

**APPENDIX C: WATER QUALITY, HYDROGEOLOGY
AND GROUNDWATER**

I PUMPING TEST

No. 6 well

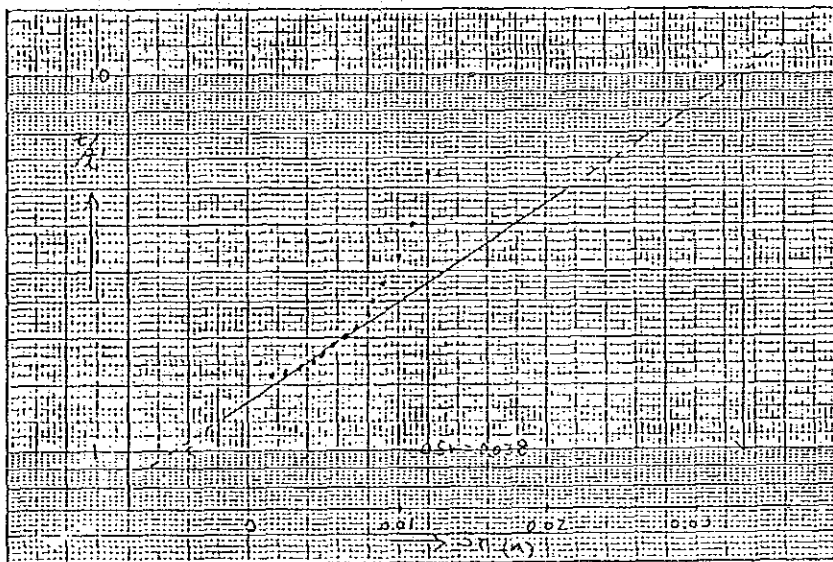
After discharge for ten minutes, the pumping was stopped and recovery test was carried out.

Its results take t/t' (t : time from pumping start, t' : time from pumping stop) on the log scale of semi-log paper and S_r (difference between static and recovery water table) on the ordinary scale and drawing S_r to t/t' curve as shown in the figure below and get draw down ΔS_r in one cycle of $\log t/t'$ and the hydrological coefficient is calculated by the following formula:

$$T = \frac{0.1830 Q}{\Delta S_r}$$

$$K = \frac{T}{b}$$

RECOVERY TEST No. 6 WELL



Where; T : transmissivity ($m^3/d/m$), Q : discharge (m^3/d)
 b : strainer length (m), and K : permeability (cm/sec).

$$T = \frac{0.183 \times 98}{0.038} = 472 \text{ m}^3/d/m$$

$$K = \frac{0.0261}{10 \times 864000} = 5.5 \times 10^{-2} \text{ cm/Sec}$$

No. 24 Well

As this is a dug well and the bottom does not reach the impermeable bed, we introduced the next formula (aquifer was certified by ES).

$$K = \frac{Q}{4Sr} = \frac{0.25 Q}{Sr}$$

Where K: permeability (CM/Sec), Q: Discharge (m³/d),
S: draw down (m), and r: well radius (m).

Then,

$$K = \frac{0.0261}{4 \times 0.06 \times 0.305} \times 6 \times 10^{-1} \text{ cm/sec}$$

II. GROUNDWATER FLOW

The groundwater flows of A - B and C - D section was calculated by the aquifer coefficients obtained from well pumping tests etc. and the hydraulic gradients presumed from the water table contours of the area.

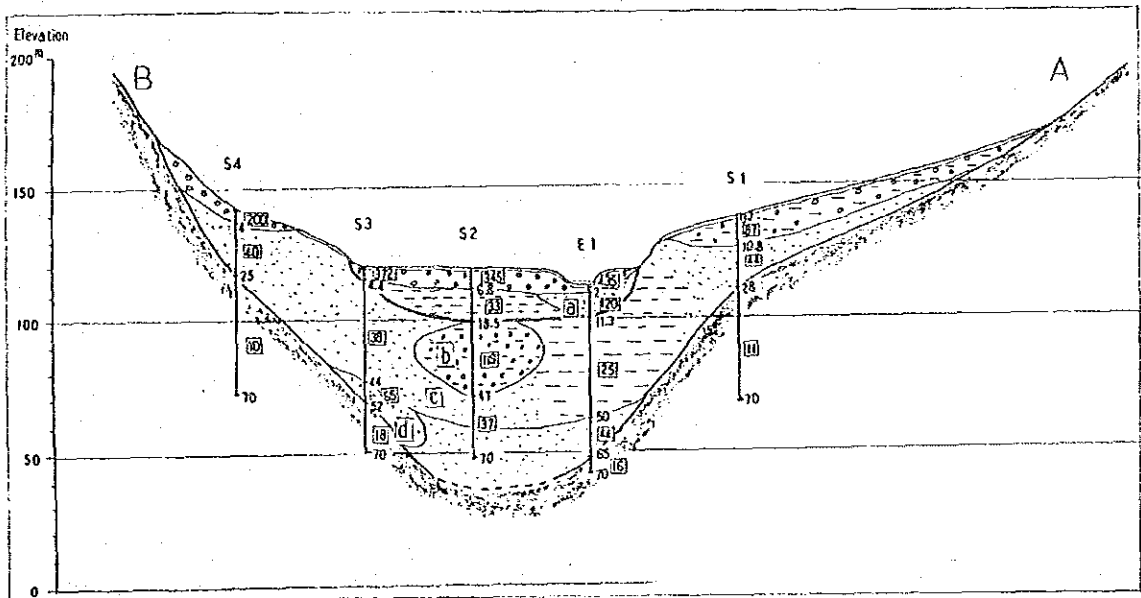
The calculation formula is as follows:

$$Q = A \cdot K \cdot i$$

Where; Q: groundwater flow (m³/sec),
 A: aquifer section area (m²),
 K: permeability (m/sec),
 i: hydraulic gradient

o A - B section

Consulting the diagram below, each aquifer flows was calculated. (It is given that the section flow of terrace plane is zero).



$$\text{Then, } Q_a = 2750 \times \frac{1}{500} \times 1.54 \times 10^{-4} = 0.00085 \text{ m}^3/\text{sec}$$

(K by boring No. 1)

$$Q_b = 10500 \times \frac{1}{500} \times 1.54 \times 10^{-4} = 0.00323 \text{ m}^3/\text{sec}$$

$$Q_c = 48750 \times \frac{1}{500} \times 4.76 \times 10^{-5} = 0.00464 \text{ m}^3/\text{sec}$$

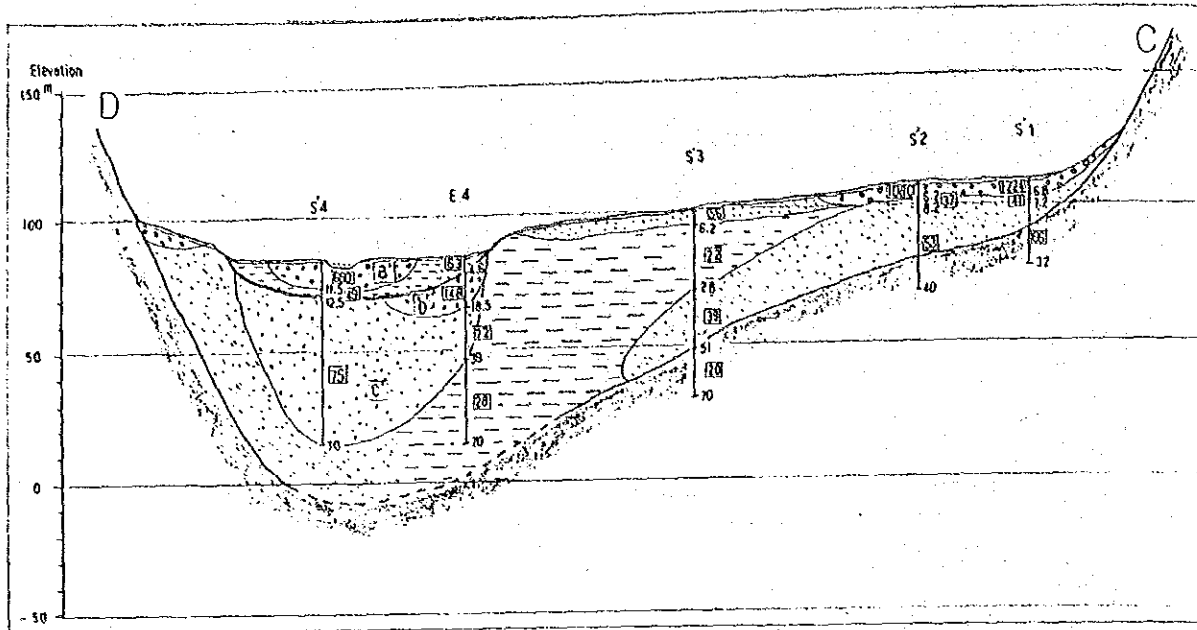
(K by existing well No. 14)

$$Q_d = 5000 \times \frac{1}{500} \times 4.76 \times 10^{-5} = 0.00048 \text{ m}^3/\text{sec}$$

$$Q_{A - B} \text{ (total)} \quad \underline{0.0092 \text{ m}^3/\text{sec}}$$

o C - D section

In the same manner, the flow for C - D section was calculated.



$$Q_{a'} = 3750 \times \frac{1}{500} \times 2.51 \times 10^{-4} = 0.00188 \text{ m}^3/\text{sec}$$

(K by boring No. 5)

$$Q_{b'} = 3750 \times \frac{1}{500} \times 2.51 \times 10^{-4} = 0.00188 \text{ m}^3/\text{sec}$$

$$Q_{c'} = 46250 \times \frac{1}{500} \times 4.76 \times 10^{-5} = 0.0044 \text{ m}^3/\text{sec}$$

(K by existing well No. 14)

$$Q_{C - D} \text{ (total)} \quad \underline{0.0082 \text{ m}^3/\text{sec}}$$

Calculation of Calculation of Reserved Groundwater Volume

We have conducted, in our study, the calculation of the available volume of reserved groundwater to ascertain to what extent the groundwater could be exploited for a large scale irrigation as planned this time, as an alternative of irrigatio water in place of superficial river flow..

In volume of reserved groundwater in a region is determined by the sum of volumes of inflow water from outside, percolation recharge of rainfall and inflow water from rivers.

Terrace plain has been excluded from the examination this time, due to the fact that the aguifer is usually scarely distributed in this area, which disqualifies itself as a major source of irrigation water in a large scale irrigation project like this.

Processes of calculation are as follows:

1 Groundwater flow (inflow from outside, Appendix C-II) 780 m³/d

2 Percolation Recharge of Rainfall

Length of Alluvium Plain x Width of Alluvium plain x Average Volume of Rainfall (1,000 mm/year - 365 days) x Percolation Rate (10%)*

$$= 40,000 \text{ m} \times 2,000 \text{ m} \times 0.0030 \text{ mm/d} \times 0.1$$

$$= 24,000 \text{ m}^3/\text{d}$$

(* Normally set at 10% in such a dimatic condition as experienced in this project area)

3 Percolation Recharge of River Flow

River bed water within the distance of 100 m from a river comes under the examination. There are two sites applicable for examination in the studied area that are located in the proximity of the river Mame and Jaguaca, as seen in Appendix Fig. C-9. Ten wells can be pitted here, with 1,000 m intervals among than.

Total volume of discharge of these wells can be calculated in the following manner.

Average volume of discharge per well is 1,250 m³/d (see legend) therefore,

$$1,250 \text{ m}^3/\text{d} \times 10 \text{ wells} = 12,500 \text{ m}^3/\text{d}$$

4 Thus, the sum of 1 2 3 volume amounts to:

$$780 \text{ m}^3/\text{d} + 24,000 \text{ m}^3/\text{d} + 12,500 \text{ m}^3/\text{d} = 3,7000 \text{ m}^3/\text{d}$$

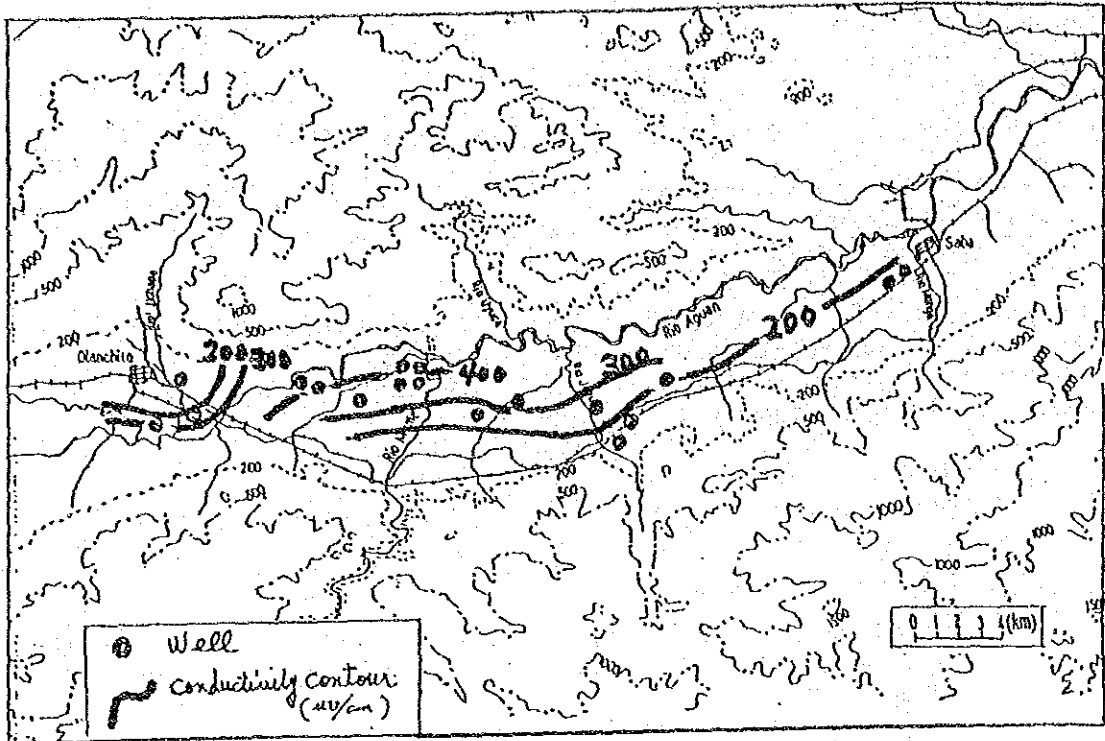


Fig. C-1 Regional Trend in Ec

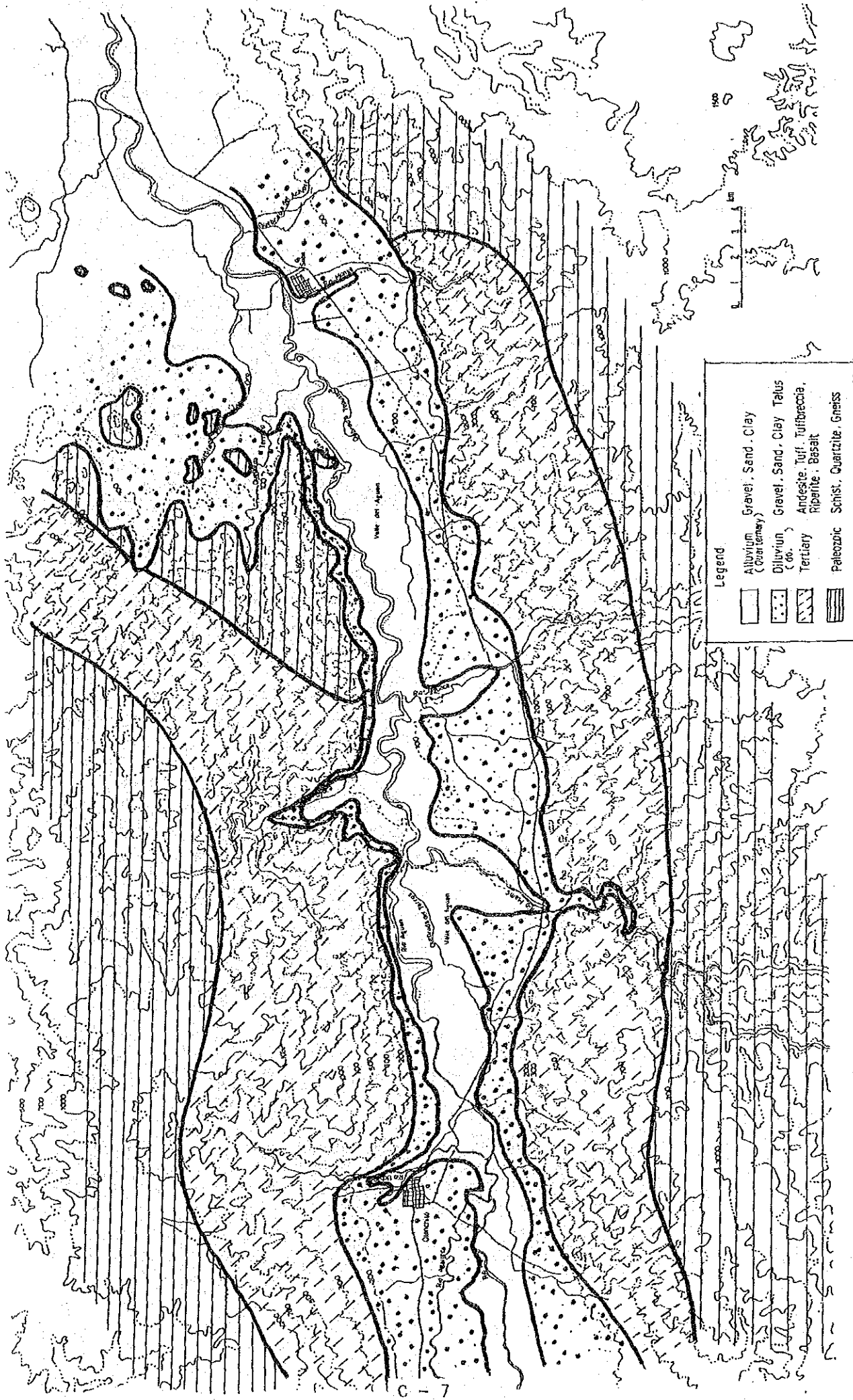


Fig. C-2 Geological Map

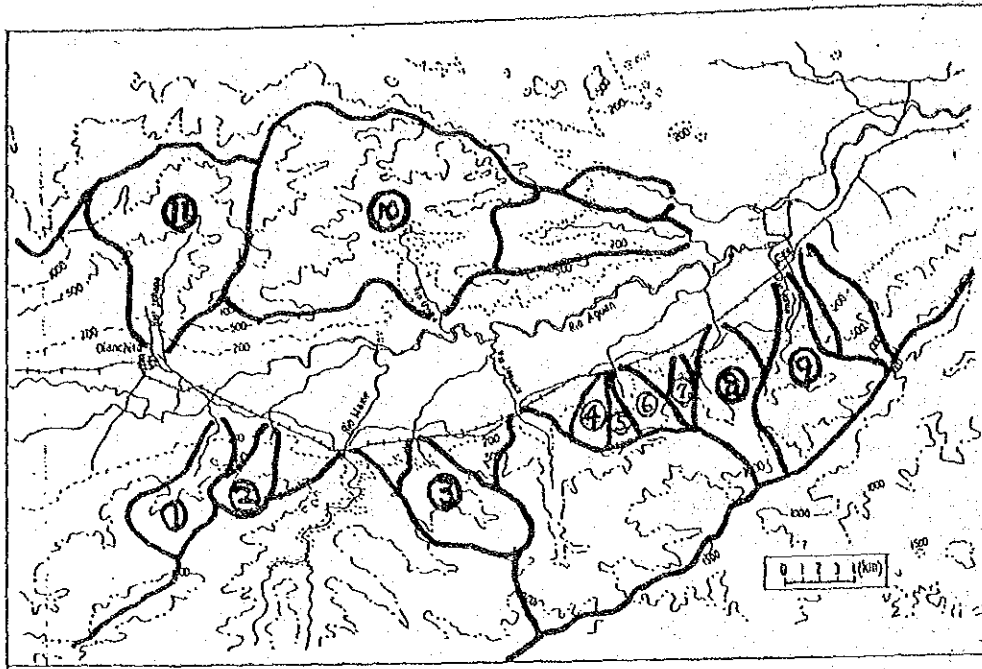


Fig. C-3 Small River Catchment

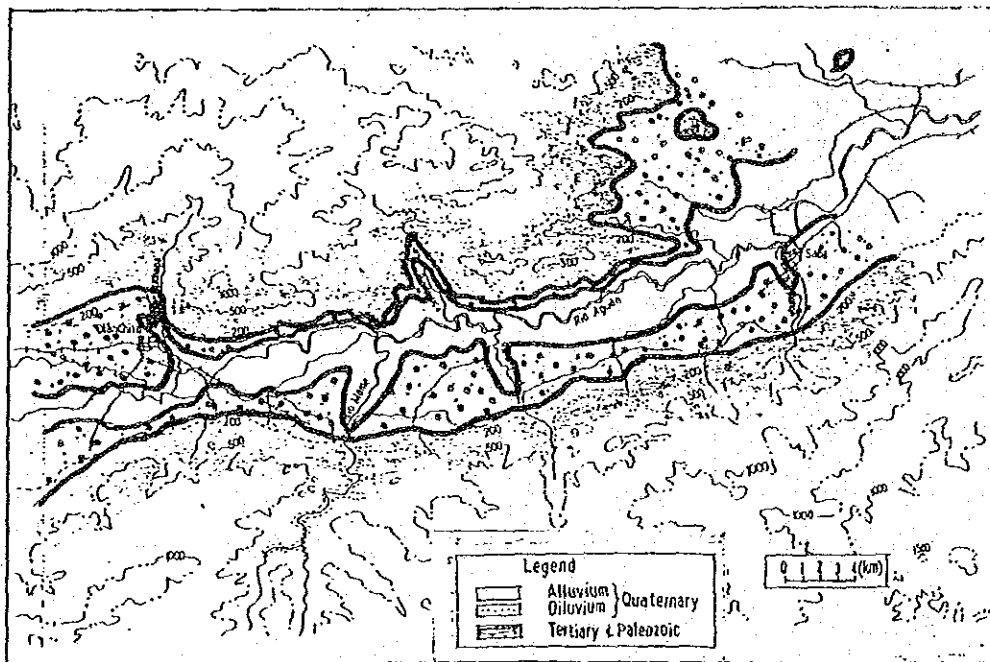
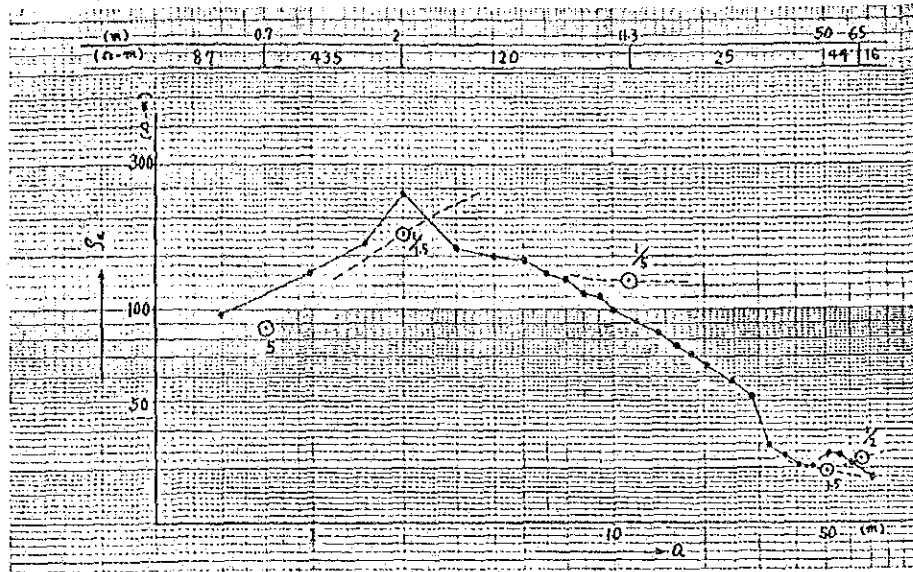
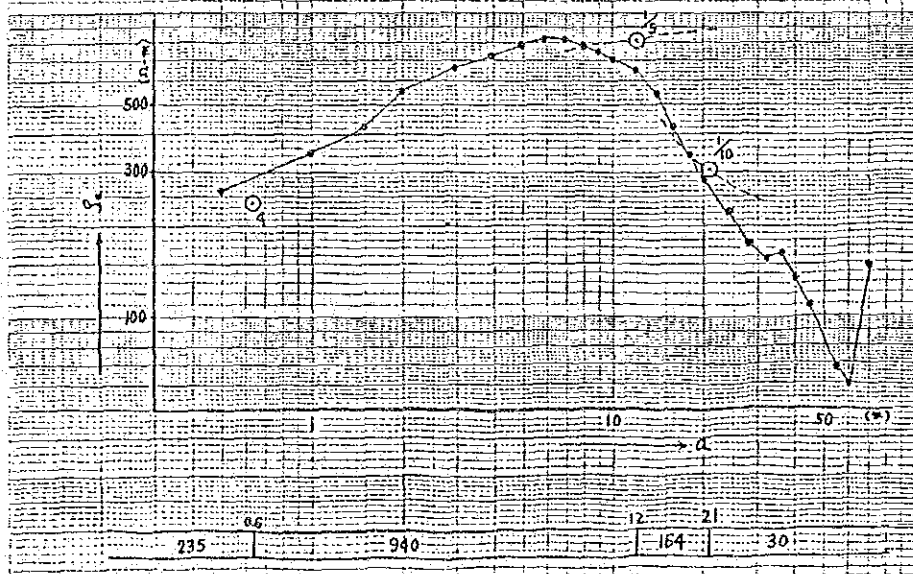


