,000	740,000	22,500	752,400	41,000	9,515,397	

G-6 Main Changes in Land Use Resulting from Project Implementation

The main changes in land use resulting from the Project are indicated in Table G-9.

Concerning national forest, the area of coffee fields is reduced while the area of man-made forest increases. Concerning private land, the area of coffee fields possessing upper trees of sparse crown, dry crops field without terraces and shrub land is reduced, whereas the area of coffee fields possessing upper trees of dense crown, dry crops field with terraces and man-made forest increases.

Table G-9 Main Changes in Land Use Resulting from the Project

Land Use			Before Project		After Project	
			Area (ha)	Ratio (%)	Area (ha)	Ratio (%)
National forest	Coffee field	10% or less *	324	0.61	0	0
		11 ~ 30% *	472	0.89	0	0
		31 ~ 70% *	801	1.52	0	0
		71% or more *	0	0	0	0
	Man-made forest	1,039	1.97	2,636	4.99	
Private land	Coffee field	10% or less *	4,688	8.87	0	0
		11 ~ 30% *	2,722	5.15	0	0
		31 ~ 70% *	17,728	33.56	0	0
		71% or more *	63	0.12	26,954	51.02
	Dry crops field without terraces	4,213	7.97	2,745	5.19	
	Dry crops field with terraces	175	0.33	1,617	3.06	
	Shrub land	3,575	6.77	1,430	2.71	
	Man-made forest	0	0	418	0.79	
Total			35,800	67.76	35,800	67.76

Note: The ratio of land use is the ratio with respect to the whole Project Area.

*; Crown density of upper trees

G-7 Effect of the Project on Soil Erosion

Table G-10 Estimated Soil Erosion Prevention Effect Ratio after Project Implementation

(Unit: %)

Project Year	National Forest	Private Land				Total
	Social Oriented Rehabilitation	Agroforestry Complex Development (Existent)	Agroforestry Complex Development (Newly)	Conservation Plantation Development	Dry Crops Field Improvement	
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	7.2	7.2
3	0.0	0.0	0.0	0.0	14.7	14.7
4	0.0	0.0	0.0	0.0	22.1	22.1
5	0.0	0.0	0.0	0.0	29.6	29.6
6	1.3	7.0	0.4	0.9	37.0	46.6
7	3.0	14.0	0.8	1.9	37.0	56.7
8	4.9	21.0	1.2	3.0	37.0	67.1
9	7.2	28.0	1.6	4.0	37.0	77.8
10	9.7	35.0	2.0	5.0	37.0	88.7
11	11.1	42.0	2.0	5.0	37.0	97.1
12	12.3	42.0	2.0	5.0	37.0	98.3
13	13.1	42.0	2.0	5.0	37.0	99.1
14	13.7	42.0	2.0	5.0	37.0	99.7
15	14.0	42.0	2.0	5.0	37.0	100.0
16	14.0	42.0	2.0	5.0	37.0	100.0
17	14.0	42.0	2.0	5.0	37.0	100.0
18	14.0	42.0	2.0	5.0	37.0	100.0
19	14.0	42.0	2.0	5.0	37.0	100.0
20	14.0	42.0	2.0	5.0	37.0	100.0
21	14.0	42.0	2.0	5.0	37.0	100.0
22	14.0	42.0	2.0	5.0	37.0	100.0
23	14.0	42.0	2.0	5.0	37.0	100.0
24	14.0	42.0	2.0	5.0	37.0	100.0
25	14.0	42.0	2.0	5.0	37.0	100.0
26	14.0	42.0	2.0	5.0	37.0	100.0
27	14.0	42.0	2.0	5.0	37.0	100.0
28	14.0	42.0	2.0	5.0	37.0	100.0
29	14.0	42.0	2.0	5.0	37.0	100.0
30	14.0	42.0	2.0	5.0	37.0	100.0

Note: This table shows the percentage of reduction in soil erosion caused by the implementation of each project item. The percentage is 100 when the the project has enough effect.

Table G-11 Prediction of Soil Erosion in a Watershed of a Planned Check Dam and Sediment at a Planned Check Dam

Project Year	Without Project Implementation	After Project Implementation		
	Annual Soil Erosion (t/year)	Reduction in Soil Erosion (t/year)	Soil Erosion (t/year)	Sediment at a Planned Check Dam (t/year)
1	4,263	0	4,263	0
2	4,263	84	4,179	1,439
3	4,263	170	4,093	1,409
4	4,263	257	4,006	1,379
5	4,263	343	3,920	1,350
6	4,263	541	3,722	1,281
7	4,263	658	3,605	1,241
8	4,263	779	3,484	1,199
9	4,263	903	3,360	1,157
10	4,263	1,030	3,233	1,113
11	4,263	1,128	3,135	1,079
12	4,263	1,141	3,122	1,075
13	4,263	1,151	3,112	1,071
14	4,263	1,158	3,105	1,069
15	4,263	1,161	3,102	1,068
16	4,263	1,161	3,102	70
Total	68,208	11,665	56,543	17,000

Notes:

- 1) A sedimentation capacity of a planned check dam is assumed to be 17,000 t.
- 2) Catchment area of a planned check dam is assumed to be 125 ha.
- 3) Current average annual soil erosion in the watersheds of planned check dams was estimated at 34.1 t/ha/year. (Cf. main report)
- 4) SDR of the catchment area of a planned check dam is calculated to be 0.344 using the following formula.

$$SDR = 36A^{-0.2}$$
"where, A: land area (km²)"

Table G-12 Controlled Soil Erosion in the Project Area and Controlled Sediment Runoff from the Project Area after the Project Implementation

Project Year	Controlled Soil Erosion in the Project Area (t/year)	Controlled Sediment Runoff from the Project Area (t/year)	
		Excluding Effect of Check Dams	Including Effect of Check Dams
1	0	0	0
2	18,719	1,449	3,120
3	37,968	2,939	6,247
4	57,218	4,429	9,673
5	76,467	5,919	11,052
6	120,473	9,326	14,304
7	146,633	11,351	16,162
8	173,532	13,433	18,052
9	201,170	15,572	20,038
10	229,548	17,769	22,077
11	251,301	19,453	23,611
12	254,258	19,682	23,735
13	256,476	19,853	23,849
14	257,955	19,968	23,952
15	258,694	20,025	24,000
16	258,694	20,025	22,837
17	258,694	20,025	21,595
18	258,694	20,025	20,123
19	258,694	20,025	20,025
20	258,694	20,025	20,025
21	258,694	20,025	20,025
22	258,694	20,025	20,025
23	258,694	20,025	20,025
24	258,694	20,025	20,025
25	258,694	20,025	20,025
26	258,694	20,025	20,025
27	258,694	20,025	20,025
28	258,694	20,025	20,025
29	258,694	20,025	20,025
30	258,694	20,025	20,025
Total	6,220,822	481,543	544,727

G-8 Preparation of Social Forestry Project Maps



The social forestry project maps will be prepared in accordance with the basic concept described in 7.1 of the Main Report and based on the land use and vegetation map (scale: 1/25,000), incorporating the findings of the present Study.

There is a total of eight maps which are submitted separately from this report. The legend used on these maps is shown in Table G-13.

Table G-13 Legend of Social Forestry Project Maps

LEGEND

A	Social Oriented Rehabilitation
	Upper Tree Plantation
1	Upto 900m Suitable Species
2	901 ~ 1,500m Suitable Species
3	More than 1,500m Suitable Species
B	Agroforestry Complex Development (Existent)
	Upper Tree Plantation
1	Upto 900m Suitable Species
2	901 ~ 1,500m Suitable Species
	Soil Conservation Work
a	No Conservation Work
b	Wood-Fenced Conservation Work
c	Wood-Fenced and Strip Planting Conservation Work
C	Agroforestry Complex Development (Newly)
D	Conservation Plantation Development
E	Dry Crops Field Improvement: Bench Terrace Work

