

## TABLES AND FIGURES



Table 2.2.1 Gross Domestic Production by Economic Sector

Unit: ₺1,000,000

Sector	1981	1982	1983	1984	1985
Agr. Fort. and Fishery	1,824.6	1,738.8	1,808.3	1,940.3	1,909.6
Min. Ind. and Manufacturing	2,109.0	1,867.6	1,902.2	2,122.9	2,169.6
Elect. and Water Supply	242.4	252.6	303.6	313.3	321.1
Construction	471.9	321.4	336.5	412.5	420.7
Commerce, Hotel	1,556.3	1,374.2	1,418.2	1,581.3	1,619.2
Transport, Communication	671.7	666.3	676.3	689.9	702.9
Finance, Insurance	490.4	494.3	522.0	550.7	564.5
Real estates	676.0	682.1	689.0	700.7	714.0
Public Services	984.3	955.8	940.5	945.2	954.7
Others	403.0	388.5	396.3	408.2	414.3
Total	9,429.6	8,742.6	8,992.9	9,664.9	9,790.6
Ratio of Real growth	- 2.3	- 7.3	2.9	7.4	1.3

Note : According to the constant price of 1966.

Source : Statistics of Central Bank, Oct.1986

Table 2.2.2 Gross Domestic Production

	Available National Income IND ₺	Gross National Production PNB ₺	Gross Domestic Production PIB ₺	Population (on June 30th)	I N D PER CAPITA	P N B PER CAPITA	P I B PER CAPITA
				(1,000 person)	₺	₺	₺
1981	48,530.8	50,668.7	57,102.7	2,307.3	21,033.0	21,960.0	24,748.0 (US\$ 1,126)
1982	78,763.1	81,418.7	97,505.1	2,371.5	33,212.0	34,332.0	41,115.0 (US\$ 1,063)
1983	112,303.9	115,640.8	129,314.0	2,435.5	46,111.0	47,481.0	53,095.0 (US\$ 1,298)
1984	140,560.8	144,452.7	158,674.0	2,501.3	56,195.0	57,751.0	63,437.0 (US\$ 1,425)
1985	n.d.	n.d.	184,036.3	2,566.3	n.d.	n.d.	71,723.0 (US\$ 1,420)

Note : Present Value ₺1,000,000

Foreign Exchange rate : 1981 21.97 ₺/US\$

1982 38.68 "

1983 40.90 "

1984 44.53 "

1985 50.50 "

Source : Statistics of Central Bank, Oct.1986

Table 3.1.1 Area According to the Elevation

Zone Elevation	A		B		C		D		合計	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
100~115	0	0.	20	0.1	30	0.2	50	0.2	100	0.2
90~100	0	0.	20	0.1	50	0.3	80	0.3	150	0.2
80~ 90	0	0.	20	0.1	90	0.7	80	0.3	190	0.3
70~ 80	0	0.	40	0.2	140	1.1	80	0.3	260	0.4
60~ 70	0	0.	60	0.3	160	1.3	360	1.5	580	0.9
50~ 60	0	0.	120	0.6	210	1.7	410	1.7	740	1.1
40~ 50	0	0.	140	0.7	340	2.7	550	2.3	1,030	1.5
30~ 40	0	0.	210	1.1	370	2.9	840	3.5	1,420	2.1
20~ 30	0	0.	630	3.2	1,470	11.7	1,980	8.2	4,080	6.1
10~ 20	2,130	19.7	6,220	31.9	4,620	36.7	7,670	31.9	20,640	30.8
6~ 10	1,460	13.6	4,210	21.6	2,390	19.	5,180	21.5	13,240	19.8
2~ 6	5,080	47.	5,140	26.4	1,470	11.7	5,280	21.9	16,970	25.3
0~ 2	2,130	19.7	2,670	13.7	1,260	10.	1,540	6.4	7,600	11.3
計	10,890	100.	19,560	100.	12,600	100.	24,100	100.	67,000	100.

Table 3.1.2 Observating Items of Each Meteorological Station

Station Code	Name of Station	Operation	Altitude (m)	Temp	R.H.	Sun.Dur.	Rainfall	Evap.	Wind	Radiation	Pressure
											Since
71008	Tortuguero Norte	IMN	5	-	-	-	-	-	-	-	1978
73003	Comandancia	IMN	1440	-	-	-	-	-	-	-	1968
010	Turrialba	CATIE	602	0	0	0	1942	0	-	0	-
013	Los Diamantes	IMN	249	0	0	0	1943	0	-	-	-
018	Linda Vista	IMN	1400	0	0	-	1951	0	-	-	-
022	Pacayas	IMN	1735	0	0	-	1951	0	-	-	-
024	Paraiso de Cartago	IMN	1380	-	-	-	1951	-	-	-	-
026	Tapanti	ICE	1203	-	-	-	1939	-	-	-	-
033	Villa Mills	ICE	3000	-	-	-	1942	-	-	-	-
036	T-Seis	ICE	2000	-	-	-	1962	-	-	-	-
037	El Destierro	ICE	2020	-	-	-	1965	-	-	-	-
039	Tres de Junio	ICE	2630	-	-	-	1962	-	-	-	-
040	Barra	ICE	2480	-	-	-	1962	-	-	-	-
042	Meneco	ICE	1410	-	-	-	1962	-	-	-	-
045	Taus	ICE	900	-	-	-	1962	-	-	-	-
047	Tucurrique	ICE	770	-	-	-	1963	-	-	-	-
074	San Antonio	ICE	1190	-	-	-	1966	-	-	-	-
078	Coliblanco	UCR	2200	0	0	0	1970-83	-	-	-	-
081	Volcan Irazú	IMN	3400	0	-	-	1964	-	-	-	-
090	Las Mercedes	IMN	95	-	-	-	1971	-	-	-	-
091	Hacienda EL Carmen	IMN	15	0	0	0	1972	0	-	-	-
092	Coop.Tierra Blanca	IMN	2100	-	-	-	1972-85	-	-	-	-
75003	Platanillo	ICE	889	-	-	-	1954	-	-	-	-
004	Pacuare	ICE	800	-	-	-	1962	-	-	-	-
005	Pacuar	ICE	710	-	-	-	1964	-	-	-	-
008	Cuencas	ICE	1835	-	-	-	1966	-	-	-	-
77002	La Lola	CATIE	40	0	0	0	1949	0	-	0	-
79005	Moravia,Chirripo	ICE	1200	0	0	0	1955	0	0	-	-
007	Boston	Private	16	-	-	-	1978	-	-	-	-
81003	Limon	IMN	5	0	0	0	1941	0	0	0	0
Total (pls)				10	9	7	30	8	2	3	1

Table 3.1.3 Description of Existing Stream Gauging Station

Name of River	Code of Station	Name of Station	D.A. (km <sup>2</sup> )	EI (m)	Commencement of Observation	Maximum Flood in M <sup>3</sup> /s (Date)
Blanco	810503	Blanco	50.0	15.0	1976	(26-07-82) 322.0
Barbilla	790602	Barbilla	212.0	30.0	-do-	(26-07-82) 1870.0
Chirripo	603	Playa Hermosa	820.6	150.0	1981	(24-07-82) 1440.0
Pacuare	750801	Pacuare	367.4	581.9	1958	(09-04-70) 1070.0
-do-	802	Siquirres	-	-	-	(09-04-70) 2920.0
-do-	803	Dos Montanas	651.8	69.5	1970	(09-04-70) 1900.0
Reventazon	730903	Angostura	1337.1	532.1	1953	(09-04-70) 3800.0
Pejiballe	904	El Humo	136.5	692.3	1955	(09-04-70) 575.0
Macho	905	Monte cristo	64.5	1658.0	1955	(09-04-70) 226.0
Reventazon	906	Cachi	-	-	-	(09-04-70) 1300.0
-do-	907	Cordoncilla	253.4	1249.5	1958	(09-04-70) 598.0
Macho	908	Belen	47.4	1955.5	1960	(04-12-70) 161.0
Pejiballe	909	Oriente	226.9	618.0	1962	(09-04-70) 1370.0
Reventazon	910	El Congo	877.0	727.6	1962	(22-09-68) 1610.0
-do-	911	Tapanti	-	-	-	(04-11-62) 309.0
-do-	912	Pascua	1673.2	247.2	1963	(09-04-70) 4260.0
-do-	913	Telemedida	-	-	-	-
Colorado	914	La Bomba	-	-	-	(07-10-73) 184.0
Navarro	916	Puente Negro	-	-	-	-
Pejiballe	917	Los Pavos	-	-	-	-
Reventazon	919	Palomo	371.1	1076.6	1971	(03-05-79) 509.0
Cuerici	920	Cuerici	-	-	-	(07-10-74) 126.0
Reventazon	921	Presa Tapanti	-	-	-	-
-do-	922	Tapanti Arriba	187.4	1650.0	1975	(02-06-78) 198.0
Navarro	923	Navarro	-	-	-	(24-08-79) 137.0
-do-	924	La Troya	274.6	1028.0	1980	(17-09-84) 218.0
Juco	925	Juco	-	-	-	-
Turrialba	926	Turrialba	76.7	575.0	1981	(01-09-83) 598.0
Reventazon	927	S.Presa Guayabo	1513.4	395.0	1983	(03-12-84) 1141.0

Note : 1) Halt of the operation

Table 3.1.4 Monthly Mean Climatological Data

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total/Mean	Period
<u>Precipitation *</u> (mm)	301	235	139	238	255	313	418	330	221	229	384	461	3,524	1970-85
<u>Temperature **</u>														
Max (°C)	29.7	30.0	30.5	30.8	31.1	30.7	29.9	30.4	30.8	30.8	29.9	29.7	30.4	1961-85
Min (°C)	19.6	20.4	20.9	21.5	22.1	22.3	22.0	21.9	22.1	21.8	21.4	20.7	21.4	- do -
Mean (°C)	24.3	24.6	25.3	25.7	26.1	26.0	25.4	25.6	25.9	24.7	25.1	24.7	25.3	- do -
<u>Relative Humidity *</u> (%)	85	84	82	82	82	86	87	86	83	84	87	87	84	1973-81
<u>Wind Velocity **</u> (km/hr)	6.6	6.5	7.0	7.2	6.3	5.7	6.1	5.9	6.1	5.9	6.5	6.7	6.5	1971-84
<u>Wind Direction **</u>							West or Southwest							1970-84
<u>Pan Evaporation (A) **</u> (mm/month)	93	112	129	132	127	102	93	127	117	115	93	89	1,329	1970-76
<u>Sunshine Duration *</u> (hr/month)	144	142	164	143	156	119	95	121	133	143	114	117	133	1972-82
<u>Pressure **</u> (mb)	1,013	1,013	1,012	1,012	1,011	1,011	1,011	1,011	1,010	1,010	1,011	1,012	1,011	1970-85

(Note) \* : La Lola meteorological Station  
 \*\* : Limon Synoptic meteorological Station

Table 3.1.5 Monthly Rainfall at La Lola Meteorological Station

単位 : (mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1970	629	779	219	679	328	221	131	130	244	190	617	1,446	5,612
71	315	90	205	257	111	436	523	110	104	175	172	209	2,703
72	816	332	85	451	188	285	576	495	428	280	141	510	4,585
73	265	160	25	131	332	228	-	88	108	132	479	679	(2,627)
74	-	193	138	357	119	219	398	424	52	252	373	336	(2,861)
75	273	79	113	158	198	354	244	480	195	260	678	630	3,662
76	370	168	89	158	454	209	1,106	455	568	149	500	396	4,620
77	203	59	274	97	219	525	925	372	395	284	346	174	3,871
78	108	531	175	55	225	192	320	342	182	174	385	285	2,975
79	131	99	79	597	230	542	153	451	166	170	329	390	3,337
80	210	216	45	149	163	459	187	271	192	228	282	913	3,314
81	225	328	191	386	218	246	264	290	196	180	926	342	3,792
82	88	122	144	103	173	222	771	609	198	396	303	246	3,375
83	266	98	306	64	515	133	357	341	88	314	108	205	2,795
84	524	263	61	66	358	258	86	476	262	270	297	393	3,313
85	80	248	72	105	-	492	231	322	161	205	211	224	(2,350)
Ave	301	235	139	238	255	313	418	330	221	229	384	461	3,524
%	8	7	4	7	7	9	12	9	6	6	11	13	100

Table 3.1.8 Description of Related Watershed

Description	Watershed			
	Rio Reventazon	Rio Pacuare	Rio Madre de Dios y Otros	Rio Matina Rio Blanco
Watershed Area	2,796	855	189	1,365
Length of Main River	145	108	37	92
Mean Width				
B=A/Lo (km)	19	8	5	15
Max. Elevation EL (m)	3,432	3,125	600	3,820
Mean Slope S (%)	2.1	2.4	1.6	3.8
River Length from National Road	40	39	22	20
Estuary				3



Table 3.1.10 Annual Maximum Peak Flood Discharge

D.A. (km <sup>2</sup> )	Reventazon 1,613	Pacuare 652	Barbilla <sup>1)</sup> 212	Chirripo <sup>2)</sup> 821	Blanco <sup>3)</sup> 50
Water Year					
1963	1,436(12) <sup>3)</sup>	724(12)			
64	839( 9)	457( 1)			
65	3,174( 3)	1,289( 2)			
66	1,351(12)	769(12)			
67	1,964( 8)	799( 8)			
68	2,113( 7)	804( 7)			
69	4,200( 4)	2,920( 4)			
1970	-	1,080(11)			
71	1,800( 7)	620( 7)			
72	2,110(12)	441(12)			
73	-	514(12)			
74	3,530(12)	654(11)			
75	2,650(12)	736(12)			
76	1,210( 8)	805( 8)			
77	845( 2)	209( 6)	522( 7)		175( 7)
78	569(11)	295(11)	349( 6)		155( 8)
79	602( 5)	466( 9)	526( 9)		141( 9)
1980	948(12)	830(12)	542(12)		205(12)
81	1,440( 8)	270(12)	774( 8)		245( 9)
82	716( 7)	588( 3)	1,870( 7)	1,440( 7)	322( 7)
83	729(10)	284( 6)	356( 6)	-	137( 1)
84	1,480(12)	394(12)	281( 8)	236(12)	92(11)

(Notes)

- 1) Tributaries of Rio Matina
- 2) May - April
- 3) Floods occurred month

Table 3.1.16 Sampling Location of Well Water

No.	Location	Depth of well (m)	Assortment of Utilization
1	Larga Distancia	2.7	Private
2	2 km south of Freeman Dos	4.0	-do-
3	Freeman Dos	30.0	Banana Farm
4	Bataan	deep well	Common
5	San Alberto	50.0 - 60.0	Banana Farm
6	Maryland	6.0	Private
7	Indiana Tres	5.0	-do-
8	Sara	--	-do-
9	Santa Marta	39.0	Common
10	Hilda	3.0	Private