Fig. C-4 Hydrogeological Map

E-1



E-2



E-3

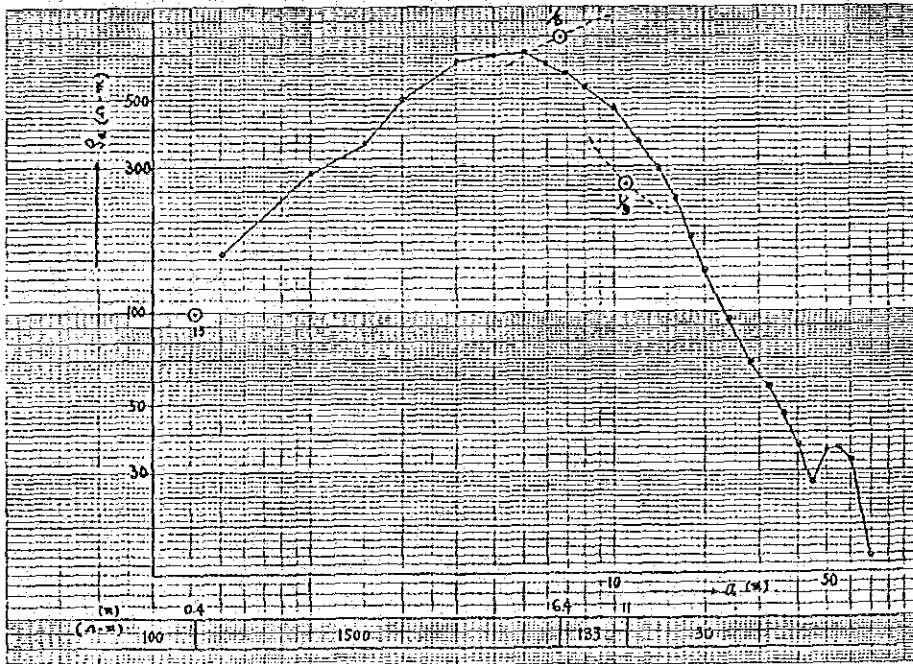
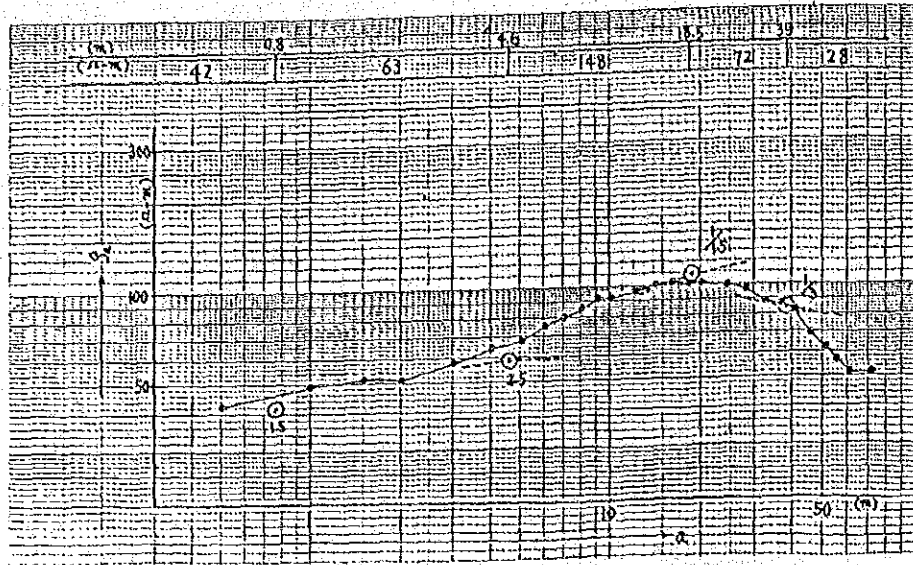
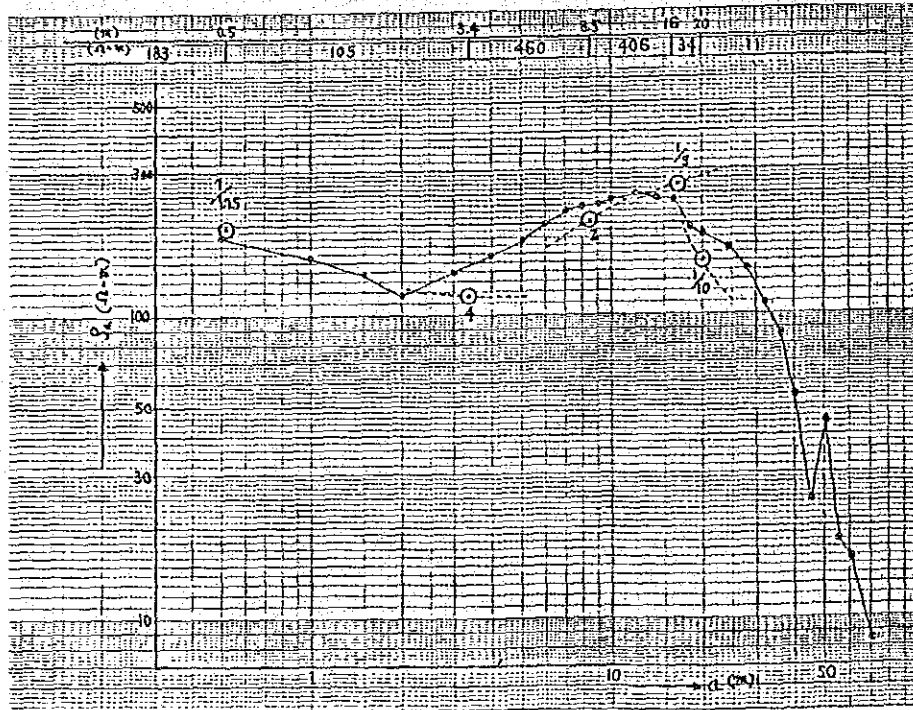


Fig. C-5 Interpretation Curve (1)

E-4



E-5



E-6

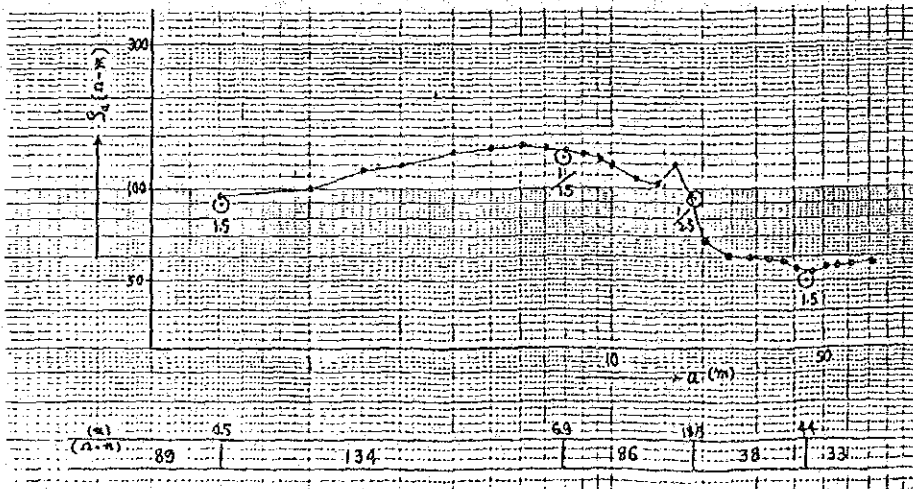
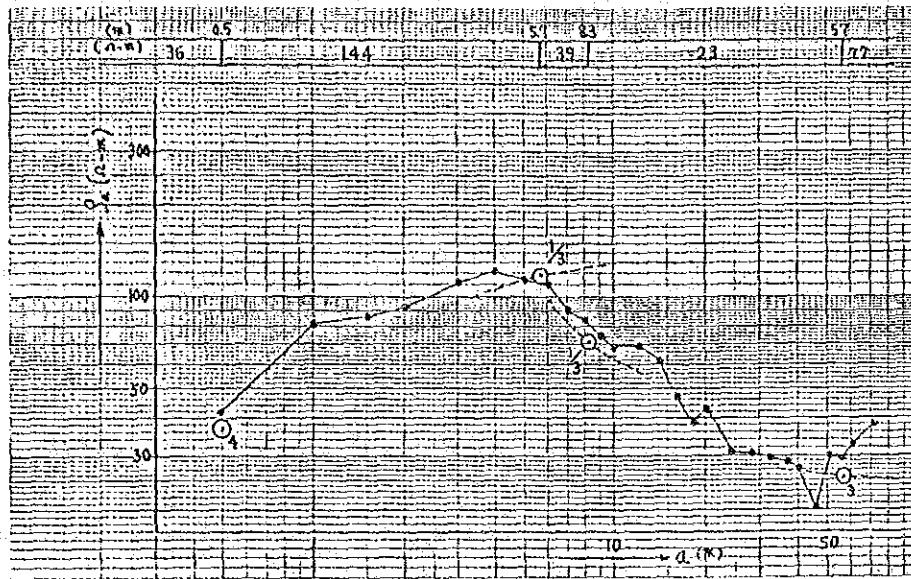
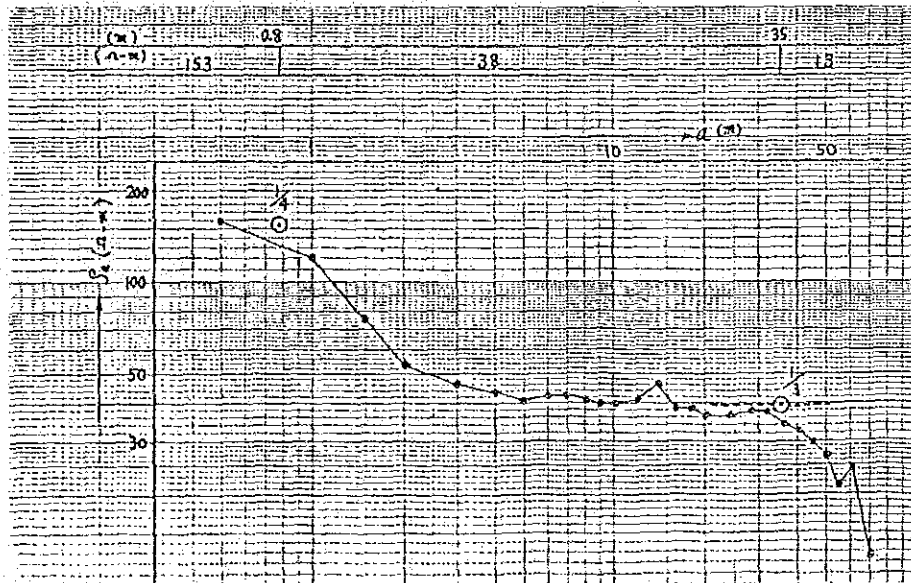


Fig. C-5 Interpretation Curve (2)

E-7



E-8



E-9

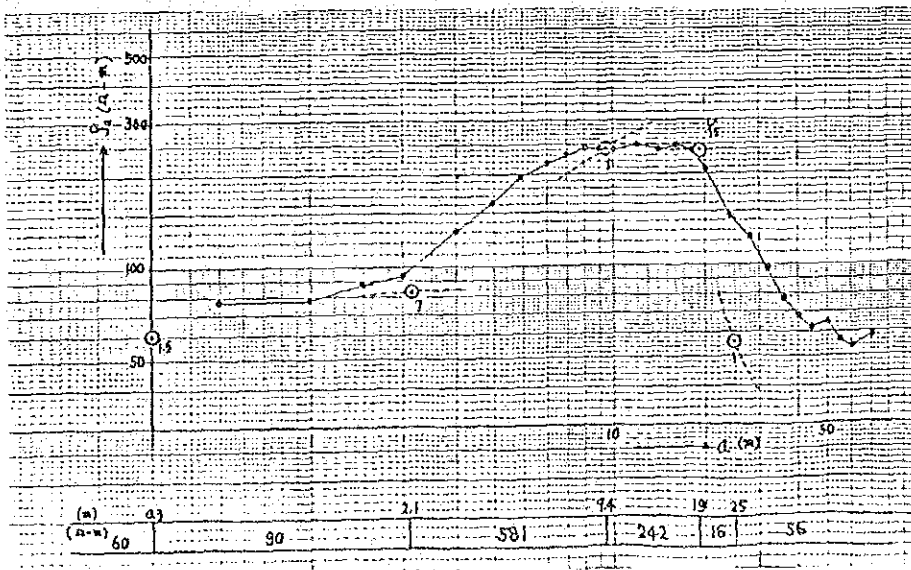
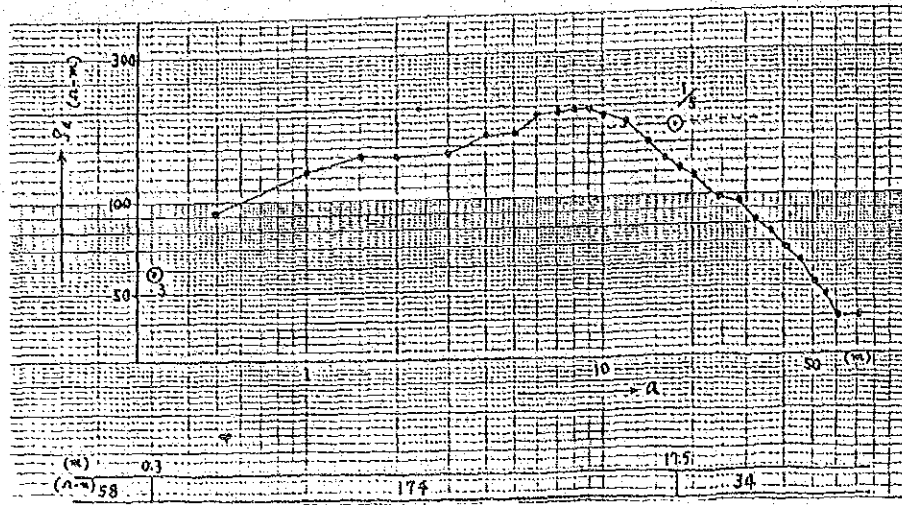
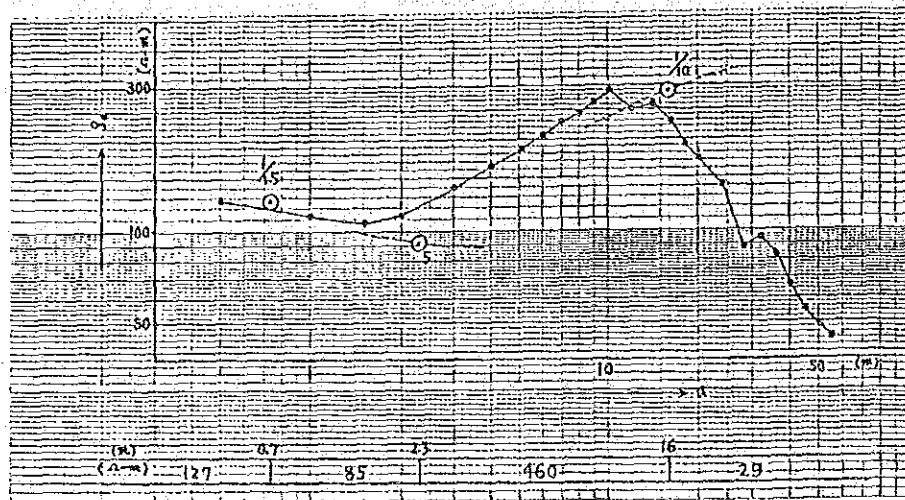


Fig.C-5 Interpretation Curve (3)

E-10



E-11



E-12

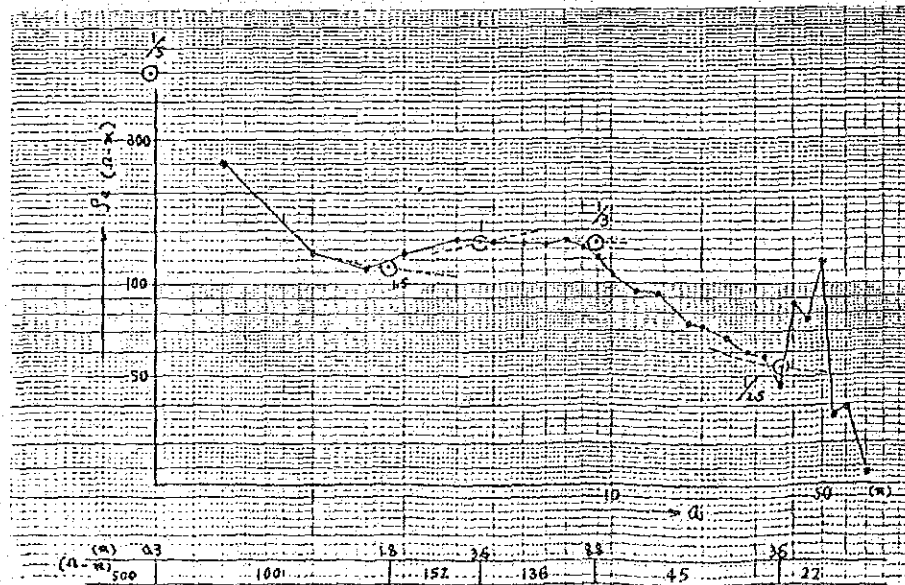
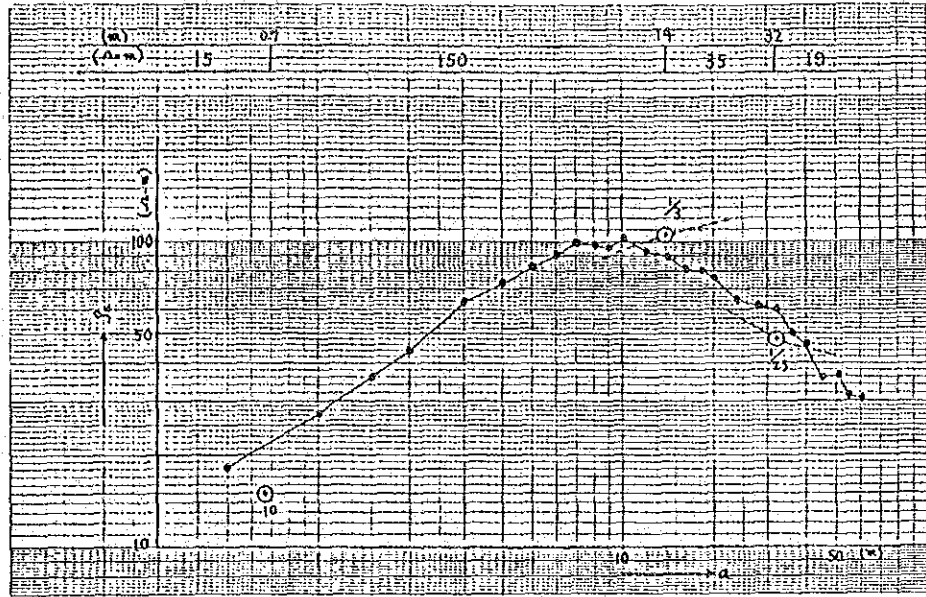
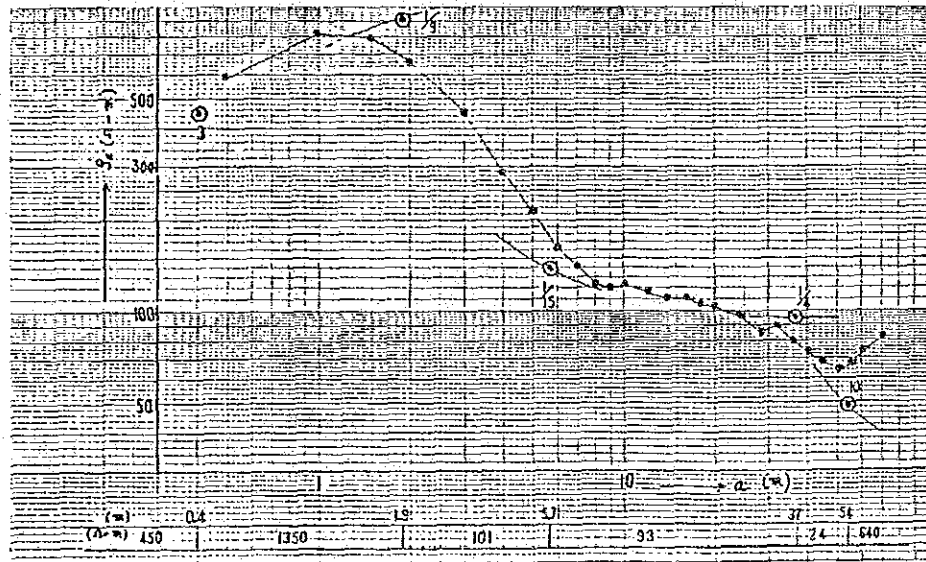


Fig. C-5 Interpretation Curve (4)

E-13



E-14



E-15

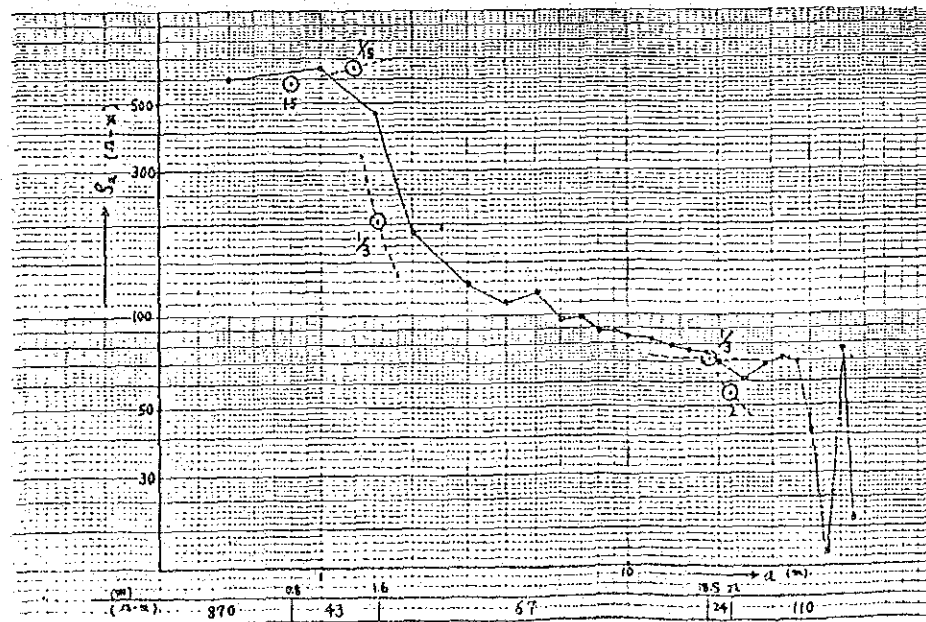
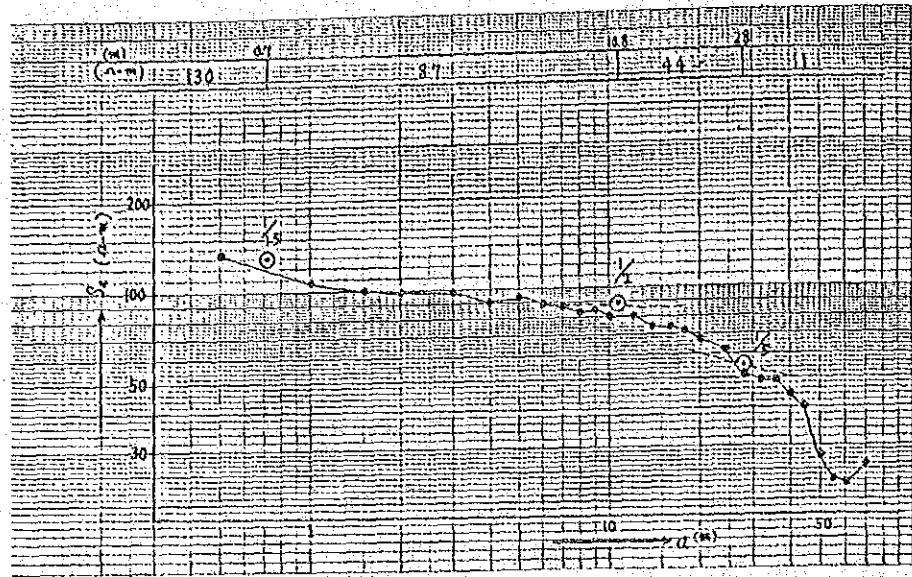
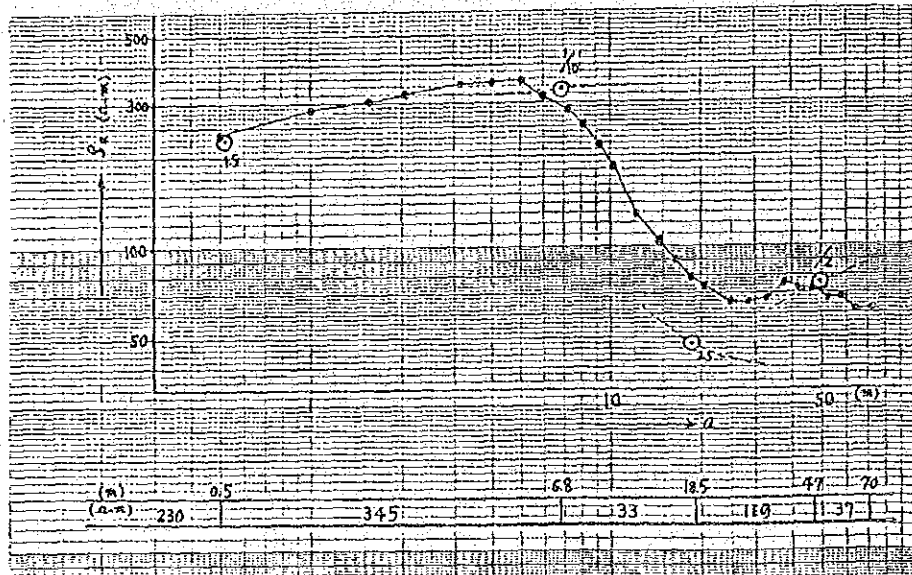


Fig. C-5 Interpretation Curve (5)

S-1



S-2



S-3

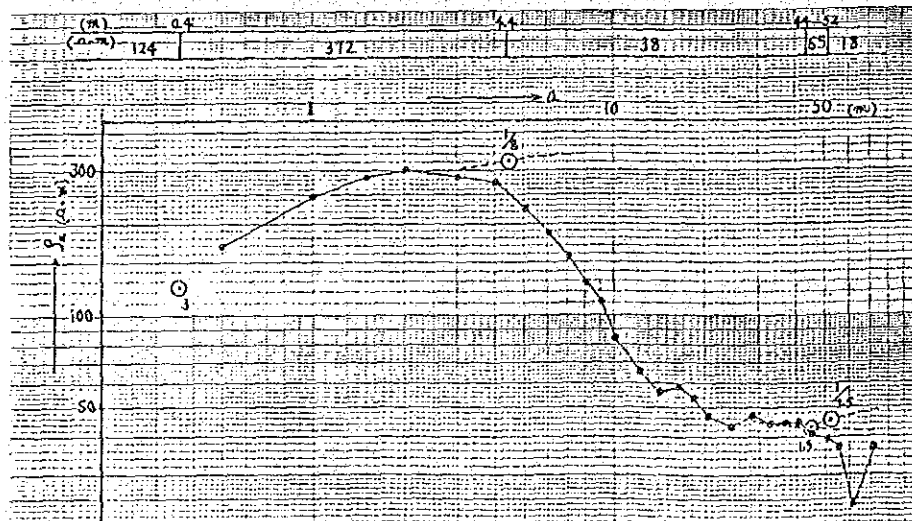
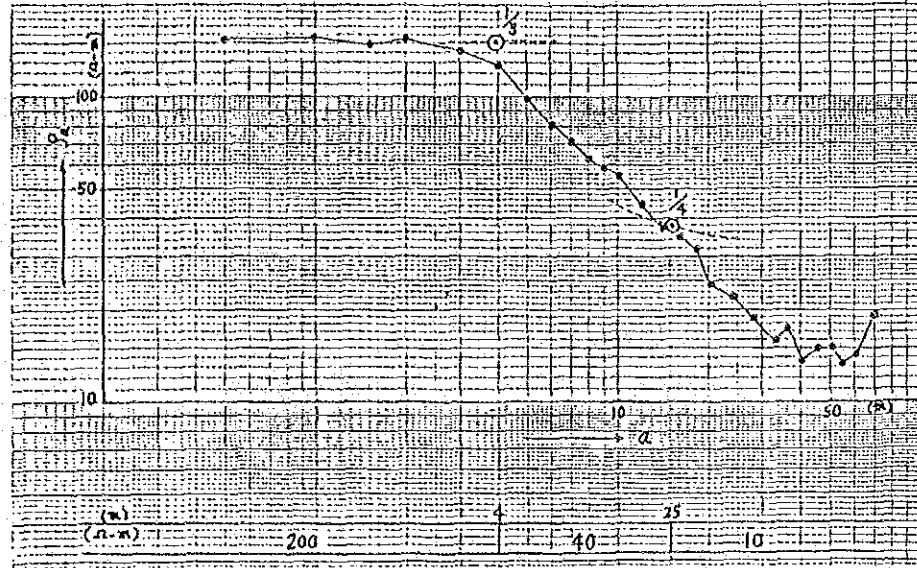
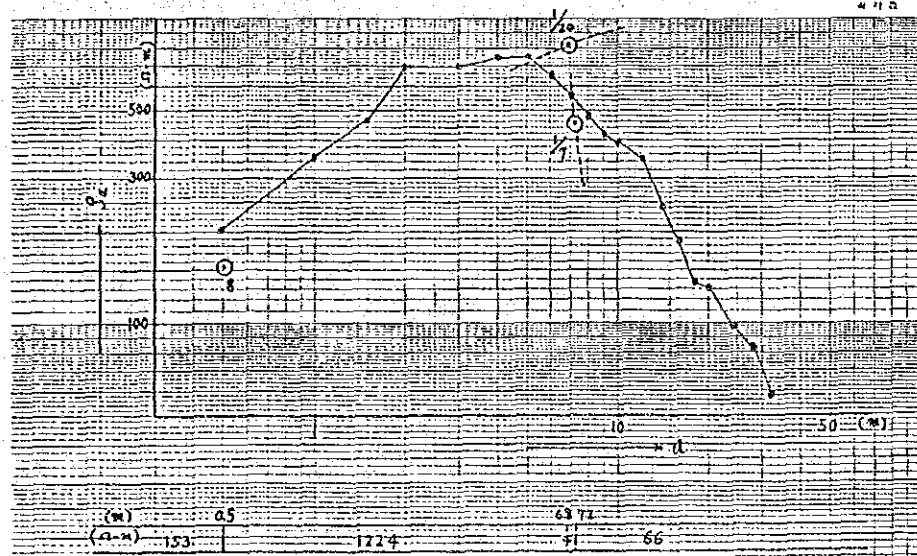