- - - -	: New Road
	: Type A Trial Plot
	: Type B Trial Plot

H. Data Relating to Project Analysis
H-1 Results of Financial Analysis

Financial Analysis
Project Effect

	Cost estimation		Benefit Estimation		Difference (f-d)-(e) (f-c)	Incremental NCF
	Project Plan(a)	Without project(b)	Difference(c)=(a)-(b)	Project Plan(d)		
1	5,910	50,550	-44,740	5,377	119,160	-69,044
2	21,467	54,088	-32,621	31,806	127,502	-95,696
3	37,949	57,874	-19,925	57,147	135,106	-97,934
4	55,188	61,925	-6,737	85,899	143,622	-87,723
5	74,861	68,260	8,601	118,565	152,667	-34,102
6	95,841	69,460	26,380	160,395	161,736	-1,341
7	115,025	74,323	40,703	207,510	173,058	34,452
8	119,480	79,525	38,954	233,552	182,562	100,989
9	127,308	85,092	42,216	259,875	194,313	155,562
10	136,734	91,048	45,685	281,057	209,596	163,911
11	149,413	93,828	55,585	301,611	229,559	174,559
12	182,134	169,044	13,090	338,751	170,186	168,565
13	218,539	120,329	98,210	380,312	112,138	268,174
14	239,601	128,752	110,849	397,887	172,623	225,264
15	262,234	137,765	124,519	433,286	241,026	192,260
16	288,559	147,408	141,151	494,135	318,150	175,977
17	307,957	157,727	150,230	569,464	340,431	229,034
18	299,890	168,768	131,122	612,825	364,261	248,564
19	292,725	180,582	112,144	656,732	389,759	266,973
20	310,364	193,222	117,142	737,060	417,042	320,018
21	333,348	206,748	126,600	816,492	446,235	370,257
22	353,757	221,220	132,537	880,137	477,472	402,665
23	376,133	236,706	139,427	939,319	510,895	428,425
24	402,393	253,275	149,118	1,002,609	546,657	455,952
25	430,552	271,004	159,548	1,072,445	584,923	487,522
26	467,849	289,975	177,874	1,164,926	675,868	539,058
27	501,115	310,273	190,842	1,242,715	669,679	575,036
28	539,739	331,992	207,807	1,339,122	512,974	826,148
29	581,870	355,231	226,639	1,397,231	403,660	993,570
30	626,900	380,097	246,803	1,408,393	276,529	1,131,824
Total	7,954,445	5,186,092	2,768,353	17,626,596	9,060,756	8,565,840

- Inflation rate 7%
- Discount Rate(nominal) 18% (Unit: Mil. Rp)
- 1 Present Values of benefits in nominal terms (Without Project) 878,698
- Present Values of costs in nominal terms (Without Project) 470,308
- Net Present Values (Without Project) (1) 408,390
- Cost Benefit Ratio 1.87
- 2 Present Values of benefits in nominal terms (With Project) 997,233
- Present Values of costs in nominal terms (With Project) 529,666
- Net Present Values (With Project) (2) 467,568
- Cost Benefit Ratio 1.88
- 3 Incremental Net Present Value (2)-(1) 59,178
- Internal Rate of Return 20.6%

H-2 Financial Analysis (Analytical Basis for the With-Project Case)

Financial Analysis

Unit: Rupiah

	Cost Estimation		Benefit Estimation		Net Cash Flow
	Constant	Nominal	Constant	Nominal	Nominal
1	5,456,482,184	5,810,035,418	5,025,256,650	5,377,024,616	-433,010,802
2	18,798,247,179	21,466,764,011	27,780,537,074	31,805,936,896	10,339,172,886
3	31,043,981,693	37,949,226,623	46,648,964,980	57,146,988,006	19,197,761,383
4	42,179,502,347	55,188,117,495	65,531,811,853	85,898,837,506	30,710,720,010
5	53,430,688,421	74,860,919,687	84,535,416,536	118,565,294,769	43,704,375,082
6	63,929,231,571	95,840,865,769	106,878,338,851	160,395,567,068	64,554,701,299
7	71,731,086,681	115,025,285,065	129,226,573,582	207,509,638,126	92,484,353,061
8	68,956,238,536	118,479,656,066	135,929,169,300	233,551,620,127	115,071,964,061
9	69,247,173,718	127,308,104,457	141,354,941,724	259,875,294,833	132,567,190,376
10	69,508,385,007	136,733,513,909	142,874,967,349	281,056,685,943	144,323,172,034
11	70,984,881,463	149,412,666,331	143,293,276,645	301,611,133,099	152,198,466,768
12	80,869,614,966	182,133,866,628	150,409,420,514	338,750,831,782	156,616,965,154
13	90,686,057,150	218,539,341,409	157,815,914,582	380,311,892,704	161,772,551,295
14	92,921,577,637	239,601,461,226	154,307,312,134	397,886,673,962	158,285,212,736
15	95,063,787,443	262,283,987,934	157,042,735,805	433,285,861,326	171,001,873,392
16	97,744,991,811	288,559,221,427	167,381,104,039	494,136,427,538	205,577,206,111
17	97,491,417,801	307,957,373,488	180,277,824,612	569,464,334,584	261,506,961,096
18	88,726,685,808	299,890,189,080	181,312,681,090	612,824,582,816	312,934,393,736
19	80,941,026,987	292,725,452,812	181,591,879,434	656,732,032,112	364,006,579,300
20	80,359,073,131	310,964,256,716	190,470,240,392	737,059,729,813	426,095,473,097
21	80,507,856,707	333,347,802,361	197,193,464,400	816,491,839,261	483,144,036,900
22	79,847,546,880	353,756,710,718	198,658,527,676	880,137,086,899	526,380,376,181
23	79,344,044,175	376,132,810,861	198,146,498,336	939,319,392,607	563,186,581,746
24	79,330,451,633	402,393,161,260	197,661,000,277	1,002,609,125,780	600,215,964,520
25	79,328,846,992	430,551,973,470	197,597,107,608	1,072,444,991,423	641,893,017,953
26	80,561,438,247	467,848,704,040	200,595,033,368	1,164,926,153,757	697,077,449,717
27	80,644,545,043	501,114,527,952	199,990,523,555	1,242,714,640,559	741,600,112,607
28	81,186,943,583	539,798,865,129	201,406,958,535	1,339,122,312,635	799,323,447,506
29	81,789,305,646	581,870,144,244	196,398,665,577	1,397,230,591,039	815,360,446,795
30	82,354,013,092	626,899,751,447	185,011,310,625	1,408,353,282,255	781,453,530,808
Total	2,174,965,123,530	7,954,444,757,033	4,522,347,457,102	17,626,595,803,841	9,672,151,046,807

TOTAL BENEFIT ESTIMATION

Unit: Rupiah

	Agroforestry etc.	KUD Activity	Nursery	Cattle+Goat+Bed	Riparian(Bambu)	Prev. soil flow	WF & Terrace	Prev. Soil Fertility	Grand Total
1	4,845,330,000	24,226,650	0	155,700,000	0	0	0	0	5,025,256,650
2	26,894,630,000	215,157,040	276,602,500	325,440,000	0	43,680,000	0	25,027,534	27,780,537,074
3	45,321,105,000	543,853,260	286,257,500	360,180,000	0	87,458,000	0	50,111,220	46,648,964,980
4	63,418,395,050	951,275,926	286,257,500	662,868,000	0	135,422,000	0	77,593,378	65,531,811,853
5	82,221,443,274	1,397,764,536	286,257,500	386,568,000	0	154,728,000	0	88,655,227	84,535,416,536
6	104,123,984,020	1,874,231,712	286,257,500	266,868,000	12,000,000	200,256,000	0	114,741,618	106,878,338,851
7	125,950,122,147	2,267,102,199	187,555,000	401,868,000	32,000,000	226,268,000	32,012,400	129,645,836	129,226,573,582
8	132,619,589,149	2,387,152,605	0	401,868,000	59,000,000	252,728,000	64,024,300	144,806,746	135,929,169,300
9	137,553,786,237	2,475,968,152	0	662,868,000	93,000,000	280,532,000	128,049,600	160,737,734	141,354,941,724
10	139,176,967,662	2,505,185,418	0	386,568,000	128,000,000	309,078,000	192,074,400	177,093,869	142,874,967,349
11	139,478,960,287	2,510,621,285		300,618,000	163,000,000	330,554,000	320,124,000	189,399,073	143,293,276,645
12	145,902,077,467	2,626,237,394		435,618,000	184,000,000	332,290,000	738,803,895	190,393,757	150,409,420,514
13	152,750,116,470	2,749,502,096		435,618,000	198,000,000	333,886,000	1,157,483,790	191,308,225	157,815,914,582
14	148,529,972,592	2,673,539,507		696,618,000	205,000,000	335,328,000	1,674,719,580	192,134,454	154,307,312,134
15	150,979,315,267	2,717,627,675		420,318,000	205,000,000	336,000,000	2,191,955,370	192,519,493	157,042,735,805
16	160,769,534,930	2,893,851,629		300,618,000	205,000,000	319,718,000	2,709,191,160	183,190,320	167,381,104,039
17	172,824,383,326	3,110,838,900		435,618,000	205,000,000	302,330,000	3,226,426,950	173,227,436	180,277,824,612
18	173,872,784,446	3,129,710,120		435,618,000	205,000,000	281,722,000	3,226,426,950	161,419,574	181,312,681,090
19	173,892,780,974	3,130,070,058		696,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	181,591,879,434
20	182,885,571,700	3,291,940,291		420,318,000	205,000,000	280,350,000	3,226,426,950	160,633,452	190,470,240,392
21	189,607,500,980	3,412,935,018		300,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	197,193,464,400
22	190,914,046,437	3,436,452,836		435,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	198,658,527,676
23	190,411,070,662	3,427,399,272		435,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	198,146,498,336
24	189,677,771,979	3,414,199,896		696,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	197,661,000,277
25	189,886,423,581	3,417,955,624		420,318,000	205,000,000	280,350,000	3,226,426,950	160,633,452	197,597,107,608
26	192,948,924,328	3,473,080,638		300,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	200,595,033,368
27	192,222,490,327	3,460,004,826		435,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	199,990,523,555
28	193,613,880,288	3,485,049,845		435,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	201,406,958,535
29	188,437,757,539	3,391,879,636		696,618,000	205,000,000	280,350,000	3,226,426,950	160,633,452	196,398,665,577
30	177,523,165,248	3,195,416,974		420,318,000	205,000,000	280,350,000	3,226,426,950	160,633,452	185,011,310,625
Total	4,359,253,881,369	77,590,231,016	1,609,187,500	13,165,956,000	4,354,000,000	7,626,178,000	54,378,416,295	4,369,606,922	4,522,347,457,102

