

2. COUNTERPARTS AND PRINCIPAL INTERVIEWEES

2. Counterparts and Principal Interviewees

(1) Counterparts

Assignment	Name	Affiliation
Team Leader	Ramon Alberto DIAZ BEARD	Dept. of Forest Policy and Planning, Under-Secretariat for Forest Resources
	Sol Teresa PAREDES	Same as above
Forest Management	William Dario HERNANDEZ R	Same as above
Forest Fire Control	Rafael David ESPINAL MONTERD	Dept. of Protection, Under-Secretariat for Forest Resources
Agroforestry/ Farmland Management	Rafael Emilio GOMEZ	Dept. of Extension, Under-Secretariat for Forest Resources
Forest Resources/Vegetation	Gilbert GOMEZ WILLIAMS	Dept. of Forest Policy and Planning, Under-Secretariat for Forest Resources
	Orlando CASADO	Dept. of Administration, Under-Secretariat for Forest Resources
Erosion Control	Cesar Rafael SENA MATOS	Dept. of Land, Under-Secretariat for Water and Soil
	Roland LANDA	National Institute of Water Resources (INDRHI)
	Ishidro FLORIAN	Same as above
Natural Environment/ Soil	Rafael Antonio RIVERA	Dept. of Land, Under-Secretariat for Water and Soil
Socioeconomy/ Participatory Development	Pedro Jose TAVERAS ALONZO	Dept. of Reforestation and Forest Management, Under-Secretariat for Forest Resources
Project Evaluation	Teresa Disla	Dept. of Forest Policy and Planning, Under-Secretariat for Forest Resources
Technology Transfer/Organizational Strengthening	Donato VASQUES	Dept. of Forest Policy and Planning, Under-Secretariat for Forest Resources
	Luis Manuel FELIZ	Same as above
GIS	Maximo HERRERA RAMIREZ	Dept. of Administration, Under-Secretariat of Water and Soil
	Rafael Santiago HERNADEZ BATISTA	Dept. of Land, Under-Secretariat for Water and Soil

(2) Principal Interviewees

[Dominican Side]

1) Governmental Organizations

Secretariat of State for Environment and Natural Resources

(1) Frank Moya Pons Minister

Under-Secretariat for Forest Resources

(1) Franklyn Reynoso Deputy Minister

(2) Abel Hernandez Director, Department of Forest Policy and Planning

(3) Ramon Diaz Beard Deputy Director, Department of Forest Policy and Planning (former)

(4) Luis Castillo Director, Department of Reforestation and Forest Management

(5) Francisco Javier Cuevas Coordinator, Department of Reforestation and Forest Management

(6) Cornelio Acosta Monegro Principal, National Forest School

(7) Gerinimo Abrue Abrue Chief, Forest Fire Prevention Program

(8) Gilberto de los Santos Chief, San Juan Forest Management Office

(9) Jose Miguel Chief, La Vega Forest Management Branch Office

(10) Ramon Mendez Reyes Chief, Azua Forest Management Branch Office

(11) William Jimenez Chief, Constanza Forest Management Branch Office

(12) Tsuyoshi Miyagi JICA Expert

Under-Secretariat of Environment Rene Ledessma Deputy Minister

Under-Secretariat of Water and Soil Gustavo Tirado Director of Land

INDHRI Gilberto Reynoso Deputy Minister

Technical Bureau of Presidential Office Yukio Haneda JICA Expert (Development Planning)

2) International Cooperation Organizations

USAID		Donnie Harrington	In Charge of Economic Affairs
GTZ		Ing. Ulich Findal	Advisor
IDB		Sergio Mora C.	Advisor for Environment/Disaster Prevention
Taiwan Cooperation	Technical	Wen-Tsun Lee	Chief, Technical Team

3) Existing Projects

PLAN SIERRA		Ing. Fermin Ramirez	Secretary General
PLAN CORDILLRA		Lic. Nestor Ortega Grullon	Secretary General
PROCRYN		Humberto Checo	Project Leader

[Japanese Side]

1) Japanese Embassy

(1)	Masato Akazawa	Ambassador (former)
(2)	Takehisa Nogami	Ambassador
(3)	Soichi Sato	Councilor
(4)	Tadashige Tanaka	Second Secretary (former)
(5)	Takashi Kato	Second Secretary

2) JICA Office

(1)	Tomio Takahashi	Chief
(2)	Atsushi Takeuchi	Deputy Chief
(3)	Hiroaki Shirai	Staff
(4)	Shogo Sasaki	Planning Staff (General Environmental Affairs)

3. RELATED DOCUMENTS/DATA

(1) Soil Survey (Comparison table of FAO/Unesco & USDA methods)

FAO/Unesco			USDA			
Major Group	Unit	Sub-unit	Order	Sub-order	Great group	Sub-group
Leptosols	Lithic Leptosols	-	Entisols (-ent)	Orth-ents or Trop-ents	Torri-orth-ents Dys-trop-ents	Lithic Torriorthents
	Dystric Leptosols	-				Lithic Dystropepts
Cambisols	Dystric Cambisols	-	Inceptisols (-ept)	Trop-epts	Dys-trop-epts or Us-trop-epts	-
		Lepti-dystric Cambisols				Lithic Dystropepts or Lithic Ustropepts
	Eutric Cambisols	-			Eu-trop-epts or Us-trop-epts	-
		Skeleti-eutric Cambisols				Skeletic Eutropepts or Skeletic Ustropepts
		Andi-eutric Cambisols				Andic Eutropepts or Andic Ustropepts
	Fluvic Cambisols	-			Eu-trop-epts or Dys-trop-epts or Us-trop-epts	Fluvic Eutropepts or Fluvic Dystropepts or Fluvic Ustropepts
Calcisols	Haplic Calcisols	Lepti-haplic Calcisols	Inceptisols (-ept) or Entisols (-ent)	Orth-epts or Orth-ents	Calci-orth-epts or Calci-orth-ents	Lithic Calciorthepts or Lithic Calciorthents
Fluvisols	-	-	Entisols (-ent)	Fluv-ents	-	-

Note : This comparison table was compiled for the Study Area only and is not intended for use in other areas.