Fig. C-5 Interpretation Curve (6)

S-4



S'-1



S'-2

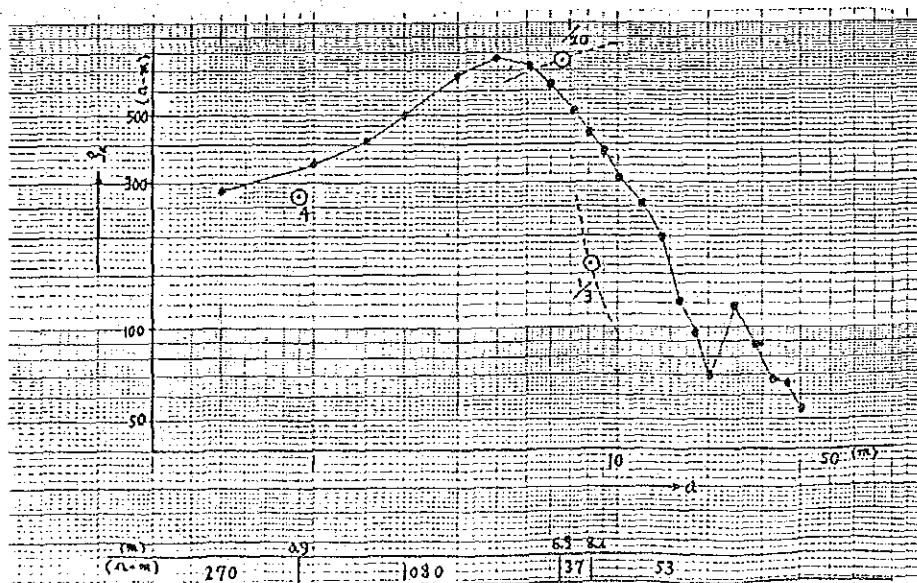
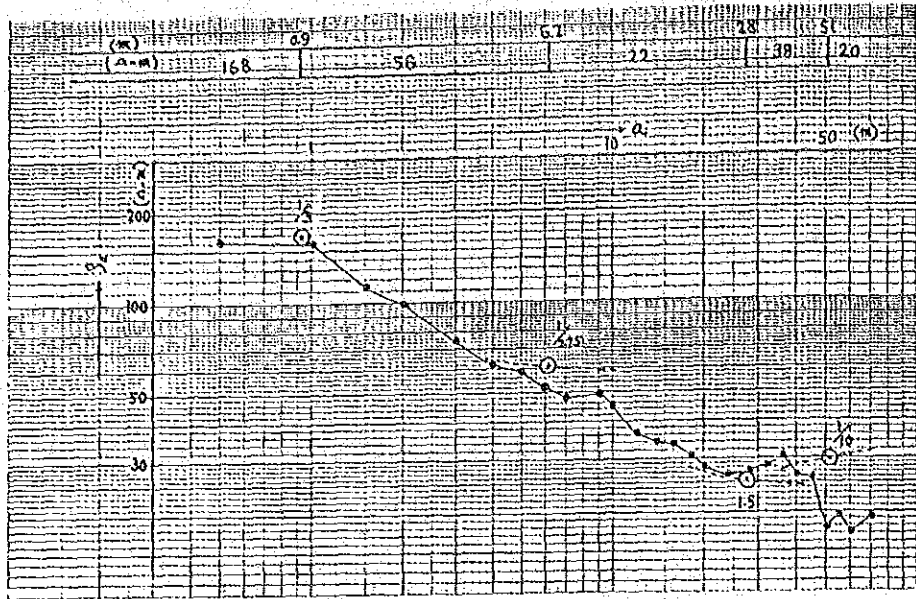


Fig. C-5 Interpretation Curve (7)

S'-3



S'-4

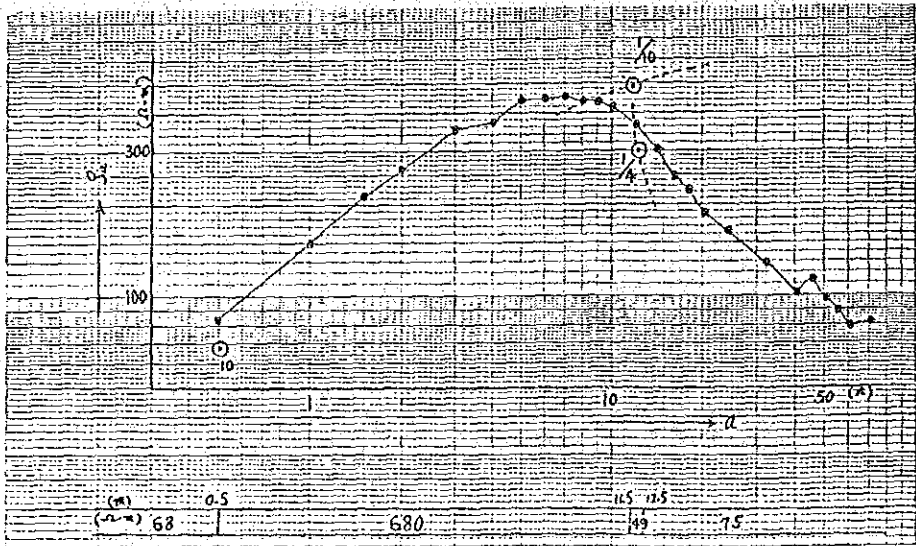


Fig. C-5 Interpretation Curve (8)

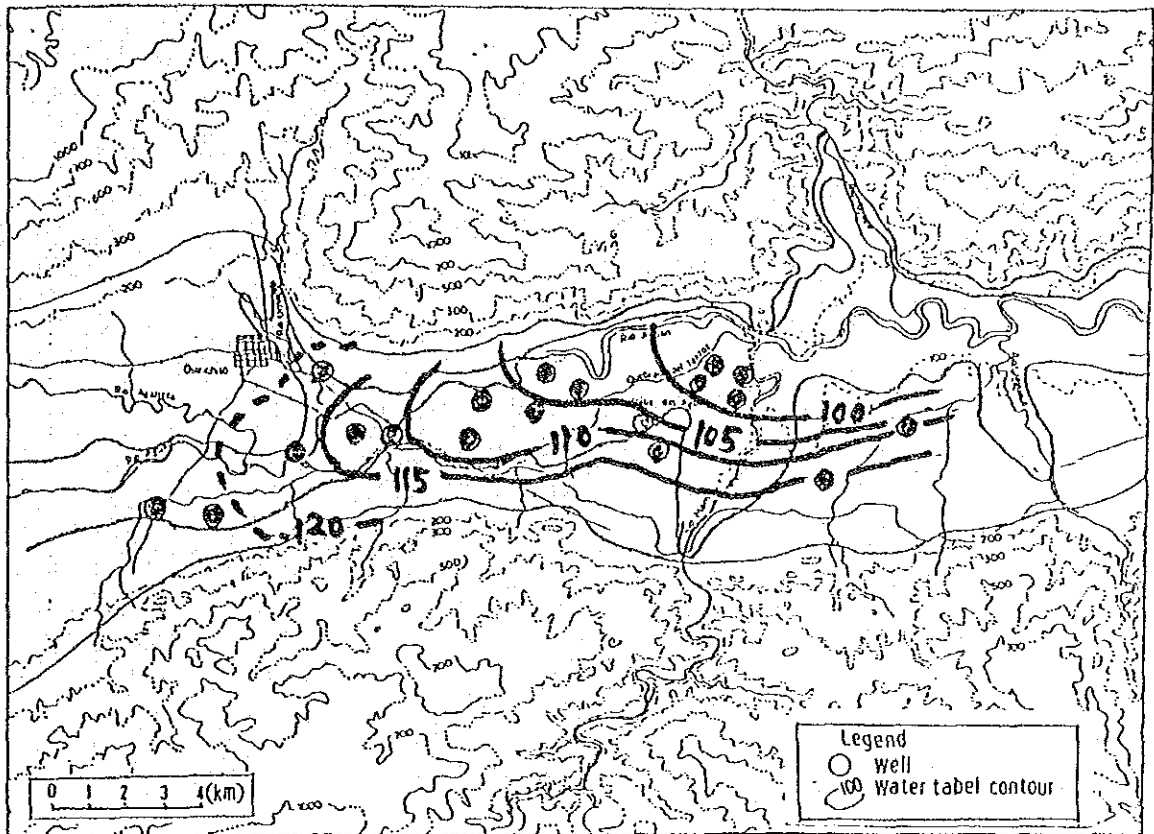
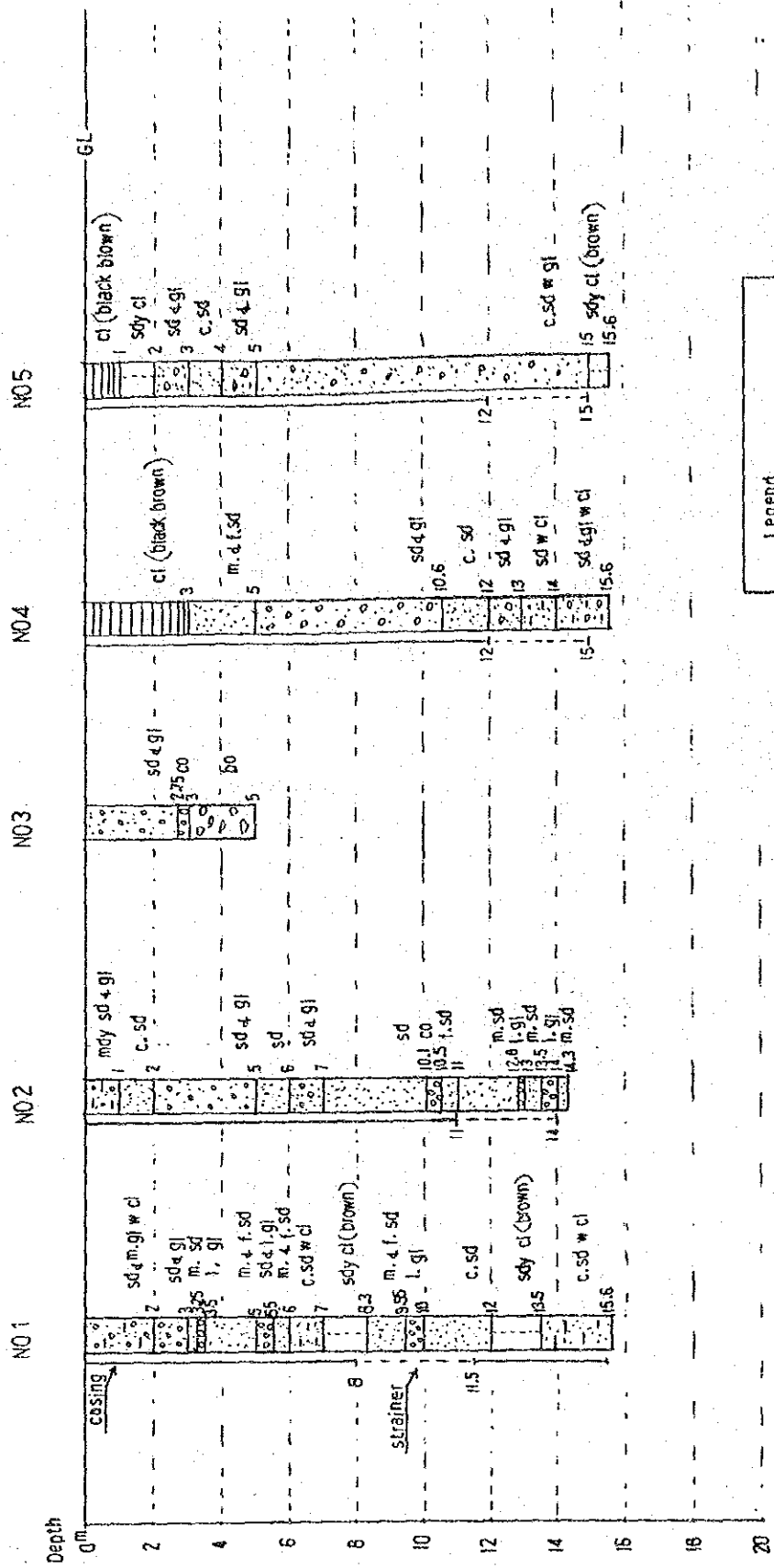


Fig. C-6 Water Table Contours



Legend

- cl ... clay
- sd ... sand
- gl ... gravel
- sd & gl ... sandy
- mdy ... muddy
- c ... coarse
- m ... medium
- f ... fine
- l ... large
- co ... cobble
- bo ... boulder
- w ... with
- s ... small

Fig. C-7 Geological Log of Boring

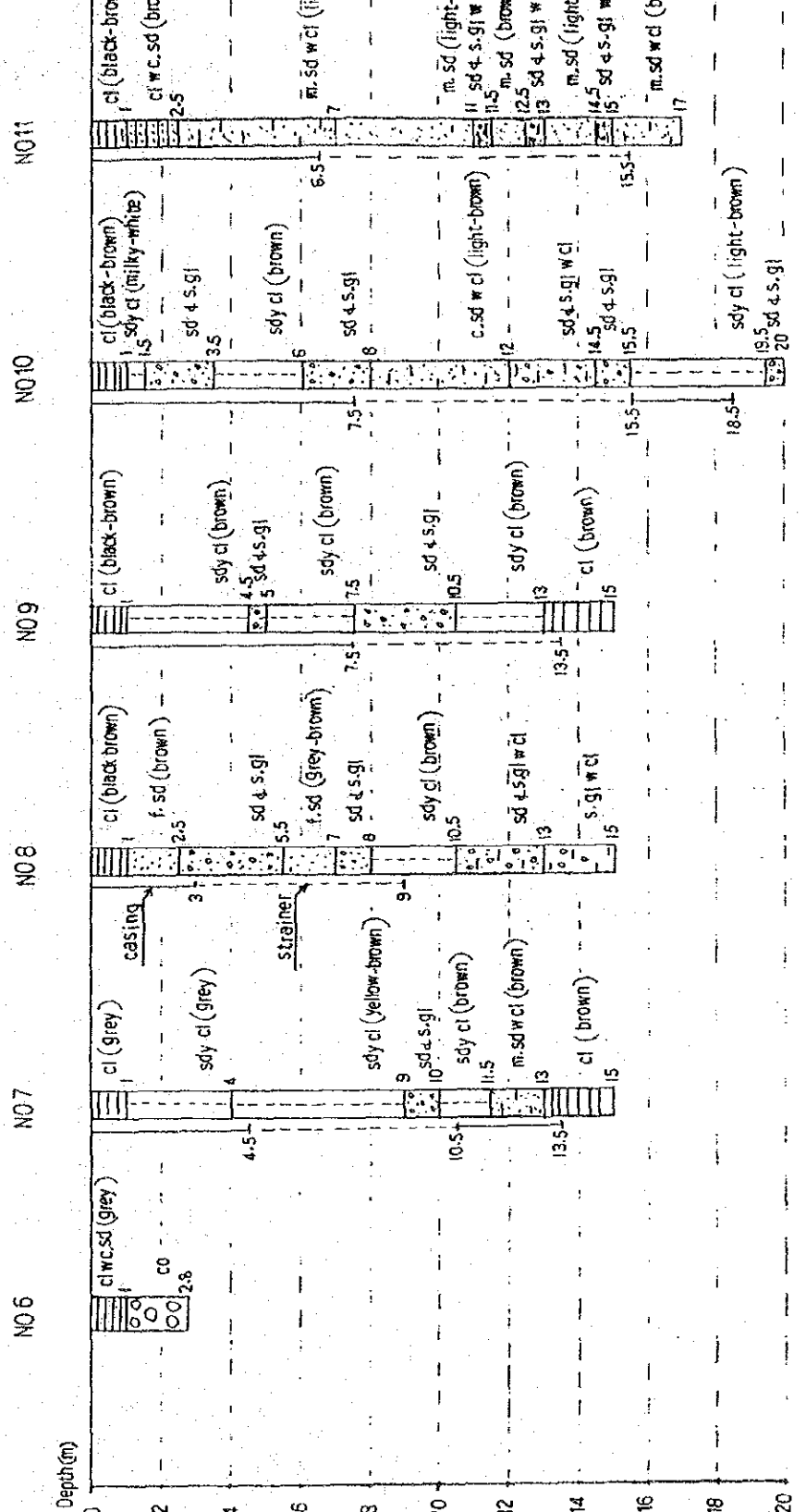


Fig. C-8 Geological Log of Boring

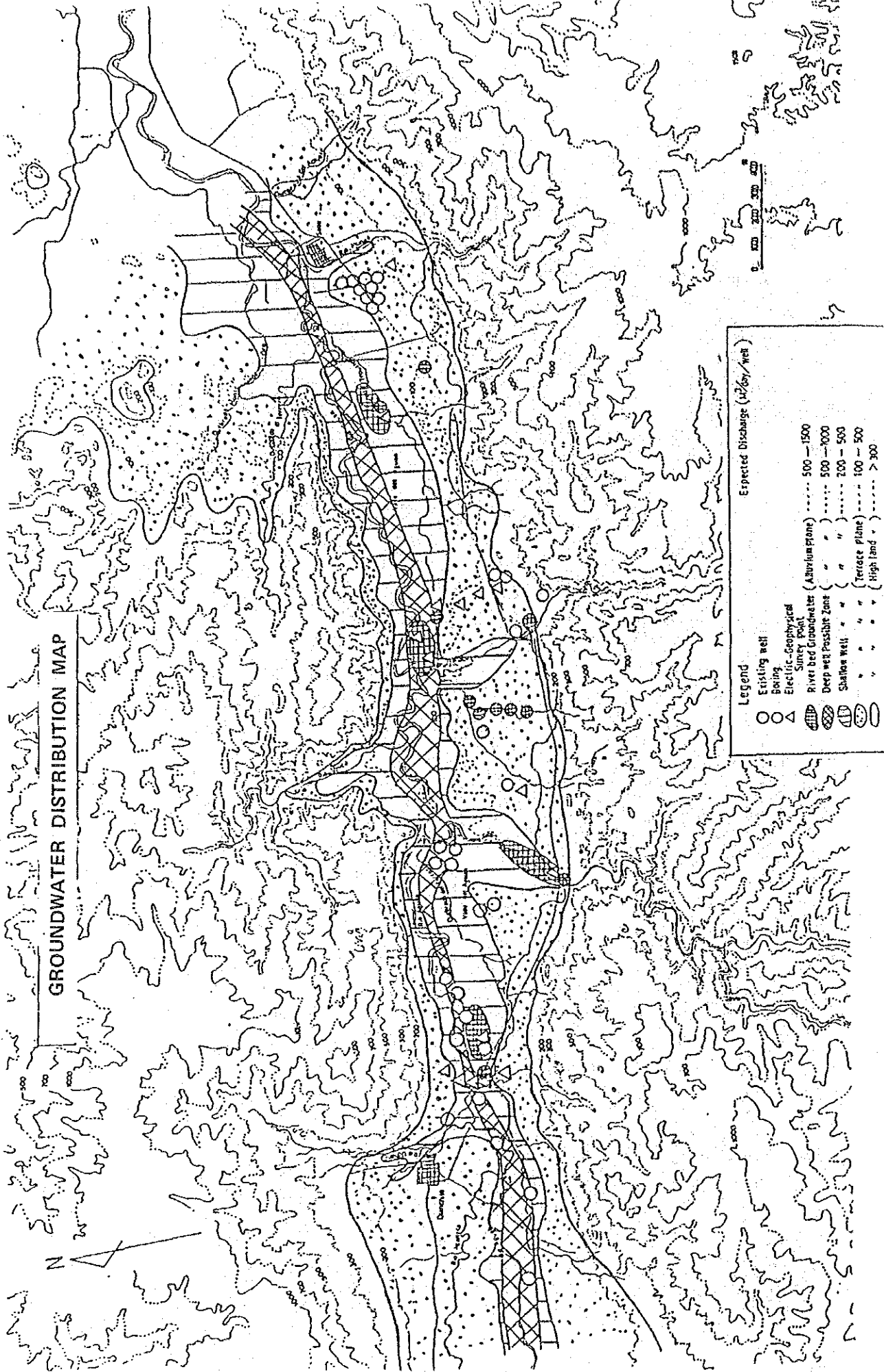


FIG. C-9 Groundwater Distribution Map.

(1)	PH	6.0 - 7.5	(6)	EC (Salinity density)	0.3MV/CM
(2)	COD	< 6 ppm	(7)	Heavy metal kinds	
(3)	SS	< 100 ppm		AS	< 0.05 ppm
(4)	DO	< 5 ppm		ZN	< 0.5 ppm
(5)	TN	< 1 ppm		CU	< 0.02 ppm

Table C-1 Agricultural Water Standard for Rice

Point No.	1 layer	2 layer	3 layer	4 layer	5 layer	6 layer	Remarks
E - 1	0 - 0.7 87	0.7 - 2.0 435	2.0 - 11.3 120	11.3 - 50.0 25	50 - 65 44	65 - 70 16	No.1 boring point
E - 2	0 - 0.6 235	0.6 - 12.0 940	12.0 - 21 164	21 - 70 30			No.2
E - 3	0 - 0.4 100	0.4 - 6.4 1500	6.4 - 11 133	11 - 70 30			No.3
E - 4	0 - 0.8 42	0.8 - 4.6 63	4.6 - 18.5 148	18.5 - 39 72	39 - 70 28		No.4
E - 5	0 - 0.5 183	0.5 - 3.4 105	3.4 - 8.5 460	8.5 - 16 406	16 - 20 34	20 - 70 11	No.5
E - 6	0 - 0.5 89	0.5 - 6.9 134	6.9 - 18.5 85	18.5 - 44 38	44 - 70 33		
E - 7	0 - 0.5 36	0.5 - 5.7 144	5.7 - 8.3 39	8.3 - 57 23	57 - 70 77		
E - 8	0 - 0.8 153	0.8 - 35 38	35 - 70 13				
E - 9	0 - 0.3 60	0.3 - 2.1 90	2.1 - 9.4 581	9.4 - 19 242	19 - 25 16	25 - 70 56	
E - 10	0 - 0.3 58	0.3 - 17.5 174	17.5 - 70 34				
E - 11	0 - 0.7 127	0.7 - 2.3 85	2.3 - 16 460	16 - 55 29			
E - 12	0 - 0.3 500	0.3 - 1.8 100	1.8 - 3.6 152	3.6 - 8.8 136	8.8 - 36 45	36 - 70 22	
E - 13	0 - 0.7 15	0.7 - 14 150	14 - 32 35	32 - 60 19			
E - 14	0 - 0.4 450	0.4 - 1.9 1350	1.9 - 5.7 101	5.7 - 37 93	37 - 54 24	54 - 70 640	No.11 boring point
E - 15	0 - 0.8 870	0.8 - 1.6 43	1.6 - 18.5 67	18.5 - 22 24	22 - 70 110		
S - 1	0 - 0.7 130	0.7 - 10.8 87	10.8 - 28 44	28 - 70 11			
S - 2	0 - 0.5 230	0.5 - 6.8 345	6.8 - 18.5 33	18.5 - 47 119	47 - 70 30		
S - 3	0 - 0.4 124	0.4 - 4.4 372	4.4 - 44 38	44 - 52 65	52 - 70 18		
S - 4	0 - 4 200	4 - 25 40	25 - 70 10				
S' - 1	0 - 0.5 153	0.5 - 6.8 1224	6.8 - 7.2 41	7.2 - 32 65			
S' - 2	0 - 0.9 270	0.9 - 6.5 1080	6.5 - 8.2 37	8.2 - 40 53			
S' - 3	0 - 0.9 168	0.9 - 6.2 56	6.2 - 28 22	28 - 51 38	51 - 70 20		
S' - 4	0 - 0.5 68	0.5 - 11.5 680	11.5 - 12.5 49	12.5 - 70 75			

Note: ⊙ good ○ common (but excluded above 5 m depth)

Table C-2 Electric-Geophysical Survey Analysis

Table C-3 Relation Between Resistance and Geology

Geology		Resistance		Hydrogeology
		Alluvium	Terrace	
Quaternary	Gravel	$\Omega \cdot m$ 133 - 1500	$\Omega \cdot m$ 174 - 1224	Major equifer
	Gravel with clay	105 - 120	134 - 150	Aquifer
	Coarse sand	72 - 90	86 - 101	"
	Fine sand	33 - 63	40 - 67	Small aquifer
	Clay	11 - 29	22 - 39	Aquitard
Tertiary and Puleozoic	Case Yook	16 - 30	10 - 640	Aquitard

Note: Standard value of water quality is set up as $250 \mu\Omega/cm$ for alluvium plain and $300 \mu\Omega$ for terrace.

Table C-4 Features of Wells for Standard Fruits Co. (at Coysles)

Location	Well No.	Depth	Diameter	Discharge	Remarks
Naranjo - Palo Verde	1	20 m	12 inch	1040 l/m	
	2	20	10		
	3	7	36	1701	
	4	30	12	2646	
	5	30	15	3024	
	6	45	12	-	
	7	22	36/8	624	
	8	32	8	1040	
	9	22	36	302	Abandoned
	10	28	8	1040	
	11	53	10	945	
	12	45	-	-	
	13	14	36/8	378	Abandoned
	14	54	8	1134	
	15	75	12	-	
	16	6	36	378	
	17	50	8	624	
	18	30	8	1134	
	19	45	8	-	
	20	9	36	-	Abandoned
	21	47	10	1323	
Cayo	22	24	8	945	
	23	38	8	-	
	24	38	8	-	
	25	24	8	-	
	26	28	8	945	
Trojas-Limones	27	43	8	567	Abandoned
	28	123	12/10	1701	
	29	66	8	756	
	30	42	8	624	
	31	51	8	945	
	32	42	8	1134	
	33	66	8	378	
	34	48	8	-	
Rosario	35	48	8	-	
	36	45	8	-	
	37	22	8	-	
	38	-	8	-	

APPENDIX D: SOILS

I DESCRIPTION OF TYPICAL SOIL PROFILE
(Colors are for the moist soil)

1. Soil Classification : Fine Texture, Well Drained Alluvium (Ab)
- Parent Material : Gravel
- A₁ 0 - 7 cm Brownish black 2, 5 YR (3/1) loam
Moderate fine blocky structure
Common vesicular pores; many coarse roots
Wavy boundary.
- B₁ 7 - 12 cm Dark brown 10 YR (3/4) sandy loam
Weak fine blocky structure
Common vesicular pores; many coarse roots
Wavy boundary.
- B₂ 12 - 24 cm Brown 10 YR (4/4) sandy loam
Weak fine blocky structure
Common vesicular pores; common fine roots
Wavy boundary.
- B₃ 24 - 76 cm Dark brown 10 YR (3/4) loam
Moderate blocky structure
Common vesicular pores; common fine roots
Wavy boundary.
- C 76 cm - Brown 10 YR (4/4) sand
No structure
Many coarse irregular pores; Few fine roots.
2. Soil Classification : Aguan Clay Loam (Ag)
- Parent Material : Gravel
- A 0 - 8 cm Brownish black 10 YR (3/2) clay loam
Moderate fine granular structure
Common vesicular pores; many coarse roots
Wavy boundary.
- B₁ 8 - 28 cm Dark brown 10 YR (3/3) loam
Moderate fine angular blocky structure
Many fine vesicular pores; many medium roots
Wavy boundary
- B₂ 28 - 59 cm Brown 17.5 YR (4/3) loam
Moderate fine blocky structure
Many fine vesicular pores; many fine roots
Wavy boundary.
- B₃ 59 cm - Brown 10 YR (4/4) sandy loam
Moderate fine subangular blocky structure
Many fine vesicular pores; fine roots.