ANNUAL BENEFIT PLAN

(Unit: Rupiah)

Page Item	Agriculture									1-9 Total
	Ichi-3	Ichi-4	Ichi-5	Ichi-6	Ichi-7	Ichi-8	Ichi-9			
Conversion of Coffee plantation	Conversion of Coffee plantation	Conversion of Coffee plantation	Present Coffee Plantation in National Forest	Improvement of Coffee plantation 0-900	Improvement of Coffee plantation 901-1500	Improvement of Wood-fence and Strip Planting				
0										0
1	0	0	0	3.593.250.000	0	0	0	0	0	3.593.250.000
2	2.092.500.000	263.250.000	13.500.000	3.593.250.000	13.838.850.000	2.802.600.000	0	0	0	22.603.950.000
3	1.464.750.000	555.750.000	27.000.000	2.515.275.000	27.710.100.000	5.698.350.000	0	0	0	37.971.225.000
4	1.097.250.000	839.475.000	36.450.000	1.796.625.000	41.599.101.616	8.597.581.083	0	0	0	53.966.482.699
5	837.750.000	1.139.775.000	43.200.000	1.077.975.000	55.505.896.409	11.500.408.949	0	0	0	70.105.005.338
6	500.000.000	1.477.125.000	47.250.000	0	72.851.857.663	15.029.950.034	48.300.000	0	0	89.954.482.697
7	863.500.000	1.525.875.000	33.750.000	0	89.678.473.700	18.751.945.955	90.300.000	0	0	110.943.844.655
8	1.293.500.000	1.627.275.000	20.250.000	0	93.624.658.202	19.907.286.690	90.300.000	0	0	116.563.269.892
9	1.775.500.000	1.796.925.000	10.800.000	0	95.057.296.367	20.547.090.247	90.300.000	0	0	119.277.911.614
10	2.189.500.000	1.979.250.000	4.050.000	0	94.009.060.999	20.755.956.634	90.300.000	0	0	119.028.117.633
11	2.545.900.000	2.125.500.000	0	0	92.757.316.374	20.380.121.949	48.300.000	0	0	117.857.138.323
12	2.896.900.000	2.351.310.000	10.200.000	0	96.751.581.563	21.373.231.375	90.300.000	0	0	123.473.522.938
13	3.206.300.000	2.607.020.000	30.600.000	0	101.485.178.022	22.256.652.666	90.300.000	0	0	129.676.050.688
14	3.422.600.000	2.892.630.000	61.200.000	0	97.386.061.713	21.180.554.019	90.300.000	0	0	125.033.345.732
15	3.603.100.000	3.237.390.000	102.000.000	0	98.905.100.215	21.224.746.192	90.300.000	0	0	127.162.636.407
16	3.657.050.000	3.670.550.000	153.000.000	0	107.059.484.340	22.343.901.570	48.300.000	0	0	136.932.285.910
17	3.599.850.000	4.024.150.000	193.800.000	0	116.516.661.738	24.700.893.368	90.300.000	0	0	149.125.655.106
18	3.516.250.000	4.289.350.000	224.400.000	0	117.262.482.499	24.975.968.127	90.300.000	0	0	150.358.750.626
19	3.373.500.000	4.413.500.000	244.800.000	0	117.817.511.902	25.251.042.887	90.300.000	0	0	151.190.654.789
20	3.200.750.000	4.408.300.000	255.000.000	0	126.229.676.294	27.205.521.444	90.300.000	0	0	161.389.547.738
21	3.051.750.000	4.275.700.000	255.000.000	0	133.416.335.764	28.508.507.148	48.300.000	0	0	169.555.592.912
22	2.913.750.000	4.086.550.000	255.000.000	0	134.536.038.206	29.160.000.000	90.300.000	0	0	171.041.638.206
23	2.771.250.000	3.891.550.000	255.000.000	0	134.536.038.206	29.160.000.000	90.300.000	0	0	170.704.138.206
24	2.722.500.000	3.825.250.000	255.000.000	0	134.536.038.206	29.160.000.000	90.300.000	0	0	170.589.088.206
25	2.759.250.000	3.875.950.000	255.000.000	0	134.536.038.206	29.160.000.000	90.300.000	0	0	170.676.538.206
26	2.893.400.000	4.003.550.000	255.000.000	0	136.442.956.170	29.160.000.000	48.300.000	0	0	172.808.206.170
27	3.096.400.000	4.203.550.000	255.000.000	0	135.117.482.147	29.160.000.000	90.300.000	0	0	171.922.732.147
28	3.320.300.000	4.398.550.000	255.000.000	0	135.880.201.932	29.160.000.000	90.300.000	0	0	173.104.351.932
29	3.418.850.000	4.356.722.500	239.700.000	0	130.733.998.172	27.977.745.489	90.300.000	0	0	166.817.316.160
30	3.392.600.000	4.113.362.500	214.200.000	0	121.507.482.587	25.968.026.717	90.300.000	0	0	155.285.971.804
Total	75.476.500.000	86.260.135.000	4.005.150.000	12.576.375.000	2.987.288.959.211	641.058.082.542	2.047.500.000	0	0	3.808.712.701.753