Table 3.1.17 Water Quality of Well Water

Substance	Unit	WHO Standard	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10
Temperature	°C		26	26.5	26.5	27	25.5	27	26.5	27	27.5	27.5
pH		7.0-8.5 (6.5-9.2)	6.85	6.76	7.58	7.84	7.52	7.14	7.33	6.96	7.78	6.53
Colour	Pt	15 TCU*	18	32	28	2	0	2	2	2	2	45
Turbidity	ppm	5 NTU*	4	19.5	20	2	0	2	0	7.5	10	5
Total Dissolved Solids	mg/l	1000*	242	154	252	239	223	289	283	202	361	267
Conductivity	µS/cm		420	225	460	400	310	540	510	460	630	440
BOD	mg/l		0.5	0.7	1.8	0.9	0.7	2.0	2.0	1.6	0.7	2.9
Dissolved Oxygen	mg/l		1.44	1.78	3.56	4.26	4.13	3.52	2.88	4.33	5.10	1.69
Coliform Group	groups	nil	15000	>24000	20	1	Neg.	>24000	2000	>24000	6700	>24000
Flouride (F)	mg/l	1.0* (1.5)	0.31	0.31	0.33	0.20	0.33	0.40	0.30	0.32	0.22	0.26
Iron (Fe)	mg/l	0.3* (1.0)	0.09	0.08	1.35	0.07	0.58	0.06	0.10	0.07	0.07	0.11
Manganese (Mn)	mg/l	0.1* (0.5)	0.01	0.01	0.70	0.01	0.13	0.01	0.02	0.005	0.01	1.30

\* : For Guide line  
( ) : Max. allowable values

Table 3.1.18 Distribution of the Soil Sub-Groups

Order	Sub-order	Great Group	Sub-group	Symbol	Area	
					ha	%
Entisol	Aquent	Tropaquent	Typic Tropaquent	E-1	13,040	19.5
			Typic Troporthent	E-4	6,200	9.3
Inceptisol	Aquept	Tropaquept	Typic Tropaquept	I-2	27,260	40.7
			Aeric Tropaquept	I-16	18,930	28.5
Ultisol	Humult	Palehumult	Oxic Palehumult	U-1	970	1.4
Histsol	Saprist	Tropasaprist	Humic & Fluvaquen Tropasaprist	H-1	600	0.9
Total					67,000	100.0

Table 3.1.19 Rate of Liquid and Air in Soils under the Field Capacity

Soil Group	Liquid (%)	Air (%)	Moisture Ratio (%)	Apparent Density
I-16	55.9	5.8	54.1	1.09
I-2	60.6	4.7	66.7	0.94
Volcanic Ash	66.4	4.9	90.2	0.75

Table 3.1.20 Land Classification

Land Use		Soil		Area	
Class	Sub-Class	Subgroup	Pit No.	ha	%
II	II h <sub>3</sub>	I - 16	5	23,030	34.4
	II h <sub>3</sub>		11		
	II h <sub>3</sub>		23		
	II S <sub>2</sub> S <sub>3</sub> h <sub>1</sub> h <sub>3</sub>		4		
	II S <sub>2</sub> h <sub>1</sub> h <sub>3</sub>	E - 4	6		
	II S <sub>2</sub> h <sub>1</sub> h <sub>3</sub>		9		
	II S <sub>3</sub> h <sub>1</sub> h <sub>3</sub>		24		
	II h <sub>1</sub> h <sub>3</sub>		22		
II S <sub>2</sub>		20			
III	III h <sub>3</sub>	I - 6	12	14,940	22.3
	III h <sub>3</sub>		26		
	III h <sub>1</sub> h <sub>2</sub>		25		
	III h <sub>1</sub> h <sub>3</sub>	E - 1	15		
	III h <sub>1</sub> h <sub>2</sub> h <sub>3</sub>		8		
	III h <sub>1</sub> h <sub>2</sub> h <sub>3</sub>	I - 2	27		
	III h <sub>2</sub> h <sub>3</sub>		19		
	III h <sub>2</sub>		7		
III h <sub>2</sub>		18			
IV	IV h <sub>1</sub> h <sub>3</sub>	I - 2	10	12,650	18.9
	IV h <sub>1</sub>		2		
	IV h <sub>1</sub>		3		
	IV h <sub>1</sub>		17		
	IV h <sub>2</sub>		16		
	IV h <sub>1</sub> h <sub>2</sub>		1		
IV h <sub>1</sub> h <sub>2</sub>		14			
VI	VI S <sub>9</sub>	U - 1	21	2,330	3.5
VII	VII h <sub>1</sub> h <sub>2</sub> h <sub>3</sub>	H - I	--	4,230	6.3
VIII	—	E - 1	--	9,820	14.6
Total				67,000	100.0

Table 3.1.21 Specifications of the Land Classification

Characteristics of Soil or land	class/ Symbol	I	II	III	IV	V	VI	VII	VIII
Drainage	h <sub>1</sub>	Well		moderately well or excess	Imperfectly	Poorly		Very poorly Extremely poorly	Excess
Groundwater level	h <sub>2</sub> (cm)	Very deep (>150) deep (100 - 150)	Moderately deep (75 - 150)	Slightly deep (50 - 75)	shallow (20 - 50)	Very shallow (5 - 20)		Surface (<5)	
Inundation	h <sub>3</sub>	no danger	slightly	moderately	severely	Extremely			
Effective depth of soil	S <sub>1</sub> (cm)	Very deep (>150) deep (100 - 150)	moderately deep (75 - 100)	Slightly deep (50 - 75)	shallow (20 - 50)	Very shallow			
Upper soil texture (0 - 30 cm)	S <sub>2</sub>	SL - L - SiL SCL-CL-SiCL	LS --- S HC - LIC - SC	gravelly SSiL - SL		Very fine (HC: >60% clay)		Sandy gravel or Gravelly fine	
Sub-soil texture	S <sub>3</sub>	SL - L - SiL SCL-CL-SiCL HC - LIC - SC	LS --- S		gravelly	HC (>60% clay)		Very gravelly	
Gravel on land surface	S <sub>4</sub> (%)	none (<5)	few (5 - 15)	moderately abundant (15 - 40)	abundant (40 - 60)	Very abundant (60 - 80)		Extremely abundant (>80)	
Stones on land surface	S <sub>7</sub> (%)	none	few (< 1)	moderately few (1 - 3)	many (3 - 15)	abundant (15 - 60)		Stony Severely stony (>80)	
Gravel in soil profile	S <sub>8</sub> (%)	almost none (< 5)	few (5 - 10)	moderately abundant (10 - 15)	abundant (15 - 40)	Very abundant (40 - 60)		Extremely abundant (>80)	
Stones in soil profile	S <sub>9</sub> (%)	almost none (< 0.1)	few (0.1 - 1)	medium (1 - 3)	rich (3 - 15)	Very rich (15 - 50)		Severe Excess (50-80) (>80)	

Table 3.2.4 Population of Economic Activities in Cantons and Districts  
belong the Study Area

Unit : person

Administrative Territory	Employable Population	Unemployed population			Total
		Temporarily unempld	Permanently unempld	Sub -total	
Province of Limon	48,417	945	3,748	4,693	53,100
Canton Siquirres	8,560	170	654	824	9,384
District Siquirres	5,002	117	376	493	5,495
District Pacuarito	1,365	27	119	146	1,511
Canton Matina	4,146	56	401	457	4,603
District Matina	1,086	4	114	118	1,204
District Bataan	1,920	11	170	181	2,101
District Carrandi	1,140	41	117	158	1,298

Source : 1984 Census

Table 3.2.5 Population of Economic Activities by Industries  
in Cantons and District belong the Study Area Unit : person

	Total	Agri.Fores -L.Fish.	Mining	Manu -fact.	Elect. Gas	Constr.	Comerce	Transp. Comun.	Finance, Insurance	Public services	Liberal Profession
Province of Limon	52,165	28,619	17	2,356	295	1,509	3,760	3,429	338	6,125	5,717
Canton Siquirres	9,214	6,049	5	218	63	256	574	456	25	803	765
District Siquirres	5,378	2,946	4	186	60	161	544	74	62	971	518
District Pacuarito	1,484	1,238	--	13	--	35	34	14	3	67	80
Canton Matina	4,547	3,372	--	112	7	138	252	49	13	330	274
District Matina	1,200	906	--	32	--	27	45	4	1	80	105
District Bataan	2,090	1,469	--	50	5	95	160	32	11	184	84
District Carrandi	1,257	997	--	30	2	16	47	13	1	66	85

Note : Including temporarily unemployed.

Source : 1984 Census

Table 3.4.6 Yield of Major Crops to Compare with the Atlantic Region and Country

Unit : t/ha

C r o p s	R e g i o n		
	Study Area	Atlantic	Nation
1. Perennial			
Banana	45.0	43.5	43.4
Cacao	0.35	0.30	0.3
Coconut	2.2	3.65	3.65
Plantain	5.5	10.0	10.5
2. Annual			
Rice	3.0	3.5	3.3
Maize	1.2	1.7	1.7
Kidney Bean	0.5	0.7	1.0
Tuber	6.0	6.8	6.5
3. Cattle (t/head)	0.25	—	0.38

Source : (1) ASBANA, Revista de la ASBANA 1987  
 (2) C.N.P AGROTECNICO 1986  
 (3) Comportamiento de las principales Actividades Productivas del Sector Agropecuario, SEPSA, 1987.

Table 3.4.7 Major Crops in the Study Area to Account for National Production

Unit : t

C r o p s	Nation	Study Area	%
1. Perennial			
Banana	882,300	192,000	22.0
Cacao	3,847	1,176	31.0
Coconut	8,358	814	10.0
Plantain	97,472	1,914	2.0
2. Annual			
Rice	229,200	30,660	13.0
Maize	120,260	2,042	1.7
Kidney Bean	33,383	66	0.2

Source : (1) ASBANA, Revista de la ASBANA 1987  
 (2) C.N.P AGROTECNICO 1986  
 (3) Comportamiento de las principales Actividades Productivas del Sector Agropecuario, SEPSA, 1987.

Table 3.4.8 Producer's Price and Production values of Crops per ha.

Crops	Yield (t/ha)	Producer's Price (¢/t)	Gross Income (¢/ha)	Production Cost (¢/ha)	Net Income (¢/ha)
1. Perennial					
Banana	45.0	13,200	594,000	528,000	66,000
Cacao	0.35	95,000	33,250	20,771	12,479
Coconut	2.2	8,600	18,920	15,400	3,520
Plantain	5.5	8,500	46,750	35,500	11,250
2. Annual					
rice	3.0(2.7)	14,200	38,340	31,094	7,246
maize	1.2	13,669	16,402	13,229	3,173
kidneyBean	0.5	35,788	17,894	16,113	1,781
Tuber	6.0	14,000	84,000	76,810	7,190
3. Cattle	0.25 (t/head)	50,000	12,500	2,500	10,000

Producer's Price of the rice including the 10% of the Impuestos.  
(OFICINA DE ARROZ,1987)

Table 3.4.9 Total Agricultural Production Values in the Study Area

Unit : ¢1,000

Crops Zone	Perennial				Sub- Total	Annual				Sub- Total	Cattle	Total	%
	Banana	Cacao	Coco- nut	Plan- tain		Rice	Maize	Kidney Bean	Tuber				
A	268,634	14,963	567	1,215	277,379	121,154	2,674	357	5,628	129,813	3,925	411,147	12.7
B	516,689	46,218	2,459	5,984	571,349	221,685	5,724	769	19,992	248,890	7,875	826,514	25.6
C	682,176	21,945	1,782	4,828	789,843	15,336	6,069	376	27,636	49,417	5,813	764,273	23.7
D	1,873,424	28,595	2,278	5,849	1,897,338	33,739	13,458	859	61,488	109,536	8,325	1,227,199	38.8
Total	2,532,322	111,721	7,888	16,269	2,667,989	391,834	27,917	2,361	114,744	536,856	24,338	3,229,183	100.0
%	78.4	3.5	0.2	0.5	82.6	12.1	0.9	0.1	3.6	16.6	0.8	100.0	



Table 3.6.1 Existing Road Conditions

Classification Zone	I (km)	II (km)	III (km)	IV (km)	Total (km)	Road density (km/1,000ha)
A	10.0	0.0	13.7	12.7	36.4	3.4
B	15.5	9.2	40.5	30.8	96.0	4.9
C	10.1	8.7	1.8	18.1	38.7	2.8
D	5.1	20.5	31.5	45.0	102.1	4.5
Total (%)	40.7 (15)	38.4 (14)	87.5 (32)	106.0 (39)	273.2 (100)	4.1

Note : Classification

I : National Route No.32

II : Road with over 6.0m of effective width

III : Road with 4.0m to 6.0m width

IV : Road with under 4.0m width

Table 3.7.2 Present Settlement Area

Name of Settlement	Area (ha)	Number of Settler's family (house)	Average Area of holding (ha)	Remarks
Castro Land	1,209	77	15.7	Completed
Coopeocho	347	23	15.1	"
Maravilla	313	30	10.4	"
Maria y Clemencia	747	182	4.1	"
Roma y Palacios	196	28	7.0	"
Von storren	300	40	7.5	"
Bataan	10,596	823	12.9	"
Luisa West	1,686	135	12.5	"
La Lola	49	7	7.0	"
Barbilla Norte	330	35	9.4	"
Amusteldum	220	43	5.1	"
Oro Cabeza	472	42	11.2	"
Fuscaldo	217	9	24.1	"
Westonia	598	184	3.2	"
Doray I	335	30	11.1	"
Corp. Turistica Carib	560	37	15.1	"
Sub Total	18,175	1,698	10.7	"
Maryland	2,594	224	11.5	Settling stage
Imperio	2,000	200	10.0	Planning stage
Finca Germania	2,400	240	10.0	"
Sub Total	4,400	440	10.0	
Total	25,169	2,362	10.6	
Nation	195,181	14,348	13.6	

Table 3.3.1 Present Drainage System Area

Drainage system	Drainage area (ha)			Remarks
	Inside	Outside	Total	
1) Rio Toro	1,530	7,250	8,780	
2) Direct to Canal	110	-	110	
3) Rio Paracios	3,620	680	4,300	
4) Direct to Canal	1,600	-	1,600	
5) Canal San Edmundo	2,410	-	2,410	
6) Oda. San Jose	1,530	400	1,930	
7) Direct to Canal	1,800	-	1,800	Flow into Rio Matina
8) Canal Principal	7,100	-	7,100	
9) Rio Matina	700	135,800	136,500	
10) Direct to Canal	2,000	-	2,000	
11) Direct to Canal	1,300	-	1,300	
12) Rio Madre de Dios	14,120	3,500	17,620	
13) Rio Cimarrones Viejo	2,950	-	2,950	Flow into Rio Pacuare
14) Rio Cimarrones	1,300	2,300	3,600	-ditto-
15) Rio Pacuare	1,610	71,250	72,450	
16) Direct to Canal	850	-	1,610	
17) Direct to Canal	6,140	-	850	
18) Rio Chiquero	8,800	-	6,140	
19) Rio Aguaz Zarcas	1,740	-	8,800	
20) Oda. Corona	4,590	-	1,740	Flow into Rio Reventazon
21) Brazo del Rio Reventazon		1,910	6,500	Flow into Rio Pacuare