3. Soil Classification : Tepusteca Loam (Te)
- Parent Material : Tuff
- A 0 - 25 cm Black 10 YR (1.7/1) loam
 Moderate fine granular structure
 Common fine vesicular pores; many coarse roots
 Wavy boundary.
- B₁ 25 - 29 cm Black 7.5 YR (2/1) silty clay loam
 Weak fine blocky structure
 Common fine vesicular pores; many coarse roots
 Wavy boundary.
- B₂ 29 - 48 cm Dark reddish brown 5 YR (3/2) silty clay loam
 Weak fine blocky structure
 Common fine vesicular pores; many fine roots
 Wavy boundary.
- B₃ 48 cm - Dark brown 10 YR (3/3) sandy loam
 No structure
 Common fine vesicular pores; fine roots.
4. Soil Classification : Olanchito Sandy Loam (O1)
- Parent Material : Gravel
- A 0 - 16 cm Brownish black 7.5 YR (3/2) sandy loam
 Weak fine granular structure
 Many fine vesicular pores; many coarse roots
 Smooth boundary.
- B₁ 16 - 25 cm Brownish black 7.5 YR (3/2) sand
 Weak fine granular structure
 Many fine vesicular pores; coarse roots
 Smooth boundary.
- B₂ 25 - 46 cm Dark reddish brown 5 YR (3/3) sandy loam
 Weak fine granular structure
 Many fine vesicular pores; few fine roots
 Smooth boundary.
- B_c 46 cm - Brownish black 7.5 YR (3/2) sand
 No structure
 Many coarse vesicular pores; few fine roots.

5. Soil classification : Ilanga Sandy Clay (I1)
- Parent Material : Gravel
- A 0 - 11 cm Dark brown 10 YR (3/3) sandy clay
Moderate fine granular structure
Common fine vesicular pores; many fine roots
Wavy boundary.
- B₁ 11 - 16 cm Dark brown 10 YR (3/4) sandy clay loam
Weak fine blocky structure
Common fine vesicular pores; few fine roots
Wavy boundary
- B₂ 16 - 40 cm Brown 7.5 YR (4/6) sandy clay loam
Weak fine blocky structure
Common fine vesicular pores; few fine roots
Wavy boundary.
- B₃ 40 - 63 cm Brown 10 YR (4/6) sandy loam
Weak fine blocky structure
Common fine vesicular pores; very few fine roots
Wavy boundary.
- B_c 63 cm - Brown 7.5 YR (4/4) loamy sand
No structure;
Common coarse vesicular pores; very few fine roots

6. Soil Classification : Taujica Clay Loam (Tj)
- Parent Material : Gravel
- A 0 - 10 cm Brownish black 10 YR (3/2) silty clay loam
Moderate fine blocky structure
Common fine vesicular pores; many coarse roots
Wavy boundary.
- B₁ 10 - 22 cm Brown 7.5 YR (4/3) silty clay loam
Moderate fine blocky structure
Common fine vesicular pores; common medium roots
Wavy boundary.
- B₂ 22 - 41 cm Brown 7.5 YR (4/4) loam
Moderate fine subangular blocky structure
Common fine vesicular pores; common medium roots
Wavy boundary.

- B₃ 41 - 62 cm Dull redish brown 5 YR (4/4) sandy loam
Moderate fine subangular blocky structure
Common fine vesicular pores; few medium roots
Wavy boundary.
- B_c 62 cm - Brown 7.5 YR (4/6) loamy sand
Weak fine subangular blocky structure
Common fine vesicular pores; few fine roots.
7. Soil Classification : Jahuaca Clay Loam (Ja)
Parent Material : Gravel
- A₁ 0 - 18 cm Dark brown 7.5 YR (3/3) clay loam
Moderate fine blocky structure
Many fine vesicular pores; many coarse roots
Wavy boundary.
- B₁ 18 - 30 cm Dark brown 7.5 YR (3/4) clay loam
Moderate fine blocky structure
Many fine vesicular pores; many fine roots
Wavy boundary.
- B₂ 30 - 62 cm Brown 7.5 YR (4/4) clay loam
Moderate fine blocky structure
Many fine vesicular pores; many fine roots
Wavy boundary.
- B₃ 60 cm - Brown 7.5 YR (4/3) clay loam
Moderate fine blocky structure
Many fine vesicular pores; few fine roots.
8. Soil Classification : Fine Texture, Poorly Drained Alluvium (Am)
Parent Material : Gravel
- A₁ 0 - 17 cm Black 19 YR (2/1) silty clay loam
Weak medium granular structure
Many fine vesicular pores; many fine roots
Smooth boundary.
- B(g) 17 - 33 cm Olive brown 2.5 Y (4/4) silty clay
Moderate subangular blocky structure
Many fine vesicular pores; few fine roots
Smooth boundary.
- G 33 cm - Gray 7.5 Y (5/1) silty clay
Moderate subangular blocky structure
Many fine vesicular pores; very few fine roots

Table D-1 Summary of Aerial Photograph Interpretation

Unit	Location	Slope Form	Slope Dip	Land Use	Drainage	Composition	Color
Crest Slope	Crest	Convex	0° ~ 15°	Woodland, Grassland	Very Good	Bedrock and Weathering Layer	Woodland: Black ~ Gray Grassland, Wasteland: Gray ~ White
Mountainside Slope	Mountainside		0° ~ 15°	Woodland, wasteland Farmland, Housingland	Very Good		Woodland: Black ~ Gray Wasteland: Gray ~ White
Piedmont Slope	Piedmont		0° ~ 15°	Woodland, Wasteland Farmland, Housingland	Good	Bedrock (or very thin Gravel, Sand and Silt Layer)	Woodland: Black ~ Gray Wasteland, Farmland: Gray ~ White
Steep	The slope of Mountains and Hills	Convex and Concave	15° <	Woodland, Wasteland	Very Good		Woodland: Black ~ Gray Wasteland: White
Rock Plateau	The Circumference of Lowland, Valley and Coast		3° >	Farmland, Woodland, Wasteland, Housingland, Paddy Field	Good	Bedrock (or very Thin Gravel, Sand and Silt Layer)	Farmland: Gray ~ White
Sandy Gravel Plateau					Very Good	Thick Sandy Gravel Layer	Paddy: Grayish ~ Dark
Volcanic Ash Plateau	The Circumference of Volcano		3° >	Farmland, Woodland, Wasteland Housingland, Paddy Field	Good	Volcanic Ash, Volcanic Sandy Gravel	Dark Gray ~ Grayish White
Karst Plateau			8° >	Farmland, Woodland, Wasteland	Good	Calcite	Grayish White
Lava Plateau	The Circumference of Volcano		8° >	Farmland, Woodland, Wasteland	Good	Lava	Black ~ Gray Black ~ Dark Gray
Cliff			30° < 15° >	Woodland, Wasteland, Desertland Farmland, Woodland, Wasteland, Housingland, Paddy Field	Good	Gravel, Sand	
Alluvial Fan	Piedmont	Convex					
Flood Plain	Lowland		8° >	Paddy Field, Wet Land	A Little Poor	Sand, Silt, Clay	Autumn, Winter, Spring: Dark Gray
Delta	Estuary		3° >	Paddy Field, Wet Land	Poor	Silt, Clay	Summer: Gray ~ Grayish White
Coastal Plain	Coast		8° >	Farmland, Paddy Field, Wasteland	A Little Poor	Sand, Gravel, Silt	
Embankment	Along new and Former River Channel		8° >	Farmland, Woodland, Housingland Paddy Field	Good	Sand, Silt, Clay	
Bar	Along Former Bank		8° >	Farmland, Woodland, Housingland	Good	Sand (Gravel)	
Former River Channel	Along Former River		3° >	Paddy Field, Wet Land	Poor	Sand, Silt, Clay	Dark Gray
River Basin	Along River		15° >	Desertland, Wasteland	A Little Good	Gravel, Sand, Silt	White
Beach	Near Shoreline		8° >	Desertland, Beach	A Little Good	Sand, Gravel	Gray ~ White
Rocky Coast	Near Shoreline		8° >	Desertland	A Little Good	Rock	Dark Gray
Tidal Flat	Near Shoreline		3° >	Unusedland	Poor	Sand, Silt, Clay	Dark Gray ~ Gray
Banking Area	Lowland		0°	Housingland, Factory	Good	Artificial Deposit	Grayish White ~ White
Filling Up Reclamation	Former Water Area		1° >	Housingland, Factory	Good	Artificial Deposit	Grayish White ~ White
Reclaimed Water Area	Former Water Area		3° >	Paddy Field, Farmland	Poor	Sand, Clay	Dark Gray
Landslide Configuration	Mountainside, Piedmont			Paddy Field, Woodland, Housingland Wasteland	Poor	Clay, Mudstone	Gray
Form of Landslide			3° <	Desertland, Wasteland	Good		White
Colluvial Slope	Mountainside, Piedmont	Convex	20° >	Farmland, Woodland, Wasteland	Very Good	Angular Gravel, Sand	
Talus	Cliff	Convex	15° ~ 35°	Woodland, Wasteland	Very Good	Angular Gravel, Sand	White
Mudflow Configuration	Mountainside of Volcano			Wasteland, Woodland Farmland	Good	Angular Gravel, Round Gravel	
Debris Flow Configuration	Valley	Convex	20° <	Wasteland, Woodland, Farmland	Very Good	Block, Angular Gravel, Clay Silt	White
Wet Land	Lowland		1° >	Wasteland, Paddy Field	Very Poor	Clay, Muck, peat	Dark Gray
Peat Land	Lowland		1° >	Wasteland, Paddy Field	Very Poor		Dark Gray

Table D-2 Result of Chemical Analysis

(1) Profile Pit

Sampling Point Pit NO.	Item Depth	PH	EC mmho/cm	Humus %	NO ₃ -N mg/100g	P ₂ O ₅ mg/100g		K meq/100g	Ca meq/100g	Mg meq/100g	CEC meq/100g
						Bray	Truog				
1	Top Soil	6.1	0.026	2.2	0.6	4.5	1.8	0.4	7.4	1.3	12.0
	Sub Soil	6.4	0.024	0.7	0.8	5.4	5.5	0.4	6.4	0.4	17.8
2	Top Soil	7.1	0.046	10.0	0.5	10.0	21.2	0.1	17.1	1.7	16.0
	Sub Soil	7.6	0.089	9.2	0.9	9.2	6.5	0.3	32.8	1.5	17.0
3	Top Soil	6.8	0.150	1.8	3.0	12.5	36.0	0.6	17.9	3.0	23.3
	Sub Soil	6.8	0.200	1.0	2.2	9.5	33.0	0.3	17.1	0.8	17.9
4	Top Soil	6.2	0.016	4.6	0.7	2.2	0.5	0.1	6.1	2.4	16.3
	Sub Soil	6.4	0.016	0.3	3.0	8.0	1.0	0.3	7.5	2.3	20.2
5	Top Soil	6.8	0.047	2.8	1.0	3.5	5.0	0.4	14.6	2.4	22.7
	Sub Soil	7.0	0.022	0.3	1.0	4.9	2.2	0.4	7.3	1.2	17.5
6	Top Soil	6.9	0.037	4.1	0.6	3.5	2.0	0.1	19.3	2.8	27.9
	Sub Soil	7.4	0.023	1.2	1.0	2.2	1.5	0.3	13.2	0.3	15.2
7	Top Soil	6.4	0.037	2.4	0.8	11.2	21.0	0.6	8.2	1.6	15.8
	Sub Soil	6.4	0.024	2.3	1.2	9.9	6.5	0.5	7.5	0.7	12.0
8	Top Soil	6.7	0.110	2.6	0.9	11.2	19.5	0.5	20.7	4.2	42.5
	Sub Soil	6.9	0.039	1.8	2.2	7.1	10.0	0.5	17.9	3.5	20.0
9	Top Soil	6.8	0.110	1.4	0.7	10.5	29.7	0.5	13.6	3.3	25.0
	Sub Soil	7.0	0.020	0.7	1.5	8.5	15.0	0.6	8.6	0.5	9.5
10	Top Soil	6.7	0.057	5.0	0.8	3.8	1.9	0.6	15.7	3.7	30.0
	Sub Soil	6.9	0.028	3.2	0.8	2.5	1.0	0.7	12.5	1.7	15.9
11	Top Soil	5.5	0.024	4.3	0.6	2.9	3.5	0.2	4.1	1.1	14.3
	Sub Soil	5.4	0.023	0.9	0.8	1.2	1.0	0.3	2.1	0.5	12.0
12	Top Soil	6.2	0.074	4.3	3.5	3.6	1.8	1.4	7.1	3.1	19.2
	Sub Soil	6.0	0.071	2.9	1.5	1.9	0.8	0.4	3.4	0.5	11.0
13	Top Soil	6.5	0.110	3.6	3.3	10.8	10.5	1.9	13.2	3.6	25.3
	Sub Soil	6.4	0.047	2.7	0.9	1.5	1.5	1.0	10.4	0.5	14.8
14	Top Soil	6.7	0.078	1.8	0.8	17.2	40.8	1.2	13.7	3.0	19.3
	Sub Soil	6.6	0.034	0.7	0.8	10.2	13.0	0.7	9.6	1.1	10.1
15	Top Soil	6.2	0.072	2.0	0.9	14.5	38.2	0.7	14.6	4.1	33.3
	Sub Soil	6.4	0.049	1.3	0.7	13.2	36.5	0.3	16.1	3.6	20.5
16	Top Soil	6.3	0.077	2.7	0.8	6.6	13.0	1.3	10.9	3.4	24.5
	Sub Soil	5.5	0.079	0.7	1.5	2.1	1.9	0.5	6.1	2.8	18.4
17	Top Soil	6.4	0.130	4.3	1.8	15.7	32.2	2.3	17.1	4.9	33.7
	Sub Soil	6.3	0.280	3.1	2.5	3.5	0.5	1.4	12.1	3.8	21.2
18	Top Soil	6.3	0.057	2.1	0.8	10.1	3.3	0.1	17.5	3.2	35.0
	Sub Soil	6.2	0.041	2.3	0.9	10.8	17.0	0.3	16.1	1.7	26.4
19	Top Soil	5.9	0.087	25.0	0.8	16.1	3.0	1.1	21.4	3.8	49.5
	Sub Soil	5.4	0.029	21.4	2.4	12.8	3.0	0.3	4.6	0.2	29.7

(2) Boring

Boring Number	Depth	PH	EC mmho/cm	Humus %	NO ₃ -N mg/100g	P ₂ O ₅ mg/100g		K meq/100g	Ca meq/100g	Mg meq/100g	CEC meq/100g
						Bray	Truog				
1	Top Soil	7.2	0.084	1.6	2.2	5.0	45.5	1.7	8.9	3.4	18.5
	Sub Soil	7.5	0.095								
2	Top Soil	6.9	0.030	2.3	2.5	7.5	4.0	0.7	8.2	1.3	26.5
	Sub Soil	7.7	0.024								
3	Top Soil	7.3	0.051	4.4	2.5	22.2	27.0	1.3	10.7	1.8	16.0
	Sub Soil	6.8	0.032	1.3	2.8	6.6	17.7	1.1	7.4	0.8	14.0
4	Top Soil	7.2	0.050	3.0	2.5	26.5	33.0	1.9	7.0	1.4	13.7
	Sub Soil	7.7	0.049								
5	Top Soil	6.5	0.043	3.0	2.9	9.8	4.5	1.1	6.8	0.5	13.2
	Sub Soil	6.2	0.037	2.4	3.5	4.2	3.0	1.0	7.5	0.6	11.3
6	Top Soil	6.9	0.034	1.9	3.5	9.0	3.2	0.9	4.1	0.2	10.7
	Sub Soil	6.8	0.038								
7	Top Soil	7.8	0.067	2.1	0.8	26.0	29.0	0.5	12.5	0.7	19.5
	Sub Soil	6.8	0.045								
8	Top Soil	6.9	0.090	3.1	1.4	30.8	39.0	1.1	17.5	0.5	24.7
	Sub Soil	7.5	0.064	1.4	0.7	8.3	15.0	0.3	17.8	1.3	17.8
9	Top Soil	6.8	0.071	4.6	0.9	19.0	21.0	1.1	10.4	2.9	24.8
	Sub Soil	6.9	0.042								
10	Top Soil	6.1	0.044	7.7	1.5	4.8	1.9	0.7	7.3	1.0	17.0
	Sub Soil	6.1	0.018	2.3	1.8	3.2	1.7	0.5	5.4	0.3	16.0
11	Top Soil	6.6	0.055	3.2	1.3	6.2	1.9	0.6	3.6	0.5	13.8
	Sub Soil	6.0	0.040								
12	Top Soil	6.6	0.057	2.4	2.2	4.9	3.0	1.1	6.1	1.1	13.2
	Sub Soil	7.1	0.032	2.3	2.5	5.1	20.5	1.0	5.4	0.6	16.0
13	Top Soil	6.4	0.051	1.4	1.0	16.6	1.0	0.6	10.0	1.1	15.0
	Sub Soil	6.4	0.024	1.1	2.2	11.2	13.0	0.3	6.4	0.6	11.7
14	Top Soil	6.7	0.085	2.3	1.9	32.2	28.5	0.9	13.9	1.3	18.9
	Sub Soil	6.6	0.034								
15	Top Soil	6.0	0.088	2.8	1.0	7.9	2.0	0.4	8.2	0.9	15.3
	Sub Soil	6.1	0.032	2.9	0.9	3.2	3.0	0.6	7.9	0.6	14.3
16	Top Soil										
17	Top Soil	6.5	0.063	5.2	1.0	20.9	15.0	1.1	13.9	2.8	28.5
	Sub Soil	6.5	0.026								
18	Top Soil	6.2	0.074	2.4	1.5	9.9	4.5	0.3	15.4	2.5	24.5
	Sub Soil	6.2	0.044	1.3	2.2	9.1	9.9	0.3	9.6	0.8	18.5
19	Top Soil	6.8	0.120	2.3	1.1	73.5	56.9	0.8	22.1	3.0	31.5
	Sub Soil	6.8	0.882								
20	Top Soil	6.3	0.110	2.9	2.5	43.2	45.0	0.6	17.9	2.4	37.3
	Sub Soil	6.6	0.036	1.2	1.5	10.7	23.0	0.3	18.0	2.3	22.0
21	Top Soil	6.3	0.052	1.3	1.0	10.5	5.2	0.6	10.9	1.7	22.6
	Sub Soil	5.8	0.045	1.5	0.9	8.5	6.7	0.3	5.3	1.3	10.4

Boring Number	Depth	PH	EC mho/cm	Humus %	NO ₃ -N mg/100g	P ₂ O ₅ mg/100g		K meq/100g	Ca meq/100g	Mg meq/100g	CEC meq/100g
						Bray	Truog				
22	Top Soil	5.5	0.063	5.1	3.7	3.2	0.2	0.5	4.3	1.0	19.8
	Sub Soil	5.4	0.013								
23	Top Soil	5.8	0.029	2.0	0.9	2.5	0.5	0.5	2.9	0.5	12.9
	Sub Soil	5.5	0.014								
24	Top Soil	6.3	0.040	4.3	2.1	7.8	10.0	1.0	8.2	1.3	16.5
	Sub Soil	5.4	0.021	1.7	0.8	1.2	1.5	0.3	1.1	0.5	7.5
25	Top Soil	5.5	0.014	2.6	2.0	9.6	2.5	1.0	4.1	1.2	17.8
	Sub Soil	6.4	0.015								
26	Top Soil	5.5	0.022	3.4	0.6	2.5	0.5	0.3	0.4	0.5	11.8
	Sub Soil	5.4	0.016	0.6	1.5	2.0	3.0	0.2	1.7	0.5	10.0
27	Top Soil	6.5	0.012	2.3	0.9	14.6	1.5	1.4	11.4	1.8	16.2
	Sub Soil	6.3	0.042								
28	Top Soil	6.2	0.014	10.8	1.9	48.5	7.0	1.7	15.4	4.7	48.0
	Sub Soil	6.2	0.038	11.3	1.9	16.9	1.5	0.4	12.5	1.7	34.0
29	Top Soil	6.1	0.068	2.7	0.9	37.5	20.2	1.1	6.9	0.8	20.8
	Sub Soil	6.2	0.034								
30	Top Soil	6.2	0.019	2.7	1.4	5.1	0.5	0.7	7.9	0.3	18.2
	Sub Soil	6.1	0.017								
31	Top Soil	6.0	0.058	23.2	1.2	43.6	17.0	1.2	15.4	3.8	48.5
	Sub Soil	6.2	0.055								
32	Top Soil	5.8	0.079	4.8	1.0	8.2	3.5	0.9	10.4	1.8	27.0
	Sub Soil	6.2	0.024								
33	Top Soil	5.7	0.064	7.7	0.8	7.5	2.2	1.5	8.9	1.3	23.3
	Sub Soil	5.7	0.048	8.7	1.5	6.9	1.0	0.8	8.7	0.5	23.0
34	Top Soil	5.9	0.029	23.6	0.8	8.4	0.5	1.2	5.0	0.4	48.0
	Sub Soil	6.0	0.023								
35	Top Soil	6.0	0.058	4.2	2.8	18.9	21.5	0.9	11.4	1.2	27.3
	Sub Soil	6.4	0.043								
36	Top Soil	6.4	0.074	4.0	2.2	16.3	12.0	1.7	7.5	2.5	21.6
	Sub Soil	6.8	0.055								
37	Top Soil	6.3	0.088	3.5	1.5	10.5	12.5	1.9	9.3	1.5	21.9
	Sub Soil	5.7	0.017	10.6	1.5	5.2	2.2	0.7	10.4	2.4	39.0
38	Top Soil	6.6	0.054								
	Sub Soil	5.6	0.013								
39	Top Soil	6.7	0.058	3.2	0.8	26.2	34.0	0.7	11.8	1.8	25.0
	Sub Soil	6.1	0.024								
40	Top Soil	6.4	0.160	4.4	1.2	40.9	48.5	1.5	15.7	2.8	30.5
	Sub Soil	6.3	0.070								
41	Top Soil	6.2	0.047	3.4	0.9	4.8	3.2	0.8	5.7	1.3	21.5
	Sub Soil	5.8	0.018								
42	Top Soil	6.1	0.052	6.0	1.0	5.6	4.5	0.3	5.9	0.6	19.0
	Sub Soil	5.4	0.014								
43	Top Soil	6.6	0.140	1.4	1.5	32.5	36.0	1.5	9.3	1.6	36.0
	Sub Soil	6.4	0.047								

Boring Number	Depth	PH	EC mmho/cm	Humus %	NO ₃ -N mg/100g	P ₂ O ₅ mg/100g		K meq/100g	Ca meq/100g	Mg meq/100g	CEC meq/100g
						Bray	Truog				
44	Top Soil	6.2	0.048	4.2	1.5	30.0	26.2	0.7	8.2	0.9	17.0
	Sub Soil	6.2	0.023								
45	Top Soil	7.1	0.047	3.9	1.0	21.5	29.0	1.1	9.3	1.0	20.3
	Sub Soil	6.4	0.044								
46	Top Soil	6.6	0.050	1.9	2.4	21.6	37.0	0.6	8.9	0.6	16.7
	Sub Soil	6.4	0.016								
47	Top Soil	6.8	0.160	4.8	2.4	21.2	23.5	1.8	13.2	4.3	30.0
	Sub Soil	6.4	0.024								
48	Top Soil	6.4	0.190	5.3	6.4	42.6	43.0	1.6	13.6	3.9	33.5
	Sub Soil	6.6	0.052								

APPENDIX E: AGRICULTURE

I. Land Use Plan for Case 5

In consideration of comments and observations by the Honduran Government, besides four alternatives set out in the Main Report, another alternative plan of land use (Case 5) is evaluated its feasibility. This plan is summarized in Table E-I-1, and it has been concluded that, in view of its EIRR and FIRR inferior to those of Case 4, this plan is not recommended.

Comparison of EIRR and FIRR between Case 4 and Case 5

	Case 4	Case 5
EIRR	13.00%	9.07%
FIRR	13.18%	12.21%

Table E-I-1 Land Use Plan for Case 5 compared with Case 4

Crop	Net return /ha (Lps.)	Case 4		Case 5		Increase/ Decrease (ha)
		Area (ha)	Net/return (Lps.)	Area (ha)	Net/return (Lps.)	
Maize:						
Primavera	1,500	1,890	1,899,450	790	793,950	-1,100
(Postrera)	(1,005)	(2,714)	(2,727,570)	(1,614)	(1,622,070)	(-1,100)
Rice	1,280	1,577	2,018,560	1,577	2,018,560	-
Beans						
Primavera	810	910	737,100	910	737,100	-
(Postrera)	(810)	(1,663)	(1,347,000)	(1,663)	(1,347,000)	-
Soy beans						
Primavera	720.5	600	432,300	600	432,300	-
(Postrera)	(720.5)	(600)	(432,300)	(600)	(432,300)	-
Cassava	1,007	221	222,547	221	222,547	-
Taro	2,336	200	467,200	200	467,200	-
Plantain	3,563	207	737,541	207	737,541	-
Orange (Agria)	3,799	130	493,870	130	493,870	-
Orange (Valencia)	3,799	-	-	1,100	4,178,900	+1,100
Cocoa	3,389.5	2,300	7,795,850	1,300	4,406,350	-1,000
Mango	3,698	300	1,109,400	300	1,109,400	-
Papaya	2,770	50	138,500	50	138,500	-
Other fruit tree	945	15	14,175	15	14,175	-
Pineapple	6,955	400	2,782,000	400	2,782,000	-
Tomato						
Primavera	1,738	300	521,400	300	521,400	-
(Postrera)	(1,738)	(300)	(521,400)	(300)	(521,400)	-
Oil Palm	1,443	-	-	1,000	1,443,000	+1,000
Primavera		9,100	19,369,893	9 100	20,496,793	-
(Postrera)		(5,277)	(5,028,300)	(4,177)	(3,922,800)	(-1,000)
Total		14,377	24,398,193	13,277	24,419,573	

* Note. In non-irrigated area, there is no difference in cultivated area between Case 4 and Case 5.