(2) Local Residents Need Ranking by Male and Female

No.	Los Corralitos		El Convento		La Guama	
	Male	Female	Male	Female	Male	Female
1	Water	Water	Electrecity	Electrecity	Electrecity	Employment opportunity
2	Road	Employment opportunity (Male)	Church	Farmland	Irrigation	School
3	Reforestation (including erosion control)	Road	House improvement, repairs	House near cliff (destruction danger)	Road	Livestock fence making
4	Bridge	Health clinic	Credit	Church	House improvement, repairs	water
5	Getting daily food	Church	Farmland	School	Farmland	House improvement, repairs
6	House improvement, repairs	School	School	Contaminated water	Health clinic	Road
7	Farmland	Toilet	Land ownership certificate	House improvement, repairs	Land ownership certificate	Electricity
8	Health clinic	House improvement, repairs	Health clinic	Toilet	School	Literacy
9	Credit	Electricity	Sport field	Employment opportunity (Male)	Transportation facilities	Flooding
10	School	Farmland	Police	Employment opportunity (Female)		Electricity
11	-	-				Land for obtaining fodder & wood for charcoal

No.	Los Frios		El Recodo		Las Lagunas	
	Male	Female	Male	Female	Male	Female
1	Credit	Farmland	Reforestation	Road	Water (drinking water)	Water (drinking water)
2	Reforestation & farmland	Health clinic & church	School food (breakfast)	School food (breakfast)	Hospital	Road
3	Stable market for agricultural produce	School food(breakfast)	Road	School	House improvement & repairs	House improvement & repairs
4	Extension of agriculture technology	Land ownership certificate	Electricity	Irrigation	Reforestation	Hospital
5	INESPRE	Rehabilitation of coffee field	Truck for village use	Electricity	Road	General education
6	Health clinic	Credit (for raising livestock)	Irrigation	Adult education	High school	Church(Parroquia)
7	House improvement & repairs	Electricity	Farmland	Water (drinking water)	Church(Parroquia)	Police
8	School food(breakfast)	Otaining daily food	Complete facilities for home cooking	Police	Government fund	Colmado Popular
9	Electricity	Community center	INESPRE	Shop	INESPRE	Erosion control measures
10	Land ownership certificate	Support for elderly	Extension of agriculture technology	House improvement & repairs	Farmland	Irrigation
11	-	-			Sport field	-

Note : INESPRE:Instituto Nacional de Estabilizacion de Precios

(3) Classification of Land Use Potential

For the classification of the land use potential in the Study Area, the land use potential evaluation criteria for the Study Area shown in Table 1 were established. While the classification of land use potential used in the Dominican Republic was used as the basis for these criteria, classification based on the relative importance of nine limiting factors, i.e. ① topography, ② gradient, ③ effective soil depth, ④ soil texture, ⑤ gravel, ⑥ drainage, ⑦ salt quantity, ⑧ flood risk and ⑨ necessity for irrigation, was decided to simplify the evaluation criteria, taking the characteristics and practical applicability of the criteria to the Study Area into consideration.

These limiting factors are closely related to the characteristics to define soil units and the process of soil generation. For example, the soil unit which is defined by the characteristic of the effective soil depth being limited to within 10 cm is Lithic Leptosols (LP) and the potential class of land where this soil is distributed is Class VIII based on the evaluation criterion for the effective soil depth. At flat land or the gently sloping land of hills or mountainous land, the development of Eutric Cambisols (CMe) is observed. This soil has an effective soil depth of more than 120 cm and is characterised by fine sandy loam or a loamy clay texture, little gravel, good drainage, absence of harmful salt and no risk of flooding. In short, CMe falls under Class I of the evaluation criterion for each limiting factor. Nevertheless, as high productivity cannot be expected without irrigation in the Study Area, land where CMe is distributed is classified as Class II or lower because of the need for irrigation.

As mentioned above, it is possible to use the soil unit to represent the corresponding limiting factor, except for topography and gradient, used for the land use potential evaluation criteria. With the use of such soil units, the evaluation criteria can be greatly simplified. Table 2 shows the relationship between the soil units (which are determined by correlation between the soil types distributed in the Study Area and the limiting factors) and the land use potential classes. With the addition of gradient classes, the land use potential classes can be finalised.

This classification of the land use potential means ranking of the potential land use based on the relative importance of the land use limiting factors. The principle of the ranking exercise is that the ranking of a specific soil type is lowered if there is one important limiting factor or upgraded if such a factor does not exist. For example, the ranking of good soil with a high fertility and deep effective depth at flat land, for example, is lowered if irrigation facilities are required because of the dry climate with low precipitation or is not lowered if the quantity and size of the gravel present are not

disruptive to cultivation. In short, evaluation is based on the relative importance of each limiting factor and not on the overall impact of the limiting factors.

Table 1 Land Use Potential Evaluation Criteria for Master Plan

Class	Limiting Factors								
	Topography	Gradient	Effective Soil Depth	Soil Texture	Gravel	Drainage	Salt Quantity	Flood Risk	Irrigation
I	Flat land	0 – 4% 0 – 2°	> 120 cm	Sandy loam – fine sandy clay	None or little	Good	None or very low	No	Not required
II	Flat land Hilly land	4 – 8% 2 – 4°		Loamy sand – fine sandy clay	Present	Excessive or slightly poor			
III		8 – 16% 4 – 9°	9- 120 cm				Present in large quantity		
IV		16 – 32% 9 – 18°	50 – 90 cm	Sandy - clayey	Yes				
V	Flat land (wetland)	0 – 4% 0 – 2°	> 50 cm	Clayey loam - clay	None or few	Poor	Slightly high	-	Required
VI	Mountainous land	32 – 64% 18 – 33°	25 – 50 cm	Sandy - clayey	Present in extremely large quantity	Excessive			
VII		64 – 100% 33 – 35°	10 – 25 cm				Present in extremely large quantity with boulders		
VII		> 100% > 45°	< 10 cm					Cropped rock	Very high
	Swamp	-	-	-	-	-	-	-	

Note : The land use potential class for each type of land is determined by the lowest class of limiting factors. For example, hilly land with a gradient class of 10% (6°), an effective soil depth of 20 cm, loamy soil, large quantity of gravel, excessive drainage, no salt and no irrigation requirement is classed as VII because of the effective soil depth.

Table 2 Relationship Between Soil Units and Land Use Potential Classes in Study Area

Soil Unit	Relationship Between Soil Unit and Land Use Potential Class	Recommended Land Use
Fluvisols (FL)	Although this type of soil is distributed at flat land along river channels without any soil-related limiting factors, it is classified as IV because of the flood risk.	Cultivation of perennial crops and grazing grassland
Fluvic Cambisols (CMf)	Although this type of soil is distributed at flat land along valleys without any soil-related limited factors, it is classified as II through IV with the final classification being based on the gradient.	Farming supported by land management and soil conservation measures
Eutric Cambosils (CMe); Andi-Eutric Cambisols (CMe-an)	This type of soil is distributed at relatively flat land in hilly or mountainous areas. Although it is not subject to any soil-related limiting factors, it is classified as II or lower because of the need for irrigation with the final classification being based on the gradient.	Intensive farming with irrigation
Dystric Cambisols (CMd)	This type of soil is distributed on flat to slightly flat land in hilly areas. The effective soil depth is the only important limiting factor for this type of soil. It is classified as IV because of its effective soil depth of 50 - 90 cm.	Cultivation of perennial crops and grazing grassland
Skeleti-Dystric Cambisols (CMd-sk)	This type of soil is distributed at flat to slightly flat land at the bottom of sloping hills. This unit is specially introduced because of the presence of a large quantity of gravel. While gravel is the only important limiting factor, it is classified as VI because of the large quantity of gravel.	Perennial crops, grazing grassland or forest
Lepti-Dystric Cambisols (CMd-le)	This type of soil is distributed at the slopes of hilly or mountainous areas and is specially classified to represent an effective soil thickness class of 30 – 50 cm. In some cases, it contains a large quantity of gravel but not boulders or cropped rocks. Accordingly, it is classified as IV or lower based on the effective soil depth with the final classification being decided by the gradient.	Cultivation of mountainous perennial crops, grazing grassland or forest
Dystric Leptosols (LPd)	This type of soil is distributed at slopes or ridges in hilly or mountainous areas and is specially classified to represent the effective soil thickness class of 10 – 30 cm. Because of the absence of cropped rocks, it is classified as VII or lower based on the effective soil depth with the final classification of either VII or VIII being decided by the gradient.	Forest and conservation area
Lithic Leptosols (LPq)	As the effective soil depth of this type of soil is less than 10 cm, this soil type is classified as VIII.	Habitat for wildlife

Note : Only those soil units shown on the soil map are listed in this table.