Table 4.2.1 Drainage Condition and Improvement Area

Unit : ha

Classification		Perma- nent swamp I	Poor Drainage Area				Good Drainage Area				Total
Zone			II	III	IV	Sub- Total	V	VI	VII	Sub- Total	
A	Total Area	1,370	5,300	2,250	300	7,930	0	0	1,100	1,100	10,400
	Area Excepting Development	1,370	910	0	0	910	0	0	0	0	2,200
	Developing Area	0	4,390	2,250	300	7,020	0	0	1,100	1,100	8,120
B	Total Area	1,650	7,620	2,400	3,170	13,190	500	1,710	1,870	4,160	19,000
	Area Excepting Development	1,650	1,710	0	0	1,710	450	740	0	1,190	4,550
	Developing Area	0	5,910	2,400	3,170	11,480	130	970	1,870	2,970	14,450
C	Total Area	0	2,960	3,830	0	6,790	630	2,670	1,810	5,110	11,900
	Area Excepting Development	0	1,390	300	0	1,690	530	310	0	840	2,530
	Developing Area	0	1,570	3,530	0	5,100	100	2,360	1,810	4,270	9,370
D	Total Area	2,850	7,150	4,860	0	12,010	1,050	4,430	2,860	8,340	23,200
	Area Excepting Development	2,850	410	0	0	410	0	0	0	0	3,260
	Developing Area	0	6,740	4,860	0	11,600	1,050	4,430	2,860	8,340	19,940
Total	Total Area	5,870	23,030	13,340	3,550	39,020	2,260	8,310	7,640	18,710	64,500
	Area Excepting Development	5,870	4,420	300	0	4,720	980	1,050	0	2,030	12,620
	Developing Area	0	18,610	13,040	3,550	35,200	1,280	7,260	7,640	16,680	51,880

Table 4.2.2 Location and Length of Proposed Principal Drainage

Zone	Principal Drainage Canal							Lateral Drainage Canal				
	Cross section and gradient (m)	Drainage area (km <sup>2</sup> )	Design discharge (m <sup>3</sup> /s)	Length				Cross section and gradient (m)	Drainage area (km <sup>2</sup> )	Design discharge (m <sup>3</sup> /s)	Length (km)	Increased Cropped Area (ha)
				Newly construction (km)	Improv-ement (km)	Exist-ing (km)	Sub-total (km)					
A	H = 3.0~4.0 B <sub>0</sub> = 1.5~16.0 B <sub>1</sub> = 10.5~28.0 I = 1/500 ~ 1/2,000	5.0 ~ 61.0	18.0 ~ 125.0	29.7	8.0	0.0	37.7	H = 2.0 B <sub>0</sub> = 1.5 B <sub>1</sub> = 5.5 I = 1/2,000	1.0	3.6	42.0	4,684
B	H = 3.0~4.0 B <sub>0</sub> = 1.5~10.0 B <sub>1</sub> = 10.5~21.0 I = 1/500 ~ 1/2,000	0.9 ~ 46.0	2.0 ~ 94.0	32.5	19.4	6.8	58.7				72.5	7,412
C	H = 3.0~5.0 B <sub>0</sub> = 1.5~50.0 B <sub>1</sub> = 10.5~65.0 I = 1/500 ~ 1/2,000	1.8 ~ 156.4	6.0 ~ 559.0	14.3	16.5	7.9	38.7				30.1	5,884
D	H = 3.0~4.0 B <sub>0</sub> = 1.5~12.0 B <sub>1</sub> = 10.5~22.0 I = 1/500 ~ 1/1,000	4.5 ~ 61.5	5.0 ~ 109.0	47.6	0.0	7.5	55.1				74.1	13,952
Total				124.1	43.9	22.2	190.2				218.7	31,852

Note) H : Depth  
B<sub>0</sub> : Base Width  
B<sub>1</sub> : Crest Width  
I : Gradient

Table 4.3.1 Facilities for the Flood Protection

River	Basin A (km <sup>2</sup> )	Design flood discharge Q <sub>0</sub> (m <sup>3</sup> /s)	Design flow capacity Q <sub>1</sub> (m <sup>3</sup> /s)	Average flow velocity V (m/s)	Gradient of river bed I	Height of embankment H (m)	Flood river width B (m)	Length of design embankment		
								Left bank (km)	Right bank (km)	Total (km)
Rio Chirripo	1,106	1,870	1,879	1.76	1/1,000	3.0	150	-	1.3	1.3
Rio Barbilla	259	714	714	1.66	1/1,000	2.5	45	8.8	-	8.8
Rio Matina	1,365	2,151	2,192	1.52	1/2,000	4.0	150	13.3	9.0	22.3
Rio Pacuare	855	1,577	1,619	1.41	1/2,000	3.5	150	27.7	25.7	53.4
Rio Reventazon	1,001	2,585	2,619	1.63	1/2,000	4.5	150	17.2	15.2	32.4
Total								67.0	51.2	118.2

Note : Rio Reventazon is included the Rio Parismina of its down stream.

Table 4.4.1 Land Use Plan

Present		Land Use Plan					Out of the development area	Total
Land use	Area	Annual crop land	Perennial crop land	Pasture	Others	Sub-total		
Annual crop	13,220	13,220				13,220		13,220
Perennial crop	14,680		14,680			14,680		14,680
Pasture	14,580	990	4,800	8,790		14,580		14,580
Forest	20,820		9,400			9,400	11,420	20,820
Other	3,700						3,700	3,700
<b>Total</b>	<b>67,000</b>	<b>14,210</b>	<b>2,8800</b>	<b>8,790</b>		<b>51,890</b>	<b>15,120</b>	<b>67,000</b>

Note) Land use area 51,890 ha includes banana plantation area 7,640 ha.

Table 4.4.5 Agricultural Production with Project

Unit: t

Crops Zone	P e r e n n i a l					A n n u a l				Cattle
	Banana	Cacao	Coconut	Plantain	Black pepper	Rice	Maize	Kidney Bean	Tuber	
A	54,143	2,007	1,350	2,295	0	12,798	427	135	2,178	105
B	101,765	2,592	4,500	7,650	356	23,409	1,206	444	7,078	188
C	95,780	1,503	2,700	4,590	792	3,483	1,080	250	4,108	133
D	116,600	2,880	7,650	13,005	2,138	9,558	3,318	1,390	24,304	221
<b>Total</b>	<b>368,288</b>	<b>8,982</b>	<b>16,200</b>	<b>27,540</b>	<b>3,286</b>	<b>49,248</b>	<b>6,031</b>	<b>2,219</b>	<b>37,670</b>	<b>647</b>

Table 4.4.7 Proposed Production Costs, Producer's Price and Production Values per ha.

Crops	Yield (t/ha)	Producer's Price (¢/t)	Gross Income (¢/ha)	Production Cost (¢/ha)	Net Income (¢/ha)
1. Perennial					
Banana	49	13,200	646,800	567,000	79,800
Cacao	1.0	95,000	95,000	40,556	54,444
BlackPeper	2.2	220,000	484,000	130,998	353,002
Coconut	10	8,600	86,000	58,997	27,003
Plantain	17	8,500	144,500	90,106	54,394
2. Annual					
Rice <sup>1)</sup>	4.5(4.1)	14,200	58,220	39,750	18,470
Maize	2.5	13,669	34,172	22,154	12,018
KidneyBean	1.5	35,788	53,682	35,357	18,325
Tuber	11	14,000	154,000	92,465	61,535
3. Cattle	0.35 (t/head)	50,000	17,500	5,400	12,100

1) Producer's Price including the 10% of the Impuestos.  
(OFICINA DE ARROZ)

Table 4.4.8 Total Agricultural Production Values with Project

Unit: #1,000

Crops Zone	P e r e n n i a l					Sub- Total	A n n u a l				Sub- Total	Cattle	Total	%
	Banana	Cacao	Coconut	Plantain	Black Pepper		Rice	Maize	Kidney Bean	Tuber				
A	714,688	198,665	11,610	19,507	0	936,470	181,731	5,836	4,831	38,492	222,890	5,200	1,164,560	14.1
B	1,343,298	246,240	38,700	65,025	78,320	1,771,583	332,407	16,484	15,889	99,106	463,886	9,400	2,244,369	27.4
C	1,264,296	142,785	23,220	39,015	174,240	1,643,556	49,458	14,762	8,947	57,526	130,693	6,650	1,786,899	21.6
D	1,539,120	273,600	65,790	110,542	470,360	2,459,412	135,723	45,353	49,745	340,270	571,091	11,350	3,041,553	36.9
Total	4,861,402	853,290	139,320	234,090	722,920	6,811,022	699,321	82,435	79,412	527,394	1,388,562	32,300	8,231,884	100.0
%	59.1	10.4	1.7	2.8	8.8	82.7	8.5	1.0	1.0	6.4	16.9	0.4	100.0	

Table 5.6.1 Estimation of Project Cost

Unit : US\$1,000

Zone, Area Item	A (7,020 ha)			B (12,580 ha)			C (7,560 ha)			D (17,080 ha)			Total (44,240 ha)		
	Total	Currency		Total	Currency		Total	Currency		Total	Currency		Total	Currency	
		F/C	L/C		F/C	L/C		F/C	L/C		F/C	L/C		F/C	L/C
Drainage improvement	8,662	5,987	2,675	13,654	9,429	4,225	7,177	4,959	2,218	11,615	8,043	3,572	41,108	28,418	12,690
Protection of Flood	1,566	962	604	2,724	1,713	1,011	3,573	2,055	1,518	9,837	6,003	3,834	17,700	10,733	6,967
Road improvement	1,566	1,044	522	3,181	2,137	1,044	2,953	2,023	930	5,073	3,442	1,631	12,773	8,646	4,127
Settlement consolidation (public facilities)	65	--	65	--	--	--	33	--	33	147	--	147	245	--	245
Detail Design & Supervision	1,052	1,052	--	1,872	1,872	--	1,214	1,214	--	2,584	2,584	--	6,722	6,722	--
Total	12,911	9,045	3,866	21,431	15,151	5,280	14,950	10,251	4,699	29,256	20,072	9,184	78,548	54,519	24,029
US\$/ha	1,839			1,704			1,978			1,713			1,775		
Price contingency	1,769	1,239	530	2,936	2,076	860	2,048	1,404	644	4,008	2,750	1,258	10,761	7,469	3,292
Total	14,680	10,284	4,396	24,367	17,227	7,140	16,998	11,655	5,343	33,264	22,822	10,442	89,309	61,988	27,321
US\$/ha	2,091			1,937			2,248			1,948			2,019		



Table 6.1.1 Repayment Schedule of Foreign Loan Unit: US\$1,000

Year	Year in order	Foreign Loan	Accumulated Foreign Loan	Interest Payment	Capital Payment	Total Payment
1988	1	443	443	18		18
1989	2	443	886	35		35
1990	3	5,578	6,464	259		259
1991	4	11,270	17,734	709		709
1992	5	6,643	24,377	975	961	1,936
1993	6	12,045	35,461	1,418	961	2,379
1994	7	3,818	38,318	1,533	961	2,494
1995	8	5,657	43,014	1,721	2,160	3,881
1996	9	1,927	42,781	1,711	2,160	3,871
1997	10	3,228	43,849	1,754	2,160	3,914
1998	11	3,802	45,491	1,820	2,512	4,332
1999	12	4,001	46,980	1,879	2,512	4,391
2000	13	3,133	47,601	1,904	2,512	4,416
2001	14		45,089	1,804	2,955	4,759
2002	15		42,134	1,685	2,955	4,640
2003	16		39,179	1,567	2,955	4,522
2004	17		36,224	1,449	2,955	4,404
2005	18		33,269	1,331	2,955	4,286
2006	19		30,314	1,213	2,955	4,168
2007	20		27,359	1,094	2,955	4,409
2008	21		24,404	976	2,955	3,931
2009	22		21,449	858	2,955	3,813
2010	23		18,494	740	2,955	3,695
2011	24		15,539	622	2,955	3,577
2012	25		12,584	503	2,936	3,439
2013	26		9,648	386	1,994	2,380
2014	27		7,654	306	1,994	2,300
2015	28		5,660	226	1,974	2,200
2016	29		3,686	147	795	942
2017	30		2,891	116	795	911
2018	31		2,096	84	784	868
2019	32		1,312	52	443	495
2020	33		869	35	443	478
2021	34		426	17	426	443
2021	35		0	0	0	0

Table 6.1.2 Estimation of Profit and Loss in Model Farmer (Farming Pattern I)

Unit: ₤

	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Balance brought forward from last term										
Proceeds of perennial crops	0	0	0	265,000	665,000	665,000	665,000	665,000	665,000	665,000
Proceeds of annual crops	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576
Sub-total	238,576	238,576	238,576	504,576	903,576	903,576	903,576	903,576	903,576	903,576
Production cost of perennial crops	447,566	156,464	283,892	283,892	283,892	283,892	283,892	283,892	283,892	283,892
Production cost of annual crops	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468
Sub-total	597,034	305,932	433,360	433,360	433,360	433,360	433,360	433,360	433,360	433,360
O & M charge										
Interest payment of long-term borrowings	90,605	90,605	175,772	175,772	166,712	157,651	140,074	122,497	104,920	87,342
Interest payment of short-term borrowings	0	16,500	0	26,400	47,300	26,400	7,150	0	0	0
Sub-total	90,605	107,105	175,772	202,172	214,012	184,051	147,224	122,497	104,920	87,342
Difference	-449,063	-174,461	-370,556	-130,956	256,204	286,165	322,992	347,719	365,296	382,874
Total (accumulated)	-449,063	-623,524	-994,080		-868,832	-582,667	-259,675	88,044	453,340	836,214

Table 6.1.3 Cash Flow of Model Farmer (Farming Pattern I)

Unit: ₤

	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Balance brought forward from last term	20,000	174,968	507	197,735	6,376	202,177	371,161	576,972	807,510	1,055,625
Long-term borrowing	604,030	0	567,784	0	0	0	0	0	0	0
Short-term borrowing	0	150,000	0	240,000	430,000	240,000	65,000	0	0	0
Sub-total	524,030	324,968	568,291	437,735	436,376	442,177	436,161	576,972	807,510	1,055,625
Production cost of perennial crops	447,566	156,464	283,892	283,892	283,892	283,892	283,892	283,892	283,892	283,892
Production cost of annual crops	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468	149,468
Sub-total	597,034	305,932	433,360	433,360	433,360	433,360	433,360	433,360	433,360	433,360
Proceeds of perennial crops	0	0	0	265,000	665,000	665,000	665,000	665,000	665,000	665,000
Proceeds of annual crops	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576	238,576
Sub-total	238,576	238,576	238,576	504,576	903,576	903,576	903,576	903,576	903,576	903,576
O & M charge										
Interest payment of long-term borrowing	90,605	90,605	175,772	175,772	166,712	157,651	140,074	122,497	104,920	87,342
Interest payment of short-term borrowing	0	16,500	0	26,400	47,300	26,400	7,150	0	0	0
Repayment of long-term borrowing	0	0	0	60,403	60,403	117,181	117,181	117,181	117,181	117,181
Repayment of short-term borrowing	0	150,000	0	240,000	430,000	240,000	65,000	0	0	0
Sub-total	90,605	257,105	175,772	502,575	704,415	541,233	329,405	239,676	222,101	204,523
Difference	174,968	507	197,735	6,376	202,177	371,161	576,972	807,510	1,055,625	1,321,318
Amount carried forward	174,968	507	197,735	6,376	202,177	371,161	576,972	807,510	1,055,625	1,321,318