ANNUAL BENEFIT PLAN

Page Item	Agriculture										10-15 Total	3-9 Total	3-15 Total	
	Ichl-10-1 Coffee Plantation Development	Ichl-10-2 Coffee Plantation Development	Ichl-11 Coffee Plantation Development	Ichl-12 Protection Forests Development	Ichl-14 Farm Land Improvement	Ichl-15 Plantation of Boundary Trees								
0	0-900-1	0-900-2	901-1,500								0		0	0
1	0	0	0	0	1,252,080,000	0	1,252,080,000	0	1,252,080,000	0	3,593,250,000	3,593,250,000	4,845,330,000	
2	0	1,462,600,000	288,400,000	0	2,539,680,000	0	2,539,680,000	0	4,290,680,000	0	22,603,950,000	22,603,950,000	26,894,630,000	
3	0	2,925,200,000	597,400,000	0	3,827,280,000	0	3,827,280,000	0	7,349,880,000	0	37,971,225,000	37,971,225,000	45,321,105,000	
4	639,813,600	2,925,200,000	744,158,351	0	5,121,140,400	0	5,121,140,400	21,600,000	9,451,912,351	21,600,000	53,966,482,699	53,966,482,699	63,418,395,050	
5	1,600,754,400	2,925,200,000	942,644,716	161,600,000	6,421,438,800	0	6,421,438,800	64,800,000	12,116,437,916	64,800,000	70,105,005,358	70,105,005,358	82,221,443,274	
6	3,096,136,728	2,925,200,000	1,272,128,995	310,400,000	6,446,835,600	0	6,446,835,600	118,800,000	14,169,501,323	118,800,000	89,954,482,697	89,954,482,697	104,123,984,020	
7	5,000,953,128	1,462,600,000	1,382,415,965	502,400,000	6,485,108,400	0	6,485,108,400	172,800,000	15,006,277,493	172,800,000	110,943,844,655	110,943,844,655	125,950,122,147	
8	7,009,202,728	0	1,531,278,529	705,700,000	6,548,778,000	0	6,548,778,000	261,360,000	16,056,319,257	261,360,000	116,563,269,892	116,563,269,892	132,619,589,149	
9	8,553,473,128	0	1,889,279,495	849,500,000	6,638,022,000	0	6,638,022,000	345,600,000	18,275,874,623	345,600,000	119,277,911,614	119,277,911,614	137,553,786,237	
10	9,812,568,328	0	2,197,743,701	960,000,000	6,753,018,000	0	6,753,018,000	425,520,000	20,148,850,029	425,520,000	119,028,117,633	119,028,117,633	139,176,967,662	
11	10,809,738,160	0	2,371,837,804	1,019,500,000	6,856,026,000	0	6,856,026,000	564,720,000	21,621,821,964	564,720,000	117,857,138,323	117,857,138,323	139,478,960,287	
12	11,256,182,560	0	2,459,393,970	1,036,500,000	6,946,158,000	0	6,946,158,000	730,320,000	22,428,554,530	730,320,000	123,473,522,938	123,473,522,938	145,902,077,467	
13	11,618,967,360	0	2,511,800,422	1,045,000,000	7,010,538,000	0	7,010,538,000	887,760,000	23,074,065,782	887,760,000	129,676,050,688	129,676,050,688	152,750,116,470	
14	11,825,691,360	0	2,528,887,500	1,045,000,000	7,042,728,000	0	7,042,728,000	1,054,320,000	23,496,626,860	1,054,320,000	125,033,345,732	125,033,345,732	148,529,972,592	
15	11,996,463,360	0	2,528,887,500	1,045,000,000	7,042,728,000	0	7,042,728,000	1,203,600,000	23,816,678,860	1,203,600,000	127,162,636,407	127,162,636,407	150,979,315,267	
16	12,003,833,520	0	2,528,887,500	1,045,000,000	7,042,728,000	0	7,042,728,000	1,216,800,000	23,837,249,020	1,216,800,000	136,932,285,910	136,932,285,910	160,769,534,930	
17	11,944,512,720	0	2,528,887,500	1,045,000,000	7,042,728,000	0	7,042,728,000	1,137,600,000	23,698,728,220	1,137,600,000	149,125,655,106	149,125,655,106	172,824,383,326	
18	11,865,418,320	0	2,528,887,500	1,045,000,000	7,042,728,000	0	7,042,728,000	1,032,000,000	23,514,033,820	1,032,000,000	150,358,750,626	150,358,750,626	173,872,784,446	
19	11,281,198,320	0	2,433,199,865	1,045,000,000	7,042,728,000	0	7,042,728,000	900,000,000	22,702,126,185	900,000,000	151,190,654,789	151,190,654,789	173,892,780,974	
20	10,373,410,320	0	2,266,885,642	1,045,000,000	7,042,728,000	0	7,042,728,000	768,000,000	21,496,023,962	768,000,000	161,389,547,738	161,389,547,738	182,885,571,700	
21	9,229,956,960	0	2,032,223,108	1,045,000,000	7,042,728,000	0	7,042,728,000	702,000,000	20,051,908,068	702,000,000	169,555,592,912	169,555,592,912	189,607,500,980	
22	7,612,116,960	1,481,222,400	1,989,340,872	1,045,000,000	7,042,728,000	0	7,042,728,000	702,000,000	19,872,408,232	702,000,000	171,041,638,206	171,041,638,206	190,914,046,437	
23	5,994,276,960	2,962,444,800	1,960,482,696	1,045,000,000	7,042,728,000	0	7,042,728,000	702,000,000	19,706,932,456	702,000,000	170,704,138,206	170,704,138,206	190,411,070,662	
24	5,508,924,960	2,962,444,800	1,869,706,014	1,045,000,000	7,042,728,000	0	7,042,728,000	659,880,000	19,088,683,774	659,880,000	170,589,088,206	170,589,088,206	189,677,771,979	
25	5,670,708,960	2,962,444,800	1,899,323,615	1,045,000,000	7,042,728,000	0	7,042,728,000	589,680,000	19,209,885,375	589,680,000	170,676,538,206	170,676,538,206	189,886,423,581	
26	6,480,707,520	2,962,444,800	2,065,637,838	1,045,000,000	7,042,728,000	0	7,042,728,000	544,200,000	20,140,718,158	544,200,000	172,808,206,170	172,808,206,170	192,948,924,328	
27	8,157,868,320	1,481,222,400	2,089,939,459	1,045,000,000	7,042,728,000	0	7,042,728,000	483,000,000	20,299,758,179	483,000,000	171,922,732,147	171,922,732,147	192,222,490,327	
28	9,854,802,720	0	2,118,797,635	1,045,000,000	7,042,728,000	0	7,042,728,000	448,200,000	20,509,528,355	448,200,000	173,104,351,932	173,104,351,932	193,613,880,288	
29	10,776,072,720	0	2,299,920,659	998,200,000	7,042,728,000	0	7,042,728,000	503,520,000	21,620,441,379	503,520,000	166,817,316,160	166,817,316,160	188,437,757,539	
30	11,274,906,720	0	2,395,038,725	916,000,000	7,042,728,000	0	7,042,728,000	608,520,000	22,237,193,445	608,520,000	155,285,971,804	155,285,971,804	177,523,165,248	
Total	231,248,660,840	29,438,224,000	56,253,415,576	24,179,800,000	192,572,479,200	16,848,600,000	192,572,479,200	550,541,179,616	3,808,712,701,753	16,848,600,000	4,359,253,881,369	4,359,253,881,369		

(Unit: Rupiah)

ANNUAL BENEFIT ESTIMATION

	NURSERY				
1	0				
2	276,602,500				
3	286,257,500				
4	286,257,500				
5	286,257,500				
6	286,257,500				
7	187,555,000				
8	0				
9	0				
10	0				
Total	1,609,187,500			0	0

ANNUAL BENEFIT PLAN

Item	Riperian Zone	Quantity of soil to be prevented from flowing out	Prevention of flow out of soil
by	Mr. Kajigaki		
Details of	Bambu sprout		
Benefit			14,000 Rp/Ton
0		Ton	
1		0	0
2		3,120	43,680,000
3		6,247	87,458,000
4		9,673	135,422,000
5		11,052	154,728,000
6	12,000,000	14,304	200,256,000
7	32,000,000	16,162	226,268,000
8	59,000,000	18,052	252,728,000
9	93,000,000	20,038	280,532,000
10	128,000,000	22,077	309,078,000
11	163,000,000	23,611	330,554,000
12	184,000,000	23,735	332,290,000
13	198,000,000	23,849	333,886,000
14	205,000,000	23,952	335,328,000
15	205,000,000	24,000	336,000,000
16	205,000,000	22,837	319,718,000
17	205,000,000	21,595	302,330,000
18	205,000,000	20,123	281,722,000
19	205,000,000	20,025	280,350,000
20	205,000,000	20,025	280,350,000
21	205,000,000	20,025	280,350,000
22	205,000,000	20,025	280,350,000
23	205,000,000	20,025	280,350,000
24	205,000,000	20,025	280,350,000
25	205,000,000	20,025	280,350,000
26	205,000,000	20,025	280,350,000
27	205,000,000	20,025	280,350,000
28	205,000,000	20,025	280,350,000
29	205,000,000	20,025	280,350,000
30	205,000,000	20,025	280,350,000
Total	4,354,000,000	544,727	7,626,178,000

BENCH TERRACE AND WOOD FENCE BENEFIT

Unit: Rupiah

Page Item	Ichi-7		Ichi-8		Ichi-10		Ichi-11		Ichi-14		Grand Total
	Agro-Forestry Complex Develop. (Exist) 0-900m WF & strip 6th	Amount	Agro-Forestry Complex Dev. (Exist) 901-1.500m WF & strip 6th	Amount	Agro-Forestry Complex Dev. (New) 0-900m WF & strip 6th	Amount	Agro-Forestry Complex Dev. (New) 901-1.500m WF & strip 6th	Amount	Farm Land Dev. Bench Terrace 3rd	Amount	
Start Y.	Inc. Rate	Amount	Inc. Rate	Amount	Inc. Rate	Amount	Inc. Rate	Amount	Inc. Rate	Amount	Amount
7.198.000		7.191.000		11.318.000		11.311.000		4.440.000		4.440.000	
5.270		1.060		452		93		1.442			
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0,005	32.012.400	32.012.400
8	0	0	0	0	0	0	0	0	0,01	64.024.800	64.024.800
9	0	0	0	0	0	0	0	0	0,02	128.049.600	128.049.600
10	0	0	0	0	0	0	0	0	0,03	192.074.400	192.074.400
11	0	0	0	0	0	0	0	0	0,05	320.124.000	320.124.000
12	0,005	189.667.300	0,005	38.112.300	0,005	25.578.680	0,005	5.259.615	0,075	480.186.000	738.803.995
13	0,010	379.334.600	0,010	76.224.600	0,010	51.157.360	0,010	10.519.230	0,100	640.248.000	1.157.493.790
14	0,020	758.669.200	0,020	152.449.200	0,020	102.314.720	0,020	21.038.460	0,100	640.248.000	1.674.719.580
15	0,030	1.138.003.800	0,030	228.673.800	0,030	153.472.080	0,030	31.557.690	0,100	640.248.000	2.191.955.370
16	0,040	1.517.338.400	0,040	304.898.400	0,040	204.629.440	0,040	42.076.920	0,100	640.248.000	2.709.191.160
17	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
18	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
19	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
20	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
21	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
22	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
23	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
24	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
25	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
26	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
27	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
28	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
29	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
30	0,050	1.896.673.000	0,050	381.123.000	0,050	255.786.800	0,050	52.596.150	0,100	640.248.000	3.226.426.950
30.536.435.300		6.136.080.300		4.118.167.480		846.798.015		12.740.935.200		54.378.416.295	