(4) Project Cost

Planned Annual Project Work Volume

Unit:1,000RDS

Item	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Total
1. Forest Management																	
Natural forest management	ha	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	3,600	40,000
Reforestation	ha	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,800	20,000
Nursery establishment	village	25					40					88					153
Forest road	km	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	630
Land survey for reforestation certification	ha	530	530	530	530	530	530	530	530	530	530	530	530	530	530	580	8,000
Establishment of land ownership right	ha	530	530	530	530	530	530	530	530	530	530	530	530	530	530	580	8,000
Sub-total																	
2. Agroforestry																	
Agroforestry & farming improvement	village	25					40					64					129
Sloping agricultural land	km		18	18	18	21		30	30		30		48	48	48	48	387
Silvipasture	village				8					8					9		25
Sub-total																	
3. Soil Conservation																	
Small scale gully control	gully	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	30
Small scale landslide control	landslide	37	37	37	37	37	37	37	37	37	37	37	37	37	37	43	561
Sub-total																	
4. Forest Fire Control																	
Formation of fire company	village	30					40					88					158
Improvement of fire fighting techniques	time	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
Stationing of fire fighting equipment (3 Forest Management Branch Offices)	set	1					1					1					3
Equipment for use by local residents	village	31					40					88					159
Sub-total																	
5. Community Development																	
Livelihood improvement	village	31					40					88					
Social infrastructure improvement																	
Sub-total																	
6. Organizing Local Residents																	
Workshop	village	25					40					88					153
Monitoring/evaluation	village	31		31		31	40	31	40	31	40	119	40	119	40	119	712
Leader meeting	area	6	6	6			8	8	8	8	8	18	18	18	18	18	95
Survey of advanced areas	village	31	25				40	40	8			88	88				312
Sub-total																	
7. Training & Extension for Local Residents																	
Training cost	village	25					40					88					153
Training equipment	village	25					40					88					153
Audio-visual equipment (Forest Management Branch Office)	set	3						3					3				9
Vehicle (pick-up trucks) (3 Forest Management Branch Offices)	set	3						3					3				9
Sub-total																	
8. Support Activity																	
Project staff	person	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	120
Extension worker	person	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	90
NGO leader	person	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	15
NGO staff	person	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	30
Training of staff within the project	person	26	26	26	26	26	17	17	17	17	17	8	8	8	8	8	255
Sub-total																	
Grand-Total																	

Renewal Cost

Unit:1,000RDS

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Total
1. Forest Management																
Natural forest management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reforestation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nursery establishment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forest road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Land survey for reforestation area certification	0	0	0	0	0	528	0	0	0	0	528	0	0	0	0	1,056
Land ownership right	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	528	0	0	0	0	528	0	0	0	0	1,056
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	554	0	0	0	0	554	0	0	0	0	1,109
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	588	0	0	0	0	588	0	0	0	0	1,175
2. Agroforestry																
Agroforestry & farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sloping agriculture land	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silvipasture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Soil Conservation																
Small scale gully control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small scale landslide control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Forest Fire Control																
formation of fire crops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Improvement of fire fighting techniques	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stationing of fire fighting equipment	0	0	0	0	0	10,617	0	0	0	0	10,617	0	0	0	0	21,234
Equipment for use by local residents	0	0	0	0	0	2,852	0	0	0	0	3,680	0	0	0	0	6,532
① Sub-total	0	0	0	0	0	13,469	0	0	0	0	14,297	0	0	0	0	27,766
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	14,142	0	0	0	0	15,012	0	0	0	0	29,154
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	14,991	0	0	0	0	15,913	0	0	0	0	30,904
5. Community Development																
Livelihood improvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Social infrastructure improvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Organizing Local Residents																
Workshop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monitoring/evaluation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leaders meeting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Survey of advanced areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Total=①×1.05 (contingency price included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Training/Extension of Local Residents																
Training cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Training material	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Audio-visual equipment	0	0	0	0	0	642	0	0	0	0	642	0	0	0	0	1,284
Vehicles (Pickup trucks)	0	0	0	0	0	1,580	0	0	0	0	1,580	0	0	0	0	3,159
① Sub-total	0	0	0	0	0	2,222	0	0	0	0	2,222	0	0	0	0	4,443
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	2,333	0	0	0	0	2,333	0	0	0	0	4,665
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	2,473	0	0	0	0	2,473	0	0	0	0	4,945
8. Support Activities																
Project staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extension worker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGO leader	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGO staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Training of staff within the project	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
① Sub-total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
② Total=①×1.05 (Contingency price included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
③ Total=②×1.06 (Inflation rate included)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total ①	0	0	0	0	0	16,219	0	0	0	0	17,047	0	0	0	0	33,265
Maintenance cost (Grand Total cost ①×10%)	0	0	0	0	0	1,622	0	0	0	0	1,705	0	0	0	0	3,327
Grand total ② (Contingency price included)	0	0	0	0	0	17,029	0	0	0	0	17,899	0	0	0	0	34,928
Grand total ③ (Contingency price+ Inflation rate)	0	0	0	0	0	26,457	0	0	0	0	37,213	0	0	0	0	63,670

Project Unit Cost

1. Forest Management

Natural Forest Management (Per 60 Tarea)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Felling	275.81 RD\$	187.47 m ³	51,706.10 RD\$	10% of felling cost of the final felling of natural forest in Plan Sierra
		10 %	5,170.00 RD\$	
Total			5,170.00 RD\$	
		Per Hectare	1,378 RD\$	5,170÷60×16

Creation of Man-made Forest (Per Tarea)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Reforestation	125 RD\$	2.33 persons	491.25 RD\$	RD\$ 200 of seedlings price included
Maintenance	125 RD\$	1.26 persons	157.50 RD\$	
Total			648.75 RD\$	
		Per Hectare	10,380 RD\$	648.75×16