Note: Long-term borrowing conditions: For perennial crops

Interest ; 15 % annually

Grace period ; 3 years

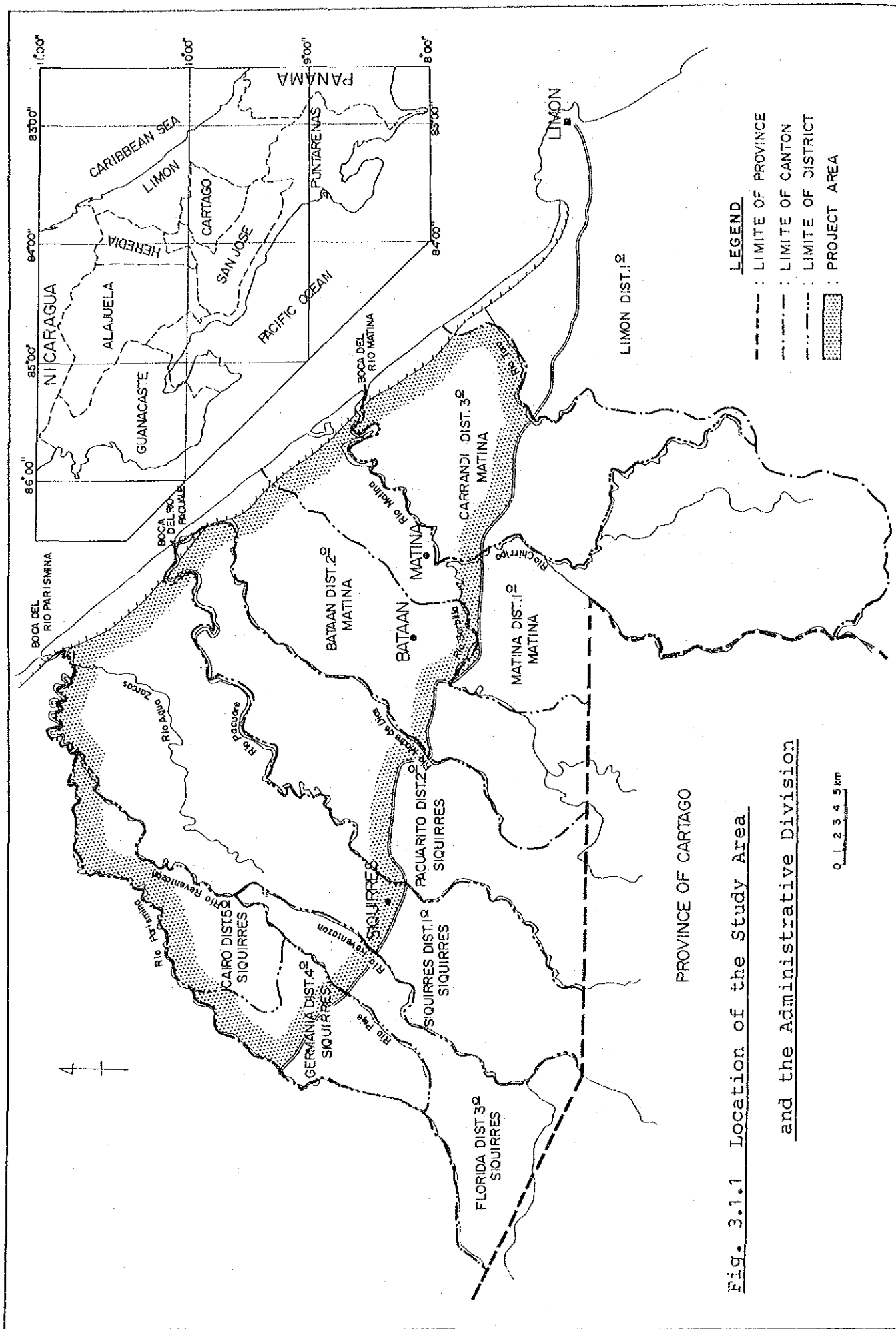
Amortization period ; 10 years

Short-term borrowing conditions: For annual crops

Interest ; 24 % annually

Amortization period ; Within 1 year, repayment term is up to

the end of year



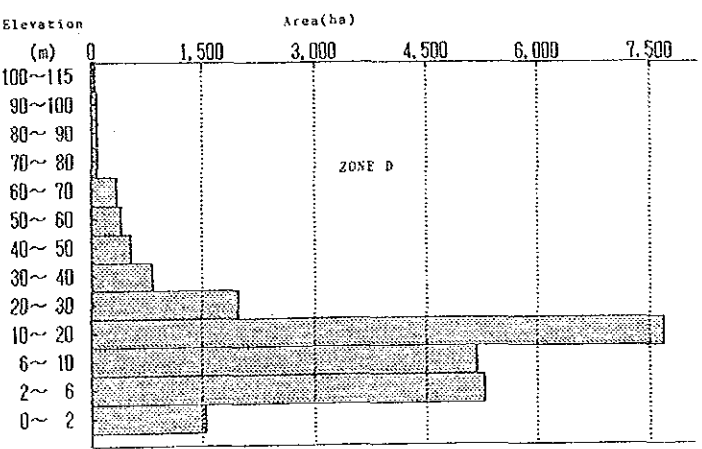
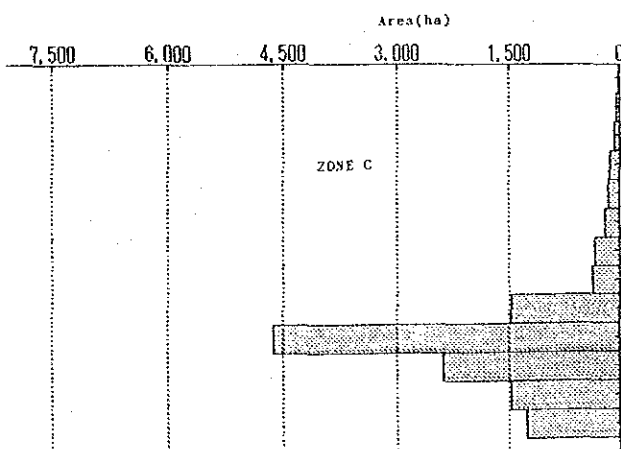
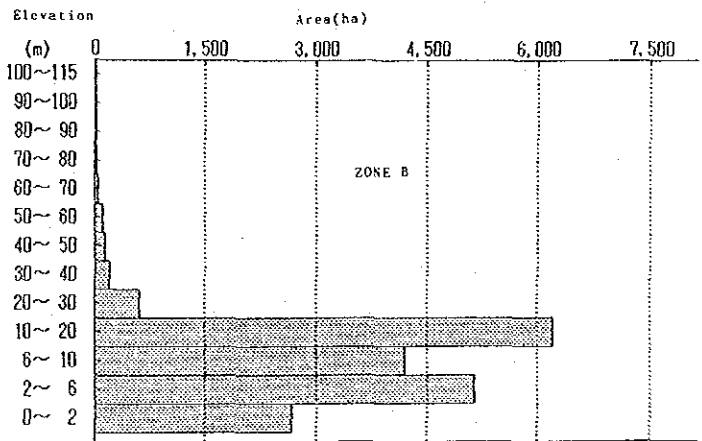
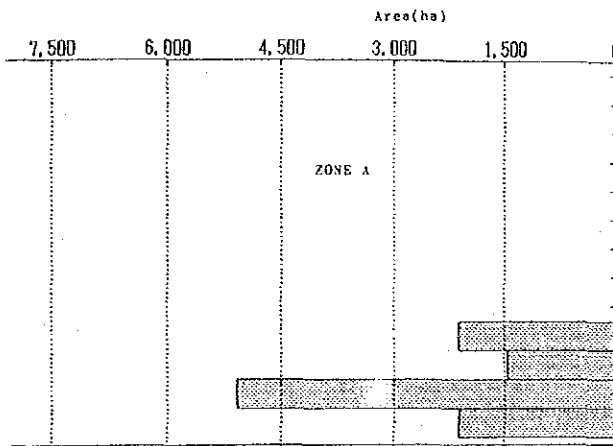
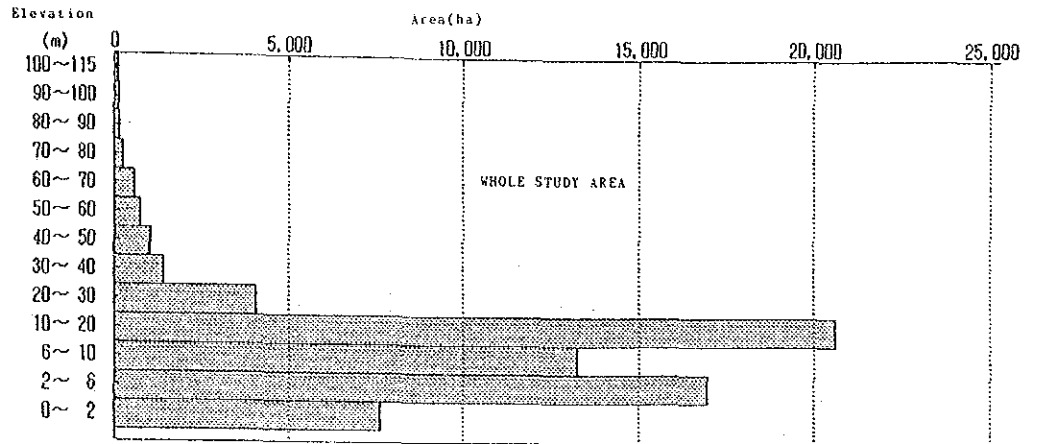


Fig. 3.1.2 Areas According to the Elevation

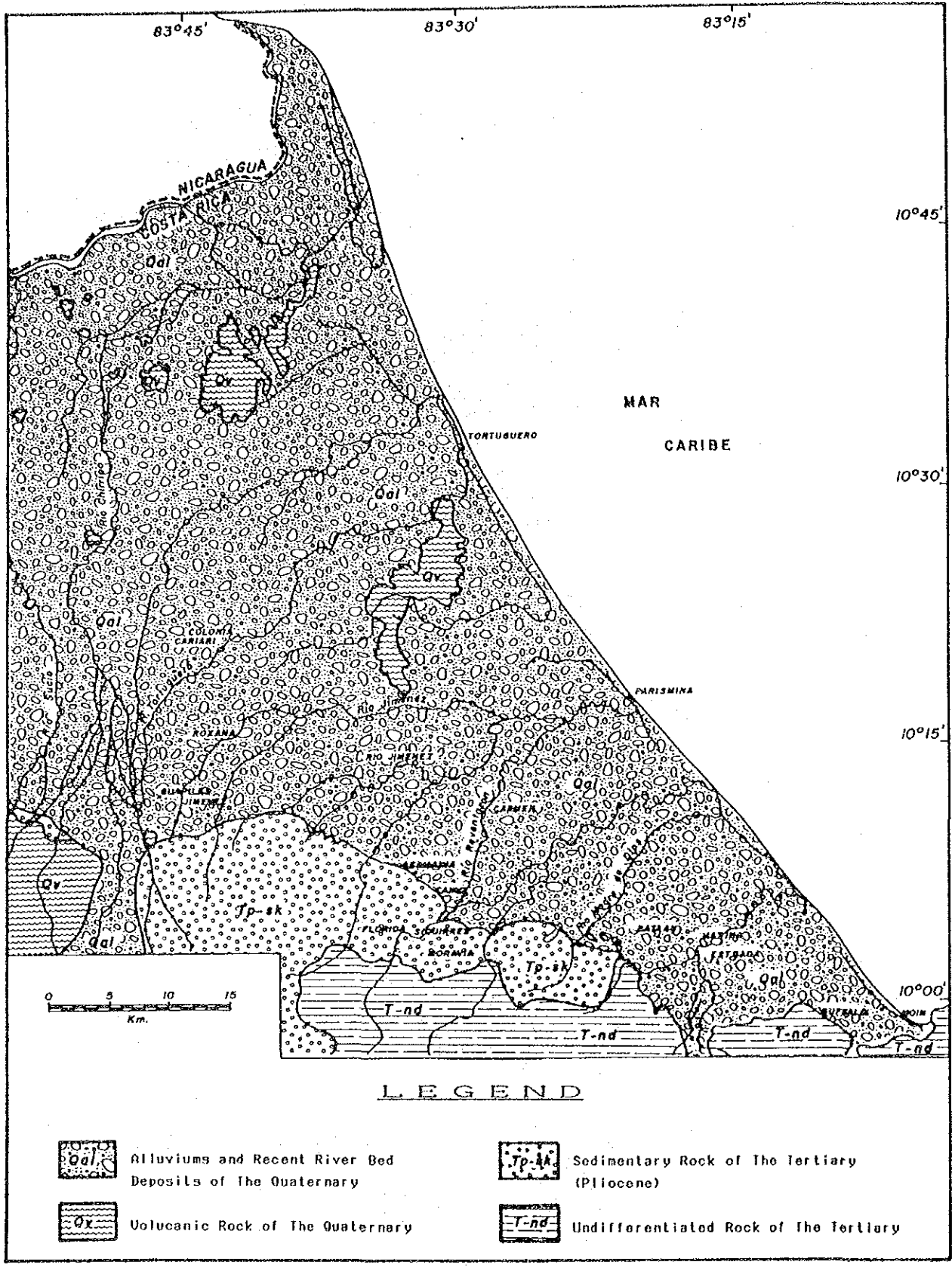
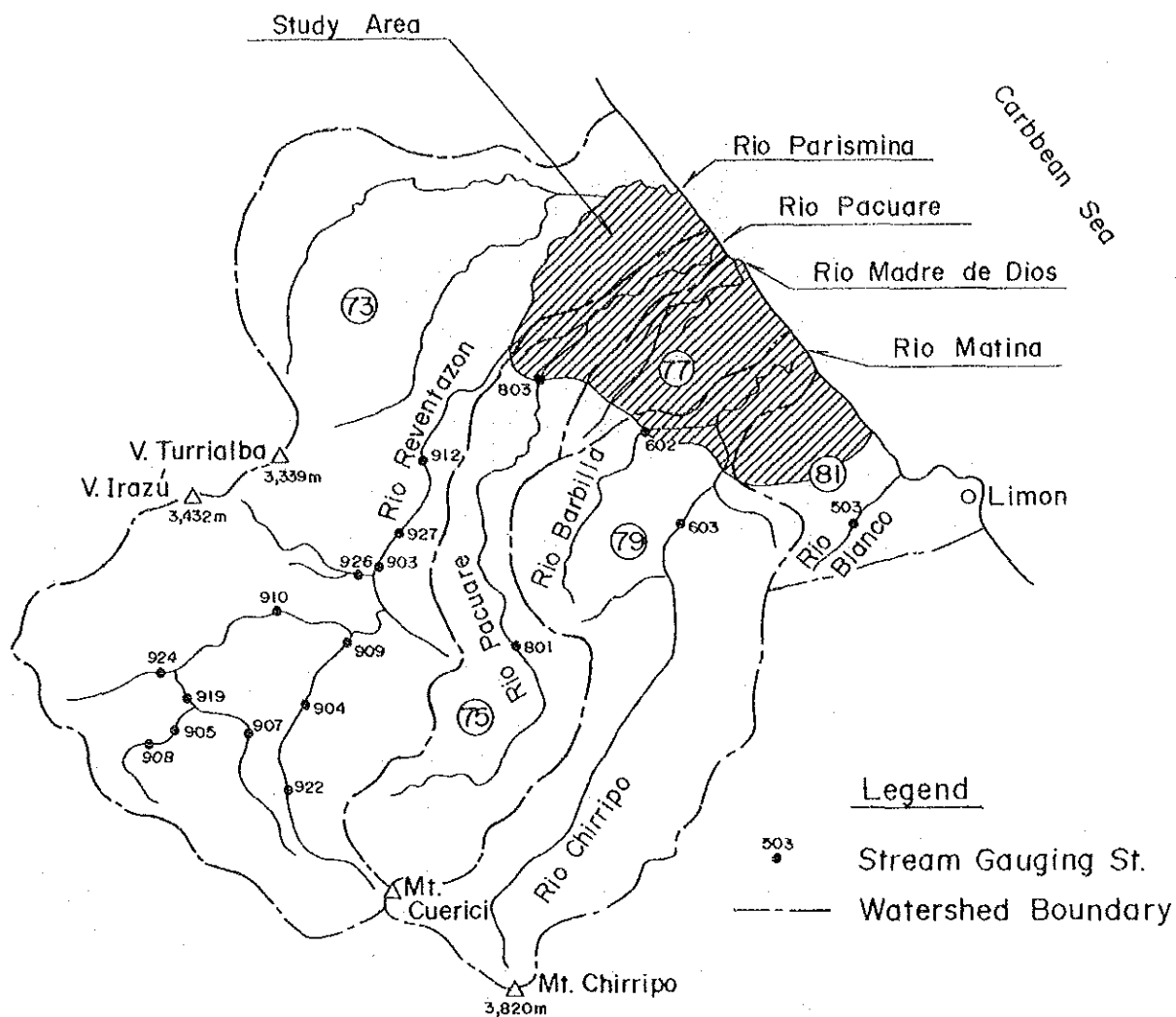


