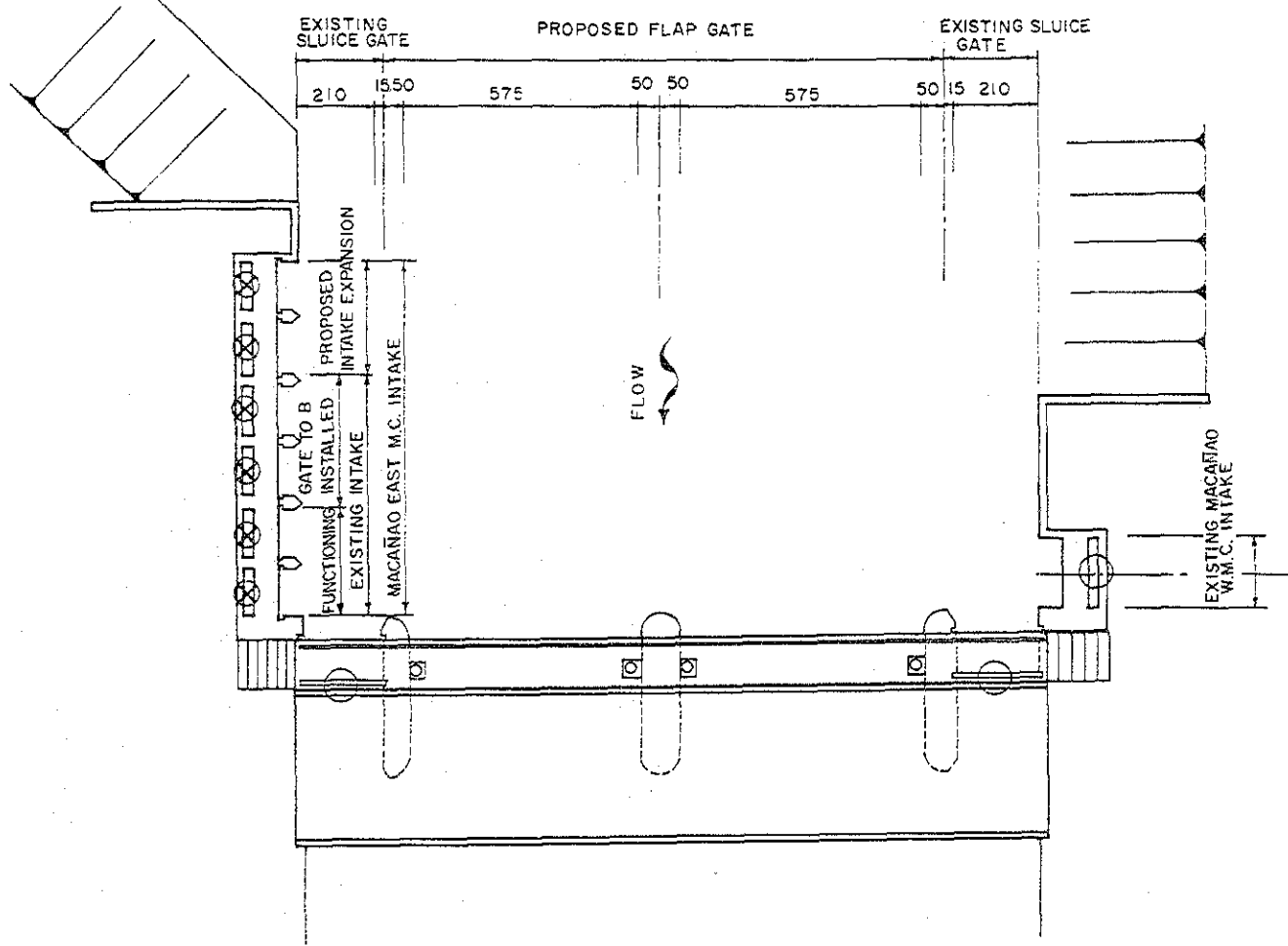
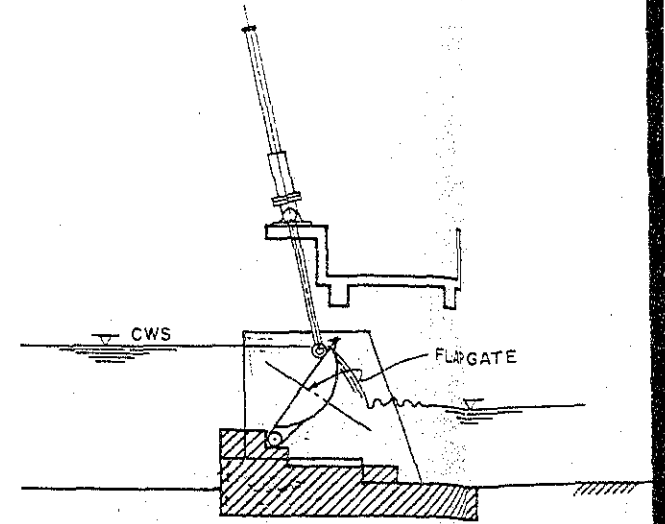