Nursery Establishment (Per/village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Barbed wire fence	1,500 RD\$	1	1,500 RD\$	
Water tank	1,500 RD\$	1	1,500 RD\$	
Shading net	12,000 RD\$	1	12,000 RD\$	
Hose	1,000 RD\$	1	1,000 RD\$	
Pole	3,500 RD\$	1	3,500 RD\$	
Equipment for establishment	3,000 RD\$	1	3,000 RD\$	scoop, shovel, wheelbarrow, wire, nail, string
Fixtures	1,500 RD\$	1	1,500 RD\$	
Total			24,000 RD\$	

Forest Road (Per Km)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Forest road	25,000 RD\$	1 km	25,000 RD\$	
Total			25,000 RD\$	

Land Survey for Certification of Reforestation Area (530ha)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Cost of certificate	36.75 RD\$	530 ha	19,477 RD\$	8,000ha÷15 years, 735 RD\$÷20ha/manday
Transportation cost	1,000 RD\$	39 day	39,000 RD\$	26 manday (530ha÷20ha/manday)×1/2 days×3man/day
Total			58,477 RD\$	
			≈ 58400 RD\$	

Equipment for Land Survey for Certification of Reforestation Area (530ha)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
GPS machine	100,000 RD\$	1	100,000 RD\$	5 year renewal
Basic system	428,000 RD\$	1	428,000 RD\$	5year renewal
Total			528,000 RD\$	

Establishment of Land Ownership Rights (Per Hectare)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Establishment	7,631 RD\$	1	7,631 RD\$	
Total			7,631 RD\$	

2. Agroforestry

Agroforestry (Per Village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Fruit seedlings	25 RD\$	2000 seedling	50,000 RD\$	Including transportation cost
Fruit tree & vegetable seeds	100 RD\$	100 seed	10,000 RD\$	
Total			60,000 RD\$	

Farmland Improvement (Per Village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Tank	300 RD\$	50	15,000 RD\$	
Molasses	1300 RD\$	10 g	13,000 RD\$	
Rice bran	100 RD\$	500 g	50,000 RD\$	
Manure	10 RD\$	1000 g	10,000 RD\$	
Husk	10 RD\$	500 g	5,000 RD\$	
Sheet	900 RD\$	10	9,000 RD\$	
Bag	3 RD\$	5000	15,000 RD\$	
Etc.	1000 RD\$	10	10,000 RD\$	
Earthworm	20 RD\$	100	2,000 RD\$	
Total			129,000 RD\$	

Agriculture in Irrigated Sloping Land (Per Km)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Pipe	61000 RD\$	1 km	61,000 RD\$	From interview survey in villages where pipe facilities were under construction
Total			61,000 RD\$	

Silvipasture (Per village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Cultivation of fooder crops & live fences	25 RD\$	2000 Plant	50,000 RD\$	The same cost as fruit tree planting in agroforestry
Total			50,000 RD\$	

3. Soil Conservation

Control of Small Scale Gully (per 1 gully)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Planting (cuttings)	10 RD\$	640 cutting	6,400 RD\$	Target gully's depth & width is about 1.0m & 1.5m, respectively
Log check dam	600 RD\$	6 dam	3,600 RD\$	
Stone check dam	1200 RD\$	5 dam	6,000 RD\$	
Waterway	300 RD\$	100 m	30,000 RD\$	
Total			46,000 RD\$	

Small Scale Landslide Control (Per 1 landslide)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Planting (seedling)	10380 RD\$	0.12 ha	1,246 RD\$	Target landslid's area is less than 1 ha & its depth about 1 meter
Log retaining wall	250 RD\$	656 m	164,000 RD\$	
Total			165,246 RD\$	
			≐	165,000 RD\$

4. Forest Fire Control

Fire company Establishment (Per village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Meeting (money for lunch)	50 RD\$	200 persons	10,000 RD\$	100 participants per village, 2 meetings
Total			10,000 RD\$	

Improvement of Fire Fighting Techniques (per 1 time)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Meetings	20,000 RD\$	1 time	20,000 RD\$	Once a year meeting, transportation cost of participants
Total			20,000 RD\$	

Stationing of Fire Fighting Equipment

(Per 3 Forest Management Branch Offices)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Vehicles for inspection	357,143 RD\$	3	1,071,429 RD\$	Precautionary surveillance
Motorbike for inspection	114,286 RD\$	3	342,858 RD\$	
Wireless equipment (5W)	21,429 RD\$	5	107,145 RD\$	From second renewal 17 sets
Binocular	11,429 RD\$	9	102,861 RD\$	
Vehicles for transportation	642,857 RD\$	3	1,928,571 RD\$	From second renewal 6 sets
Set of portable pump	144,286 RD\$	7 set	1,010,002 RD\$	From second renewal 12 sets
Fire hunter	4,286 RD\$	90 set	385,740 RD\$	From second renewal 12150 sets
Uniform	2,857 RD\$	150 set	428,550 RD\$	
Helicopter bucket	64,286 RD\$	10	642,860 RD\$	
Transportation cost	600,000 RD\$	1	600,000 RD\$	
Total			6,620,016 RD\$	From the second time renewal, in addition to the equipment mentioned above, such equipment as fire beater 150 sets, 15 water tanks, 60 dustproof masks & 60 goggles are added, & the total amount of money become RD\$10,617,125.
			≐ 6,620,000 RD\$	

Equipment for Use by Local Residents

(Per village)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Fire beater	2,800 RD\$	25	70,000 RD\$	
Dustproof mask	500	25	12,500	
Goggle	380	25	9,500	
Total			92,000 RD\$	

5. Community Development

Livelihood Improvement

(Per village)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Sheep	1000 RD\$	10	10,000 RD\$	
Goat	1000 RD\$	10	10,000 RD\$	
Pig	500 RD\$	5	2,500 RD\$	
Rabbit	50 RD\$	60	3,000 RD\$	
Flower	300 RD\$	1	300 RD\$	
Total			25,800 RD\$	

6. Organizing Local Residents

Workshop (PRA)

(Per village)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Meeting (money for lunch)	33.4 RD\$	140 persons	4,676 RD\$	70 persons×2 times
Travel cost (NGO)	835 RD\$	2 days	1,670 RD\$	NGO
Total			6,346 RD\$	
			≐ 6340 RD\$	

Monitoring/Evaluation

(Per village)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Travel cost (NGO)	835 RD\$	3 days	2,505 RD\$	Monitoring, 3 days
Travel cost (NGO)	835 RD\$	1 days	835 RD\$	Evaluation, 1day
Meeting (money for lunch)	33.4 RD\$	50 persons	1,670 RD\$	50 persons×1 time
Travel cost (NGO)	835 RD\$	2 days	1,670 RD\$	Followup, 2 days
Total			6,680 RD\$	

Leader Meeting

(Per area)

Item	Unit Cost	Quantity	Amount of Money	Remarks
Meeting (money for lunch)	33.4 RD\$	100 persons	3,340 RD\$	50 persons×2 times
Travel cost (NGO)	835 RD\$	2 days	1,670 RD\$	
Travel cost (leader)	50.1 RD\$	100 days	5,010 RD\$	50 persons×2 days
Total			10,020 RD\$	