Fig. 3.1.3 Geological Map





Code of Watershed	Name of Watershed
81	Rio Moiny otros
79	Rio Matina
77	Rio Madre de Dios y otros
75	Rio Pacuare
73	Rio Reventazón – Parismina

Fig. 3.1.5 Location of Existing Stream Gauging Station



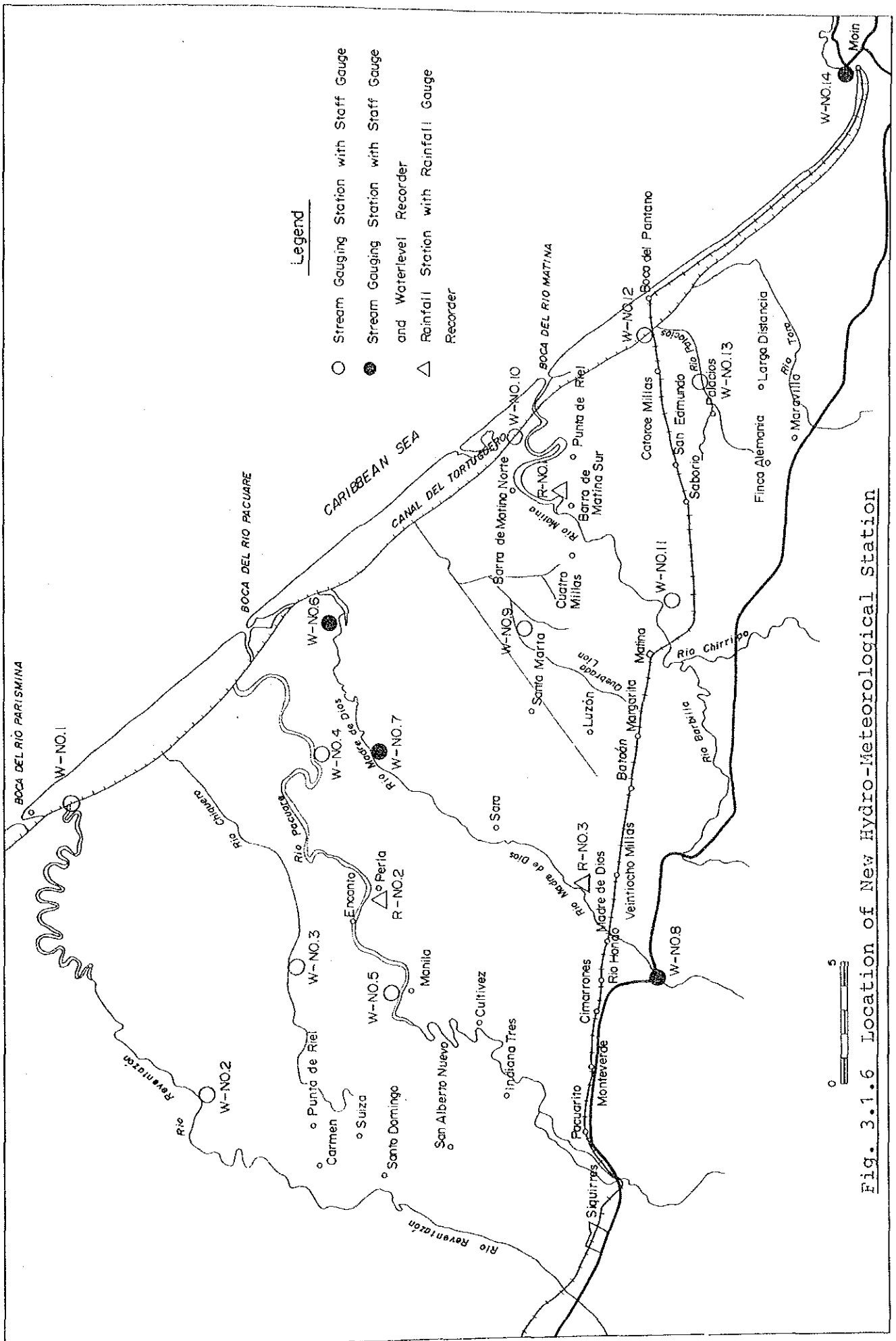


Fig. 3.1.6 Location of New Hydro-Meteorological Station

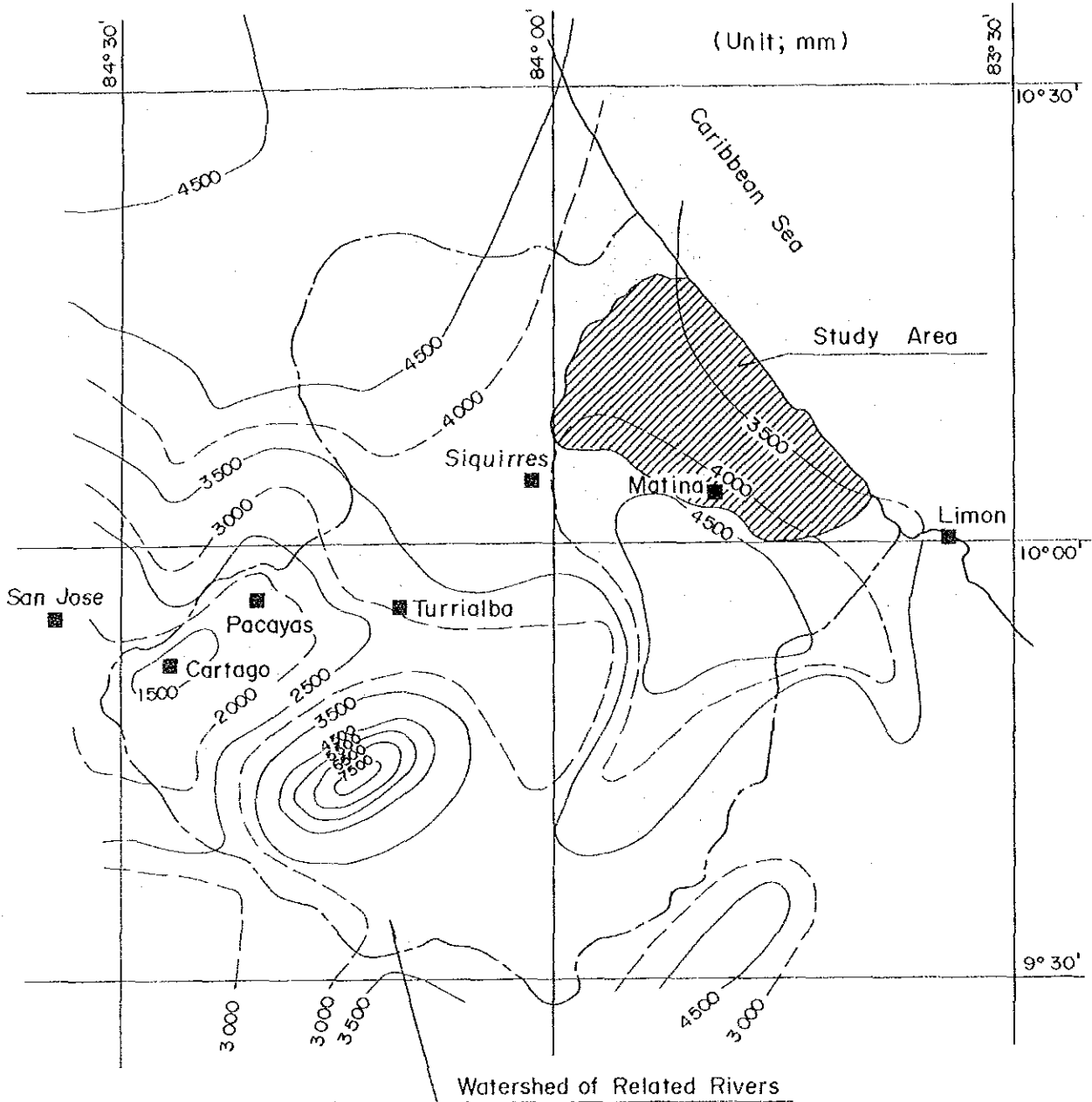


Fig. 3.1.7 Isohyetal Map

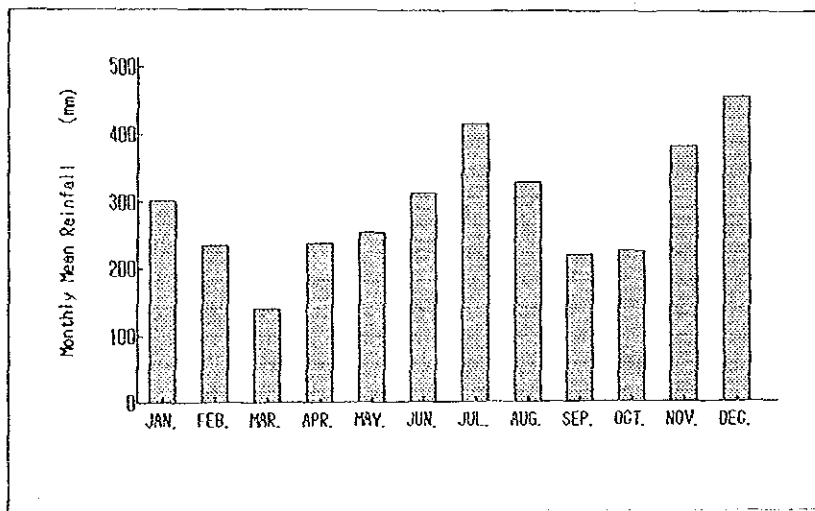
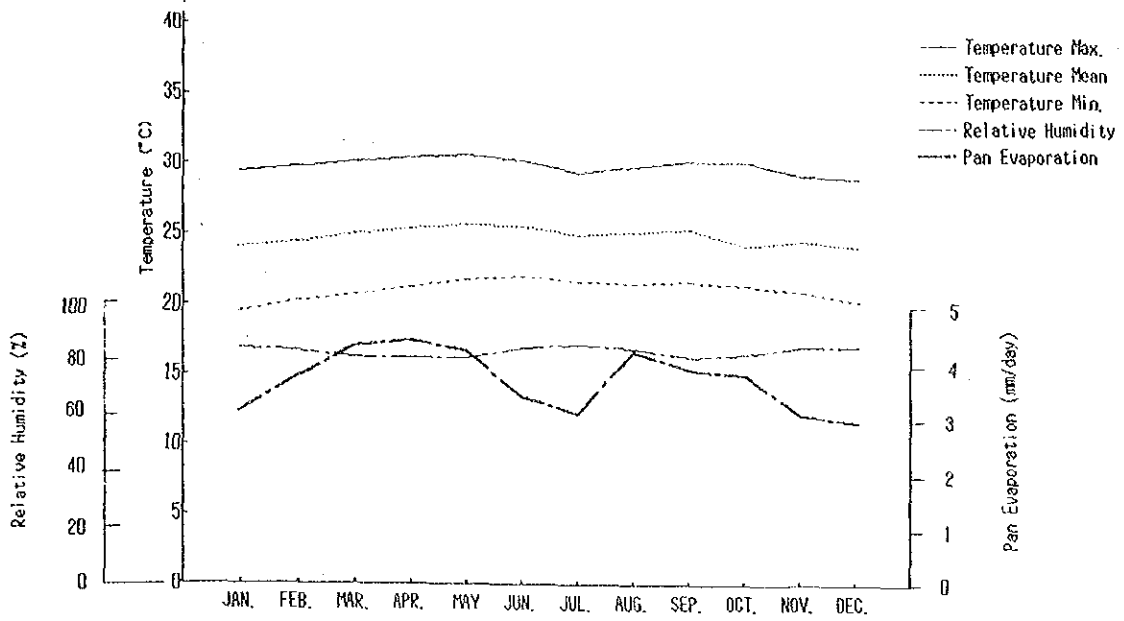
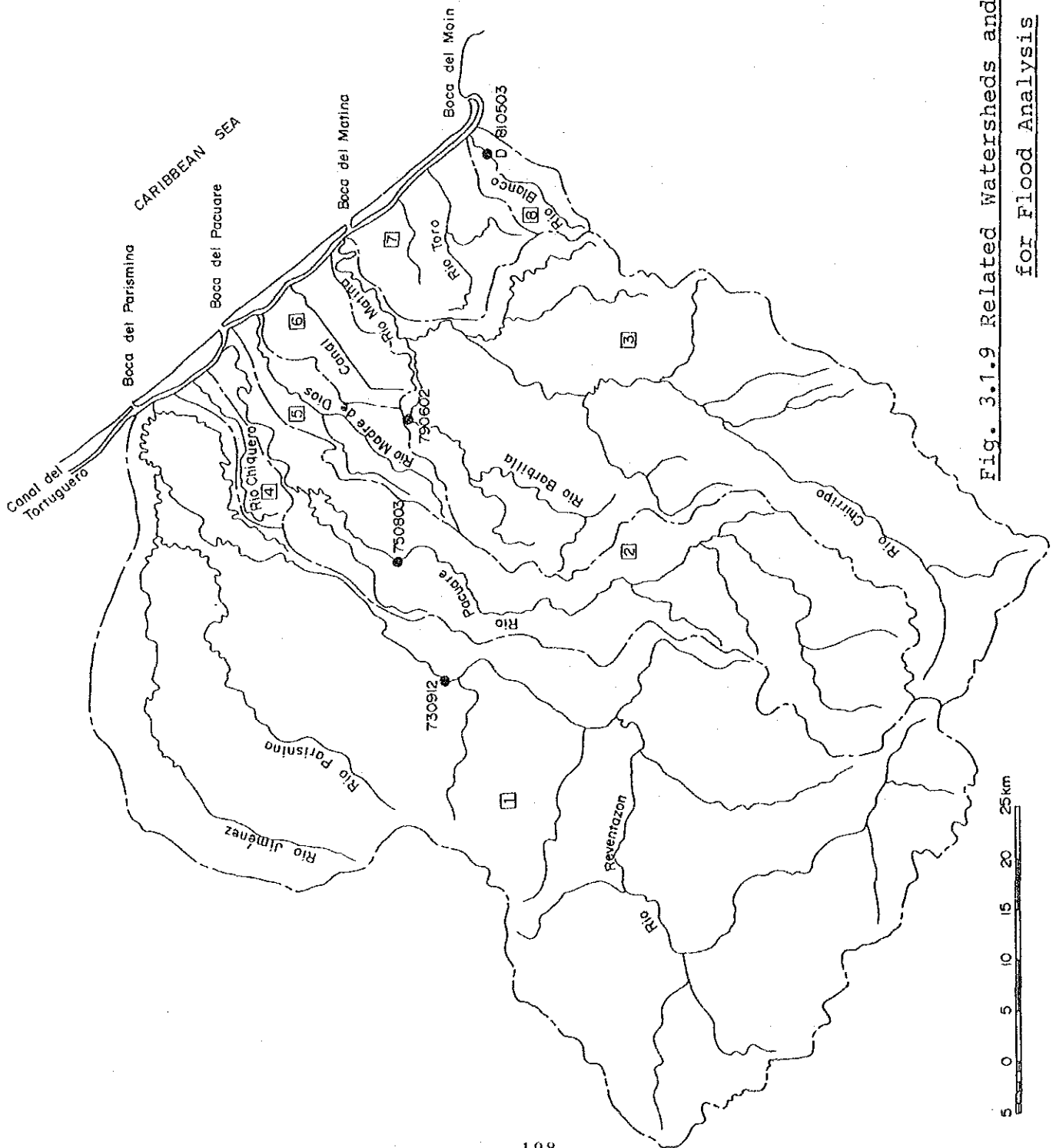