Year	Inflation	Recovery and Maintenance of Soil Fertility		
		Annual Benefits in Full Scale= Rp	160,633,452	Benefits o: Prev.of Soil Fertility
		Volume of Soil Prev	%	
1	1.07	0	0.0%	0
2	1.14	3,120	15.6%	25,027,534
3	1.23	6,247	31.2%	50,111,220
4	1.31	9,673	48.3%	77,593,378
5	1.40	11,052	55.2%	88,655,227
6	1.50	14,304	71.4%	114,741,618
7	1.61	16,162	80.7%	129,645,836
8	1.72	18,052	90.1%	144,806,746
9	1.84	20,038	100.1%	160,737,734
10	1.97	22,077	110.2%	177,093,869
11	2.10	23,611	117.9%	189,399,073
12	2.25	23,735	118.5%	190,393,757
13	2.41	23,849	119.1%	191,308,225
14	2.58	23,952	119.6%	192,134,454
15	2.76	24,000	119.9%	192,519,493
16	2.95	22,837	114.0%	183,190,320
17	3.16	21,595	107.8%	173,227,436
18	3.38	20,123	100.5%	161,419,574
19	3.62	20,025	100.0%	160,633,452
20	3.87	20,025	100.0%	160,633,452
21	4.14	20,025	100.0%	160,633,452
22	4.43	20,025	100.0%	160,633,452
23	4.74	20,025	100.0%	160,633,452
24	5.07	20,025	100.0%	160,633,452
25	5.43	20,025	100.0%	160,633,452
26	5.81	20,025	100.0%	160,633,452
27	6.21	20,025	100.0%	160,633,452
28	6.65	20,025	100.0%	160,633,452
29	7.11	20,025	100.0%	160,633,452
30	7.51	20,025	100.0%	160,633,452
				4,369,606,922

TOTAL COST ESTIMATION (Constant Price)

Unit: Rupiah

	Agroforestry etc.	Road Construction	Nursery	W.S. Air Lanang	KUD Staff	Information Center	Cattler+Goat+Beo	Check dam	Riparian Zone	Project Management	Total
P	704.179.500	553.085.204	84.827.600	131.176.100	45.600.000	1.323.020.000	440.017.000	249.461.000	0	1.353.669.600	4.395.026.004
R	5.629.366.500	1.190.903.832	41.371.512	0	45.600.000	338.420.000	150.422.000	249.461.000	29.410.000	1.244.980.800	8.318.535.644
O	5.717.047.000	1.201.906.517	43.561.921	0	45.600.000	340.300.000	165.788.000	299.352.200	33.145.000	1.146.172.900	8.992.374.438
J	5.717.047.000	1.213.309.202	43.561.921	0	0	298.790.000	165.788.000	0	33.145.000	1.007.841.600	8.479.482.723
E	5.717.047.000	1.224.711.887	43.561.921	0	0	298.790.000	165.788.000	0	33.145.000	592.848.000	9.071.901.908
C	5.510.085.500	50.931.993	43.561.921	0	0	289.700.000	0	0	33.145.000	592.848.000	6.520.272.414
T	3.886.607.250	50.931.993	21.346.767	0	0	267.930.000	0	0	33.145.000	765.762.000	5.025.723.010
F	0	0	0	0	0	0	0	0	0	0	0
U	0	0	0	0	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	0	0	0	0
D	32.881.379.750	5.485.380.629	321.793.563	131.176.100	136.800.000	3.152.860.000	1.087.803.000	798.275.200	194.135.000	6.704.122.900	50.993.726.042
											Project Funds +
	Agro-Forestry etc	Road Construction	Income Tax				Cattler+Goat+Beo	Check dam	Riparian Zone	Grand Total	Farmers Funds
1	541.440.000		30.006.180					0	0	571.446.180	5.456.482.184
2	9.714.731.500		164.980.035					0	0	9.879.711.535	18.798.247.179
3	21.775.302.000		275.803.255					0	0	22.051.107.255	31.043.981.693
4	33.313.814.500		386.205.123					0	0	33.700.019.623	42.179.502.347
5	44.857.872.000		497.365.613					2.689.000	960.000	45.358.886.613	53.430.688.421
6	56.333.349.500		628.134.857					5.378.000	2.080.000	57.403.959.157	63.929.231.571
7	65.783.707.600		759.429.271					8.604.800	3.200.000	66.705.362.671	71.731.086.681
8	67.928.111.000		798.482.743					8.604.800	4.320.000	68.956.238.536	74.956.238.536
9	68.186.551.000		829.857.925					8.604.800	5.440.000	69.247.173.718	74.924.173.718
10	68.438.351.000		838.149.214					8.604.800	6.560.000	69.508.395.007	74.934.821.463
11	69.639.112.200		839.655.470					8.604.800	6.560.000	70.984.831.463	76.908.385.007
12	79.773.966.000		879.130.173					8.604.800	6.560.000	80.869.614.966	80.869.614.966
13	89.533.869.950		920.302.407					8.604.800	6.560.000	90.686.057.150	90.686.057.150
14	91.793.103.300		896.589.544					8.604.800	6.560.000	92.921.577.637	92.921.577.637
15	93.922.274.850		909.627.900					8.604.800	6.560.000	95.063.787.443	95.063.787.443
16	96.271.227.100		967.650.918					8.604.800	6.560.000	97.744.991.811	97.744.991.811
17	96.234.109.000		1.040.790.008					8.604.800	6.560.000	97.491.417.801	97.491.417.801
18	87.447.720.600		1.047.080.415					8.604.800	6.560.000	88.726.685.808	88.726.685.808
19	79.660.375.800		1.048.766.394					8.604.800	6.560.000	80.941.026.987	80.941.026.987
20	79.026.123.000		1.101.065.938					8.604.800	6.560.000	80.359.073.131	80.359.073.131
21	78.861.064.200		1.140.678.714					8.604.800	6.560.000	80.507.856.707	80.507.856.707
22	78.481.700.100		1.149.327.987					8.604.800	6.560.000	79.344.044.175	79.344.044.175
23	77.995.849.250		1.146.310.132					8.604.800	6.560.000	79.330.451.632	79.330.451.632
24	77.955.090.500		1.143.476.340					8.604.800	6.560.000	79.328.845.992	79.328.845.992
25	77.933.891.750		1.143.070.449					8.604.800	6.560.000	80.561.438.247	80.561.438.247
26	78.894.597.200		1.160.727.254					8.604.800	6.560.000	80.644.545.043	80.644.545.043
27	79.270.847.600		1.157.178.650					8.604.800	6.560.000	81.186.943.593	81.186.943.593
28	79.789.531.800		1.165.526.990					8.604.800	6.560.000	81.789.305.646	81.789.305.646
29	80.421.384.600		1.136.036.253					8.604.800	6.560.000	82.354.013.092	82.354.013.092
30	81.053.237.400		1.068.890.899					8.604.800	6.560.000	153.160.000	2.174.965.123.530
Total	2.090.822.306.300	1.171.435.839	26.270.298.149	0	0	5.439.015.000	0	214.952.200	153.160.000	2.124.071.397.488	2.174.965.123.530

TOTAL OF ANNUAL INVESTMENT PLAN

Unit: Rupiah

	lchi-4	lchi-5	lchi-6	lchi-8	lchi-9	lchi-10a
	930	637	30	20,542	4,267	6,150
1	0	0	0	0	0	233,160,000
2	138,720,000	63,238,500	5,364,000	2,901,887,250	424,888,000	235,840,000
3	155,040,000	70,265,000	5,364,000	2,908,681,250	439,010,000	235,840,000
4	155,040,000	70,265,000	5,364,000	2,908,681,250	439,010,000	235,840,000
5	155,040,000	70,265,000	5,364,000	2,908,681,250	439,010,000	235,840,000
6	155,040,000	70,265,000	5,364,000	2,908,681,250	439,010,000	469,000,000
7	0	0	0	2,908,681,250	439,010,000	471,680,000
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
Total	758,880,000	344,298,500	26,820,000	17,445,293,500	2,619,938,000	2,117,200,000

	lchi-10b	lchi-11a	lchi-11b	lchi-12	lchi-13	lchi-14
	530	180	15	1,775	370 ha	418 ha
1	24,120,000	0	0	0	0	0
2	29,480,000	24,210,000	3,631,500	1,010,915,750	182,868,000	68,484,000
3	29,480,000	48,420,000	3,631,500	1,010,915,750	195,930,000	74,630,000
4	29,480,000	48,420,000	3,631,500	1,010,915,750	195,930,000	74,630,000
5	29,480,000	48,420,000	3,631,500	1,010,915,750	195,930,000	74,630,000
6	24,120,000	48,420,000	3,631,500	1,010,915,750	195,930,000	74,630,000
7	29,480,000	10,640,000	1,596,000	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
Total	195,640,000	228,530,000	19,753,500	5,054,578,750	966,588,000	367,004,000

	lchi-16	lchi-17	lchi-18	Total		
	1,442 ha	1,442 ha	30 km			
1	326,203,500	120,696,000	0	704,179,500		
2	335,457,500	124,120,000	80,262,000	5,629,366,500		
3	335,457,500	124,120,000	80,262,000	5,717,047,000		
4	335,457,500	124,120,000	80,262,000	5,717,047,000		
5	335,457,500	124,120,000	80,262,000	5,717,047,000		
6	0	24,816,000	80,262,000	5,510,085,500		
7	0	25,520,000	0	3,886,607,250		
8	0	0	0	0		
9	0	0	0	0		
10	0	0	0	0		
Total	1,668,033,500	667,512,000	401,310,000	32,881,379,750	0	0