Inspection of Advanced Areas (Per village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Plan Sierra	2,000 RD\$	80 day	160,000 RD\$	20 persons×4 days
Los Dahao	200 RD\$	20 day	4,000 RD\$	20 persons×1 day
Ocoa	200 RD\$	20 persons	4,000 RD\$	20 persons×1 day
Surrounding areas	100 RD\$	100 day	10,000 RD\$	100 persons×1day
Total			178,000 RD\$	

7. Extension and Training

Training Cost (Per village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Nursery	50 RD\$	100 person	5,000 RD\$	50 persons×2 days
Home garden	50 RD\$	60 person	3,000 RD\$	30 persons×2 days
Agroforestry & soil conservation	50 RD\$	90 person	4,500 RD\$	30 persons×3 days
Grafting	50 RD\$	30 person	1,500 RD\$	30 persons×1days
Agricultural training	50 RD\$	40 person	2,000 RD\$	20 persons×2 days
Organic fertilizer & biomass	50 RD\$	30 person	1,500 RD\$	30 persons×1 days
Total			17,500 RD\$	

Cost of Material Used for Training (Per village)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Nursery	100 RD\$	50	5,000 RD\$	15 pages
Home garden	170 RD\$	10	1,700 RD\$	50 pages
Agricultural training	120 RD\$	10	1,200 RD\$	30 pages
Organic fertilizer & biomass	370 RD\$	15 persons	5,550 RD\$	17 pages, color
Total			13,450 RD\$	

Audio-visual Equipment Cost (Per Forest Management Branch Office)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Vedio	21,192 RD\$	1	21,192 RD\$	50 persons×2 days
Tape	53 RD\$	20	1,060 RD\$	30 persons×2 days
Lap top computer	38,764 RD\$	1	38,764 RD\$	30 persons×3 days
OHP Screen	4,612 RD\$	1	4,612 RD\$	30 persons×1 days
Portable generator	16,327 RD\$	1	16,327 RD\$	20 persons×2 days
Gasoline for generator	2,379 RD\$	1	2,379 RD\$	30 persons×1 days
Electricity current stabilizer	6,482 RD\$	1	6,482 RD\$	30 persons×1 days
Extension cable	162 RD\$	3	486 RD\$	20 persons×2 days
Projector	123,526 RD\$	1	123,526 RD\$	30 persons×1 days
Total			214,828 RD\$	
			≡	214,000

Vehicle (For extension use)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Pick-up truck	285000 RD\$	3	855,000 RD\$	5 year renewal
Motorbike	33000 RD\$	6	198,000 RD\$	5 year renewal
Pick-up maintenance cost	142500 RD\$	3	427,500 RD\$	50% of vehicle's cost
Motorbike maintenance cost	16500 RD\$	6	99,000 RD\$	50% of vehicle's cost
Pick-up fuel cost	2000 RD\$	150 months	300,000 RD\$	
Motorbike fuel cost	500 RD\$	150 months	75,000 RD\$	
Total			1,954,500 RD\$	

8. Support Activities

Project staff, etc. (Per person per year)				
Item	Unit Cost	Quantity	Amount of Money	Remarks
Project staff	20000 RD\$	13 months	260,000 RD\$	13 months×15 years
Extension worker	10000 RD\$	13 months	130,000 RD\$	13 months×10 years
NGO (leader)	2200 RD\$	100 days	220,000 RD\$	100 days×5 years
NGO (staff)	650 RD\$	200 days	130,000 RD\$	200 days×5 years
Training of staff within the project	800 RD\$	20 days	16,000 RD\$	

(5) Economic Evaluation

Economic Cost and Benefit Flow (EIRR)

(Unit: 1,000 RD\$)

Year	Cost				Benefit Inflow Total	Net Benefit Flow	Sensitivity Test Net Benefit Flow		
	Initial	O/M	Replace-ment	Outflow Total			Case 1 Agro 80%	Case 2 Agro 60%	Case 3 Agro 40%
1	60,354	6,035	0	66,389	-43,036	-109,425	-115,515	-121,605	-127,695
2	29,344	8,970	0	38,314	-36,881	-75,195	-81,404	-87,612	-93,821
3	25,343	11,504	0	36,847	-30,727	-67,574	-73,901	-80,228	-86,555
4	25,186	14,023	0	39,209	-24,572	-63,781	-70,226	-76,672	-83,118
5	25,287	16,551	0	41,839	-18,417	-60,256	-66,820	-73,385	-79,949
6	43,727	20,924	25,006	89,657	-55,299	-144,955	-157,728	-170,501	-183,274
7	31,198	24,044	0	55,242	-42,989	-98,231	-111,241	-124,251	-137,261
8	24,594	26,503	0	51,097	-30,680	-81,777	-95,024	-108,272	-121,519
9	24,865	28,990	0	53,855	-18,371	-72,225	-85,710	-99,194	-112,679
10	24,594	31,449	0	56,043	-6,061	-62,104	-75,826	-89,548	-103,269
11	63,779	37,827	25,006	126,612	-36,788	-163,400	-183,449	-203,497	-223,546
12	39,105	41,738	0	80,843	-18,324	-99,167	-119,571	-139,976	-160,380
13	24,604	44,198	0	68,803	140	-68,662	-89,423	-110,183	-130,943
14	24,780	46,676	0	71,456	18,604	-52,851	-73,967	-95,084	-116,200
15	30,256	49,702	0	79,958	37,068	-42,889	-64,361	-85,833	-107,305
16	0	49,702	0	49,702	55,532	5,831	-15,997	-37,825	-59,652
17	0	49,702	0	49,702	73,996	24,295	2,111	-20,072	-42,256
18	0	49,702	0	49,702	92,460	42,759	20,220	-2,320	-24,859
19	0	49,702	0	49,702	110,925	61,223	38,328	15,433	-7,462
20	0	49,702	0	49,702	129,389	79,687	56,436	33,185	9,934
21	0	49,702	0	49,702	147,853	98,151	74,544	50,938	27,331
22	0	49,702	0	49,702	166,317	116,615	92,653	68,690	44,728
23	0	49,702	0	49,702	184,781	135,079	110,761	86,443	62,124
24	0	49,702	0	49,702	203,245	153,543	128,869	104,195	79,521
25	0	49,702	0	49,702	221,709	172,007	146,977	121,948	96,918
26	0	49,702	0	49,702	240,173	190,471	165,086	139,700	114,314
27	0	49,702	0	49,702	258,637	208,935	183,194	157,452	131,711
28	0	49,702	0	49,702	277,101	227,399	201,302	175,205	149,108
29	0	49,702	0	49,702	295,565	245,863	219,410	192,957	166,504
30	0	49,702	0	49,702	314,029	264,327	237,519	210,710	183,901
31	0	49,702	0	49,702	326,338	276,637	249,591	222,545	195,499
32	0	49,702	0	49,702	338,648	288,946	261,663	234,380	207,097
33	0	49,702	0	49,702	350,957	301,255	273,735	246,215	218,695
34	0	49,702	0	49,702	363,266	313,565	285,807	258,050	230,292
35	0	49,702	0	49,702	375,576	325,874	297,879	269,885	241,890
36	0	49,702	0	49,702	381,730	332,029	303,916	275,802	247,689
37	0	49,702	0	49,702	387,885	338,183	309,952	281,720	253,488
38	0	49,702	0	49,702	394,040	344,338	315,988	287,637	259,287
39	0	49,702	0	49,702	400,194	350,493	322,024	293,555	265,086
40	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
41	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
42	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
43	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
44	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
45	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
46	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
47	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
48	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
49	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
50	0	49,702	0	49,702	406,349	356,647	328,060	299,472	270,885
Total	497,017	2,148,693	50,012	2,695,721	10,253,855	7,558,134	6,426,457	5,294,781	4,163,104