Fig. 3.1.8 General Climate of the Study Area



Related Watershed

No.	Watershed	D.A. (km <sup>2</sup> )
1	Reventazon	2,796
2	Pacuare	855
3	Matina	1,365
	Sub-Total	5,016
4	Chiquero	86
5	Madre de Dios	189
6	Canal	109
7	Toro	191
8	Blanco	57
	Sub-Total	632
	Total	5,648

Stream Gauging Station Used for Flood Analysis

River	Code of St.	D.A. (km <sup>2</sup> )
Reventazon	730912	1,673
Pacuare	750803	652
Barbilla	790602	212
Blanco	810503	50

Fig. 3.1.9 Related Watersheds and Stream Gauging Stations Used for Flood Analysis

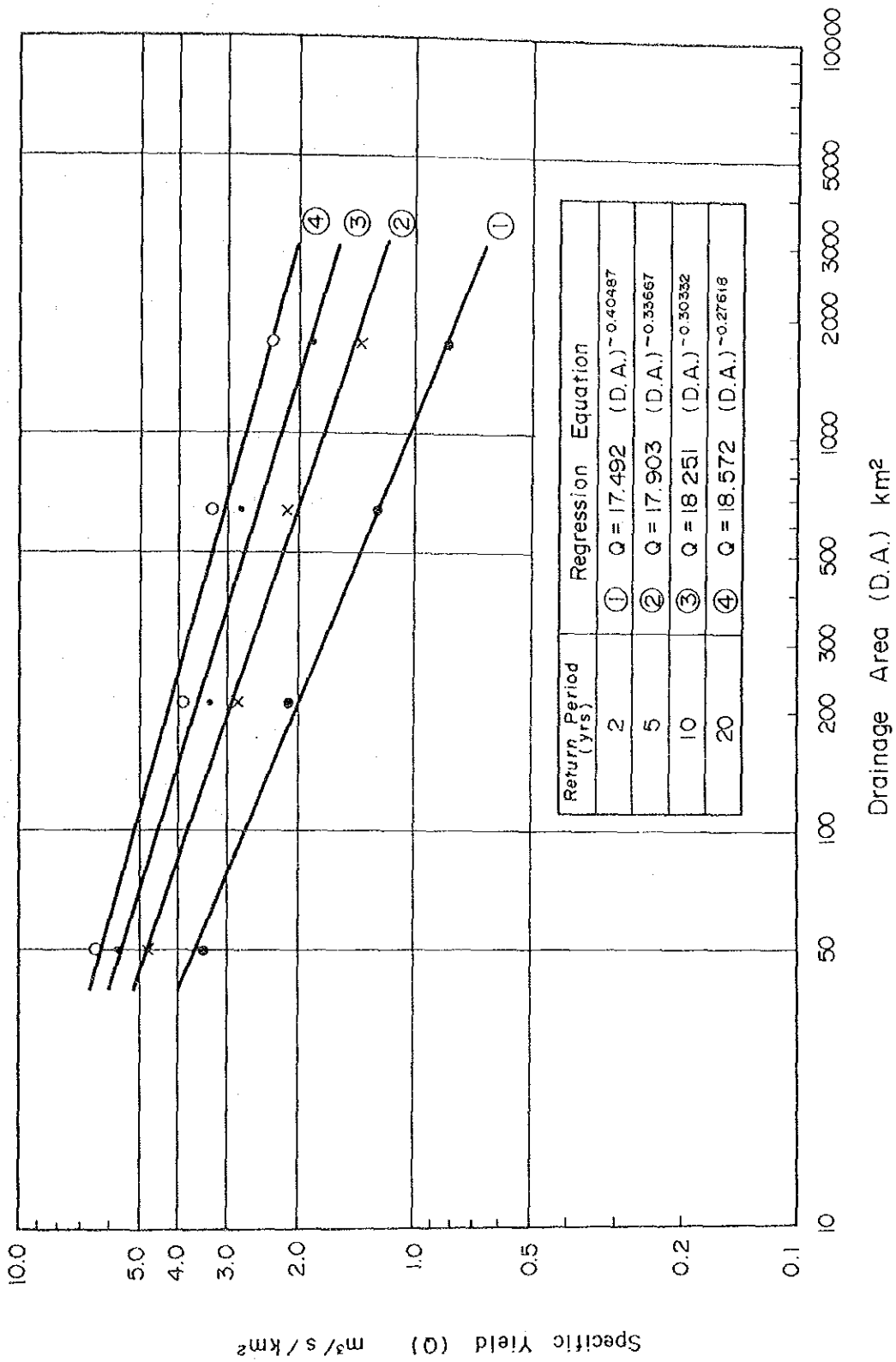


Fig. 3.1.10 Probable Specific Yield Discharge of Peak Flood

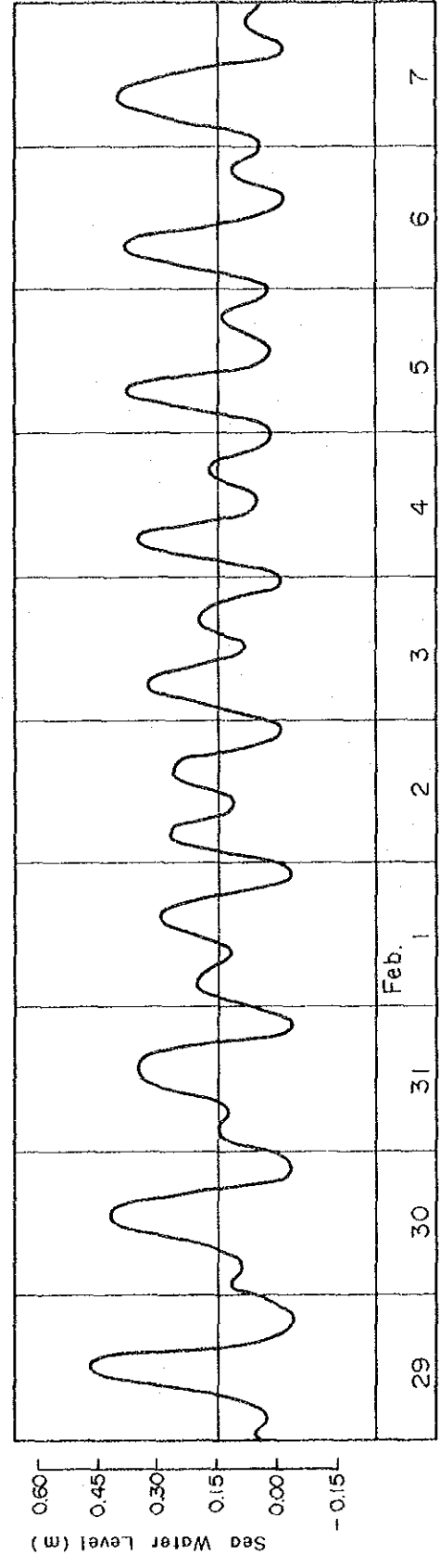
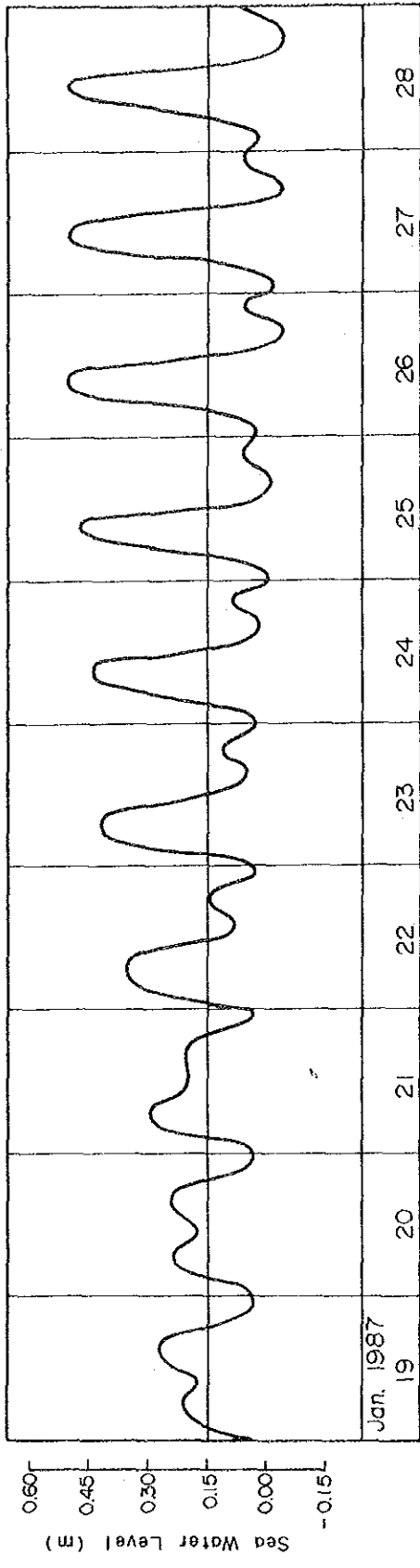
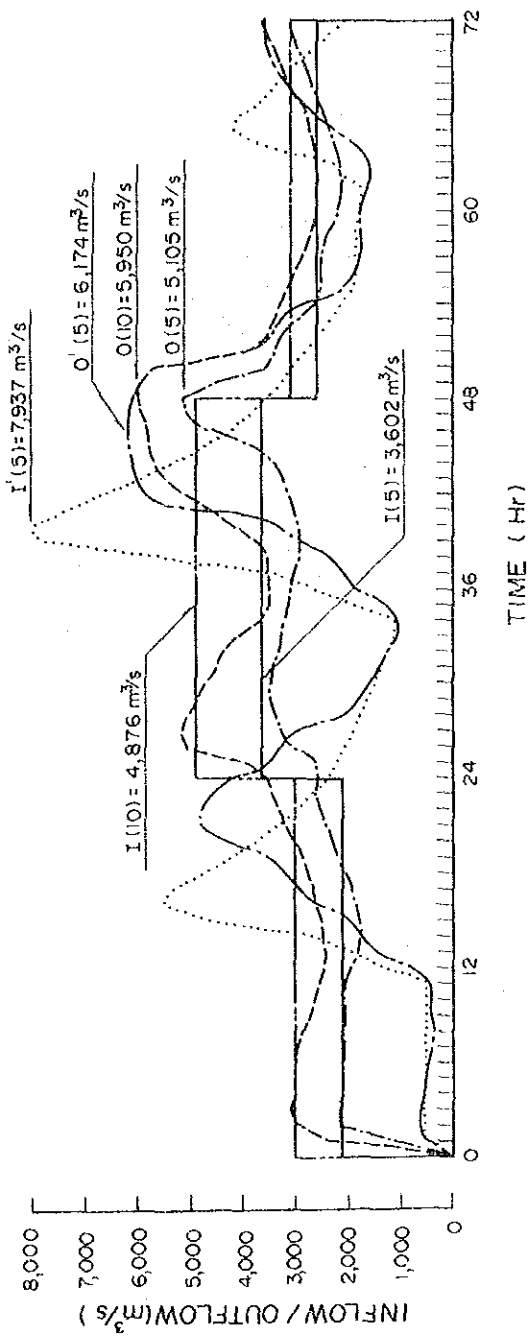
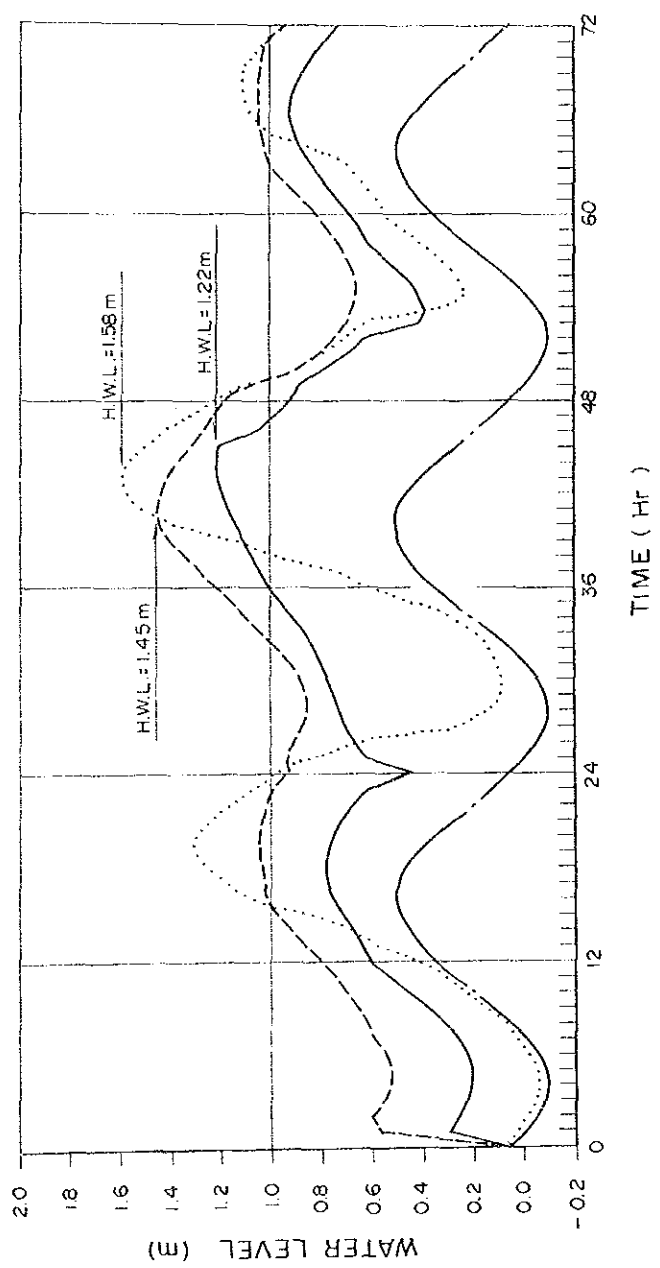