II. Domestic Agro-economy

1) Plantain

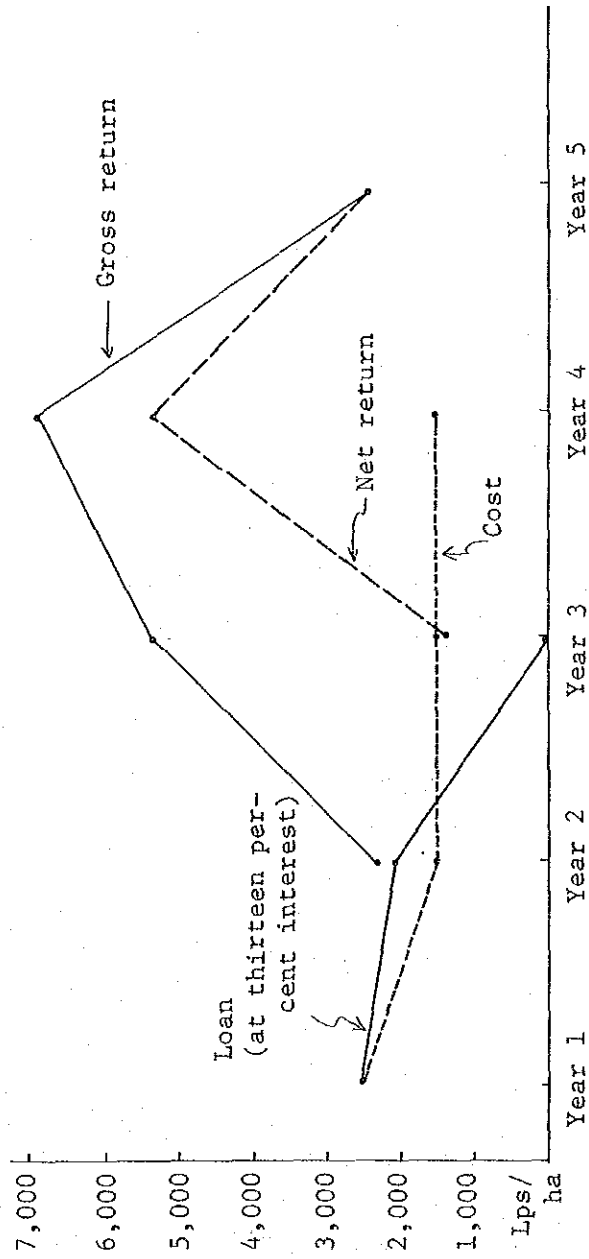


Fig. E-II-1 Calling in of Early Investment in Crop Cultivation/ha

2) Oranges

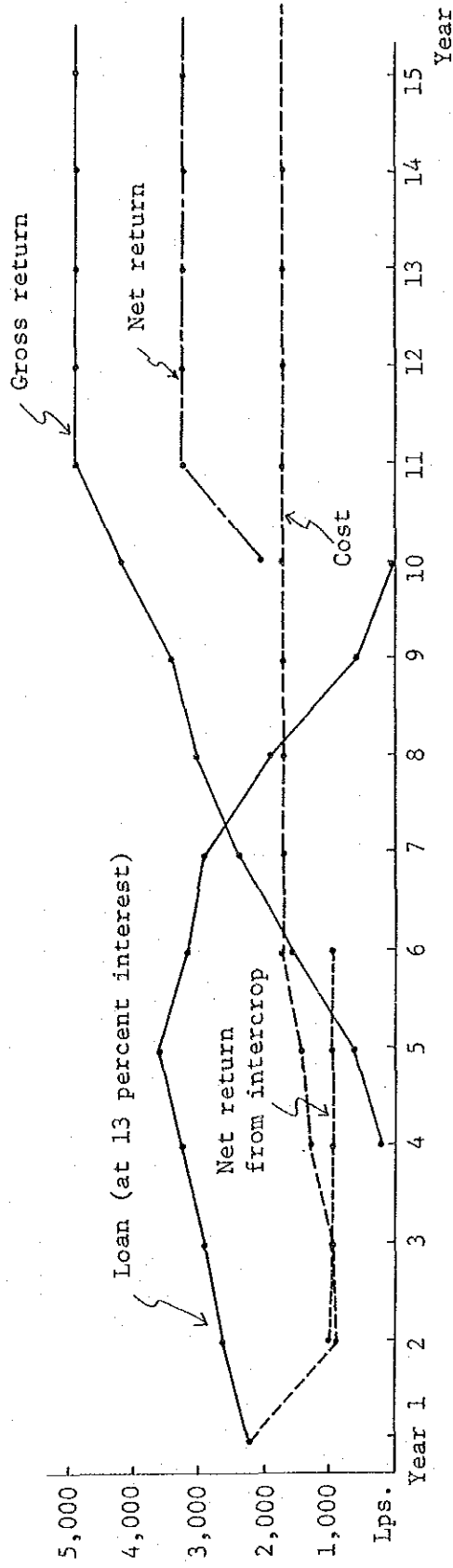


Fig. E-II-2 Calling in of Early Investment in New Crop Cultivation/ha

3) Cocoa

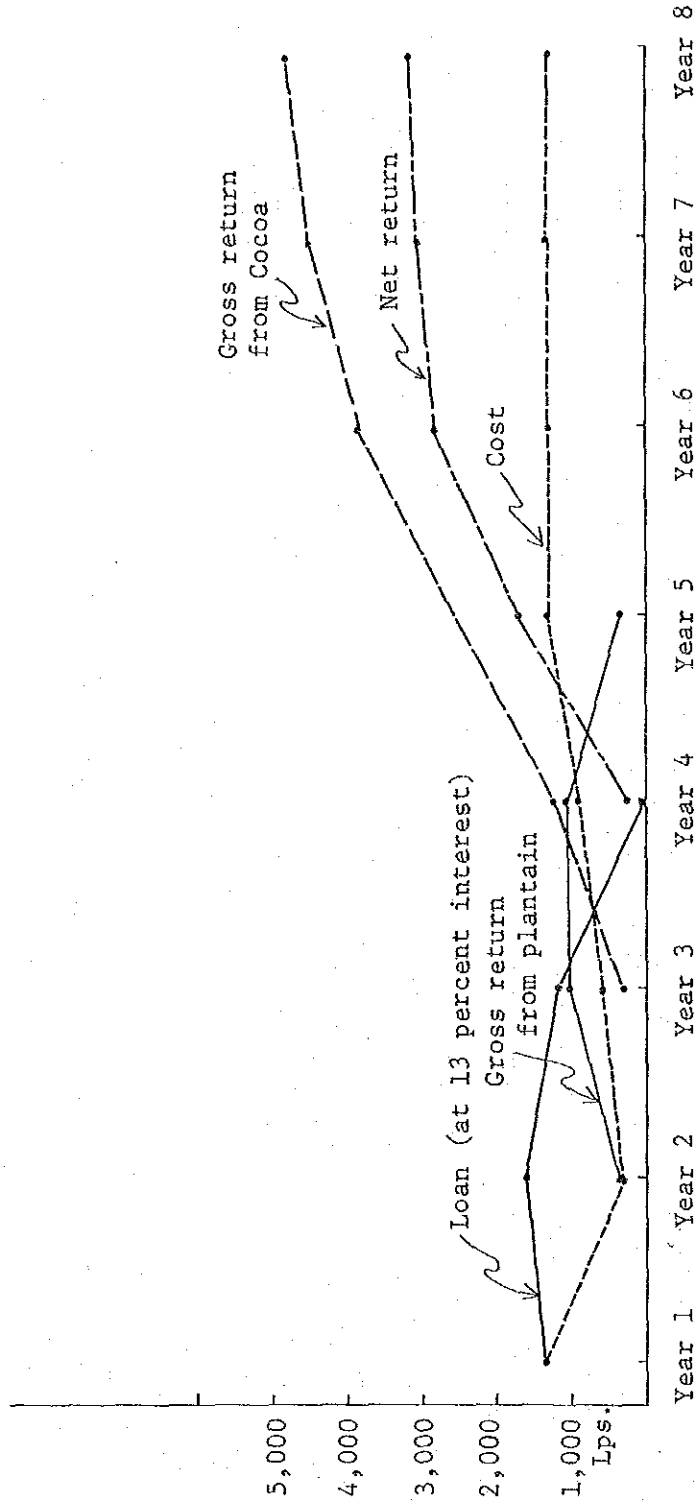


Fig.E-II-3 Calling in of Early Investment in New Crop Cultivation/ha

4) Mango

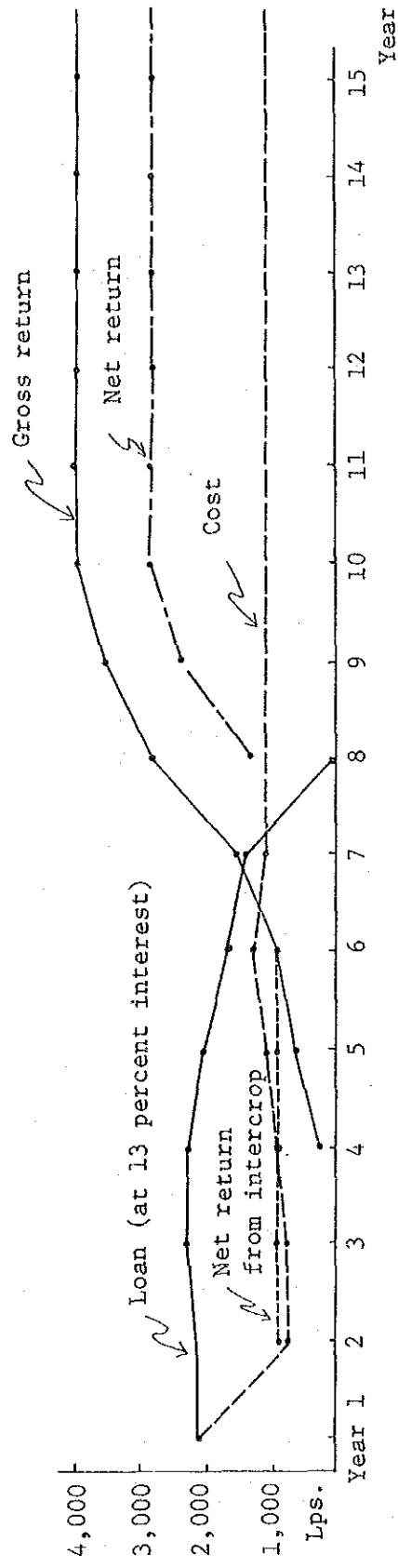


Fig. E-II-4 Calling in of Early Investment in New Crop Cultivation/ha

5) Papaya

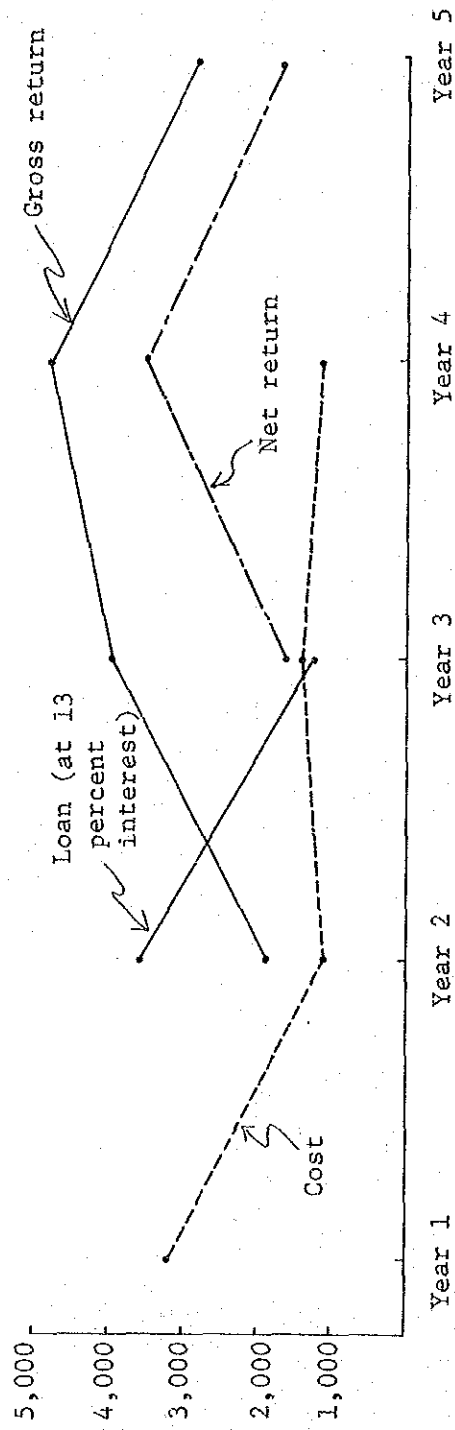


Fig. E-II-5 Calling in of Early Investment in New Crop Cultivation/ha

6) Pineapple

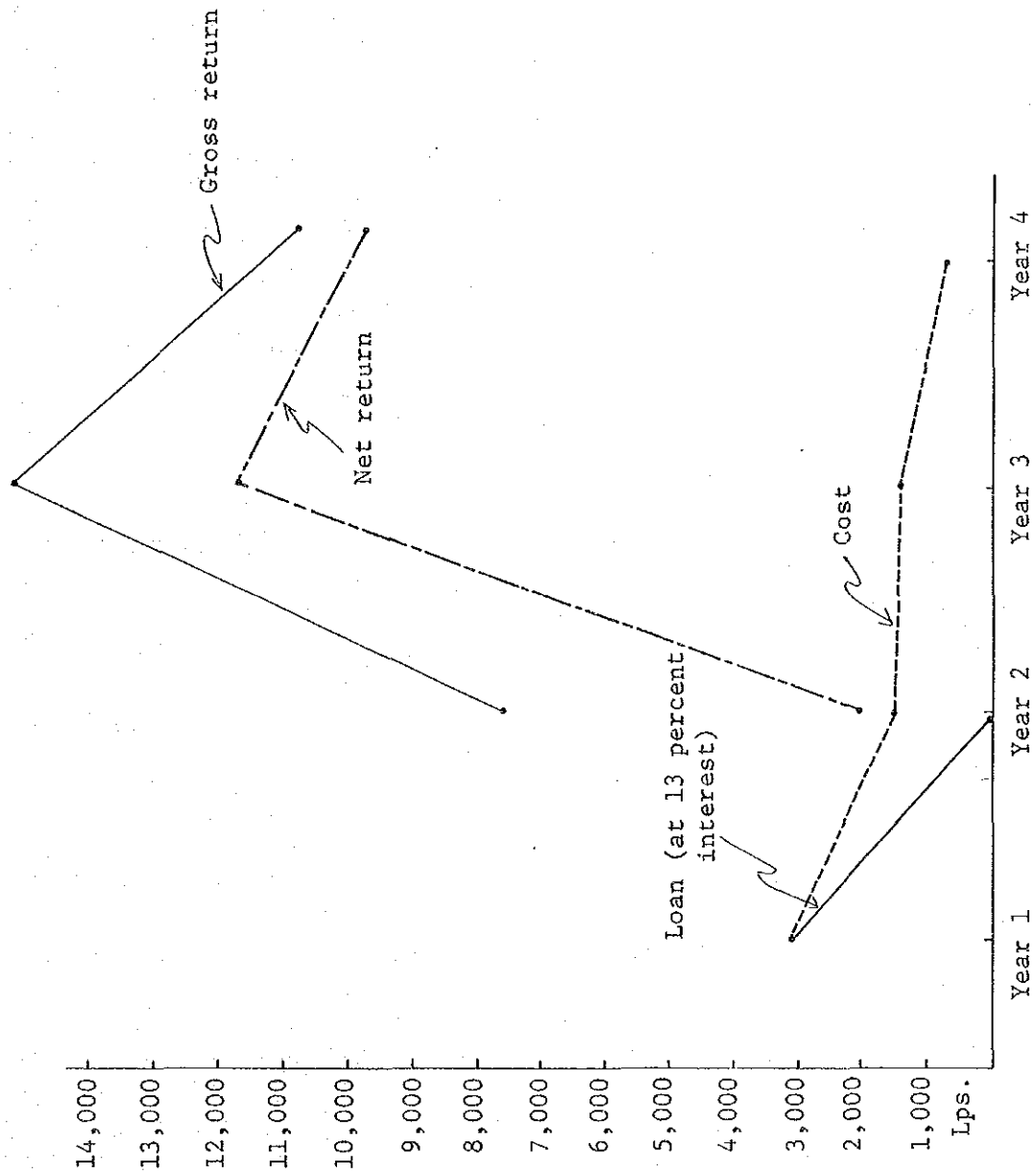
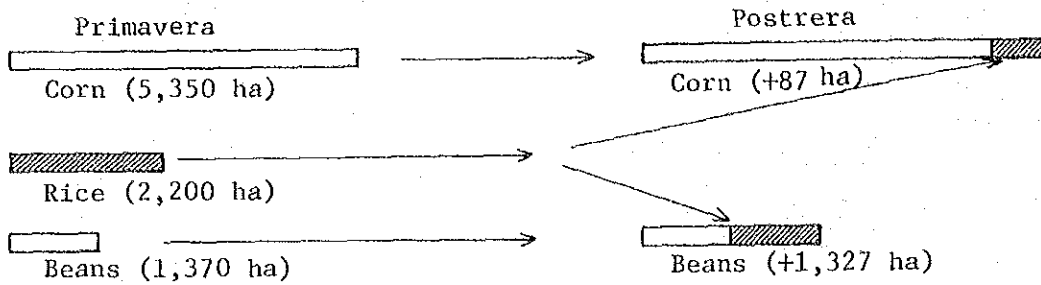
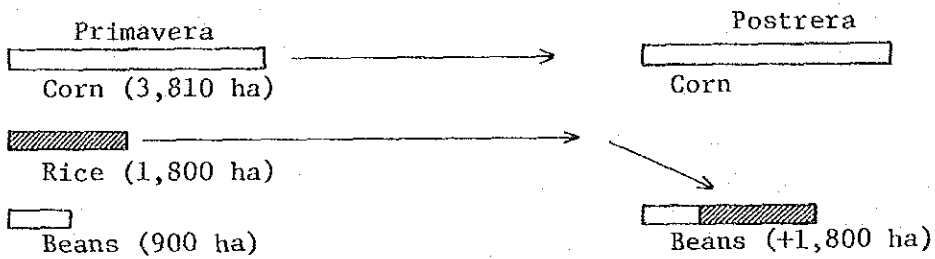


Fig. E-II-6 Calling in of Early Investment in New Crop Cultivation/ha

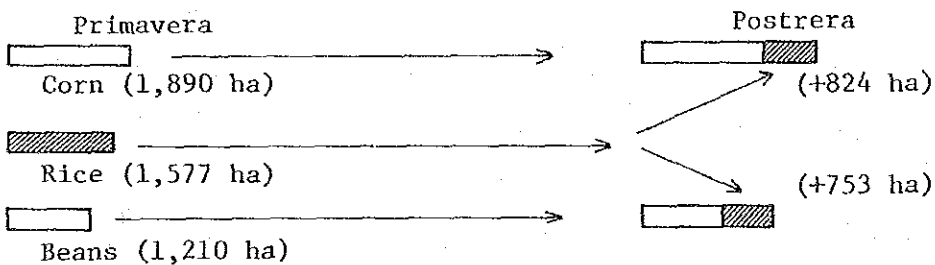
(CASE 1)



(CASE 2)



(CASE 3)



(CASE 4)

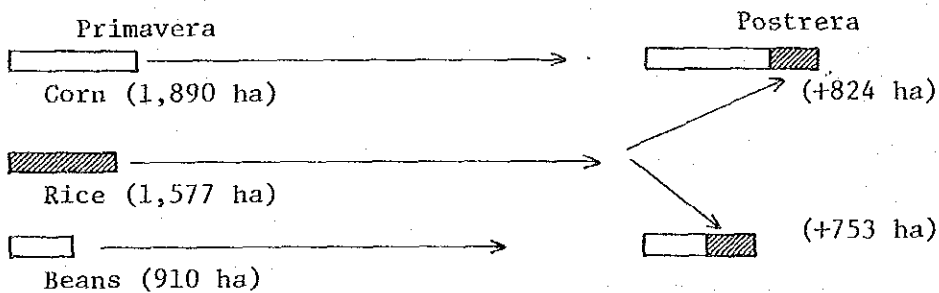


Fig. E-II-7 Succeeding Crop of Rice

Table E-II-1 Affectation of Land, Period:
January-December 1983

Unit: ha

Agrarian Region	Expropriations	Recuperations	Negotiations	Donations	TOTAL
NORTH	2,181	2,038	-	315	4,534
ATLANTIC LITTORAL	5,505	4,493	-	-	9,998
OCCIDENTAL	32	89	238	-	359
OCCIDENTAL CENTER	23	2,079	-	29	2,131
ORIENTAL CENTER	186	2,069	-	-	2,255
NORTH ORIENTAL	457	545	204	-	1,206
SOUTH	1,302	443	-	-	1,745
CENTRAL OFFICE	396	102	-	-	498
TOTAL	10,082	11,858	442	344	22,726
PERCENTAGE (%)	44.4	52.2	1.9	1.5	100

Source: Annual Report 1983. Division of Affectation and Adjudication of land.

Table E-II-2 Adjudication of Land According to the
Farmers Organization, Period: January-
December 1983

ORGANIZATION	AREA (HAS.)	NO. (GROUP)	NO. (MEMBER)	AREA FOR MEMBER (HAS.)
1. ANACH	5,379	76	1,528	
2. UNC	5,193	51	1,134	
3. FECORAH	666	8	457	
4. INDEPENDIENTE	4 234	47	934	
5. OFRANEHGH	2 241	3	443	
6. ALCONH	326	6	130	
7. UNCAH	389	7	117	
8. UHTAC	137	2	66	
9. ACAN	90	1	14	
10. UNCACOOP	122	3	40	
11. FRENACAINH	249	3	67	
TOTAL	19,016	207	4,930	3.86
(1982)	16,874	150	3,506	4.81

Source: Labour Report 1983. Division of Affectation and Adjudication of Land.

Table E-II-3 Areas Adjudicated to Cooperatives, Land Use and Number of Members in the Bajo Aguan Project as at 1st July, 1982

<u>Municipality</u>	<u>Sabá</u>	<u>Tocao</u>	<u>Trujillo</u>	<u>Sonoguera</u>	<u>Olanchito</u>	<u>Total</u>
Number of Cooperatives	14	23	35	6	13	91
Number of Initial Members	420	895	1,466	234	425	3,440
Number of Members, July 1982	471	1,477	1,213	301	616	4,078
Area Adjudicated (ha)	6,726	13,637	22,395	2,480	6,201	51,439
Cultivable Area (ha)	6,066	12,814	18,731	2,430	5,704	45,745
Cultivated Area (ha)	3,367	7,692	13,159	825	4,230	29,273
Palm	1,684	4,725	4,054	0	0	10,463
Grapefruit	278	642	0	0	0	920
Basic Grains	955	1,629	3,260	239	1,839	7,922
Pasture	302	663	5,138	440	2,331	8,874
Other, Unspecified	148	33	707	146	60	1,094

Source: INA Survey, 1982

Table E-II-4 Bank Loans and Discounts

	1981	%	1982	%	1983	%
I. AGRICULTURE & LIVESTOCK	343.3	23.5	398.7	24.1	465.6	24.3
II. INDUSTRY	324.8	22.2	408.2	24.7	485.9	25.3
III. SERVICES	190.1	13.0	208.8	12.6	256.8	13.4
IV. REAL ESTATE	313.0	21.4	353.3	21.3	381.6	19.9
V. COMMERCIAL	223.1	15.3	218.7	13.2	255.9	13.3
VI. CONSUMPTION	55.4	3.8	55.1	3.3	60.5	3.2
VII. OTHERS	12.2	0.8	12.9	0.8	13.1	0.6
TOTAL	1,461.9	100.0	1,655.7	100.0	1,919.4	100.0
			+13.3%		+15.9%	

Source: Boletín Estadístico, Marzo 1984

Table E-II-5 Distribution of Domestic Loan Market between Lending Institutions

	1981 December			1982 December			1983 December		
	C	D	A	C	D	A	C	D	A
I. AGRICULTURE & LIVESTOCK	57.1	42.9	0.0	57.0	43.0	0.0	58.0	42.0	0.0
Agriculture	49.3	50.7	0.0	50.4	49.6	0.0	52.5	47.5	0.0
Grains	37.9	62.1	0.0	37.5	62.5	0.0	35.5	64.5	0.0
Livestock	68.0	32.0	0.0	66.9	33.1	0.0	66.8	33.2	0.0
II. INDUSTRY	58.6	41.4	0.0	61.8	38.2	0.0	66.5	33.5	0.0
III. SERVICES	68.9	31.1	0.0	72.2	27.8	0.0	75.5	24.5	0.0
IV. REAL ESTATE	45.4	0.7	53.9	42.6	0.8	56.6	42.0	0.7	57.3
V. COMMERCIAL	97.8	2.2	0.0	95.6	4.4	0.0	94.0	0.6	0.0
VI. CONSUMPTION	69.5	0.8	29.7	77.0	0.3	22.7	76.5	0.2	23.3
VII. OTHER	100.0	0.0	0.0	100.0	0.0	0.0	97.2	2.8	0.0
TOTAL	63.5	23.8	12.7	63.1	24.0	12.9	65.0	22.9	12.1

Legend: C: Bancos de Comerciales: Commercial Banks

D: Bancos de Desarrollos: Development Banks

A: Instituciones de Ahorro: Special Saving Institutions Especializado

Source: Boletín Estadístico Marzo 1984.

Table E-II-6 Loans and Discounts in the Agriculture/
Animal Husbandry Sector

	1981 December %		1982 December %		1983 December %	
I. AGRICULTURE	233.4	68.0	271.2	68.1	314.6	67.6
a) Bananas	1.7	0.5	2.9	0.7	8.5	1.8
b) Coffee	58.9	17.1	83.6	21.0	92.7	19.9
c) Tobacco	18.5	5.4	20.7	5.2	24.9	5.4
d) Cotton	23.1	6.7	19.8	5.0	23.2	5.0
e) Suggar Cane	45.7	13.3	55.8	14.0	67.0	14.4
f) Grains	44.8	13.0	44.2	11.1	55.0	11.8
(Rice)	(22.7)	(6.6)	(21.2)	(5.3)	(29.3)	(6.3)
(Maize)	(17.6)	(5.1)	(17.9)	(4.5)	(19.9)	(4.3)
(Beans)	(4.5)	(1.3)	(5.1)	(1.3)	(5.8)	(1.2)
g) Other Cultivations	40.7	11.9	44.2	11.1	43.3	9.3
II. ANIMAL HUSBANDRY	81.7	23.8	97.4	24.4	120.8	25.9
III. OTHER	28.2	8.2	30.1	7.5	30.2	6.5
a) Aviculture	7.1	2.1	9.8	2.5	12.6	2.7
b) Beekeeping	2.4	0.7	3.8	0.9	3.5	0.8
c) Fishing	1.1	0.3	1.2	0.3	1.2	0.2
d) Forestry	17.6	5.1	15.3	3.8	12.9	2.8
TOTAL AGRICULTURE AND ANIMAL HUSBANDRY	343.3	100.0	398.7	100.0	465.6	100.0

Source: Statistical Bulletin/March 1984.

Table E-II-7 Distributions of Loans Granted by BANADESA
to the Agriculture in 1982

(Value in Thousands of Lempiras)

Rubros	TOTAL BANADESA			
	No. of Loans	%	Value	%
Rice	6,800	12.8	7,647.2	7.8
Beans	9,633	18.1	3,546.0	3.6
Maize	27,017	50.9	29,442.5	29.8
Maicillo	1,864	3.5	2,483.8	2.5
(Total Basic Grains)	(45,314)	(85.3)	(43,119.5)	(43.7)
Cotton	602	1.1	7,122.2	7.2
Coffee	4,643	8.7	22,253.6	22.5
Cane	854	1.7	21,201.4	21.5
Fruits	17	-	11.7	0.1
Vegetables	110	0.3	713.2	0.7
Potatoes	178	0.3	1,250.6	1.4
Sesame	173	0.3	44.1	-
Cacao	55	0.1	524.7	0.5
Melon	360	0.7	912.7	0.9
Watermelon	376	0.7	104.7	0.1
Orange & Grapefruit	63	0.1	779.1	0.8
Tomato	163	0.3	105.4	0.1
Onion	105	0.2	70.4	-
Chilli	48	0.1	108.4	0.1
Soy	19	-	35.4	-
Other	43	0.1	397.9	0.4
TOTAL	53,123	100.0	98,755.0	100.0

Source: Economic Studies BANADESA
1982 BANADESA Memory.