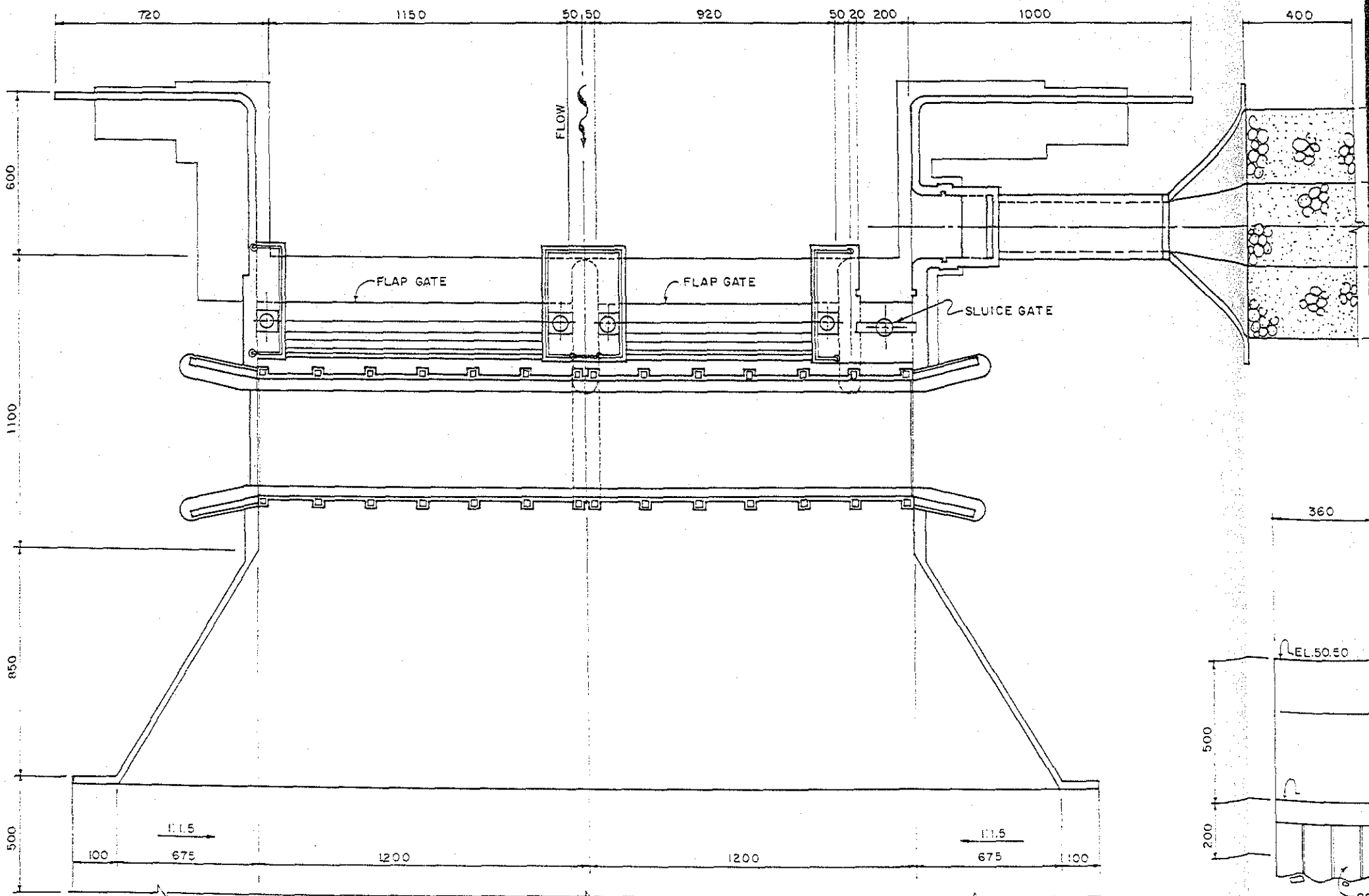
IMPROVEMENT OF MACAÑO AN



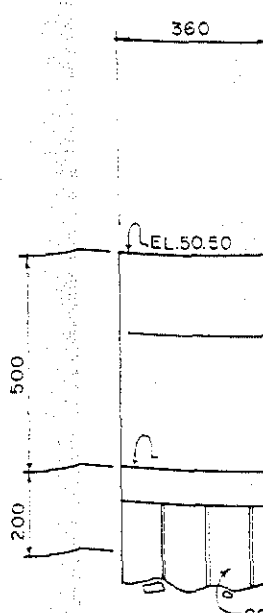
PLAN OF MACAÑO WEIR