Fig. 3.1.11 Astronomical Tide at Limon Harbor



**LEGEND**

FLOOD	PRESENT SITUATION	PROJECTION
	RETURN PERIOD (yrs)	RETURN PERIOD (yrs)
INFLOW	5	5
OUTFLOW	10	5



**LEGEND**

WATER LEVEL	PRESENT SITUATION	PROJECTION
	RETURN PERIOD (yrs)	RETURN PERIOD (yrs)
FLOODING WATER LEVEL	5	5
OUTER SEA WATER LEVEL	10	5

Fig. 3.1.12 Estimated Inundation Condition







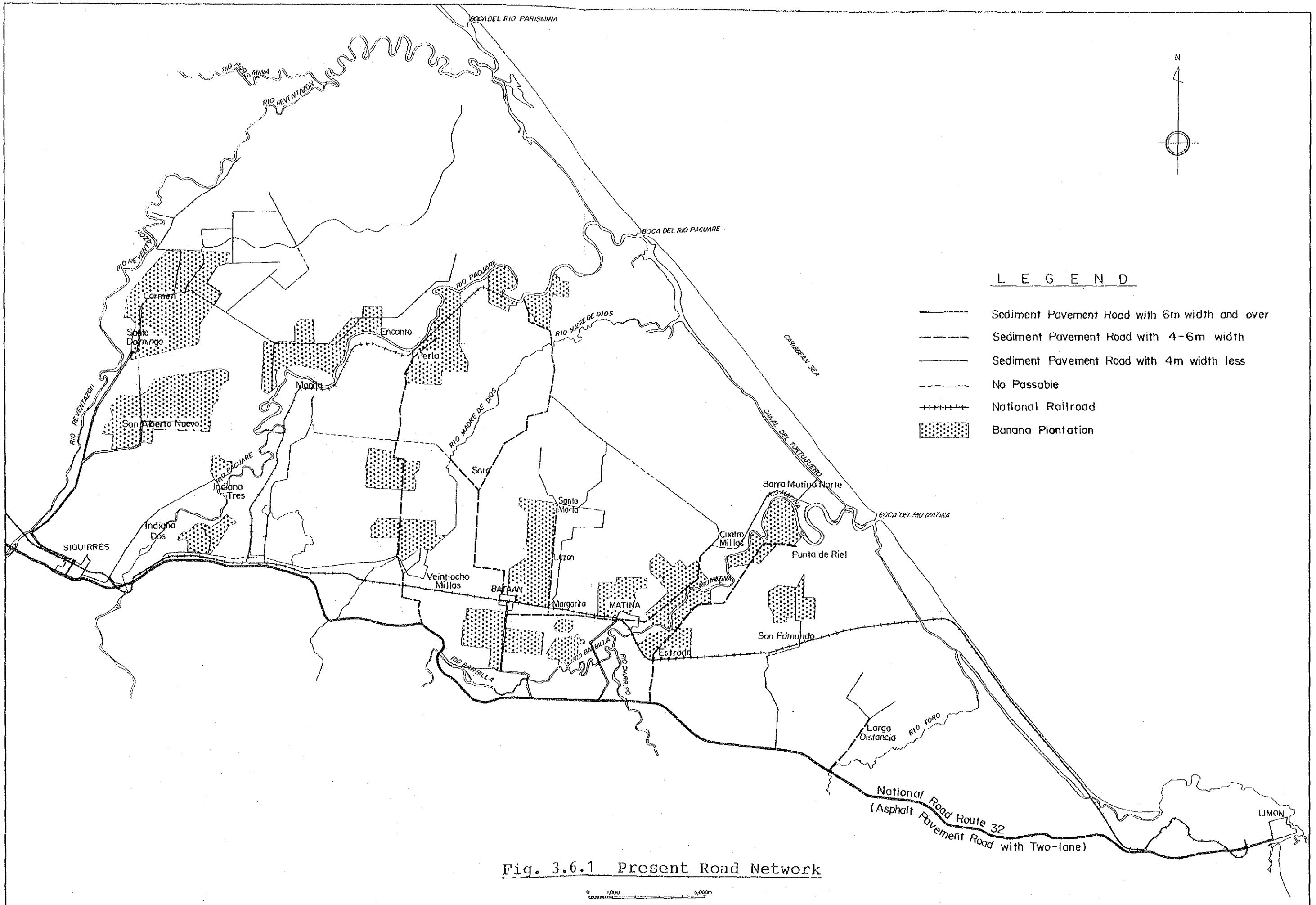


Fig. 3.6.1 Present Road Network





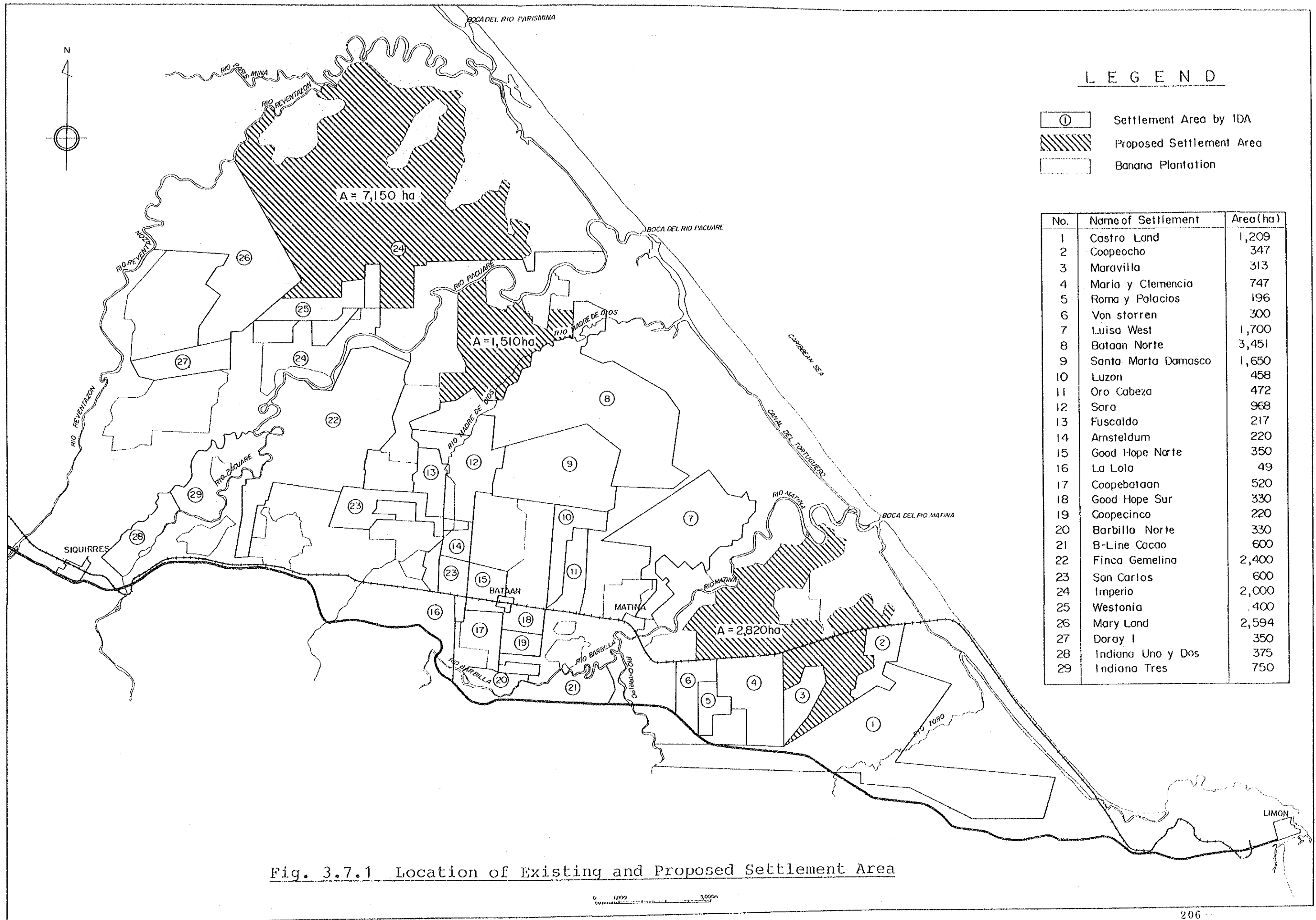
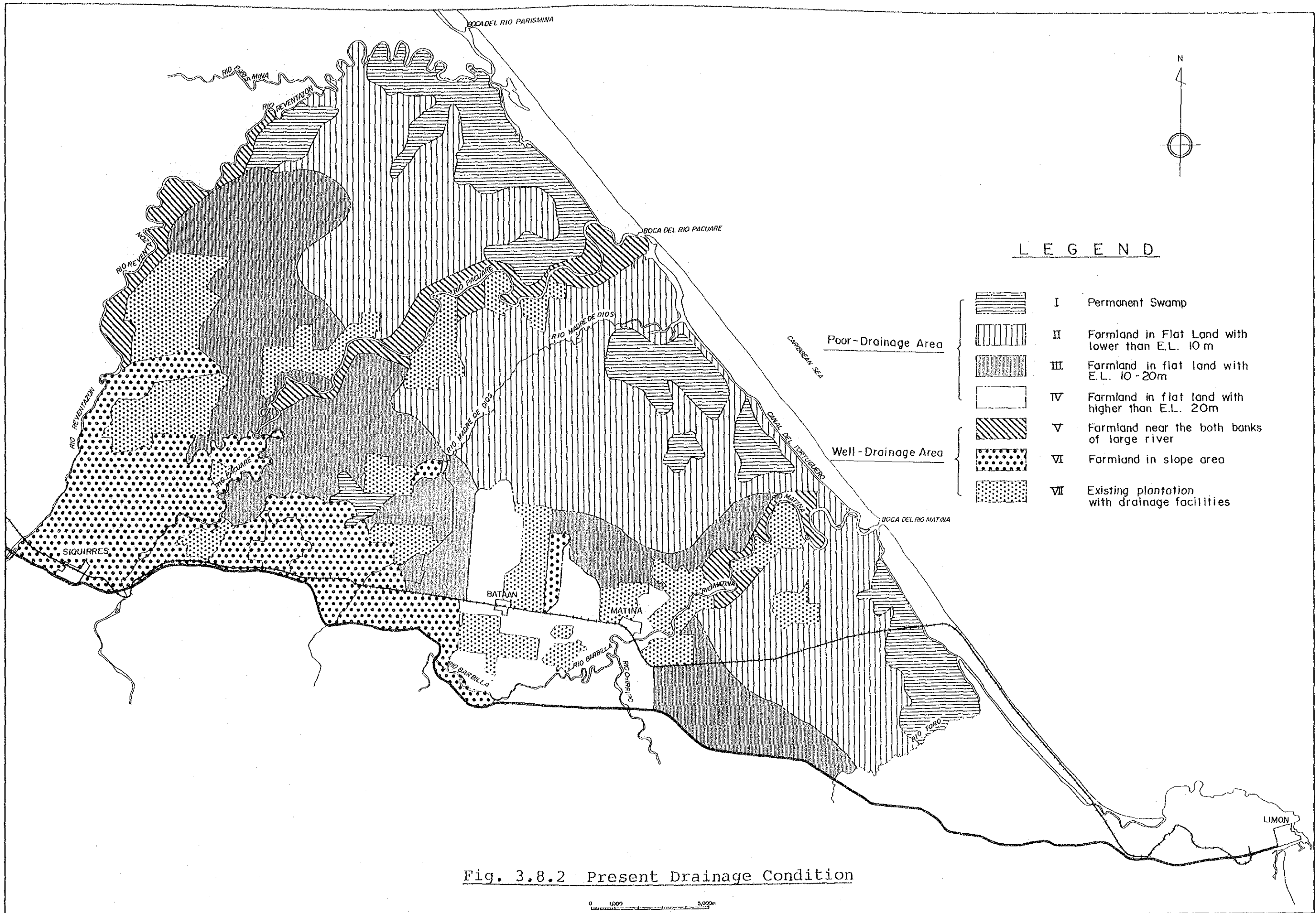


Fig. 3.7.1 Location of Existing and Proposed Settlement Area

0 1000 5000m





LEGEND

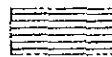




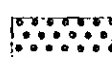

- |   |     |   |
|---|-----|---|
|    | I   | Permanent Swamp                                 |
|    | II  | Farmland in Flat Land with lower than E.L. 10 m |
|    | III | Farmland in flat land with E.L. 10-20m          |
|    | IV  | Farmland in flat land with higher than E.L. 20m |
|   | V   | Farmland near the both banks of large river     |
|  | VI  | Farmland in slope area                          |
|  | VII | Existing plantation with drainage facilities    |