ANNUAL INVESTMENT PLAN
Cost Estimation of 30 Years for Farmers' Account

Year	1960-69-3										1970-79-3										Unit Budget	
	Seed	Fertilizer	Chemicals	Maintenance	Interest	Harvest	% Invest	Abolition	Total	Work plan	370 ha	Maintenance	Emblem	1970-79-3	Total	ha	418 ha					
1	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	70	187,320,000	320,000	290,000	290,000	290,000	0	72	2,948,000					
2	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
3	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
4	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
5	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
6	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
7	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
8	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
9	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
10	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
11	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
12	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
13	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
14	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
15	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
16	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
17	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
18	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
19	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
20	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
21	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
22	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
23	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
24	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
25	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
26	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
27	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
28	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
29	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
30	70,000	1,216,000	50,000	600,000	1,600,000	1,600,000	0	2,676,000	75	179,920,000	320,000	290,000	290,000	290,000	0	91	2,948,000					
Total	2,100,000	36,288,000	1,500,000	18,000,000	48,000,000	48,000,000	0	110,888,000	3,700	119,910,000	3,700,000	3,700,000	3,700,000	3,700,000	0	418	4,418,000					

Annual Investment Plan for Road, Nursery, and W.S. Air Lanang (Government Account)

Unit: Rupiah

Year	Road			Nursery	W.S. Air Lanang	Grand Total	
	Construction	Maintenance	Total				
M	1	509,291,241	0	509,291,241	84,827,600	131,176,100	725,294,941
A	2	1,091,338,373	2,787,323	1,094,125,696	29,111,040	0	1,123,236,736
T	3	1,091,338,373	8,760,158	1,100,098,531	30,652,320	0	1,130,750,851
E	4	1,091,338,373	14,732,993	1,106,071,366	30,652,320	0	1,136,723,686
R	5	1,091,338,373	20,705,828	1,112,044,201	30,652,320	0	1,142,696,521
I	6	0	26,678,663	26,678,663	30,652,320	0	57,330,983
A	7	0	26,678,663	26,678,663	15,020,640	0	41,699,303
L	8	0	0	0	0	0	0
S	9	0	0	0	0	0	0
	10	0	0	0	0	0	0
	Total	4,874,644,734	100,343,628	4,974,988,362	251,568,560	131,176,100	5,357,733,022
	1	43,793,963	0	43,793,963	0	0	43,793,963
L	2	93,844,206	2,533,930	96,378,136	12,260,472	0	108,638,608
A	3	93,844,206	7,963,780	101,807,986	12,909,601	0	114,717,587
B	4	93,844,206	13,393,630	107,237,836	12,909,601	0	120,147,437
O	5	93,844,206	18,823,480	112,667,686	12,909,601	0	125,577,287
R	6	0	24,253,330	24,253,330	12,909,601	0	37,162,931
	7	0	24,253,330	24,253,330	6,326,127	0	30,579,457
	8	0	0	0	0	0	0
	9	0	0	0	0	0	0
	10	0	0	0	0	0	0
	Total	419,170,787	91,221,480	510,392,267	70,225,003	0	580,617,270
	1	553,085,204	0	553,085,204	84,827,600	131,176,100	769,088,904
T	2	1,185,182,579	5,321,253	1,190,503,832	41,371,512	0	1,231,875,344
O	3	1,185,182,579	16,723,938	1,201,906,517	43,561,921	0	1,245,468,438
T	4	1,185,182,579	28,126,623	1,213,309,202	43,561,921	0	1,256,871,123
A	5	1,185,182,579	39,529,308	1,224,711,887	43,561,921	0	1,268,273,808
L	6	0	50,931,993	50,931,993	43,561,921	0	94,493,914
	7	0	50,931,993	50,931,993	21,346,767	0	72,278,760
	8	0	0	0	0	0	0
	9	0	0	0	0	0	0
	10	0	0	0	0	0	0
	Total	5,293,815,521	191,565,108	5,485,380,629	321,793,563	131,176,100	5,938,350,292

**COST ESTIMATION FOR 8TH TO 30TH
ROAD MAINTENANCE**

Unit: Rupiah

	Road Maintenance Cost			Materials+Labor+Tax
	Material Cost	Labor Cost	Total	
8	26,678,663	24,253,330	48,506,660	50,931,993
9	26,678,663	24,253,330	48,506,660	50,931,993
10	26,678,663	24,253,330	48,506,660	50,931,993
11	26,678,663	24,253,330	48,506,660	50,931,993
12	26,678,663	24,253,330	48,506,660	50,931,993
13	26,678,663	24,253,330	48,506,660	50,931,993
14	26,678,663	24,253,330	48,506,660	50,931,993
15	26,678,663	24,253,330	48,506,660	50,931,993
16	26,678,663	24,253,330	48,506,660	50,931,993
17	26,678,663	24,253,330	48,506,660	50,931,993
18	26,678,663	24,253,330	48,506,660	50,931,993
19	26,678,663	24,253,330	48,506,660	50,931,993
20	26,678,663	24,253,330	48,506,660	50,931,993
21	26,678,663	24,253,330	48,506,660	50,931,993
22	26,678,663	24,253,330	48,506,660	50,931,993
23	26,678,663	24,253,330	48,506,660	50,931,993
24	26,678,663	24,253,330	48,506,660	50,931,993
25	26,678,663	24,253,330	48,506,660	50,931,993
26	26,678,663	24,253,330	48,506,660	50,931,993
27	26,678,663	24,253,330	48,506,660	50,931,993
28	26,678,663	24,253,330	48,506,660	50,931,993
29	26,678,663	24,253,330	48,506,660	50,931,993
30	26,678,663	24,253,330	48,506,660	50,931,993
Total	613,609,249	557,826,590	1,115,653,180	1,171,435,839

COST AND BENEFIT ESTIMATION

For Strengthening KUD Activities by Professional Staff Prepared by: Mr. Ozawa Unit: Rupiah

No.	Item	Revenues	Increase %	Benefit estimation	Cost estimation
1	Increase of revenue	4,845,330,000	0.50%	24,226,650	45,600,000
2		26,894,630,000	0.80%	215,157,040	45,600,000
3		45,321,105,000	1.20%	543,853,260	45,600,000
4		63,418,395,050	1.50%	951,275,926	
5		82,221,443,274	1.70%	1,397,764,536	
6		104,123,984,020	1.80%	1,874,231,712	
7		125,950,122,147	1.80%	2,267,102,199	
8		132,619,589,149	1.80%	2,387,152,605	
9		137,553,786,237	1.80%	2,475,968,152	
10		139,176,967,662	1.80%	2,505,185,418	
11		139,478,960,287	1.80%	2,510,621,285	
12		145,902,077,467	1.80%	2,626,237,394	
13		152,750,116,470	1.80%	2,749,502,096	
14		148,529,972,592	1.80%	2,673,539,507	
15		150,979,315,267	1.80%	2,717,627,675	
16		160,769,534,930	1.80%	2,893,851,629	
17		172,824,383,326	1.80%	3,110,838,900	
18		173,872,784,446	1.80%	3,129,710,120	
19		173,892,780,974	1.80%	3,130,070,058	
20		182,885,571,700	1.80%	3,291,940,291	
21		189,607,500,980	1.80%	3,412,935,018	
22		190,914,046,437	1.80%	3,436,452,836	
23		190,411,070,662	1.80%	3,427,399,272	
24		189,677,771,979	1.80%	3,414,199,896	
25		189,886,423,581	1.80%	3,417,955,624	
26		192,948,924,328	1.80%	3,473,080,638	
27		192,222,490,327	1.80%	3,460,004,826	
28		193,613,880,288	1.80%	3,485,049,845	
29		188,437,757,539	1.80%	3,391,879,636	
30		177,523,165,248	1.80%	3,195,416,974	
31	Grand Total			77,590,231,016	136,800,000

Note: Through the strengthening measures of the project including employment of professional staff, it is expected that selling prices of the products can be raised by 2 to 5%.

Considering reduction by some unsuccessful business, the selling prices can be raised average 2%.

In this projection, however, the average increase of the selling price is more safely estimated as 1.8%.

Information Center, etc.