SCALE 1:100



LONGITUDINAL SECTION OF MACAÑO
SCALE 1:100

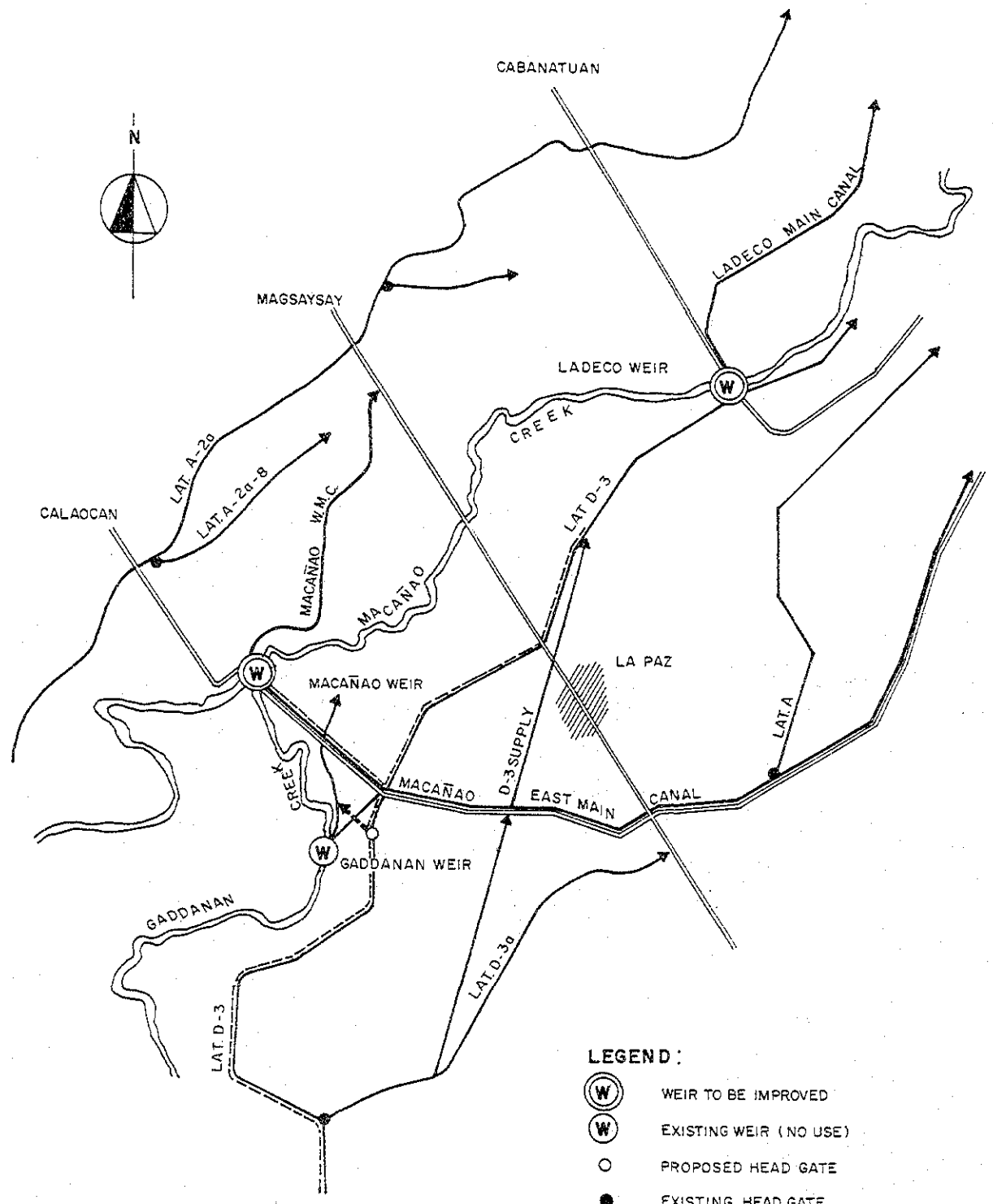









PLAN OF LADECO WEIR
SCALE 1:100