EIRR (50) =

7.3%

Sensitivity test
EIRR =

Case 1
Cost+20%
6.1%

Case 2
Benefit-20%
5.0%

Case 3
C+20%,B-20%
4.0%

Economic Initial Cost Flow

(Unit: 1,000 RD\$)

Year	Forestry Management Measure	Agroforestry Measure	Erosion Measure	Forest Fire Measure	Village Dev. Measure	Organiza- tion Measure	Extantion	Project Support	Total
1	16,053	4,316	4,262	21,040	658	4,728	4,372	4,925	60,354
2	14,950	1,003	4,262	18	0	4,187	0	4,925	29,344
3	14,978	1,003	4,262	18	0	157	0	4,925	25,343
4	14,978	1,003	4,262	18	0	0	0	4,925	25,186
5	14,755	1,170	4,262	18	0	157	0	4,925	25,287
6	15,855	6,906	4,262	3,745	850	7,566	1,131	3,413	43,727
7	14,978	1,672	4,262	18	0	6,856	0	3,413	31,198
8	14,978	1,672	4,262	18	0	251	0	3,413	24,594
9	14,978	2,037	4,262	18	0	157	0	3,413	24,865
10	14,978	1,672	4,262	18	0	251	0	3,413	24,594
11	16,907	11,050	4,262	8,218	1,869	16,801	2,488	2,184	63,779
12	14,978	2,675	4,262	18	0	14,988	0	2,184	39,105
13	14,755	2,675	4,262	18	0	710	0	2,184	24,604
14	14,978	3,086	4,262	18	0	251	0	2,184	24,780
15	19,726	2,675	4,943	18	0	710	0	2,184	30,256
16	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
Total	232,826	44,614	64,611	33,222	3,377	57,771	7,991	52,605	497,017

Economic Bnefit Flow

(Unit: 1,000 RD\$)

Year	Agricultural Benefit		Erosion Control Benefit		Total Benefit
	Incremental Benefit	Minus Benefit	Incremental Benefit	Minus Benefit	
1	0	-12,586	0	-30,450	-43,036
2	593	-12,586	5,562	-30,450	-36,881
3	1,186	-12,586	11,123	-30,450	-30,727
4	1,779	-12,586	16,685	-30,450	-24,572
5	2,372	-12,586	22,247	-30,450	-18,417
6	2,965	-25,173	27,809	-60,899	-55,299
7	4,151	-25,173	38,932	-60,899	-42,989
8	5,337	-25,173	50,055	-60,899	-30,680
9	6,523	-25,173	61,179	-60,899	-18,371
10	7,709	-25,173	72,302	-60,899	-6,061
11	8,895	-37,759	83,426	-91,349	-36,788
12	10,674	-37,759	100,111	-91,349	-18,324
13	12,453	-37,759	116,796	-91,349	140
14	14,232	-37,759	133,481	-91,349	18,604
15	16,010	-37,759	150,166	-91,349	37,068
16	17,789	-37,759	166,851	-91,349	55,532
17	19,568	-37,759	183,536	-91,349	73,996
18	21,347	-37,759	200,221	-91,349	92,460
19	23,126	-37,759	216,906	-91,349	110,925
20	24,905	-37,759	233,591	-91,349	129,389
21	26,684	-37,759	250,277	-91,349	147,853
22	28,463	-37,759	266,962	-91,349	166,317
23	30,242	-37,759	283,647	-91,349	184,781
24	32,021	-37,759	300,332	-91,349	203,245
25	33,800	-37,759	317,017	-91,349	221,709
26	35,579	-37,759	333,702	-91,349	240,173
27	37,358	-37,759	350,387	-91,349	258,637
28	39,137	-37,759	367,072	-91,349	277,101
29	40,916	-37,759	383,757	-91,349	295,565
30	42,695	-37,759	400,442	-91,349	314,029
31	43,881	-37,759	411,566	-91,349	326,338
32	45,066	-37,759	422,689	-91,349	338,648
33	46,252	-37,759	433,813	-91,349	350,957
34	47,438	-37,759	444,936	-91,349	363,266
35	48,624	-37,759	456,059	-91,349	375,576
36	49,217	-37,759	461,621	-91,349	381,730
37	49,810	-37,759	467,183	-91,349	387,885
38	50,403	-37,759	472,745	-91,349	394,040
39	50,996	-37,759	478,306	-91,349	400,194
40	51,589	-37,759	483,868	-91,349	406,349
41	51,589	-37,759	483,868	-91,349	406,349
42	51,589	-37,759	483,868	-91,349	406,349
43	51,589	-37,759	483,868	-91,349	406,349
44	51,589	-37,759	483,868	-91,349	406,349
45	51,589	-37,759	483,868	-91,349	406,349
46	51,589	-37,759	483,868	-91,349	406,349
47	51,589	-37,759	483,868	-91,349	406,349
48	51,589	-37,759	483,868	-91,349	406,349
49	51,589	-37,759	483,868	-91,349	406,349
50	51,589	-37,759	483,868	-91,349	406,349
Total	1,547,678	-1,699,155	14,516,037	-4,110,705	10,253,855

Unit Economic Benefit

Items	Unit	Benefit
Thinning Benefit ¹⁾	RD\$/ha	2,500
Erosion Control Benefit ²⁾	RD\$/t	167
Grassing Benefit ³⁾ (Without)	RD\$/ha	2,400
Grassing Benefit ⁴⁾ (With)	RD\$/ha	2,850
Pasuturte (shifting Cultivation) ⁵⁾	RD\$/ha	730
Agricultural Benefit ⁶⁾ (Without)	RD\$/ha	2,234
Agricultural-1 Benefit ⁷⁾ (With)	RD\$/ha	3,210
Agricultural-2 Benefit ⁸⁾ (With)	RD\$/ha	2,767

- 1) Quoted from "Promoting Fram Forestry in the Dominican Republic", Rural Development Forestry Net Work Paper 22d, Winter 1997/1998; 390RD\$/tarea
- 2) Estimated at 10US\$/t as one fifth of 50\$/t (the figure are adapted in Forest Agency in Japan).
- 3) and 4) Calculated from the date of field survey and Ministry of Agriculture
- 5) Assumed seven years interval on present shifting cultivation, included in both cultivation (2,234RD\$/year:1/7) benefit and pasture land (2,400RD\$/year:6/7) benefits respectively.
- 6) Based on the figure without condition presented at Table 8-5 in main report chapter 8.
- 7) Based on the figure with condition 2 presented at Table 8-5 in main report chapter 8.
- 8) Based on the figure with condition 1 presented at Table 8-5 in main report chapter 8.