(Unit: 1000 Rp)

Year	1998	1999	2000	2001	2002	2003	2004	Sub-Total
Calendar Year	1	2	3	4	5	6	7	
1 Supporting Village Level Groups								
A Supporting System for Participation								
Supporting Village Level Groups								
Materials								
Office	300,000							300,000
Typewriter	55,800							55,800
Whiteboard	18,600							18,600
Desk	18,600							18,600
Chair	93,000							93,000
Stationary	18,600	18,600	18,600	18,600	18,600	18,600	18,600	130,200
Sub-Total of Material Costs	504,600	18,600	18,600	18,600	18,600	18,600	18,600	616,200
Labor								0
Assist for LKMD A type	62,400	62,400	62,400					187,200
Assist for LKMD B type				34,320	34,320	31,200	31,200	131,040
Allowance for Study/Training A type	29,700	29,700	29,700					89,100
Allowance for Study/Training B type			18,150	18,150	34,650	16,500	16,500	103,950
Award to excellent Villagers (incl. training fee)		10,000	10,000	10,000	10,000	10,000	10,000	60,000
Sub-Total of Labor Costs, Etc.	92,100	102,100	120,250	62,470	78,970	57,700	57,700	571,290
B Lecture								
Payment to Lecturer(Coffee)	1,400	2,800	1,400	2,800	1,400	2,800	1,400	14,000
Payment to Lecturer(Fruit Tree)	1,400	2,800	1,400	2,800	1,400	2,800	1,400	14,000
Payment to Lecturer(Others)	600	1,200	600	1,200	600	1,200	600	6,000
Sub-Total of Payment to Lecturer	3,400	6,800	3,400	6,800	3,400	6,800	3,400	34,000
Materials	1,700	3,400	1,700	3,400	1,700	3,400	1,700	17,000
Sub-Total of Lecture Related Expenses	5,100	10,200	5,100	10,200	5,100	10,200	5,100	51,000
2 Information Center								
D Public Relation and Other Administration								
Materials								
Information Center Office	150,000							150,000
Typewriter	1,800							1,800
Computer	4,000							4,000
Printer	1,000							1,000
Photo Copy Machine	28,000							28,000
OHP Equipment	1,000							1,000
Desk	2,000							2,000
Chair	2,500							2,500
TV & Video Set	7,000							7,000
Automobile	60,000							60,000
Whiteboard	600							600
Generator	4,000							4,000
Stationary	1,000	1,000	1,000	1,000	1,000	1,000	1,000	7,000
News Letter	3,000	3,000	3,000	3,000	3,000	3,000	3,000	21,000
Video Film		10,000		10,000		10,000		30,000
Circuit Show		5,000	5,000	5,000	5,000	5,000		25,000
Liason Meeting of Project Area	10,000	10,000	10,000	10,000	10,000	10,000	10,000	70,000
Payment to NGO	63,000	63,000	63,000	63,000	63,000	63,000	63,000	441,000
Motorcycle	180,000							180,000
Motorcycle (Maintenance and Fuel 10%)	18,000	18,000	18,000	18,000	18,000	18,000	18,000	126,000
Sub-Total of Material Cost	536,900	110,000	100,000	110,000	100,000	110,000	95,000	1,161,900
Labor								0
Staff, etc.	60,000	60,000	60,000	60,000	60,000	60,000	60,000	420,000
KUD Experts		4,320	4,320	4,320				12,960
Advisory Committee	20,000	20,000	20,000	20,000	20,000	20,000	20,000	140,000
Sub-Total of Labor Cost	80,000	84,320	84,320	84,320	80,000	80,000	80,000	572,960
Sub-Total of 2	616,900	194,320	184,320	194,320	180,000	190,000	175,000	1,734,860
Total of Material Costs	1,043,200	132,000	120,300	132,000	120,300	132,000	115,300	1,795,100
Sales Tax on Materials	104,320	13,200	12,030	13,200	12,030	13,200	11,530	179,510
Total of Labor Costs	175,500	193,220	207,970	153,590	162,370	144,500	141,100	1,178,250
Grand-Total of 1 and 2	1,323,020	338,420	340,300	298,790	294,700	289,700	267,930	3,152,860
Grand-Total of 1 and 2 (Million Rp)	1,323	338	340	299	295	290	268	3,153

COST AND BENEFIT ESTIMATION

Cattle raising etc.

Unit: Rupiah

Year	Cost Estimation					Benefit Estimation					Total
	Cattle Raising	Goat Raising	Bee Keeping	Fish Pond	Total	Cattle Raising	Goat Raising	Bee Keeping	Fish Pond	Total	
P	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		98,200,000	67,500,000		155,700,000	
R	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	34,740,000	325,440,000	
O	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	69,480,000	360,180,000	
J	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	662,992,000	
E	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	385,568,000	
D	590,280,000	240,180,000	96,000,000	161,343,000	1,087,803,000	666,000,000	560,700,000	337,500,000	326,556,000	1,890,756,000	
T	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		88,200,000	67,500,000	111,168,000	266,868,000	
A	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	401,868,000	
F	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	401,868,000	
T	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	662,868,000	
E	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		207,900,000	67,500,000	111,168,000	385,568,000	
R	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		98,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		88,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		98,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		88,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	252,456,000	107,556,000	67,200,000	12,805,000	440,017,000		98,200,000	67,500,000	111,168,000	300,618,000	
	84,456,000	33,156,000	7,200,000	25,610,000	150,422,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	135,000,000	88,200,000	67,500,000	111,168,000	435,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000	396,000,000	88,200,000	67,500,000	111,168,000	696,618,000	
	84,456,000	33,156,000	7,200,000	40,976,000	165,788,000		207,900,000	67,500,000	111,168,000	420,318,000	
	2,951,400,000	1,200,900,000	480,000,000	806,715,000	5,439,015,000	3,320,000,000	2,803,500,000	2,362,500,000	2,779,200,000	11,275,200,000	
	3,541,680,000	1,441,080,000	576,000,000	988,058,000	6,526,818,000	3,996,000,000	3,364,200,000	2,700,000,000	3,105,756,000	13,155,956,000	

ANNUAL INVESTMENT PLAN

(Unit: Rupiah)

Item Detail	Check Dam				Riparian Zone				Plantation for Riparian Zone				
	Materials, etc.	Skilled labor	unskilled labor	Labor Total	Total	Materials, etc.	Unskilled Labor	Labor Total	Total	Materials, etc.	Unskilled Labor	Labor	Total
0													
1	104,951,000	12,955,000	131,555,000	144,510,000	249,461,000			17,760,000	28,410,000	10,650,000	17,760,000	28,410,000	
2	104,951,000	12,955,000	131,555,000	144,510,000	249,461,000			20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
3	125,941,200	15,546,000	157,866,000	173,412,000	299,353,200			20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
4								20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
5								20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
6								20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
7								20,720,000	33,145,000	12,425,000	20,720,000	33,145,000	
8													
9													
10													
Total	335,843,200	41,456,000	420,976,000	462,432,000	798,275,200			121,360,000	194,135,000	72,775,000	121,360,000	194,135,000	
Riparian Zone													
Item Detail	Materials, etc.	Skilled labor	Unskilled Labor	Labor Total	Total	Materials, etc.	Unskilled Labor	Labor Total	Total	Materials, etc.	Labor	Total	Total
0													
1													
2	10,650,000		17,760,000	17,760,000	28,410,000			17,760,000	28,410,000				
3	12,425,000		20,720,000	20,720,000	33,145,000			20,720,000	33,145,000				
4	12,425,000		20,720,000	20,720,000	33,145,000			20,720,000	33,145,000				
5	12,425,000		20,720,000	20,720,000	33,145,000			20,720,000	33,145,000				
6	12,425,000		20,720,000	20,720,000	33,145,000			20,720,000	33,145,000				
7	12,425,000		20,720,000	20,720,000	33,145,000			20,720,000	33,145,000				
8													
9													
10													
Total	72,775,000		121,360,000	121,360,000	194,135,000			121,360,000	194,135,000				