Table E-II-8 Distributions of the Loans Granted by BANADESA in 1982 through Funds and Production Sectors

(Value in Thousands of Lempiras)

CONCEPT	No. of Loans	%	Value	%
TOTAL BANADESA	57,064	100.0	155,252.1	100.0
Agriculture	53,123	93.1	98,755.0	63.6
Animal Husbandry	3,107	5.4	13,469.4	8.7
Industry	95	0.2	12,066.6	7.8
Other Sectors	739	1.3	30,961.1	19.9

Source: Economic Studies, BANADESA
1982 BANADESA Memory

Table E-II-9 Aguan Valley: Projection of the Urban and Rural Population, by Municipalities, 1981-1985

		VALLE AGUAN	SABA	OLANCHITO
1980	Total	151,562	14,257	56,740
1981	TOTAL	157,545	14,877	58,847
	URBAN	27,954	4,595	13,100
	RURAL	129,591	10,282	45,747
1982	TOTAL	163,736	15,518	61,022
	URBAN	36,566	4,842	13,942
	RURAL	127,170	10,676	47,080
1983	TOTAL	170,099	16,180	63,251
	URBAN	38,544	5,098	14,828
	RURAL	131,555	11,082	48,423
1984	TOTAL	176,553	16,855	65,500
	URBAN	40,595	5,362	15,758
	RURAL	135,958	11,493	49,742
1985	TOTAL	183,118	17,544	67,779
	URBAN	42,715	5,632	16,731
	RURAL	140,403	11,912	51,048
80-85	GROWTH INDEX	3.86	4.24	3.62

Source: Appraisal derived from the Projection of the population (total population) through Municipalities and Departments. (Cipher in revision process)

Population Unit, Statistical Department of the Superior Counsel of Economic Planification.

SYNTHESIS OF INTEGRAL DEVELOPMENT PROJECT OF VALLE DEL AGUAN, III PERIOD, INA, NOVEMBER 1983.

Table E-II-10 (i) Comparison of Local Market Price

Unit: Lps

Market	Product	Unit	OLANCHIHO			COYOLÉS			SABA			Ave. Price (3 Markets)
			Min. Price	Max. Price	Ave. Price	Min. Price	Max. Price	Ave. Price	Min. Price	Max. Price	Ave. Price	
I. VEGETABLES												
	Cassava	lb.	0.18	0.25	0.22	0.20	0.23	0.22	0.20	0.20	0.20	0.21
	Potato	"	0.51	0.70	0.61	0.48	0.65	0.57	0.67	0.93	0.80	0.66
	Taro	"	0.18	0.40	0.29	0.23	0.50	0.37				0.33
	Tomato	"	0.40	0.60	0.50	0.30	0.80	0.55	0.47	0.55	0.51	0.53
	Beet	"	0.80	0.90	0.85	0.70	1.07	0.89				0.87
	Onion	"	0.85	1.23	1.04	0.93	1.20	1.07	0.78	0.98	0.88	1.00
	Cabbage	"	0.49	0.70	0.60	0.50	0.80	0.65				0.63
	Carrot	"	0.40	0.90	0.65	0.65	1.17	0.91				0.78
	Green Pepper	"	0.25	0.40	0.33	0.30	0.50	0.40				0.37
	Red Pepper	"	0.50	.00	0.75							0.75
	Radish	Bundle	0.17	0.25	0.21							0.21
	Potato	No.	0.25	0.30	0.28	0.18	0.33	0.26				0.27
	Beans	Bundle	0.15	0.30	0.23	0.15						0.20
	Pumpkin	Pc.	0.10	0.30	0.20	0.13	0.30	0.22				0.21
	Coriander	Bundle	0.10	0.35	0.23	0.10	0.20	0.15				0.19
	Sweet Potato	lb.	0.28	0.80	0.54	0.32	0.70	0.51				0.53
	Garlic	"	1.45	2.00	1.73	1.57	2.50	2.04	2.18			1.87
	Cucumber	No.	0.40	0.30	0.35	0.33	0.34	0.34				0.35
	Cauliflower	lb.	0.85	1.00	0.93		1.23					1.03
	Celery	"	0.80	1.50	1.15	0.50	1.20	0.85				1.00
	Lettuce	"	0.86	1.00	0.93		1.20					1.02
II. BASIC GRAINS												
	Maize	lb.	0.16	0.21	0.19	0.15	0.22	0.19	0.15	0.25	0.20	0.19
	Rice (Class 1)	"	0.55	0.75	0.65	0.54	0.73	0.64		0.70	0.62	0.65
	" (Class 2)	"	0.50	0.55	0.53	0.42	0.63	0.53	0.58	0.65	0.62	0.56
	" (Class 3)	"	0.36	0.50	0.43	0.39	0.50	0.45		0.50	0.45	0.45
	Beans	"	0.54	0.70	0.62	0.51	0.65	0.58	0.58	0.65	0.62	0.61

Table E-II-10 (ii) Comparison of Local Market Price

Market Product	Unit	OLANCHITO			COYOLÉS			SABA			Ave. Price (3 Markets)
		Min. Price	Max. Price	Ave. Price	Min. Price	Max. Price	Ave. Price	Min. Price	Max. Price	Ave. Price	
III. FRUITS											
Banana	Bag	0.98	1.30	1.14							1.14
Orange	100 pcs.	3.80	4.83	4.82	10						6.21
Grapefruits	"		4.50								4.50
Coconut	Pc.	0.50	0.60	0.55	0.50	0.43	0.47				0.51
Plantain		4.50	5.0	4.75	6.0	4.0	5.0				4.88
Mandarin	100 pcs.	3.80									3.80
Pineapple	Pc.	1.00			1.50						1.25
IV. MEAT											
Pork	lb.	1.80	2.0	1.90	2.10	2.0	2.05	2.0			1.98
Beef	"	1.80	2.0	1.90							1.90
Chicken	"	1.80	2.0	1.90	2.0	1.85	1.93	2.0	2.0		1.94
Chicken	doz.	2.56	2.80	2.68	3.0	1.90	2.45				2.57
V. DAILY PRODUCTS											
Typical Cheese	lb.	1.50	1.67	1.59	2.20	2.0	2.10	1.80	2.0	1.90	1.86
Bombel Cheese	"	3.50									3.50
Ahumado Cheese	"	1.80									1.80
Kraft Cheese	"	4.0	4.0	4.0	4.95	4.5	4.73				4.37
Butter	"	2.50	2.20	2.03	2.0				2.10		2.04
VI. OTHERS											
Vegetable Oil (Fabla)	lb.	1.73	1.75	1.74	1.83						1.78
Vegetable Butter Butter (Topchef)	"		1.65								1.65

Table E-II-11 Price of Wholesale and Retail for Main Agricultural and Livestock Products in the Different Cities of the Country, June, 1984

Products	Unit	Price in Lempiras																
		Tequigalpa		San Pedro S.		Choluteca		Juticalpa		Santa Rosa de Copán		Danlí		La Ceiba		Comayagua		V.C.
		Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	Wholesale Mayor	Retail Menor	
MAIZE	qq	14.86	0.18	14.00	0.15	17.25	0.20	16.00	0.19	14.50	0.16	**	0.15	14.00	0.18	15.00	0.20	7.27
BEAN	qq	51.71	0.60	53.00	0.55	54.00	0.60	47.00	0.55	51.00	0.58	**	0.60	53.00	0.63	52.50	0.60	4.13
RICE	qq	48.98	0.58	48.00	0.55	49.00	0.75	55.00	0.60	52.50	0.70	65.00	0.70	47.50	0.58	48.00	0.55	11.89
COFFEE		158.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GREEN PLANTAIN	Hundred	8.50	0.11	NA	NA	13.50	0.15	15.00	0.20	9.50	0.12	10.00	0.15	12.00	0.15	13.00	0.20	18.83
MATUR PLANTAIN	Hundred	8.00	0.10	NA	NA	13.50	0.15	15.00	0.20	9.00	0.12	10.00	0.15	12.00	0.15	13.00	0.20	20.66
BANANA	Hundred	2.25	0.03	1.00	0.02	3.30	0.05	4.00	0.05	3.00	0.05	3.50	0.05	1.40	0.03	7.00	0.10	54.69
POTATO	qq	28.00	0.35	30.00	0.35	31.00	0.40	44.00	0.50	28.00	0.30	40.00	0.60	40.00	0.48	30.00	0.40	17.61
TOMATO	Box	6.75	0.50	6.00	1.00	8.00	0.20	7.50	0.45	8.50	0.35	7.00	0.50	10.00	0.50	3.50	0.50	24.99
CABBAGE	c/u	-	0.75	-	0.30	-	1.20	-	0.90	-	0.30	-	1.50	-	0.40	-	NA	-
CASSAVA	Bag	20.00	0.25	22.00	0.30	NA	NA	10.00	0.35	19.00	0.28	15.00	0.30	13.00	0.20	16.00	0.25	23.65
ORANGE	Hundred	8.00	0.10	5.00	0.07	5.00	0.07	12.50	0.18	10.00	0.15	7.50	0.15	7.00	0.10	6.50	0.10	30.83
LEMON	Hundred	4.00	0.05	NA	NA	1.75	0.03	4.00	0.05	3.50	0.05	4.00	0.07	5.50	0.09	6.50	0.10	33.33
ONION	-	-	0.55	-	0.70	-	0.60	-	0.90	-	0.70	-	0.70	-	1.10	-	0.45	-
COCONUT	Hundred	50.00	0.60	NA	NA	60.00	0.68	67.50	0.70	40.00	0.50	50.00	0.70	30.00	0.40	NA	NA	24.77
WATERMELON	Hundred	NA	NA	3.50	3.00	NA	NA	NA	NA	NA	NA	NA	NA	DI	DI	NA	NA	NA
BEEF	qq	250.00	2.80	220.00	2.40	NA	NA	200.00	2.25	200.00	2.00	NA	2.40	130.00	2.20	200.00	2.20	18.03
PORK	qq	260.00	2.80	220.00	2.40	NA	NA	247.50	2.65	250.00	2.50	NA	2.50	200.00	2.40	270.00	3.00	9.57
CHICKEN	-	-	1.80	-	1.70	-	1.85	-	1.80	-	1.80	-	1.90	-	1.80	-	1.80	-
EGG	Doz.	1.70	0.16	1.85	0.16	NA	0.20	2.05	0.23	2.00	0.20	NA	0.20	1.70	0.20	2.00	0.20	7.06
BUTTER	Arrb.	87.50	3.90	82.00	3.40	85.00	3.50	69.00	3.50	93.75	4.00	NA	3.50	67.50	3.00	100.00	4.50	13.30
DRY CHEESE	Arrb.	90.00	4.00	72.50	3.00	75.00	3.75	45.00	2.15	72.50	3.00	NA	2.50	45.00	2.15	80.00	4.00	23.21
FRESH CHEESE	Arrb.	65.00	3.00	47.00	2.00	57.25	3.00	45.00	2.15	60.00	2.50	NA	2.50	50.00	2.40	70.00	3.00	15.48

Source: Unidades Regionales de Planificación (D.P.S. RR.NN.)

V.C. : Variation Coefficient

NA : Not Available

Table E-II-12 Crop Budget and Labour Requirements for Maize (ha)
(extensive)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Land cleaning (with machete)	23 Man·Day	6.00	138.00
Sowing	6 Man·Day	6.00	36.00
Weeding	12 Man·Day	6.00	72.00
Insecticide application	4 Man·Day	6.00	24.00
Second weeding	7 Man·Day	6.00	42.00
Doubling	7 Man·Day	6.00	42.00
Harvesting	10 Man·Day	6.00	60.00
Carting		30./ha	30.00
Removing sheath and shelling		1./1 99	55.00
Transportation		1./1 99	55.00
		Sub-total	Lps. 554.00
2. Inputs			
Improved seed	29 lbs	0.50/libra	14.50
Insecticide	20 lbs	0.60/libra	12.00
		Sub-Total	26.50
		Total	580.50
		+ 5% Incidental expenses	29.00
		Interest of Bank	47.64
		Grand-total	Lps. 657.14
Production 99/ha	55 (2.5 Ton)		
Price of 1 99	Lps. 16.00		
		Gross return	Lps. 880.00
		Net return	Lps. 222.86

Table E-II-13 Crop Budget and Labour Requirements for Maize (ha)
(Semi-Improved)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Sowing	8 Man·Day	6.00	48.00
Herbicide application	5 Man·Day	6.00	30.00
Fertilizer application	5 Man·Day	6.00	30.00
Insecticide application	3 Man·Day	6.00	18.00
Hand-weeding	10 Man·Day	6.00	60.00
Harvesting	5 Man·Day	6.00	30.00
Carting		35./ha	35.00
Shelling (machine)	L.S.		60.00
Shelling	10 Man·Day	6.00	60.00
Transportation			70.00
		Sub-total	Lps. 441.00
2. Machinery Requirement			
Harrowing (heavy)	2 hours	50.00	100.00
Harrowing (light)	1 hour	20.00	20.00
		Sub-total	Lps. 120.00
3. Inputs			
Improved seed	30 libras/ha	0.50	15.00
Herbicide	2.5 lts/ha	24.00	60.00
Fertilizer	2 m^3	30.00	60.00
Insecticide	20 libras	0.60	12.00
		Sub-total	Lps. 147.00
		Total	708.00
		Incidental expenses	33.0
		Grand-total	741.0
Yield 70 m^3 (3.2 ton)	Price/ m^3 16 Lps.		
Gross return		1,120 Lps.	
Net return		379/Lps.	

Table E-II-14 Crop Budget and Labour Requirements for Maize (ha)
(Irrigated)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Sowing	8 Man·Day	6.00	48.00
Herbicide application	5 Man·Day	6.00	30.00
Fertilizer application	5 Man·Day	6.00	30.00
Insecticide application	3 Man·Day	6.00	18.00
Hand-weeding	10 Man·Day	6.00	60.00
Harvesting	8 Man·Day	6.00	48.00
Carting		55/ha	55.00
Shelling (machine)			100.00
Shelling	18 Man·Day	6.00	108.00
Transportation			110.00
		Sub-total	Lps. 607.00
2. Machinery Requirement			
Harrowing (heavy)	2 hours	50.00	Lps. 100.00
Harrowing (light)	1 hour	20.00	20.00
		Sub-total	Lps. 120.00
3. Inputs			
Improved seed	30 libras/ha	0.50	Lps. 15.00
Herbicide	2.5 lts/ha	24.00	60.00
Fertilizer	2 99	30.00	60.00
Insecticide	20 libras	0.60	12.00
		Sub-total	Lps. 147.00
		Total	874.00
		Incidental expenses	93.7
		Grand-total	967.7
Yield 110/99 (5 ton)			
Price of 1 99	16 Lps.		
Gross return	1,760 Lps.		
Net return	792.3/Lps.		

Table E-II-15 Crop Budget and Labour Requirements for Rice(ha)
(Semi-improved)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Bird scaring	10 Man·Day	6.00	60.00
Application herbicide	4 Man·Day	6.00	24.00
Application fertilizer	12 Man·Day	6.00	72.00
Application fungicide	4 Man·Day	6.00	24.00
Hand-weeding	8 Man·Day	6.00	48.00
Bird scaring (before harvest)	12 Man·Day	6.00	72.00
Harvesting	30 Man·Day	6.00	180.00
Transportation		1.00/99	65.00
		Sub-total	Lps. 545.00
2. Machinery Requirement			
Ploughing	2.5 hours	17.00	42.50
Harvesting	3.0 hours	17.00	51.00
Sowing	1.5 hours	20.00	30.00
		Sub-total	Lps. 123.50
3. Inputs			
Improved seed	1.0 99	55.00	55.00
Herbicide	7.0 Lbs.	10.00	70.00
Urea	50 Kg.	0.68	34.00
Insecticide	2.0 Lbs.	20.00	40.00
Fungicide	2.0 Lbs.	30.00	60.00
		Sub-total	Lps. 259.00
		Total	Lps. 927.50
		+10% Incidental expenses	<u>92.75</u>
		Grand-total	Lps. 1,020.25
Yield 65/99 (2.96 ton)			
Price 22 Lps/1 99			
Gross return 1,430 Lps.			
Net return 409.75/Lps.			

Table E-II-16 Crop Budget and Labour Requirements for Rice Irrigated (ha)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Bird scaring	10 Man·Day	6.00	60.00
Application herbicide	4 Man·Day	6.00	24.00
Application fertilizer	12 Man·Day	6.00	72.00
Application fungicide	4 Man·Day	6.00	24.00
Hand-weeding	8 Man·Day	6.00	48.00
Bird scaring (before harvest)	12 Man·Day	6.00	72.00
Harvesting	50 Man·Day	6.00	300.00
Transportation		1.00/99	110.00
		Sub-total	Lps . 690.00
2. Machinery Requirement			
Ploughing	2.5 hours	17.00	42.50
Harvesting	3.0 hours	17.00	51.00
Sowing	1.5 hours	20.00	30.00
		Sub-total	Lps. 123.50
3. Inputs			
Improved seed	1.0 99	55.00	55.00
Herbicide	7.0 Lbs.	10.00	70.00
Urea	50.0 Kg.	0.68	34.00
Insecticide	2.0 Lbs.	20.00	40.00
Fungicide	2.0 Lbs.	30.00	60.00
		Sub-total	Lps. 259.00
		Total	Lps.1,072.50
		+10% Incidental expenses	<u>107.25</u>
		Grand-total	Lps.1,179.75
Yield 110/99 (2.96 ton)			
Price 22 Lps/1 99			
Gross return 2,420 Lps.			
Net return 1,240.25 Lps.			

Table E-II-17. Crop Budget and Labour Requirements for Beans

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Sowing	12 Man·Day	6.00	72.00
Hand-weeding	10 Man·Day	6.00	60.00
Pulling out	12 Man·Day	6.00	72.00
Threshing and Winnowing	8 Man·Day	6.00	48.00
		Sub-total	Lps . 252.00
2. Machinery Requirement			
Ploughing	2.5 hours	17.00	42.50
Harrowing	2.5 hours	17.00	42.50
Transportation		1.00/99	18.00
		Sub-total	Lps. 103.00
3. Inputs			
Improved seed	1.0 99	60.00	60.00
Insecticide	2.0 Lbs.	20.00	40.00
		Sub-total	Lps. 100.00
		Total	Lps. 455.00
		+10% Incidental expenses	45.50
		Grand-total	Lps. 500.50

Yield 18/99 (0.8 ton)

Price 45 Lps/1 99

Gross return 810 Lps.

Net return 310 Lps.

Table E-11-18 Crop Budget and Labour Requirements for Beans Irrigated (ha)

	No. (Unit)	Unit Price (Lps)	Cost (Lps)
1. Activity			
Sowing	12 Man·Day	6.00	72.00
Hand-weeding	10 Man·Day	6.00	60.00
Pulling out	16 Man·Day	6.00	96.00
Threshing and Winnowing	12 Man·Day	6.00	72.00
		<hr/>	
		Sub-total	Lps . 300.00
2. Machinery Requirement			
Ploughing	2.5 hours	17.00	42.50
Harrowing	2.5 hours	17.00	42.50
Transportation		1.00/99	33.00
		<hr/>	
		Sub-total	Lps. 118.00
3. Inputs			
Improved seed	1.0 99	60.00	60.00
Insecticide	2.0 Lbs.	20.00	40.00
		<hr/>	
		Sub-total	Lps. 100.00
		Total	Lps. 518.00
		+10% Incidental expenses	<u>51.80</u>
		Grand-total	Lps. 569.80

Yield 33/99 (1.5 ton)/ha

Price 45 Lps/1 99

Gross return 1,485 Lps.

Net return 915.2 Lps.

Table E-II-19 Crop Budget and Labor Requirement for Cassava

1. Activity	<u>NO.</u>	<u>Unit</u>	<u>Unit Price</u> <u>(Lps.)</u>	<u>Cost (Lps.)</u>
Labor Requirement				
Plowing/Harrowing	10	Man. day	6	60
Preparation of Planting material	8	"	6	48
Planting	14	"	6	84
Weeding	51	"	6	306
Application pesticide	8	"	6	48
Harvesting	84	"	6	504
Carting	21	"	6	126
Machinery Service				
Plowing	3	Hour	20	60
Harrowing	2	"	20	40
Banking	2	"	20	40
Carting by animal	10	Day	12	120
Transportation	400	¥¥	1	<u>400</u>
			Sub-Total	Lps. 1,836
2. Inputs				
Plants	10	Millar	10	100
Insecticide				50
Herbicide				<u>8</u>
			Sub-Total	Lps. 158
Total Direct Cost				Lps. 1,994
Indirect Cost				Lps. 199
Total Cost				Lps. 2,193
Yield/ha	20 Ton			
Price	160 Lps/Ton			
	Gross Return			Lps. 3,200
	Net Return			<u>Lps. 1,007</u>

Table E-II-20 Crop Budget and Labour Requirement for Taro (Malanga)

1. Activity	<u>NO.</u>	<u>Unit</u>	<u>Unit Price (Lps.)</u>	<u>Cost (Lps.)</u>
Site Preparation	16	Man. Day	6	96
Preparation and transport of planting materials	8	"	6	48
Planting	20	"	6	120
Fertilizer application	2	"	6	12
Weeding	20	"	6	120
Cutting Tops	3	"	6	18
Harvesting	30	"	6	180
Carting	30	"	6	<u>180</u>
			Sub-Total	Lps. 774
2. Inputs				
Plants	1.5	Ton	75	112.5
Fertilizer	300	kg	0.8	240
Urea	200	kg	0.8	<u>160</u>
			Sub-Total	Lps. 512.50
Total direct cost				Lps.1,286.50
Indirect Costs (Including sacks and boxes)				<u>Lps.1,977.50</u>
			Total Cost	Lps.3,264
Yield/ha	35 Ton			
Price of 1 Ton	Lps. 160			
			Gross Return	Lps. 5,600/ha
			Net Return	Lps. 2,336/ha

Table E-II- 21 Crop Budget and Labor Requirement for Tomato

1. Activity	<u>NO.</u>	<u>Unit</u>	<u>Unit Price (Lps.)</u>	<u>Cost (Lps.)</u>
Machine Service				
Ploughing	2.5	Hour	38	95
Harrowing	1	"	45	45
Ridging	2	"	36	72
Mist Blower	36	"	1.5	54
Carting	20	"	14	280
Labor Requirement	133	Man. Day	6	<u>798</u>
			Sub-Total	Lps.1,344
2. Inputs				
Seed	130	kg	0.15	20
Nematicide:	25	kg	9	225
Fertilizer:				
12-24-12	300	kg	0.8	240
Fungicide:				
Dithane M45	6	kg	16	96
Benlate	6	kg	70	420
Herbicide:				
Gramoxone	1	Litre	17	<u>17</u>
			Sub-Total	Lps.1,018
			Total Direct Cost	Lps.2,362
			Sundry Other Cost (Including boxes, Sacks, bower)	Lps. 300
			Total Cost	Lps.2,662
Yield	40 Ton/ha			
Price	117 Lps/Ton			
			Gross Return	Lps.4,680
			Net Return	<u>Lps.2,018</u>

Table E-II-22 Crop Budget and Labor Requirement for Soybean

1. Activity	<u>NO.</u>	<u>Unit</u>	<u>Unit Price (Lps.)</u>	<u>Cost (Lps.)</u>
Machinery Service				
Plowing	2.2	Hour	38	84
Harrowing	0.9	"	45	40
Seeding	0.75	"	45	34
Interrow Cultivation	0.75	"	36	27
Threshing/Winnowing	1.3	Ton	23	30
Labor Requirement	31	Man. Day	6	<u>186</u>
			Sub-Total	Lps. 401
2. Inputs				
Seed (Improved)	25	kg	1.7	42
Herbicide:				
Treflan	2	Litre	17	34
Insecticide:				
Furadan	10	kg	9	90
Fertilizer	50	kg	0.8	<u>40</u>
			Sub-Total	Lps. 206
			Total Direct Cost	Lps. 607
			Indirect Cost	Lps. 60
			Total Cost	Lps. 667
Yield	2.5 Ton/ha			
Price	555 Lps./Ton			
			Gross Return	Lps. 1,387.5
			Net Return	<u>Lps. 720.5</u>

Table E-II-23 (a) Gross Return Until Now

Crop Season	Crop	Area	Yield/ha	Total Yield	Price
Primavera	Maize	84 ha	1.8 ton	151.2 ton	Lps. 47,040
	Rice	28	2.5	70	30,800
	Beans	10	1.3	13.0	11,250
Postrera	Maize	105	1.8	189.0	67,200
	Beans	35	1.3	45.5	39,375
Total Gross Return					Lps. 195,665
Remark 1: Price		Maize			Lps. 16/quintal
		Rice			Lps. 22/quintal
		Beans			Lps. 45/quintal
2: Costs of production					Lps. 125,580
Net Return					Lps. 70,085

Table E-II-19 (b) Gross Return Under High Yield

Crop Season	Crop	Area	Yield/ha	Total Yield	Gross Return
Primavera	Maize	84 ha	5 ton	420 ton	Lps. 134,400
	Rice	28	5	140	61,000
	Beans	10	1.5	150	13,500
Postrera	Maize	105	5	525	168,000
	Beans	35	1.5	52.5	47,250
Total Gross Return					Lps. 424,150
Remark: Costs of production					Lps. 187,860
Net Return					Lps. 236,290

Table E-II-24 Crop Budget for Plantain (*)

1. Activity	Initial Investment (Lps.)	Year				
		Year 1	Year 2	Year 3	Year 4	Year 5
Land Preparation	240					
Construction of drain	456					
Construction of In-farm road	216					
Lining and drilling	114					
Stump treatment	36					
Distribution and Sowing	48					
Re-sowing	6					
Construction of canal and road		72	72	72	72	72
Application Fertilizer		12	18	18	18	18
Application Pesticide		60	84	84	84	84
Weeding on Foot and Between Rows		288	312	312	312	312
Pruning		30	30	30	30	30
Husking		36	72	72	72	72
Extracting Plants		72	102	102	102	102
Cutting and Handling of Fruits		36	144	144	144	144
Carting		18	36	36	36	36
Mechanical Traction	36					
Transportation	60					
Traction by animal	40					
	24	12	36	36	36	36
Sub-Total	1,276	636	906	906	906	906
2. Inputs						
Seed	200					
Fertilizer (Lps. 35/99)		166	210	210	210	210
Pesticide		140	150	150	150	150
Others		180	268	268	268	268
Sub-Total	200	486	628	628	628	628
Total Direct Cost (Lps.)	1,476	1,122	1,534	1,534	1,534	1,534
Indirect Cost (Lps.)	148	112	153	153	153	153
Total Cost (Lps.)	1,624	1,234 (2,858)	1,687	1,687	1,687	1,687
Yield (Ton/ha)		15	35	45	45	45
Price (Lps./Ton)		150	150	150	150	150
Gross Return (Lps.)		2,250	5,250	6,750	6,750	6,750
Net Return (Lps.)		4608	3,563	5,063	5,063	5,063

Table E-II-25 Crop Budget for Papaya (*)