Estimation of Soil Loss Before and After

Land Use	Before			After			Difference = -
	Area Ha	Soil Loss t/ha/y	Soil Loss 1,000t/y	Area ha	Soil Loss t/ha/y	Soil Loss 1,000t/y	Soil Loss 1,000t/y
1. Forest land	87,531	50	4,377	87,531	-	2,245	-2,132
1) Forest-1	-	-	-	2,252	50	113	
2) Forest-2	-	-	-	34,556	25	864	
3) Forest-3	-	-	-	50,723	25	1,268	
2. Bush land	6,301	69	435	6,301	-	166	-269
1) Forest-1	-	-	-	223	50	16	
2) Forest-2	-	-	-	2,951	25	74	
3) Forest-3	-	-	-	3,027	25	76	
3. Intensive grazing land	2,580	67	172	2,580	-	80	-93
1) Forest-2	-	-	-	104	25	3	
2) Forest-3	-	-	-	28	25	1	
3) Grazing-1	-	-	-	95	67	6	
4) Grazing-2	-	-	-	2,353	30	71	
4. Pasture land	51,724	78	4,034	51,724	-	1,423	-2,612
1) Forest-2	-	-	-	4,399	25	110	
2) Forest-3	-	-	-	21,404	25	535	
3) Agriculture-1	-	-	-	119	30	4	
4) Agriculture-2	-	-	-	25,802	30	774	
5. Agricultural land	10,355	47	487	10,355	-	301	-185
1) Forest-2	-	-	-	198	25	5	
2) Forest-3	-	-	-	1,649	25	41	
3) Agriculture-1	-	-	-	1,551	30	47	
4) Agriculture-2	-	-	-	6,975	30	209	
Total	158,491	-	9,505	158,491	-	4,215	-5,291

1) The soil loss per ha is based on the data obtained from Plan Sierra and World Bank.

2) The soil loss in table above is at stable stage on land use and vegetation.

Estimation of Production Benefit Before and After

Classes	Before			After			Difference = -
	Area ha	Production Benefit RD\$/ha/y	Production Benefit 1,000RD\$/y	Area ha	Production Benefit RD\$/ha/y	Production Benefit 1,000RD\$/y	Incremental B 1,000RD\$/y
1. Forest land	87,531	-	0	87,531	-	5,630	5,630
1) Forest-1	-	-	-	2,252	2,500	5,630	
2) Forest-2	-	-	-	80,206	-	-	
3) Forest-3	-	-	-	5,073	-	-	
2. Bush land	6,301	-	0	6,301	-	808	808
1) Forest-1	-	-	-	323	2,500	808	
2) Forest-2	-	-	-	5,242	-	-	
3) Forest-3	-	-	-	698	-	-	
3. Intensive grazing land	2,580	2,400	6,192	2,580	-	6,934	742
1) Forest-2	-	-	-	104	-	-	
2) Forest-3	-	-	-	28	-	-	
3) Graging-1	-	-	-	95	2,400	228	
4) Grazing-2	-	-	-	2,353	2,850	6,706	
4. Pasture land	51,724	730	37,759	51,724	-	71,776	34,017
1) Forest-2	-	-	-	21,554	-	-	
2) Forest-3	-	-	-	4,249	-	-	
3) Agriculture-1	-	-	-	119	3,210	382	
4) Agriculture-2	-	-	-	25,802	2,767	71,394	
5. Agriculture land	10,355	2,234	23,133	10,355	-	24,229	1,096
1) Forest-2	-	-	-	1,591	-	-	
2) Forest-3	-	-	-	256	-	-	
3) Agriculture-1	-	-	-	1,551	3,210	4,979	
4) Agriculture-2	-	-	-	6,957	2,767	19,250	
Total	158,491	-	67,084	158,491	-	109,377	42,293

- 1) Benefits of forestry are calculated only about forest-1 (reforestation). Benefit per unit is based on "Promoting Farm Forestry in the Dominican Republic" Rural Development Forestry Network Paper 22d, Winter 1997/1998.
- 2) Benefits of intensive grazing land are feeding potential per ha, milk production per year, unit milk price and income and expenditure per ha.
- 3) Benefits of agriculture land are based on the data used in 8-3-2 farm budget analyses.
- 4) Benefits in table above are at stable stage on land use and vegetation.