Fig. 3.8.2 Present Drainage Condition

0 1,000 5,000m



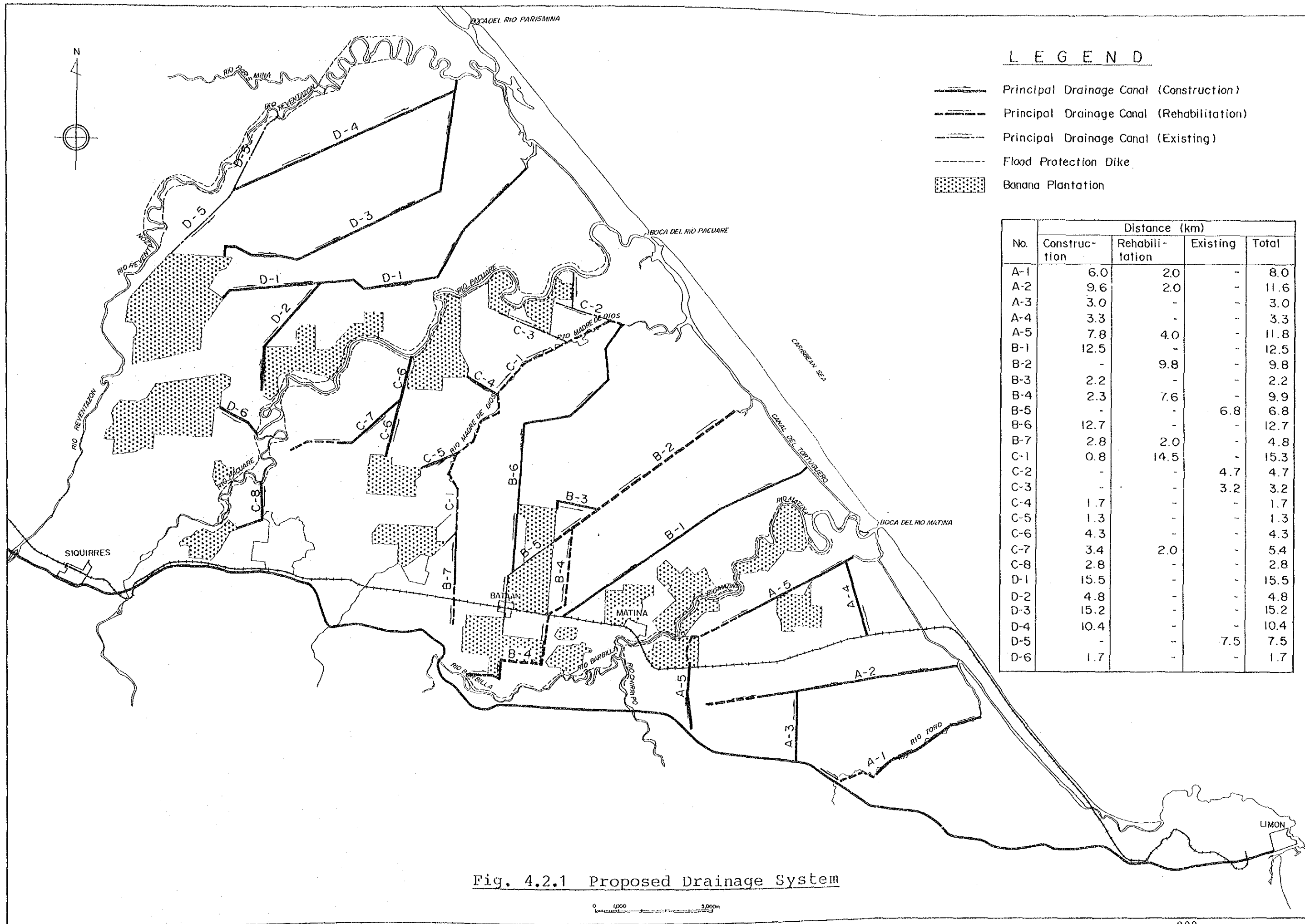


Fig. 4.2.1 Proposed Drainage System

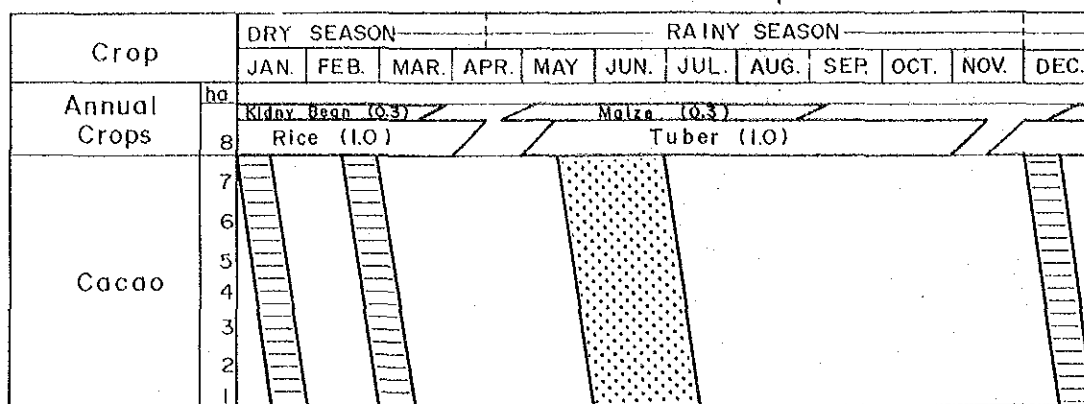
0 1000 2000 3000m



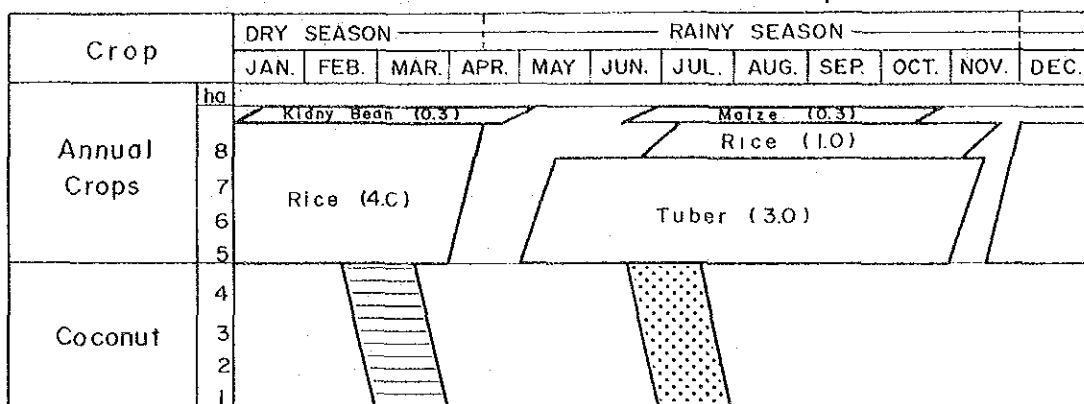




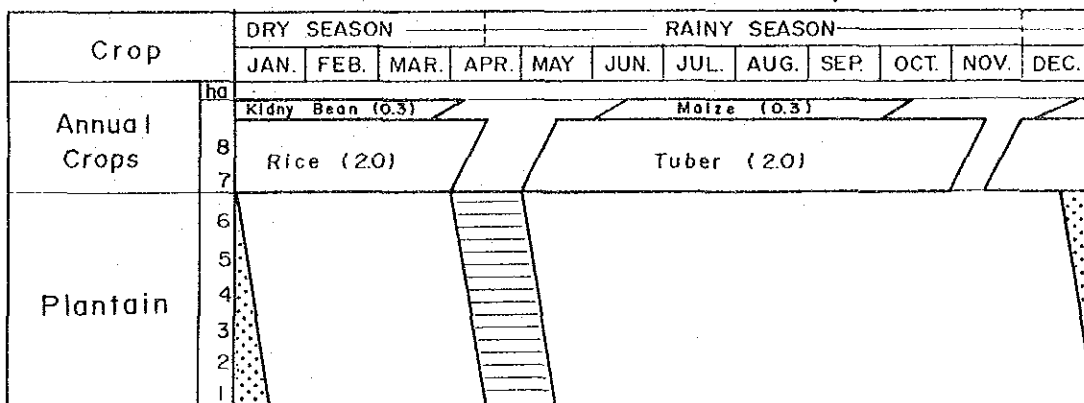
A : Cacao + Annual Crops



B : Coconut + Annual Crops



C : Plantain + Annual Crops



D : Black Peper + Annual Crops

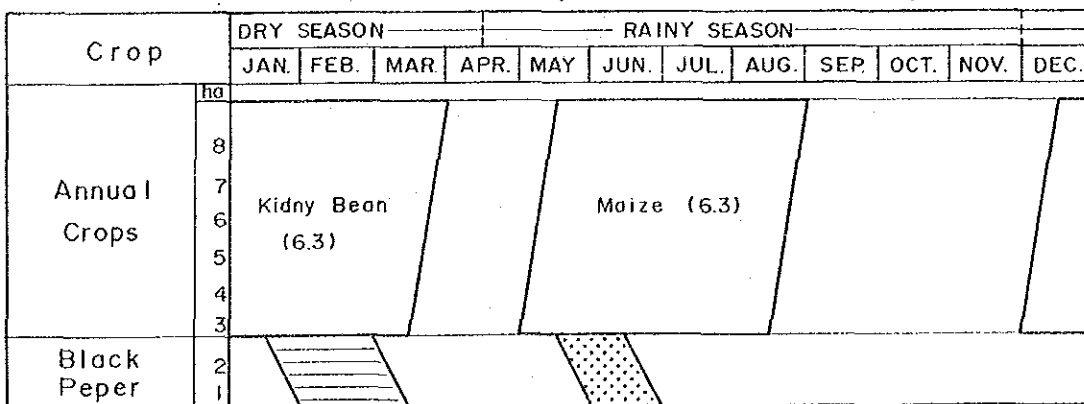
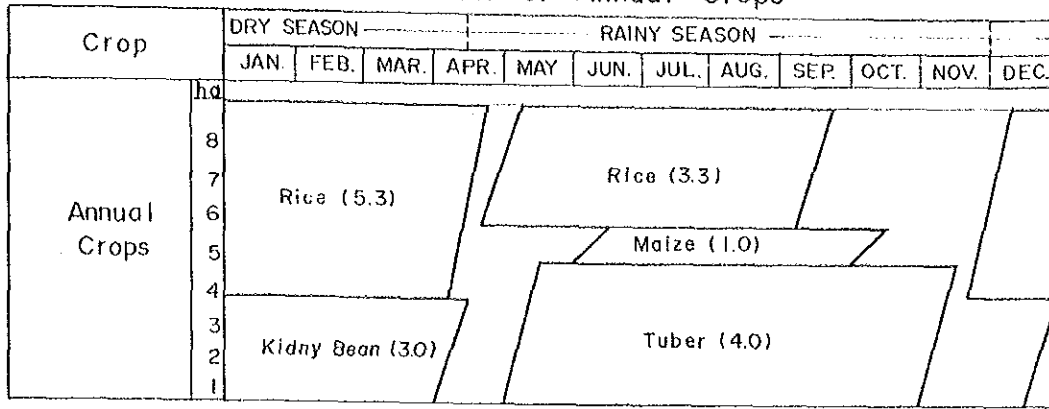
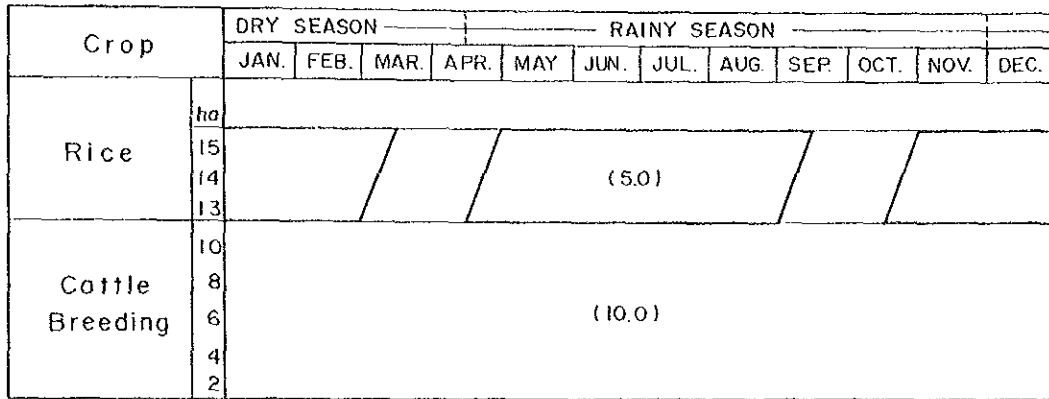


Fig. 4.4.2 (1) Proposed Cropping Pattern

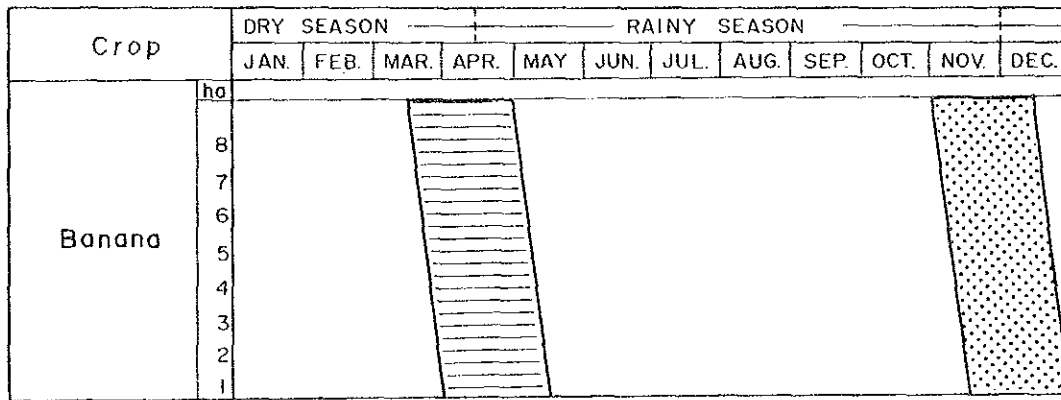
E : Rotation of Annual Crops




F : Cattle + Rice



G : Banana mono-cultivation



REMARKS

 Harvesting Period


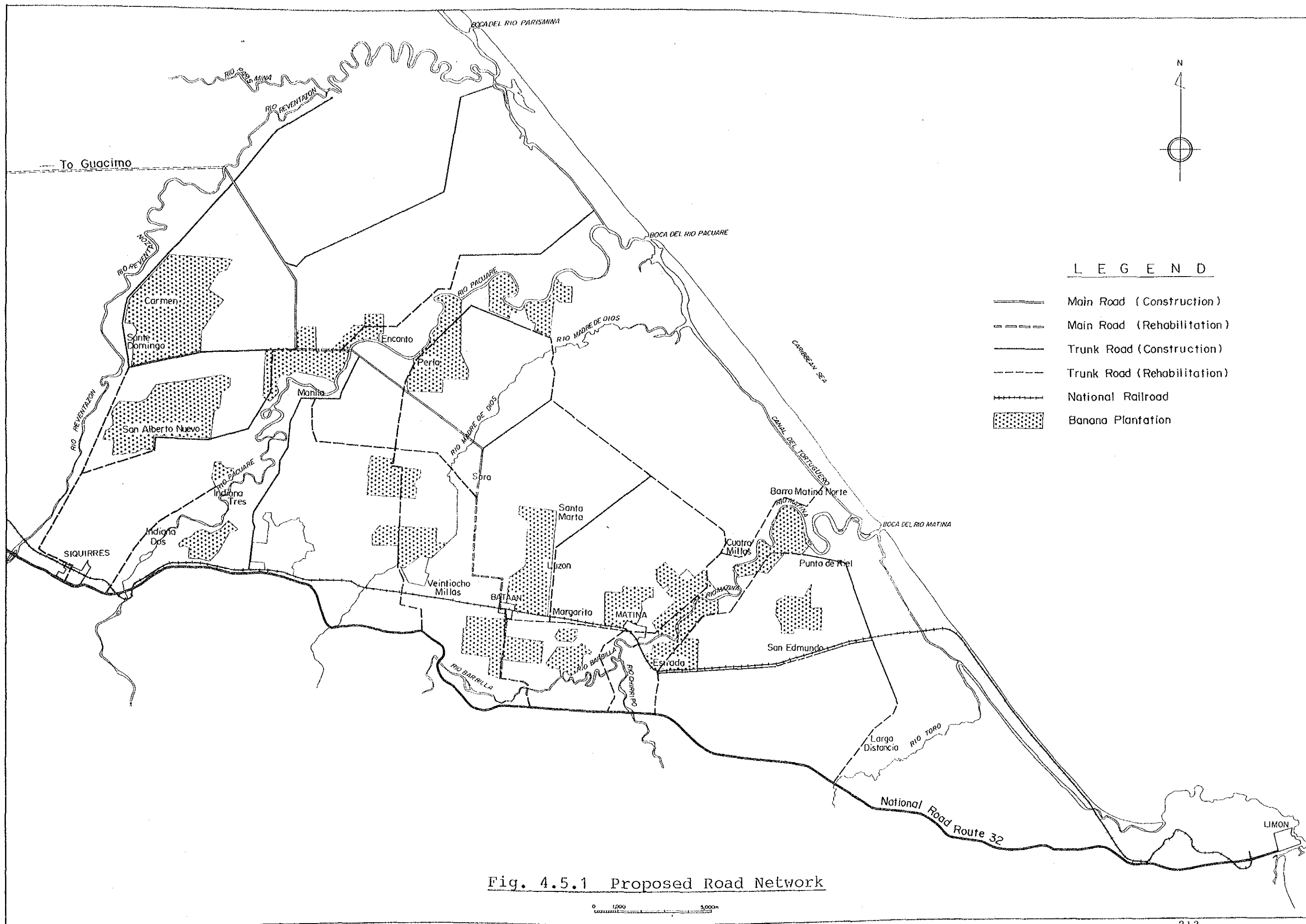
 Flowering Period

Fig. 4.4.2 (2) Proposed Cropping Pattern



L E G E N D

- Main Road (Construction)
- - - Main Road (Rehabilitation)
- Trunk Road (Construction)
- - - Trunk Road (Rehabilitation)
- National Railroad
- Banana Plantation

Fig. 4.5.1 Proposed Road Network

0 1,000 5,000m





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