1. Activity	Initial Investment	Year 1	Year 2	Year 3	Year 4
Land Preparation	240				
Construction of drain	228				
Construction of In-farm road	108				
Lining and drilling	114				
Irrigation	18	60	60	60	60
Distribution and Sowing	48				
Re-sowing (5%)	12				
Construction of canal and road		72	72	72	72
Application fertilizer	36	36	36	36	36
Application Pesticide		48	60	60	60
Weeding on foot		120	144	144	144
Weeding between rows		144	144	144	144
Cutting and handling of fruits		72	144	120	96
Carting	36	36	48	48	36
Mechanical Traction	100				
Transportation	40	40	60	60	40
Traction by animal	24	36	72	60	48
Sub-Total (Lps.)	1,004	664	840	804	736
2. Inputs					
Seed	664				
Fertilizer	56	332	411	385	332
Pesticide		30	40	40	30
Others	20	20	20	20	20
Sub-Total (Lps.)	740	382	471	445	382
Total Direct Cost (Lps.)	1,744	1,046	1,311	1,249	1,118
Indirect Cost (Lps.)	174	105	131	125	112
Total Cost (Lps.)	1,918	1,151 (3,069)	1,442	1,374	1,230
Yield (Ton/ha)		12	25	30	18
Price (Lps./Ton)		160	160	160	160
Gross Return (Lps.)		1,920	4,000	4,800	2,880
Net Return (Lps.)		Δ1,149	2,558	3,426	1,650

Table E-II-26 Crop Budget for Orange (*)

Initial Investment	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
1. Activity													
Land Preparation	240												
Construction of drain	180												
Construction of irrigation basin	30	42	54										
Lining and drilling	54												
Summer Irrigation	30	42											
Re-sowing and Transplantation	30												
Conservation of drains	72	72	72	72	72	72	72	72	72	72	72	72	72
Application fertilizer	24	48	60	72	72	72	72	72	72	72	72	72	72
Application pesticide	24	48	72	84	96	96	96	96	96	96	96	96	96
Weeding on foot	12	16	24	36	36	36	36	36	36	36	36	36	36
Weeding between rows	180	180	180	168	168	168	168	168	168	168	168	168	168
Pruning	24	24	36	36	36	36	36	36	36	36	36	36	36
Application herbicide	24	36	48	72	72	72	72	72	72	72	72	72	72
Harvesting and handling of fruits				48	72	90	120	120	120	120	120	120	120
Carting	24	26	24	30	36	48	60	60	60	60	60	60	60
Mechanical Traction	120	40	50	60	70	80	100	100	100	100	100	100	100
Transportation	30	30	40	40	40	40	40	40	40	40	40	40	40
Traction by animal	24	24	30	48	60	72	84	84	84	84	84	84	84
Sub-Total (Lps.)	762	506	652	766	830	882	956	956	956	956	956	956	956
2. Inputs													
Grafting tree	705												
Fertilizer	60	85	110	135	150	185	250	250	250	250	250	250	250
Pesticide	30	40	60	80	100	140	180	180	180	180	180	180	180
Herbicide	80	90	100	120	120	120	120	120	120	120	120	120	120
Box and other materials				10	20	30	40	40	40	40	40	40	40
Sub-Total (Lps.)	705	215	270	345	390	475	590	590	590	590	590	590	590
Total Direct Cost (Lps.)	1,467	676	906	1,111	1,220	1,357	1,546	1,546	1,546	1,546	1,546	1,546	1,546
Indirect Cost (Lps.)	147	68	91	111	122	136	155	155	155	155	155	155	155
Total Cost (Lps.)	1,614	744	997	1,222	1,342	1,493	1,701	1,701	1,701	1,701	1,701	1,701	1,701
Yield (Ton/ha)				2	6	14	22	31	35	39	45	48	50
Price (Lps./Ton)				110	110	110	110	110	110	110	110	110	110
Gross Return (Lps.)				220	660	1,540	2,420	3,410	3,850	4,290	4,950	5,280	5,500
Net Return (Lps.)		42,358	4954	41,002	4682	47	719	1,709	2,149	2,589	3,249	3,579	3,799

Table E-II-27 Crop and Labor Requirement for Cocoa (*)

1. Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Land Preparation								
Construction of drain	72							
Sowing and Re-sowing	72							
Lining and drilling	18	18	18	18	18	18	18	18
Conservation of drains	12	12	12	12	12	12	12	12
Conservation of fence								
Conservation of roads								
Application fertilizer	12	18	24	30	36	36	36	36
Application Pesticide	12	12	36	48	72	72	72	72
Weeding on foot	42	48	54	60	60	60	60	60
Weeding between rows					120	120	120	120
Pruning	24	36	36	36	36	36	36	36
Regulation for Sowing	12	18	24	24	24	24	24	24
Harvesting			69	120	180	216	240	252
Carting	24	18	12	24	36	42	48	48
Fermentation and drying			30	60	90	108	120	126
Transportation	10	10	12	18	22	26	30	30
Traction by animal	48	12	24	36	48	54	60	60
Sub-Total	358	202	351	486	778	848	900	894
2. Inputs								
Plants	855							
Fertilizer	95	140	180	280	330	330	330	330
Pesticide	10	15	40	50	60	60	60	60
Herbicide	10	15	20	20	20	20	20	20
Other materials	10	10	10	20	30	36	40	40
Sub-Total (Lps.)	980	180	250	370	440	446	450	450
Total Direct Cost (Lps.)	1,338	382	601	856	1,218	1,294	1,350	1,344
Indirect Cost (Lps.)	134	38	60	86	122	129	135	134
Total Cost (Lps.)	1,472	420	661	942	1,340	1,423	1,485	1,478
Yield (Ton/ha)			0.1	0.4	0.8	1.2	1.4	1.5
Price (Lps./Ton)			3,245	3,245	3,245	3,245	3,245	3,245
Gross Return (Lps.)			325	1,298	2,596	3,894	4,543	4,868
Gross Return from Plantain (Lps.)		460	1,080	1,080	460			
Net Return (Lps.)	Δ1,472	40	744	1,436	1,716	2,471	3,058	3,390

Table E-II-28 Budget for Mango (*)

Initial Investment	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
1. Activity	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Land Preparation	240														
Construction of drain	180														
Construction of In-farm road	42														
Lining and drilling	30														
Conservation of drains		48	48	48	48	48	48	48	48	48	48	48	48	48	48
Distribution and Sowing															
Construction of irrigation basin	24	36	48												
Summer irrigation	24	36	48												
Application fertilizer	18	24	30	36	36	36	36	36	36	36	36	36	36	36	36
Application pesticide	24	30	36	48	54	54	54	54	54	54	54	54	54	54	54
Weeding on foot	12	18	24	36	36	36	36	36	36	36	36	36	36	36	36
Weeding between rows	180	180	180	168	144	144	144	144	144	144	144	144	144	144	144
Pruning	12	18	24	24	24	24	24	24	24	24	24	24	24	24	24
Harvesting and handling															
Application herbicide	24	30	42	54	60	60	60	60	60	60	60	60	60	60	60
Carting	12	18	24	36	42	48	48	48	48	48	48	48	48	48	48
Mechanical Traction	120														
Transportation	30	30	40	40	40	40	40	40	40	40	40	40	40	40	40
Traction by Animal	12	12	12	24	36	48	60	60	60	60	60	60	60	60	60
Sub-Total (Lps.)	434	504	480	574	626	664	700	700	700	700	700	700	700	700	700
2. Inputs															
Grafting Tree	665														
Fertilizer	53	70	88	105	122	122	122	122	122	122	122	122	122	122	122
Pesticide	20	30	40	80	80	120	120	120	120	120	120	120	120	120	120
Herbicide	80	90	105	120	120	120	120	120	120	120	120	120	120	120	120
Box and other materials			10	10	20	30	30	30	30	30	30	30	30	30	30
Sub-Total (Lps.)	665	153	190	233	315	342	392	392	392	392	392	392	392	392	392
Total Direct Cost (Lps.)	1,391	587	694	713	889	968	1,056	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092
Indirect Cost (Lps.)	139	59	69	71	89	97	106	109	109	109	109	109	109	109	109
Total Cost (Lps.)	1,530	646	763	784	978	1,065	1,162	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201
Yield (Ton/ha)			1	2	4	6	10	14	18	22	26	28	30	30	30
Price (Lps./Ton)			160	160	160	160	160	160	160	160	160	160	160	160	160
Gross Return (Lps.)			160	320	640	960	1,600	2,240	2,880	3,520	4,160	4,480	4,800	4,800	4,800
Net Return (Lps.)		42,176	Δ763	Δ784	Δ978	Δ905	Δ842	Δ561	Δ241	399	1,039	1,679	2,319	2,959	3,699

(*) To simplify the yearly budget of the perennial tree crops after they reach the stage of producing full yield, the detailed calculation of the budget for the periodical renewal of trees at certain portion of the plantation to maintain continuous regular yield is not carried out. Instead, it is presumed that a certain rate of yield is horizontally deducted to provide

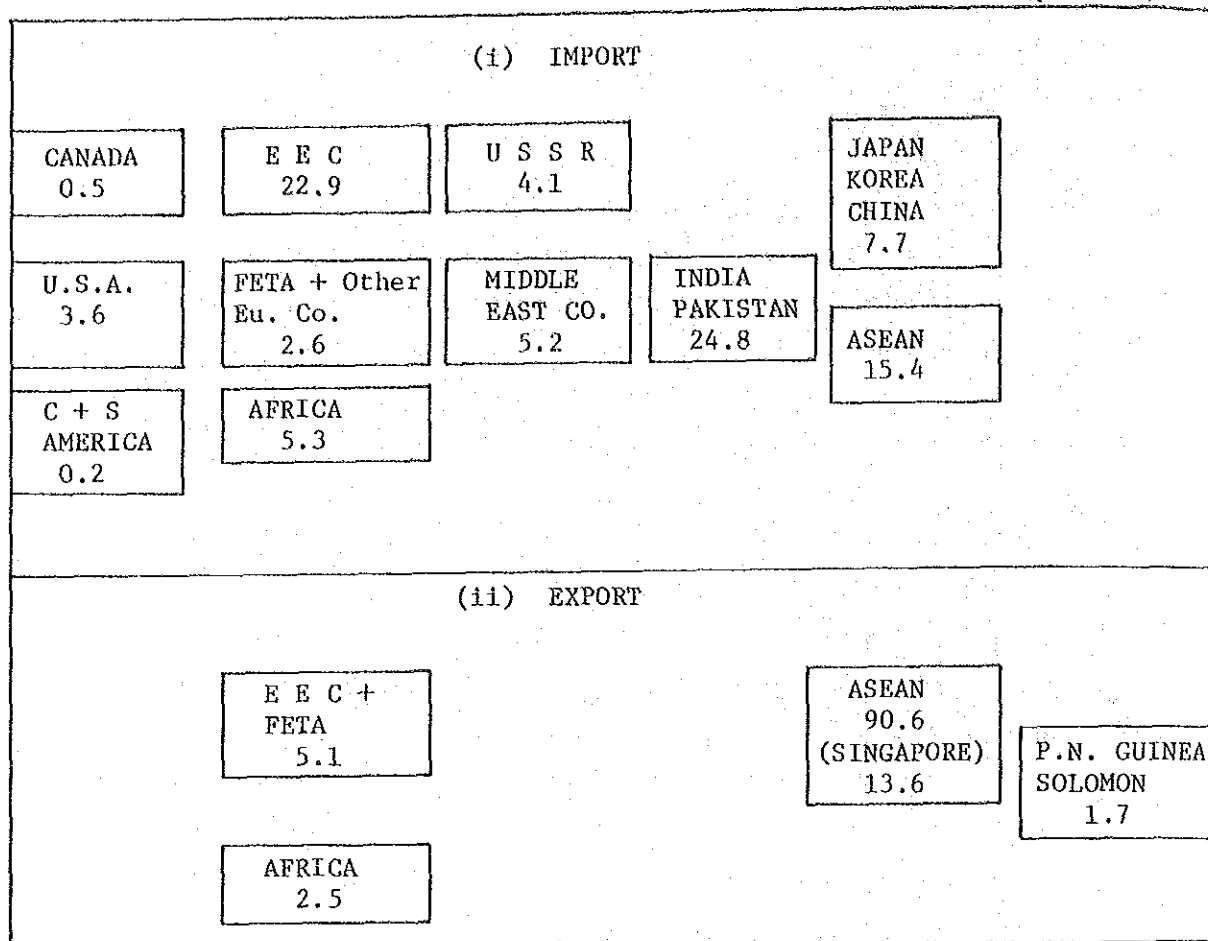
III. International Market

Consideration on the various import regulations of agro-product in USA.

Basically, US market is open to the foreign agro-product. Only consideration made is the aspect of competition against domestic producers. For that purpose, import is regulated by quota system. Section 24 of the Agriculture Adjustment Act of 1933 and the Trade Agreements Extension Act of 1951 and 53 provide the judicial basis of executing it. The Meat Import Law of 1964 is an extension. Base quantity of import is adjusted each year according to the domestic market situation. For example, in 1978, initially, 1,292 million pounds, 7 percent of the expected domestic meat production was allocated to 12 supplying countries, in which the share of Honduras was about 3 percent. But in June of the same year, additional 200 million pounds was further allocated as the shortage of minced meat for hamburger steak became explicit. Sugar is another commodity of which import is regulated. Honduras has a share of 1 percent. Import of dairy products such as dried milk, cheese and butter are also controlled by quota system.

Besides quarantine regulations, certain agro-products such as fresh tomatoes, avocados, mangoes, limes, oranges, grapefruits, green peppers, cucumbers, eggplants have to clear US import standards on grade, size, quality and ripeness set by the Department of Agriculture. The Agricultural Marketing service of the department is the office concern which handles the matter.

(percent)



Source: Arranged by the consultant from various FAO publications.

Fig. E-III-1 Share of Export & Import of Palm Oil in 1981

Table E-III-1 Affiliation of Central American Countries to Various Inter-State Organizations

	Political Economy							Commodity Cartel		
	UN	OSA	OEAC	GATT	ALDI	CACM	SELA	GELPA CEA	BOGOTA GROUP	ABEC
1. Costa Rica	o	o	o			o	o	o	o	o
2. Belize	o									
3. El Salvador	o	o	o			o	o	o	o	
4. Guatemala	o	o	o			o	o	o	o	o
5. Honduras	o	o	o			o	o	o	o	o
6. Mexico	o	o			o		o	o	o	
7. Nicaragua	o	o	o	o		o	o	o		
8. Panama	o	o					o	o		o

Legend:

- UN: United Nations.
- OSA: Organization of American States. (+11 South-American and 8 Caribbean countries. Japan is one of the 15 observers).
- OEAC: Organization of Central American States. (5 countries)
- GATT: General Agreement on Tariffs and Trade.
- ALDI: Latino Americana de Integrelnacion. (+10 South American Countries)
- CACM: Central American Common Market. (5 countries)
- SELA: Sistema Economico Latino America. (+12 American and 6 Caribbean Countries)
- GEPLACEA: Group of Latin American and Caribbean Sugar Exporting Countries. (+9 South American and 6 Caribbean Countries).
- BOGOTA GROUP: For coffee exporting countries.
(+ Brazil, Colombia and Venezuela).
- ABEC: Association of Banana Exporting Countries.
(+ Colombia and Dominica).

Table E-III-2 Ratio between Trade in CACM Zone and Total Trade

EXPORT	CACM Total	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica
1975	23.8	27.0	27.6	9.1	24.7	21.7
1976	21.6	24.9	24.4	9.1	21.7	22.0
1977	19.1	19.2	21.8	8.5	21.0	21.0
1978	22.4	22.9	37.0	8.2	22.6	20.7
1979	20.2	26.0	25.6	8.2	15.9	18.8
1980	24.6	29.0	28.1	11.4	17.3	27.2

	CACM Total	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica
1975	17.6	14.1	22.9	12.8	21.8	16.5
1976	18.4	12.7	23.7	12.9	26.4	17.6
1977	16.5	10.0	22.4	12.8	21.6	16.4
1978	18.6	16.5	23.4	13.1	23.4	17.4
1979	18.0	15.4	25.8	11.9	30.9	16.2
1980	19.5	13.6	33.7	10.3	33.9	14.6

Table E-III-3 Trade in CACM

(Million US dollar)

	1978	1979	1980
GUATEMALA			
EXPORT	254.9	410.0	440.8
IMPORT	207.6	307.5	217.8
BALANCE	+47.3	+102.5	+223.0
EL SALVADOR			
EXPORT	233.6	263.6	289.3
IMPORT	239.9	256.9	318.7
BALANCE	-6.3	+6.7	-29.4
HONDURAS			
EXPORT	49.2	59.8	83.9
IMPORT	91.5	98.5	103.5
BALANCE	-42.3	-38.7	-19.6
NICARAGUA			
EXPORT	146.3	90.1	75.4
IMPORT	138.9	111.2	300.6
BALANCE	+7.4	-21.1	-225.2
COSTA RICA			
EXPORT	178.6	175.4	266.4
IMPORT	203.0	211.7	219.3
BALANCE	-24.4	-36.3	+47.1

Source: Evolution of the Central American Economy: 1978-1980
June 1981 (SIECA)

Table E-III-4. COMPOSITION OF EXTERNAL TRADE OF CENTRAL AMERICAN COUNTRIES

Importer Exporter	Honduras	Costa Rica	El Sal- vador	Guatemala	Nicaragua	CACM	Belize	A Q	(Mexico)	U.S.A	Europe	Japan	Panama	Others	Export Total	Remarks
Honduras		1.9		4.3	2.0	8.2		8.2		57.5	22.9	2.4		0.8	100	0= Dominica
Costa Rica	2.4	1.1	5.4	6.7	5.3	19.8		1.0		37.2	30.1		3.1	8.8	100	
El Salvador	3.7	9.5	4.7	2.4	7.3	37.0		0.1		19.7	25.4	8.8	2.6	8.0	100	
Guatemala	2.5	4.0	9.1	4.3	5.2	19.2		0.8		33.1	25.8	7.8	11.1	13.3	100	
Nicaragua	6.3	5.9	14.7		8.5	(19.1)	1.5			18.0	27.8	8.8	1.3	22.0	100	
CACM	3.1	8.8	5.8	5.4		22.9		0.5								
Belize	3.1	4.7	4.0	1.5		(23.1)			0.1							
Panama	13.1	16.8	23.4	(23.3)		(2.3)	(3.9)									
ABDI				(23.4)		3.7	5.0									
*1 (Mexico)	12.2	9.5	11.4	0.4	0.3	1.0		18.6	(18.6)	39.1	33.6		0.3	7.4	100	
U.S.A						(0.7)										
*2 Europe																
Japan																
Others																
Import Total	100.	100.	100	100	100	100	100	100	100	100	100	100	100	100	100	
	41.9	34.1	31.0	34.9	33.8		41.6		62.5				33.0			
	7.7	16.7	10.1	15.7	11.9		32.7		19.2				7.4			
	8.8	13.0	11.9	11.5	6.9		4.0		6.6				4.6			
	16.3	8.3	10.8	14.0	17.6		11.7		6.9				24.9			

Table E-III-5 (i) Major Agro Exports

(Mil lempiras current price)

			78	79	80	81	82	83
BANANA	Value	Mil Lps	282	400	456	427	437	
	Volume	'000 Ton	716	892	861	766	811	
	Unit Price	Lps/Ton	394	448	530	557	539	
COFFEE	Unit Price		422	394	408	346	305	
	Unit Price		57	66	57	66	57	
	Unit Price		7,404	5,970	7,158	5,242	5,351	
(Net Refined) SUGAR	Unit Price		11	27	59	93	42	
	Unit Price		22	55	81	83	88	
	Unit Price		500	491	728	1,120	477	
TOBACCO	Unit Price		18	24	27	26	22	
	Unit Price		4	4	5	4	3	
	Unit Price		4,500	6,000	5,400	6,500	7,333	
COTTON	Unit Price		31	23	27	25	21	
	Unit Price		13	8	9	8	6	
	Unit Price		2,385	2,875	3,000	3,125	3,500	
PINEAPPLE	Unit Price		14	12	16	n.a.	n.a.	
	Unit Price		28	26	26			
	Unit Price		500	462	615			
(Refrigerated) Meat	Unit Price		78	121	121	93	62	
	Unit Price		23	30	29	24	15	
	Unit Price		3,391	4,033	4,172	3,875	4,133	

Table E-III-5 (ii) Imports of Agricultural Inputs

(Million lempiras)

	78	79	80	81	82
(1) Materials and intermediate goods	66	81	91	110	
(2) Capital goods	43	59	45	37	

Source: 1982 Report

Table E-III-6 PALM OIL

PRODUCTION (1,000 Ton)	69/71	73	74	75	76	77	78	79	80	81	82	Share 82
World Total	1971	2576.6	2951.7	3307.9	3495	3808	3998	4246	5080	5389	6350	100.0
Increase ratio	-	-	1.15	1.12	1.06	1.09	1.05	1.06	1.20	1.06	1.18	-
TOP THREE PRODUCERS												
MALAYSIA	457	812.3	1045.7	1256.3	1390.0	1614	1786	2000	2576	2822	3600	56.7
INDONESIA	218	290.0	351.1	411.4	433.9	497.4	525	570	720	742	820	12.9
NIGERIA	528	590.0	600.0	640.0	655.0	660.0	670	675	675	675	700	11.0
CENTRAL AMERICAN COUNTRIES												
COSTA RICA	13	22.2	22.0	22.0	23.0	23.5	24.0	25	23	24	24	0.4
HONDURAS	6	8.8	8.4	9.1	8.8	10.1	10	11	12	12	13	0.2
MEXICO	13	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7	7	7	0.1
EXPORT (World Total)												
Value (1 million dollar)			74	75	76	77	78	79	80	81		
Weight (1,000 Ton)			891.7	937.1	765.4	1133.6	1193.3	n.a.	2022.4	1759.6		
World Average Unit Price (\$/Ton)			1683.7	2017.9	2114.1	2176.5	2117.4	n.a.	3589.5	3322.7		
Malaysia Average Unit Price			529.6	464.4	362.0	520.8	563.6	n.a.	563.4	529.6		
U.S.A. Average Unit Price			500.5	471.8	356.8	510.6	532.0	n.a.	541.1	505.0		
IMPORT (U.S.A.)												
Value (1 mil dollar)			74	75	76	77	78	79	80	81		Share 81
Weight (1,000 Ton)			96.3	204.8	131.1	116.7	68.7	n.a.	61.6	60.0		3.6
Unit Price (\$/Ton) CIF			200.4	442.2	360.9	250.9	149.4	n.a.	116.8	122.4		
MALAYAN 5% CIF U.K. Unit Price			480.5	463.1	363.3	465.1	459.8	n.a.	527.4	490.2		
OECD Total			669.0	429.1	406.6	538.4	600.3	674	586	580		
Value (million dollar)									702.8	583.3		34.9
Weight (1000 Ton)									1146.3	1027.1		
Unit Price (\$/Ton) (C.I.F.)									613.1	567.9		
IMPORT												
HONDURAS (Value C.I.F.)									80	81		Share 81
Weight									3.6	1.3		
Unit Price									4.6	1.9		
									782.6	684.2		

Source: Arranged by the consultant from FAO Publications.

Table E-III-7 Production and Export of Vegetable Oil
(SITC 423 and SITC 424)

Total Vegetable Oil (Soft + Non Soft)							
Production (1000 Ton)		70	77	78	79	80	81
Soft		12,832	16,800	17,265	17,977	19,837	
Non soft		7,395	10,807	11,099	11,866	12,430	
World Total		20,227	27,607	28,364	29,843	32,267	
Share of palm oil		-	13.8	14.1	14.2	15.7	
Export (1 mil dollar)	Soft					3973.6	4019.9
	Non soft					3777.4	3458.8
World Total						7751.0	7478.7
Share of palm oil						26.0	23.5

Table E-III-8 Share of Import of Edible Oil in 1981

(SITC 423 * and SITC 424)

ITEM	VALUE (Mil dollars)	%
Soy bean	2,050	26.8
Peanut	380	5.0
Cotton seed	300	3.9
Coleseed	450	5.9
Sunflower	750	9.8
Olive	410	5.3
Total Soft Oil	4,340	56.7
Palm	1,670	21.8
Coconut, Copra	820	10.7
Other	830	10.8
Total Non Soft Oil	3,320	43.3
Grand Total	7,660	100.0

* Trade between countries of centrally planned economy included sesame oil and mustered oil excluded.

Source: Arranged by consultant from various FAO publications.

Table E-III-10 Lemon & Lime (SIIC 057-21)

	73	74	75	76	77	78	79	80	81	82	Share in
PRODUCTION (1,000 Ton)											
World Total	69/71 3,665					4,510		4,873 1.3	5,524 13.4%	5,234 -5.2%	82
TOP THREE PRODUCERS											
USA	572					916		756	1,122	902	17.2
ITALY	813					652		747	845	683	13.0
INDIA	450					453		485	490	512	9.8
CENTRAL AMERICAN COUNTRIES											
MEXICO	326					440		473	500	500	10.7
EL SALVADOR	15							19	19	20	0.4
EXPORT (World Total)											
											Share in
Value (1 Million dollar)								80	81	82	8
(World Average Unit Price \$1 Ton)								498.3	467.3		
Weight (1,000 Ton)								624.5	474.1		
								797.9	985.6		
IMPORT											
(OECD TOTAL Value)								373.6	330.2		63.4
Weight								568.6	563.6		
Unit Price (\$1 Ton)								567.1	585.9		
IMPORT											
(France) Value								73.5	65.5		12.6
								117.5	115.9		
								625.5	565.1		
EXPORT Value (Millions)											
USA								95.2	92.5		19.8
SPAIN								118.3	105.5		22.6
TURKEY								62.1	92.5		13.7
ITALY								94.3	60.0		12.8
CENTRAL AMERICA											
MEXICO								1.4	1.1		0.2
CUBA								2.8	2.7		0.6

Source: Arranged by the consultants from various FAO publications.

Table E-III-11 Grapefruits & Other Citrus (Excluding Orange and Lemon)
(SITC 057-22 29)

PRODUCTION (1,000) (Ton)	73	74	75	76	77	78	79	80	81	82	Share of 82
World Total	69/71 3,952							5,378	5,269	4,484	
TOP THREE PRODUCERS											
USA	2,179							2,709	2,503	2,625	47.5
ISRAEL	303							520	505	500	9.6
JAPAN	94							302	300	n.a.	5.7
CENTRAL AMERICAN COUNTRIES											
CUBA	16							85	111	100	2.1
GUATEMALA	53							90	92	n.a.	1.7
JAMAICA	39							28	25	24	0.5
EXPORT (World Total)											
Value								305.3	300.8		
Weight								868.2	887.4		
Unit Price											
USA								103.4	114.1		37.9
ISRAEL								72.0	65.7		21.8
SOUTH AFRICA								23.2	23.0		7.6
CYPRUS								20.1	19.7		6.5
IMPORT (JAPAN)											
Value								79.0	111.3		27.6
Weight								135.2	166.9		
Unit Price											
OECD											
Value								373.8	373.7		92.5
Weight								762.3	775.8		
Unit Price											

Source: Arranged by the consultants from various FAO publications.