Farm Budget Analyses with the Conservation Practices and Avocado

I.Mixed Culture	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Without																						
- Soil loss(tons/ha)		47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	
- Cumulative Soil loss(tons/ha)		47	95	142	189	237	284	332	379	426	474	521	569	616	663	711	758	805	853	900	948	995
1) Production(kg)	ha																					
Grandul	0.5	450	431	412	393	374	356	338	315	297	279	261	214	222	203	184	165	146	127	108	89	70
Habichuela	0.5	225	221	214	209	203	198	194	187	182	178	173	148	144	139	134	130	125	120	116	111	106
Total	1.0																					
2) Gross Income(RD\$)																						
Grandul	0.5	3,600	3,447	3,296	3,144	2,988	2,844	2,700	2,520	2,376	2,232	2,088	1,713	1,776	1,624	1,472	1,320	1,168	1,016	864	712	560
Habichuela	0.5	2,925	2,867	2,779	2,720	2,633	2,574	2,516	2,428	2,369	2,311	2,252	1,928	1,868	1,807	1,746	1,685	1,625	1,564	1,503	1,442	1,382
Total	1.0	6,525	6,314	6,075	5,864	5,621	5,418	5,216	4,948	4,745	4,543	4,340	3,642	3,643	3,431	3,218	3,005	2,792	2,580	2,367	2,154	1,941
3) Production Cost(RD\$)																						
Grandul	0.5	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900
Habichuela	0.5	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650
Total	1.0	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550
4) Net Income(RD\$)																						
Grandul	0.5	2,700	2,547	2,396	2,244	2,088	1,944	1,800	1,620	1,476	1,332	1,188	813	876	724	572	420	268	116	-36	-188	-340
Habichuela	0.5	1,275	1,217	1,129	1,070	983	924	866	778	719	661	602	278	218	157	96	35	-25	-86	-147	-208	-268
Total	1.0	3,975	3,764	3,525	3,314	3,071	2,868	2,666	2,398	2,195	1,993	1,790	1,092	1,093	881	668	455	242	30	-183	-396	-609
With II (Abocado+Conservation)																						
- Soil loss(tons/ha)		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
- Cumulative Soil loss(tons/ha)		7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
1) Production(kg)	ha																					
Grandul	0.4	360	356	353	349	349	348	348	347	346	346	345	345	344	344	343	343	342	341	341	340	340
Habichuela	0.4	180	179	178	177	177	176	175	174	173	173	172	171	170	169	169	168	167	166	165	164	164
Avocado	0.1	0	0	0	496	496	495	494	493	493	492	491	490	490	489	488	487	487	486	485	484	484
Total	0.9																					
2) Gross Income(RD\$)	ha																					
Grandul	0.4	2,880	2,851	2,822	2,795	2,790	2,786	2,781	2,776	2,772	2,767	2,763	2,758	2,754	2,749	2,745	2,740	2,736	2,731	2,727	2,722	2,718
Habichuela	0.4	2,340	2,328	2,317	2,307	2,297	2,286	2,276	2,265	2,255	2,244	2,233	2,223	2,212	2,202	2,191	2,181	2,170	2,160	2,149	2,138	2,128
Avocado	0.1	0	0	0	1,985	1,982	1,979	1,976	1,973	1,970	1,967	1,964	1,961	1,958	1,955	1,952	1,949	1,947	1,944	1,941	1,938	1,935
Total	0.9	5,220	5,180	5,139	7,087	7,069	7,051	7,033	7,015	6,997	6,979	6,961	6,943	6,925	6,907	6,889	6,870	6,852	6,834	6,816	6,798	6,780
3) Production Cost(RD\$)	ha																					
Grandul	0.4	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
Habichuela	0.4	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320
Avocado	0.1	250	100	110	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Total	0.9	2,290	2,140	2,150	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140	3,140
4) Conservation Cost(RD\$)		3,000	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	301	302	303	304
5) Net Income(RD\$)	ha																					
Grandul	0.4	2,160	2,131	2,102	2,075	2,070	2,066	2,061	2,056	2,052	2,047	2,043	2,038	2,034	2,029	2,025	2,020	2,016	2,011	2,007	2,002	1,998
Habichuela	0.4	1,020	1,008	997	987	977	966	956	945	935	924	913	903	892	882	871	861	850	840	829	818	808
Avocado	0.1	-250	-100	-110	885	882	879	876	873	870	867	864	861	858	855	852	849	847	844	841	838	835
Total	0.9	-70	2,740	2,689	3,647	3,629	3,611	3,593	3,575	3,557	3,539	3,521	3,503	3,485	3,467	3,449	3,430	3,412	3,393	3,374	3,355	3,336
Without Net	1	3,975	3,764	3,525	3,314	3,071	2,868	2,666	2,398	2,195	1,993	1,790	1,092	1,093	881	668	455	242	30	-183	-396	-609
With Net	0.9	-70	2,740	2,689	3,647	3,629	3,611	3,593	3,575	3,557	3,539	3,521	3,503	3,485	3,467	3,449	3,430	3,412	3,393	3,374	3,355	3,336
Increment		-4,045	-1,024	-836	333	558	743	927	1,177	1,362	1,546	1,730	2,411	2,391	2,586	2,781	2,975	3,170	3,364	3,557	3,751	3,945
IRR:20	16.9%	Average Net 20			3,249RD\$/year				Average Net 10				3,094RD\$/year									
IRR:15	14.1%	Average Net 15			3,210RD\$/year				Average Net 4				2,527RD\$/year									

4. REFERENCES

Japan International Cooperation Agency (2001). Guideline for Project Evaluation.

FASID (2000). Project Cycle Management, Monitoring and Evaluation Based on the PCM Method.

Rural Development Forestry Network (1993). "The Political and Socio-Economic Factors Causing

Forest Degradation in the Dominican Republic", Network Paper 16d.

Rural Development Forestry Network (1997/98). "Promoting Farm Forestry in the Dominican Republic", Network Paper 22d,

World Bank(1994). Economic and Institutional Analysis of Soil Conservation Projects in the Caribbean.

Departamento de Economía Agropecuaria "Venta de Los Productos Agrícolas".

Departamento de Economía Agropecuaria "Costos Estimados de Producción de Los Principales Cultivos".

Secretaría de Estado de Medio Ambiente y Recursos Naturales (Junio 2001). Reglamento Forestal.Santo Domingo.

Gunter Dobler (Marzo,1999). Manejo y Tablas de Rendimiento de Pinus occidentalis. Plan Sierra,San Jose de las Matas, RD.

.Prodos (Octubre,2000). "Prinsipal Logros" INDRHI, Santo Domingo.

Plan Cordillera (2000). Datos generales del plan cordillera.

Secretaría de Estado de Medio Ambiente y Recursos Naturales (2001). Guía para Plantar un Arbol. Plan Nacional de Reforestación. Santo Domingo.

Union Panamericana (2000). Reconocimiento y Evaluación de los Recursos Naturales de la República Dominicana.

Gregory Nagle. 2000?. Los Efectos de un Huracan sobre la Perdida de suelos de Parcelas Cultivadas en un Cuenca de Montana Tropical. Cornell University. 21p.

Instituto Interamericano de Cooperacion para la Agricultura, Corporacion Dominicana de Electricidad. 1985. Sistemas Integrados de Conservacion de Suelos. 139 p.

Instituto Nacional de Recursos Hidraulicos (INDRHI). 1992. Batimetria Embalse de Sabana Yegua. 23p.

Instituto Nacional de Recursos Hidraulicos (INDRHI). Departamento de Hidrologia. 2001. Caudales Medios Mensuales (M^3/S). 7p.

Instituto Nacional de Recursos Hidraulicos(INDRHI). 1992. La Ordenacion Agrohidrologica de la Cuenca Alimentadora del Embalse de Sabana Yegua. INDRHI. 82 p.

Instituto de Desarrollo Rural (IDR), Proyecto "Los Maribios". 1997. Manejo de Suelos para Producir mas sin Destruir. 28 p.

Secretaria de Estado de Medio Ambiente y Recursos Naturales, Subsecretaria de Estado de Recursos Forestales. 2001. Cuadro de Arboles Afectados en el Area de Influencia del Estudio. 4p.

Secretariado Tecnico de la Presidencia & Naciones Unidas Comision Economica para America Latina y el Caribe-Cepal. 1998. Evaluacion de los Danos Ocasionados por el Huracan Georges, 1998. 110p.

Cuencas Hidrograficas de la Republica Dominicana, (Scale 1/2,000,000).

Instituto Nacional de Recursos Hidraulicos (INDRHI), Proyecto Manejo de Tierras Regadas y Cuencas (PROMATREC) & Asociacion para el Desarrollo de San Jose de Ocoa (ADESJO). Componente Manejo de Cuenca Rio Nizao. 1 p.

Secretaria de Agricultura, Subsecretaria de Recursos Naturales, Departamento de Tierras y Aguas. 1988. Las Parcelas de Erosion en el Naranjal Abajo, San Jose de Ocoa. 1 p.