Calculation of Income Tax

Unit: Rupiah

	Agro-Forestry etc	Nursery	Cattle, etc.	Riparian(Bambu)	Grand Total	Income Tax
1	4,845,330,000	0	155,700,000	0	5,001,030,000	30,006,180
2	26,894,630,000	276,602,500	325,440,000	0	27,496,672,500	164,980,035
3	45,321,105,000	286,257,500	360,180,000	0	45,967,542,500	275,805,255
4	63,418,395,050	286,257,500	662,868,000	0	64,367,520,550	386,205,123
5	82,221,443,274	286,257,500	386,568,000	0	82,894,268,774	497,365,613
6	104,123,984,020	286,257,500	266,868,000	12,000,000	104,689,109,520	628,134,657
7	125,950,122,147	187,555,000	401,868,000	32,000,000	126,571,545,147	759,429,271
8	132,619,589,149	0	401,868,000	59,000,000	133,080,457,149	798,482,743
9	137,553,786,237	0	662,868,000	93,000,000	138,309,654,237	829,857,925
10	139,176,967,662	0	386,568,000	128,000,000	139,691,535,662	838,149,214
11	139,478,960,287		300,618,000	163,000,000	139,942,578,287	839,655,470
12	145,902,077,467		435,618,000	184,000,000	146,521,695,467	879,130,173
13	152,750,116,470		435,618,000	198,000,000	153,383,734,470	920,302,407
14	148,529,972,592		696,618,000	205,000,000	149,431,590,592	896,589,544
15	150,979,315,267		420,318,000	205,000,000	151,604,633,267	909,627,800
16	160,769,534,930		300,618,000	205,000,000	161,275,152,930	967,650,918
17	172,824,383,326		435,618,000	205,000,000	173,465,001,326	1,040,790,008
18	173,872,784,446		435,618,000	205,000,000	174,513,402,446	1,047,080,415
19	173,892,780,974		696,618,000	205,000,000	174,794,398,974	1,048,766,394
20	182,885,571,700		420,318,000	205,000,000	183,510,889,700	1,101,065,338
21	189,607,500,980		300,618,000	205,000,000	190,113,118,980	1,140,678,714
22	190,914,046,437		435,618,000	205,000,000	191,554,664,437	1,149,327,987
23	190,411,070,662		435,618,000	205,000,000	191,051,688,662	1,146,310,132
24	189,677,771,979		696,618,000	205,000,000	190,579,389,979	1,143,476,340
25	189,886,423,581		420,318,000	205,000,000	190,511,741,581	1,143,070,449
26	192,948,924,328		300,618,000	205,000,000	193,454,542,328	1,160,727,254
27	192,222,490,327		435,618,000	205,000,000	192,863,108,327	1,157,178,650
28	193,613,380,288		435,618,000	205,000,000	194,254,498,288	1,165,526,990
29	188,437,757,539		696,618,000	205,000,000	189,339,375,539	1,136,036,253
30	177,523,165,248		420,318,000	205,000,000	178,148,483,248	1,068,890,899
Total	4,359,253,881,369	1,609,187,500	13,165,956,000	4,354,000,000	4,378,383,024,869	26,270,298,149

The average rate of income tax is estimated at 20% of the net income from the above benefits.

The net income is estimated at 3% of the gross benefits.

FARMERS FUND COSTS

Riparian Zone

Check Dam Maintenance

	Materials		Labor		Total Cost	Remarks	Materials		Labor		Total Cost	Remarks
	Skilled	Unskilled	Skilled	Unskilled			Skilled	Unskilled	Skilled	Unskilled		
0												
1												
2												
3												
4												
5	1,749,000	25,000	915,000		940,000	2,689,000			960,000	960,000	960,000	
6	3,498,000	50,000	1,830,000		1,880,000	5,378,000			2,080,000	2,080,000	2,080,000	
7	5,596,800	80,000	2,928,000		3,008,000	8,604,800			3,200,000	3,200,000	3,200,000	
8	5,596,800	80,000	2,928,000		3,008,000	8,604,800			4,320,000	4,320,000	4,320,000	
9	5,596,800	80,000	2,928,000		3,008,000	8,604,800			5,440,000	5,440,000	5,440,000	
10	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
11	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
12	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
13	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
14	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
15	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
16	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
17	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
18	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
19	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
20	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
21	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
22	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
23	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
24	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
25	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
26	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
27	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
28	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
29	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
30	5,596,800	80,000	2,928,000		3,008,000	8,604,800			6,560,000	6,560,000	6,560,000	
Total	139,570,200	1,935,000	73,017,000		75,012,000	214,582,200			153,760,000	153,760,000	153,760,000	

Project Management

1 Exchange Rate	21.43 Rp/Yen
2 Domestic Inflation	2% pa
Foreign Inflation	2% pa
3 Monthly Remuneration Foreign Consultant	
Management/Finance/Procurement	2,200,000 Yen
Engineers	2,000,000 Yen
Local Consultant	
Management	500,000 Yen
Engineers	400,000 Yen
4 Office & Mobilization Cost	15% of 3 above

Assignment Plan of Consultants

Year	(Unit: Man-Month)							Sub-Total
	1998	1999	2000	2001	2002	2003	2004	
Calendar Year	1	2	3	4	5	6	7	
1 Foreign Consultants								
a Management/Finance/Procurement	8	6	6	6	2	2	3	33
b Civil Engineer	2	2	2	2				8
c Architecture	2	2	2	2				8
d Water Quality	2	2	2	2				8
e Soil	2	2	0	0	0	2	3	9
f Environment	0	0	0	0	2	2	3	7
2 Local Consultants								
a Management	12	12	12	12	12	12	12	84
b Finance & Procurement	12	12	12	12	12	12	12	84
c Civil Engineer	12	12	12	12	0	0	0	48
d Architecture	12	12	12	0	12	0	0	48
e Soil	2	2	2	0	0	0	2	8
f Environment	0	0	0	0	0	2	2	4

Year	(Unit: Yen)							Sub-Total
	1998	1999	2000	2001	2002	2003	2004	
Calendar Year	1	2	3	4	5	6	7	
Relative Inflation	1.043	1.100	1.154	1.211	1.270	1.333	1.399	
1 Foreign Consultants								
a Management/Finance/Procurement	17,600,000	13,200,000	13,200,000	13,200,000	4,400,000	4,400,000	6,600,000	72,600,000
b Civil Engineer	4,000,000	4,000,000	4,000,000	4,000,000	0	0	0	16,000,000
c Architecture	4,000,000	4,000,000	4,000,000	4,000,000	0	0	0	16,000,000
d Water Quality	4,000,000	4,000,000	4,000,000	4,000,000	0	0	0	16,000,000
e Soil	4,000,000	4,000,000	0	0	0	4,000,000	6,000,000	18,000,000
f Environment	0	0	0	0	4,000,000	4,000,000	6,000,000	14,000,000
2 Local Consultants								
a Management	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	42,000,000
b Finance & Procurement	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000	33,600,000
c Civil Engineer	4,800,000	4,800,000	4,800,000	4,800,000	0	0	0	19,200,000
d Architecture	4,800,000	4,800,000	4,800,000	0	4,800,000	0	0	19,200,000
e Soil	800,000	800,000	800,000	0	0	0	800,000	3,200,000
f Environment	0	0	0	0	0	800,000	800,000	1,600,000
3 Office & Mobilization	8,220,000	7,560,000	6,960,000	6,120,000	3,600,000	3,600,000	4,650,000	47,710,000
Total of 1, 2, and 3	63,020,000	52,960,000	53,360,000	46,920,000	27,600,000	27,600,000	35,650,000	312,110,000

Year	(Unit: Rp)							Sub-Total
	1998	1999	2000	2001	2002	2003	2004	
Calendar Year	1	2	3	4	5	6	7	
Relative Inflation	1.043	1.100	1.154	1.211	1.270	1.333	1.399	
Expected Exch. (Rp/Yen)	22.53	23.84	24.80	25.01	27.29	28.62	30.03	
1 Foreign Consultants								
a Management/Finance/Procurement	378,043,000	283,538,000	283,538,000	283,538,000	94,512,000	94,512,000	141,768,000	1,559,443,000
b Civil Engineer	85,920,000	85,920,000	85,920,000	85,920,000	0	0	0	343,680,000
c Architecture	85,920,000	85,920,000	85,920,000	85,920,000	0	0	0	343,680,000
d Water Quality	85,920,000	85,920,000	85,920,000	85,920,000	0	0	0	343,680,000
e Soil	85,920,000	85,920,000	0	0	0	85,920,000	128,880,000	388,540,000
f Environment	0	0	0	0	85,920,000	85,920,000	128,880,000	300,720,000
2 Local Consultants								
a Management	128,880,000	128,880,000	128,880,000	128,880,000	128,880,000	128,880,000	128,880,000	902,160,000
b Finance & Procurement	103,104,000	103,104,000	103,104,000	103,104,000	103,104,000	103,104,000	103,104,000	721,728,000
c Civil Engineer	103,104,000	103,104,000	103,104,000	103,104,000	0	0	0	412,416,000
d Architecture	103,104,000	103,104,000	103,104,000	0	103,104,000	0	0	412,416,000
e Soil	17,184,000	17,184,000	17,184,000	0	0	0	17,184,000	68,736,000
f Environment	0	0	0	0	0	17,184,000	17,184,000	34,368,000
3 Office & Mobilization	178,565,800	162,388,800	149,500,800	131,457,600	72,328,000	72,328,000	99,882,000	874,450,800
Total of 1, 2, and 3 (Constant)	1,353,669,600	1,244,590,800	1,145,172,800	1,007,841,600	592,843,000	592,843,000	765,752,000	6,704,122,800
Total of 1, 2, and 3 (Nominal)	1,420,025,953	1,370,029,333	1,323,125,123	1,220,469,853	753,113,158	799,092,569	1,070,431,220	7,547,278,218