Table E-III-12 Pineapple

	69/71	73	74	75	76	77	78	79	80	81	82	Share in
PRODUCTION (1,000 Ton)												
World Total									7,843	8,595	8,616	82
Rate of Increase										+ 9.6	+ 0.2	
TOP THREE PRODUCERS												
THAILAND	187								1,372	1,673	1,824	21.2
PHILIPPINE	251								901	896	871	10.1
BRAZIL	431								566	620	667	7.7
CENTRAL AMERICAN COUNTRIES/ MEXICO									551	560	550	8.4
EXPORT (World Total)												
Value (1 million dollar fresh)			74	75	76	77	78	79	80	81	82	82
Value Canned										75.5		
Weight (1,000 Ton) Fresh										355.1		
Canned										380.2		
Average Unit Price (\$1 Ton)												
(fresh)										198.6		
(canned)										586.5		
EXPORT												
Value in million dollar (1981)					FRESH	CANNED	TOTAL	SHARE				
PHILIPPINES					11.6	82.0	93.6	21.7				
THAILAND					-	93.6	93.6	21.7				
IVORY COAST					26.0	38.0	64.0	14.9				
KENYA					1.4	26.0	27.4	6.4				
IMPORT												
Value in million dollar (1981)					FRESH	CANNED	TOTAL	SHARE				
USA					9.5	117.1	126.6	23.4				
JAPAN					47.2	15.8	63.0	11.6				
OECD					139.6	342.5	482.1	88.9				

Table E-III-13 BEEF (Including Buffalowo Meat)

PRODUCTION (1,000 Ton)	69/71	73	74	75	76	77	78	79	80	81	82	Share 82
World Total	38,871	39,353	42,235	44,282	46,280	46,785	46,796	48,141	46,436	46,762	47,008	
							+ 0.0	+ 2.9	- 3.5	+ 0.7	+ 0.5	
TOP THREE PRODUCER												
USA	10,062	9,813	10,176	11,271	12,166	11,845	11,283	9,730	9,999	10,353	10,431	22.2
USSR	5,508	5,873	6,384	6,473	6,552	6,888	7,086	7,000	6,673	6,600	6,600	14.0
ARGENTINE	2,503	2,159	2,163	2,439	2,811	2,914	3,197	3,168	2,876	2,923	2,550	5.4
CENTRAL AMERICAN COUNTRIES												
MEXICO	450	472	517	509	527	588	600	585	612	624	626	1.3
EXPORT (World Total)												
Value (1 million dollar)		73	74	75	76	77	78	79	80	81	82	82
Weight (1,000 Ton)			3824.8	3703.0	4000.8	4870.1	6010.8	n.a.	8792.5	8317.9		
			2269.1	2355.2	2664.5	2967.7	3193.0	n.a.	3404.3	3384.1		
EXPORT (Value) mil. dollar												
AUSTRALIA		73	74	75	76	77	78	79	80	81	82	
WEST GERMANY								n.a.	1466.6	1287.9		15.5
FRANCE								n.a.	906.3	977.0		11.7
IRELAND								n.a.	750.6	794.8		9.3
								n.a.	960.5	567.6		6.8
IMPORT (USA)												
Value (Mil. dollar)			745.8	591.0	788.1	696.6	1149.7	n.a.	1564.3	1192.7		14.9
Weight (1,000 Ton)			490.4	557.3	606.6	553.1	673.3	n.a.	642.3	544.5		
IMPORT (Value) mil. dollar												
ITALY			642.9	844.2	700.7	821.6	970.8	n.a.	1330.4	1280.8		16.0
USSR			359.0	375.2	216.6	477.9	118.8	n.a.	590.0	677.0		8.4
FRANCE			233.9	370.4	369.2	574.0	842.0	n.a.	899.1	781.1		9.7

Table E-III-14 Cacao

unit ¢/kg

Average 1960-1970	1976	1977	1978	1979	1980	1981	1982	1983	1974
58	205	379	340	329	260	208	174	212	238

*1 Price in current dollars.

*2 Daily average price, New York and London, nearest three future trading months.

Source: World Bank; September 1984.

Note : Though France's share of import is around 5 percent, import CIF price from Ivory Coast at le Havre is given below.

1979	1980	1981	1982	1983	1984*
1525.1	1184.3	1201.7	1205.0	1814.7	2336.9

Unit: France Franc/100kg

* Monthly average Jan. to April

Table E-III-15 Supply and Consumption of Basic Grains

(Thousands Tons)

	Maize	Beans	Rice	Sorghum	Corn	Basic Grains Total
Initial Supply	4.7	4.3	3.7	0.6	-	13.3
Gross Production	412.3	40.4	29.6	46.3	-	528.6
Importations	18.9	-	-	-	71.3	90.2
National Availability	435.9	44.7	33.3	46.9	71.3	632.1
Interm Gross Demand	417.2	41.9	24.3	42.5	71.3	597.2
Exportations	-	-	-	-	-	-
Final Inventory Next Year	18.7	2.8	9.0	4.4	-	34.9
(2)	492.9	50.3	24.5	50.6	-	618.3
(3)	-	-	-	-	74.3	74.3
(4)	511.6	53.1	33.5	55.0	74.3	727.5
(5)	429.7	43.2	25.0	43.8	74.3	616.0
(6)	-	-	-	-	-	-
(7)	81.9	9.9	8.5	11.2	-	111.5

Source: SIECA.

The 17th Meeting of the Technical Group of CCMEP, 1984

Table E-III-16 Import of Foodstuffs

Weight: Thousand Ton
Value: Million lempiras (current price)

	1981		1982		1983		1984*		1985*	
	W	V	W	V	W	V	W	V	W	V
Maize	17.8	7.9	5.7	0.9	28.5	10.6	0.5	0.1	0.6	0.1
Paddy	2.5	2.0	0.03	0.1	-	-	-	-	-	-
Wheat	62.5	29.0	79.7	29.0	71.3	26.7	73.4	27.5	74.1	27.8
Beam	-	-	0.06	0.08	0.03	0.04	-	-	-	-
Milk (Powdered)	6.0	20.8	6.1	19.9	6.2	20.2	6.3	20.6	6.4	20.9
Total		59.7		49.98		57.54		48.2		48.8

* Estimate

Source: Statistical Yearbook - D.G. Foreign Commerce 1984.

Table E-III-17 (i) Importations of Oils and Greases

(Partial Data in Ton)

	1980	1981
Cotton Oil	2,304.6	999.8
Soy bean Oil	883.7	1,366.2
Coconut Oil	33.6	16.0
Palm Oil	1,540.9	20.0
Salad Oil	15.1	17.2
Lard	29.1	69.9
Vegetable Grease		
Diverse	0.9	1.0
Total	4,807.9	2,489.9
Not Edible fodder	8,801.3	7,048.7

Source: Agrarian National Institute II Mesa Redonda Internacional about the African Grease Palm, 1982.

Table E-III-17 (ii) Export of Processed Agro-Products

			'78	'79	'80	'81	'82
Canned Fruit	Value	(Million Lps)	6	9	9	11	8
	Volume	(1000 ton)	10	13	13	12	14
	Unit Price	(Lps/Ton)	600	692	693	917	571
Cotton Fabrics	Value	(Million Lps)	31.1	22.6	26.9	24.9	
Soap	Value	(Million Lps)	27	33	41	26	19
	Volume	(1000 Ton)	24	24	20	14	12
	Unit Price	(Lps/Ton)	1,125	1,375	2,050	1,875	1,583

Source: Hydraulic Masterplan of Aguan Valley 1983

*Source: Central Bank

IV. Livestock

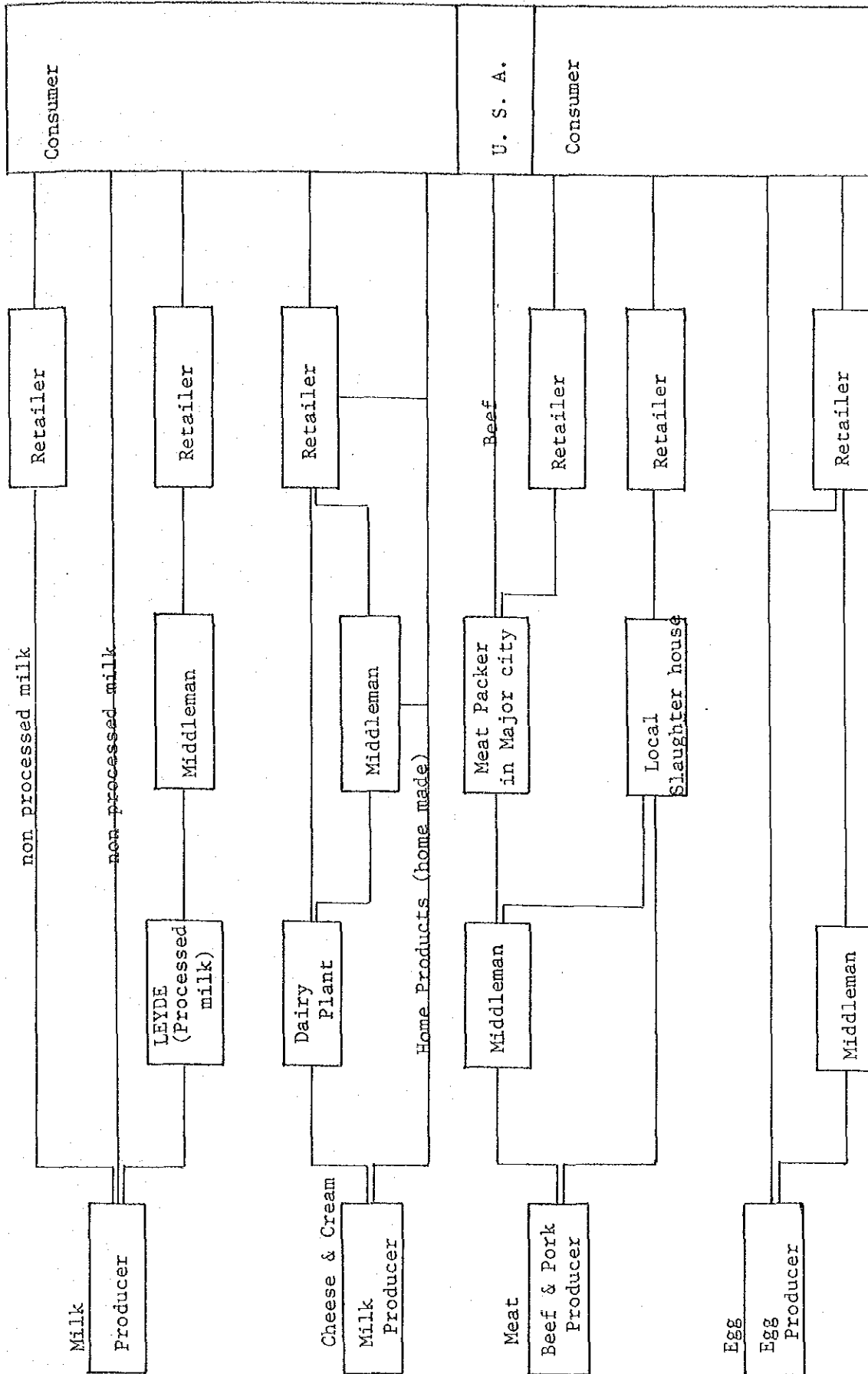


Fig. E-IV-1 Outline of Marketing Channel of Livestock Products in the Study Area

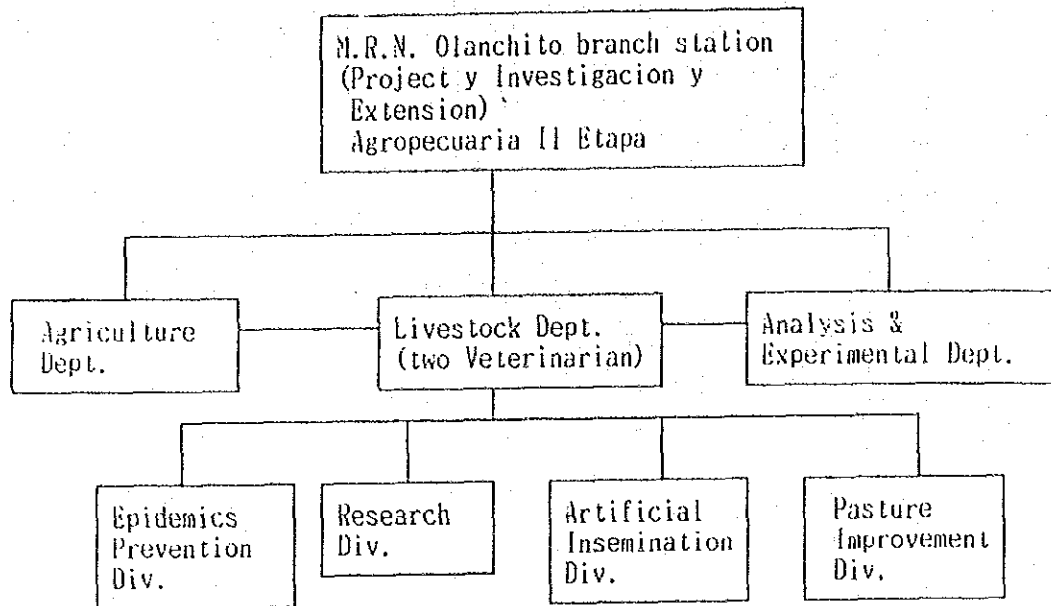


Fig. E-IV-2 Organization Chart of MRN' Regional Office in Olanchito

Table E-IV-1. Number and Area of Cattle Raised by Province in Honduras

Ranking in No. of Cattles	Province	No. of Cattles,	% of Share	Ranking in Area	Area (km ²)
1	Olancho	304,598	11.3	1	24,350.9
2	Yoro	251,675	9.3	4	7,939.2
3	Comayagua	246,734	9.2	7	5,196.4
4	Choluteca	236,046	8.8	11	4,211.0
5	Fco. Morazan	233,777	8.6	5	7,496.2
6	Cortes	228,346	8.5	12	3,954.0
7	Sta. Barbara	207,388	7.7	8	5,115.3
8	El Paraiso	192,544	7.1	6	7,218.1
9	Copan	141,957	5.3	13	3,203.4
10	Atlantida	113,963	4.3	10	4,251.2
11	Lempira	113,597	4.2	9	4,289.7
12	Colon	99,693	3.7	3	8,874.8
13	La Paz	85,198	3.2	15	2,330.6
14	Intibuca	84,229	3.1	14	3,072.2
15	Valle	71,068	2.6	17	1,564.6
16	Ocotepeque	67,855	2.5	16	1,680.2
17	Isla (Bahia)	8,342	0.3	18	260.6
18	Gracias A Dios	7,785	0.3	2	16,630.0
Total		2,694,797	100.0		111,638.0

Source: Diagnostico de Ganaderia de Honduras, LATINOCONSULT S.A., Marzo, 1984.

Table E-IV-2 Livestock in and out of Project Area

Area	In Project Area		Out of Project Area			
	Olanchito to Jaguaca	Olanchito to El Juncal	Olanchito to Santa Barbara	San Lorenzo	Ooote to Arenal	
No. of households (SAGO members) *	56	31	126		86	
No. of households who returned answer	29	38	16	56	35	
Year of Experience on Cattle raising in average	17.5	13.5	32	25	21	
Area of Pasture occupied per households Average (ha)	115.2	73.2	112.8	215.8	144.7	
No. of Cattles per households	196	79	118	119	154	
Rate of Improved Pasture (%)	92	74	97	80	80	
No. of Cattle raised per ha	1.7	1.07	1.05	0.55	1.06	
No. of households who are member of any Livestock organization including SAGO	15 (51%)	13 (34%)	8 (50%)	30 (53%)	22 (63%)	
No. of households getting a loan	13 (45%)	14 (37%)	10 (63%)	42 (75%)	10 (54%)	
No. of households receiving any technical assistance	7 (24%)	2 (5%)	7 (44%)	21 (38%)	2 (6%)	
No. of households keeping a record of farm management	11 (38%)	16 (42%)	7 (44%)	46 (82%)	7 (20%)	
No. of households cultivating main grasses and its ratio	Guinea	22 (76%)	37 (97%)	16 (100%)	52 (93%)	32 (91%)
	Merkeron	24 (83%)	21 (55%)	1 (6%)	1 (2%)	0 (0%)
	Estrella	8 (28%)	10 (26%)	3 (19%)	7 (13%)	6 (17%)
	Alicia	12 (41%)	6 (16%)	1 (6%)	6 (11%)	3 (9%)
	Rodesia	8 (28%)	10 (26%)	3 (19%)	7 (13%)	6 (17%)
	Jaragua	8 (28%)	10 (26%)	1 (6%)	22 (39%)	5 (14%)
	Others	5 (17%)	5 (13%)	0 (0%)	4 (7%)	1 (3%)
No. of households raising other animals and its average number of animals per households	Horse	18 (13)	22 (8)	9 (9)	53 (10)	25 (12)
	Pig	20 (17)	21 (14)	10 (16)	55 (15)	17 (26)
	Chicken	18 (206)**	11 (40)	2 (55)	55 (32)	14 (33)

* : Data was supplied by SAGO.

** : The average is high due to existence of lage farms raising 3,000 units of chicken broiler.

Table E-IV-3 Outline of New Project for Rural Women Group
in the Middle Aguan by Financial Aid from Foreign Countries

Type of Project	PIG RAISING (Breeding)	CHICKEN RAISING		VEGETABLES
		(Layer chicken)	(Broiler)	
Project Area	Mendez El Esperanza San Francisco	Chaparral	Agalteca ★	San Lorenzo ★
Years of Commencement	1983 ~	1983 ~	1984~	1984 ~
Project cost per one unit	12,000 LPS.	13,000 LPS.	8,000 LPS.	10,000 LPS.
Aid Countries	Holland	Holland	Canada	Canada

★marks shows out of the survey area.

Table E-IV-4 Outline of Dairy Plant in the Middle Aguan

LOCATION	El Juncal	Santa Barbara	San Lorenzo
Management Body	Local dairy Cooperatives	COSAGO	COSAGO
Production Capacity	2,500 litre/day	2,500 litre/day	6,000 litre/day
Present Production	2,300 litre/day	2,800 litre/day	4,000 litre/day
Month of Commencement	May, 1984	August, 1981	September, 1983
Cost of Construction	30,000 LPS.	100,000 LPS.	185,000 LPS.
Distance to Olanchito	20 km	30 km	54 km

Table E-IV-5 Main Grasses in the Study Area

Family	Local Name	Scientific Name
Leguminosae	Guinea grass	Panicum maximum Jacq.
	Merkeron	Penisetum Purpureum
	Rodesia	Andropogon gayanus Kunth
	Jaragua grass	Hyparrhenia rufa (Ness) Stapf.
	Estrella	Cynodon plecostachyus (K. Schum) Pilger
Imbricaceae	Leucaena	Leucaena leucocephala (Lam) De Wit

Table E-IV-6 A Model of the Existing Cattle Raising Farm in the Study Area (Based on result of questionnaire survey and SAGO's data)

Area of Pasture	90 ha.
Rate of the Improved Pasture	80 %
Total No. of Cattle	131 head
(Bull)	(2)
(Milking Cow)	(50)
(No. of used for constant milking)	(33)
(2-3 years Calves)	(25)
(1-2 years Calves)	(26)
(under 1 years Calves)	(28)
No. of Cattle Raised per ha.	1.45 head
Production Rate of Calf	66 %
Replacement Rate of Milking Cow	25 %
Mortality Rate of Calf (under 1 year)	15 %
Mortality Rate of Calf (1-3 years)	5 %
No. of permanent staffs	3 men
Average volume of milk per head per day	2.6 L

Table E-IV-7 Livestock Budget for Swine
(Farrow to Finish)

A. Baby Pig Production Cost

1. Breeding Sow Cost

<u>Items</u>	<u>Cost (Lps.)</u>	<u>Remarks</u>
Pig cost for Breeding	165.00	at 30kg. 5.5 LPS./kg
Feed cost (30kg to first service)	86.80	F.C. =4.0 280kg consumed. 0.31 Lps/kg
Veterinary cost	6.30	Vaccine, Antiparasitic agent, Disinfectant, Insecticide & others.
Hog pen	25.00	Annual charge at 5% of initial cost (1,000 Lps./ pen. put in 2 pigs.)
Labor cost	18.00	10 min./day/head. 120 days, = 20 hours. (1 hour p.9 Lps. 200 Lps./month)
TOTAL	<u>301.10</u>	
Culling sow	300.00	Lps. at 200 kg. 1.5 Lps. or more per kg.

* Culling sow price will cover all the cost of growing breeding sow. No annual charge at initial cost.

2. Baby Pig Production Cost

<u>Item</u>	<u>Cost (Lps.)</u>	<u>Remarks</u>
Sow feed	260.40	2.3 kg/day x 365 days = 840kg. 0.31 Lps./kg.
Boar feed	13.02	1 Boar 840kg. 0.31 Lps./kg. served 20 sows per year.
Veterinary cost	11.60	
Hog pen	50.00	Annual charge at 5% of initial cost (1,000 Lps. per pen)
Labor cost	54.90	10 min./head/day- 3,650 min. 61 hours. (200 Los./month)
TOTAL	389.92	Lps.
16 Pigs Weaned Per Sow Per Year.		
Baby Pig Cost	24.37	at birth

B. Market Hog Production Cost

<u>Items</u>	<u>Cost (Lps.)</u>	<u>Remarks</u>
Baby pig cost	24.37	at birth
Feed cost	126.95	F.C. = 4.0 360 kg consumed
Veterinary cost	6.48	
Hog pen	3.13	Annual charge at 5% of initial cost (1,000 Lps./pen: 6 month use, put in 8 hogs)
Labor cost	13.50	5 min./head/day. 180 days = 900 min. = 15 hours. (200 Lps./month/man)
TOTAL	<u>174.43</u>	
 <u>OUTPUT</u>		
Market hog	220.00	at 100 kg. 2.2 Lps./kg. liveweight.
NET RETURN	45.57	per hog.
 One sow produce 16 pigs per year;		
One sow NET RETURN	<u>729.12</u>	

Table E-IV-8 Physical Production Data for Swine

Farrow to Finish

Breeding

Conception-first service	80-90 %
No. of pigs born live per litter	10 heads
No. of pigs weaned per litter	8 heads
No. of pigs weaned per sow per year	16 heads
Percent death loss	20 %

Nutrition

Feed conversion efficiency (Wean to Finish)	4.0
Age at weaning (weeks)	5-6
Average liveweight of hogs sold	100 kg

Management

Labor hours per pig	3 hours (future target)
---------------------	-------------------------

Breed

Landrace, Large White (Yorkshire), Duroc and Hampshire.

Table E-IV-9 Swine Feed Calculation (Per kg)

<u>Items</u>	<u>Production Cost (Lps.)</u>	<u>Damage of Low Grade (Lps.)</u>	<u>Grinding Charge (Lps.)</u>	<u>Transport Charge (Lps.)</u>	<u>Total Cost For Feed (Lps.)</u>
Maize	0.35	0.12	0.02	0.02	0.16
Rice	0.46	0.15	0.02	0.02	0.19
Palm oil seed		0.01	0.02	0.02	0.05
Rice bran		0.04		0.02	0.06
Cassava	0.16	0.05		0.02	0.07
Plantain	0.15	0.05		0.02	0.07
Whey		1.0/litre		0.02	1.02/litre

Formula Feed (Commercial Feed)

Starter	0.58		0.02	0.60
Grower	0.53		0.02	0.55
Finisher	0.46		0.02	0.48
Sow & Boar	0.44		0.02	0.46
Salt & Minerals	1.53		0.02	1.55

* Formular Feed Mixed Farm Byproducts

Grower

Formular feed	69.5kg			
Maize	15.0			
Rice bran	15.0			
Salt & Mineral	0.5			
TOTAL	100.0	Cost: 0.42 Lps./kg	0.11 Lps.	Cost Down.

Finisher

Formular Feed	49.5			
Maize	25.0			
Rice	10.0			
Rice bran	15.0			
Salt & Minerals	0.5			
TOTAL	100.0	Cost: 0.31 Lps./kg	0.15 Lps.	Cost Down.

Sow Feed

Formular Feed	49.5			
Maize	20.0			
Rice	15.0			
Rice bran	15.0			
Salt & Minerals	0.5			
TOTAL	100.0	Cost: 0.31 Lps./kg	0.13 Lps.	Cost Down.

Table-E-IV-10 Cost and Benefit Calculation on Freshwater Fish Culture
(Per Ha Per Cycle)

<u>Item</u>	<u>Amount (Lps.)</u>	<u>Calculation Base</u>
1. Operational Cost		
(1) Depreciation for culture pond (17,500 Lps./30 years/2 cycles)	292	- Pond construction cost: 17,500 Lps./ha. - Depreciation period: 30 years
(2) Pond repairing cost (Depreciation x 10%)	29	
(3) Purchasing cost of fingerling (0.06 Lps./pc. x 3,000 pcs)	180	- Estimated fish production: 750 kg/cycle/ha. - Harvesting size of fish: 340 g/pc. - Survival rate: 75% - No. of fingerling required: Approx. 3,000 pcs/ha - Price of fingerling: 0.06 Lps./pc (incl. transportation cost 0.01 Lps./pc) - Size of fingerling: 5 g/pc.
(4) Purchasing cost of feed (rice bran) (4,020 kg x 0.04 Lps./kg)	161	- Feed conversion rate: 4 - Volume of feed required: 4,020 kg/ha/cycle (340-5) g x 4 x 3,000 pcs) - Price of feed: 0.04 Lps./kg
(5) Labour cost (0.9 Lps./hr. x 90 hrs.)	81	- Working hours per day: 0.5 hr. - Total working hours per cycle: 90 hrs. (0.5 hr. x 180 days) - Labour cost: 0.9 Lps./he. (200 Lps./month/30 days/8hrs)
Total Operational Cost	<u>743.</u>	
2. Gross Income		
Sales income of tilapia (750 kg x 1.5 Lps./kg)	<u>1,125</u>	
3. Net Return		
(1,125 Lps. - 743 Lps.)	<u>382</u>	

If 2 cycles of operation per year are realized, the annual net return will become double, i.e. Lps. 764.

Table E-IV-11 Comparison of Livestock Budget for 100 ha. Improved Pasture

	Unit	Unit price (Lps.)	Present		Improved Management	
			Quantity	Lps.	Quantity	Lps.
Stocking						
No. of animals			Cows 56 head		Cows 56 head	Bulls 2, Calves 36, Heifers 34, Steers 34
			Total 145 head		Total 160 head	
Output						
Milk	litre	0.40	35,113	14,045	46,720	3.2 L/cow/day: Production cow cow 40 head
Cull cow/heifers	head	1.32 L/kg	14	6,468	11	375kg x 1.32 L: Replacement rate 20%
Heifers	head	500	-	-	6	3,000
3 years male	head	1.32 L/kg	13	6,006	17	375kg x 1.32 L = @495 L
Total				26,519	35,548	
Cost						
Fencing	km	100/km	7	700	8	800
Maintenance of fencing	10%			70		80
Veterinary cost & salt	head	35	145	5,075	160	8,000
Herbicide	Lps./ha	5 Lps./ha	100	500	100	2,000
Pasture cleaning	man/month	200	15	1,000	15	3,000
Labour	man/month	200	44	8,800	48	9,600
Total				16,145		23,480
Net Return				10,374		12,068
Net Return Per Hectare				104		121

Table E-IV-12 Livestock (Cattle) Budget for 100 ha. Improved Pasture

	Unit	Master Plan				JICA Plan				
		Unit price per cost (Lps.)	Present		Level A	Unit price per cost (Lps.)	Present		Improved Management	
			Quantity	Lps.			Quantity	Lps.		Quantity
Stocking										
No. of animals	head		67	67		56: Total 145 Cows	56: Total 160 Cows			
Output										
Milk	litre	0.35	11,250	3,935		0.40	35,113	14,045	46,720	18,688
Cull cows/heifers	head	600	8	4,800	25% up	462 & 495	14	6,468	11	5,445
Heifers	-	-	-	-		500	-	-	6	3,000
3 year male	head	670	7	4,690		462 & 495	13	6,006	17	8,415
Total				13,425	16,780			26,519		35,548
Cost										
Fencing	km	93	7	651	7	100	7	700	8	800
Maintenance of fencing	-	-	-	-	-	10%	-	70	-	70
Veterinary cost & salt	head	20	67	1,340	30x670	35/head	145	5,075	50x160	8,000
Herbicide	litre	8	25	200	200	5L/ha:20L/ha	5x 100	500	20x100	2,000
Pasture cleaning	-	-	-	-	-	man/month	200x5	1,000	200x15	3,000
Labour	man/month	200	20	4,000	20	man/month @ 200	200x44	8,800	200x48	9,000
Total				6,191	8,261			16,145		23,480
Net Return				7,234	8,519			10,374		12,068
Net Return Per Hectare				72	85			104		121