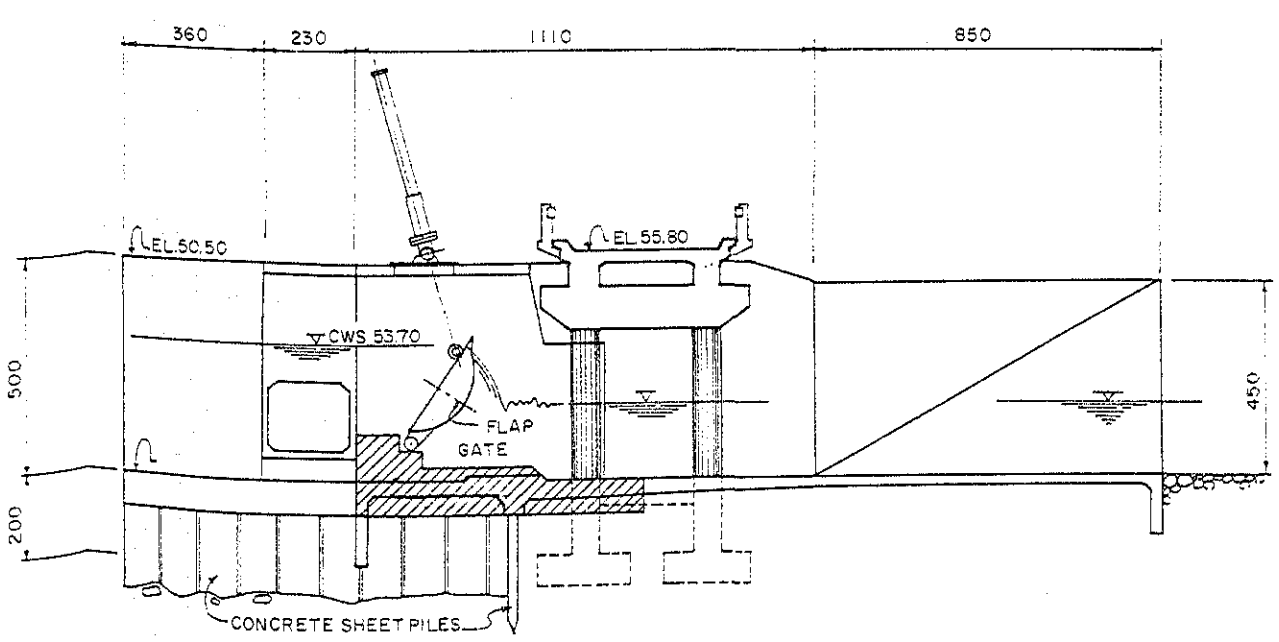
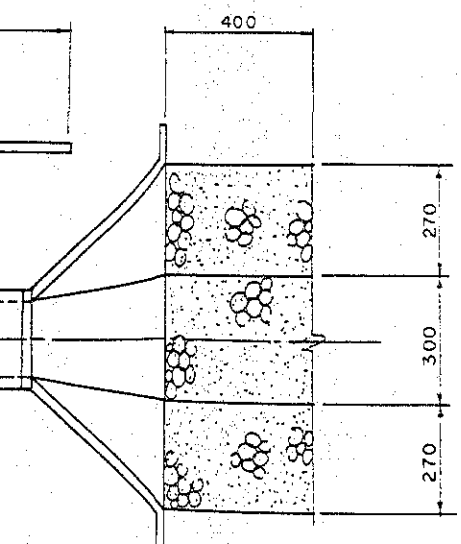
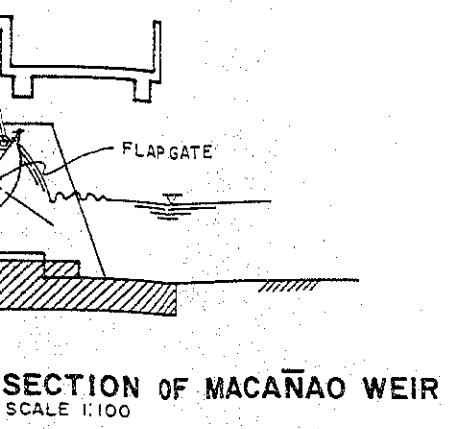


LO

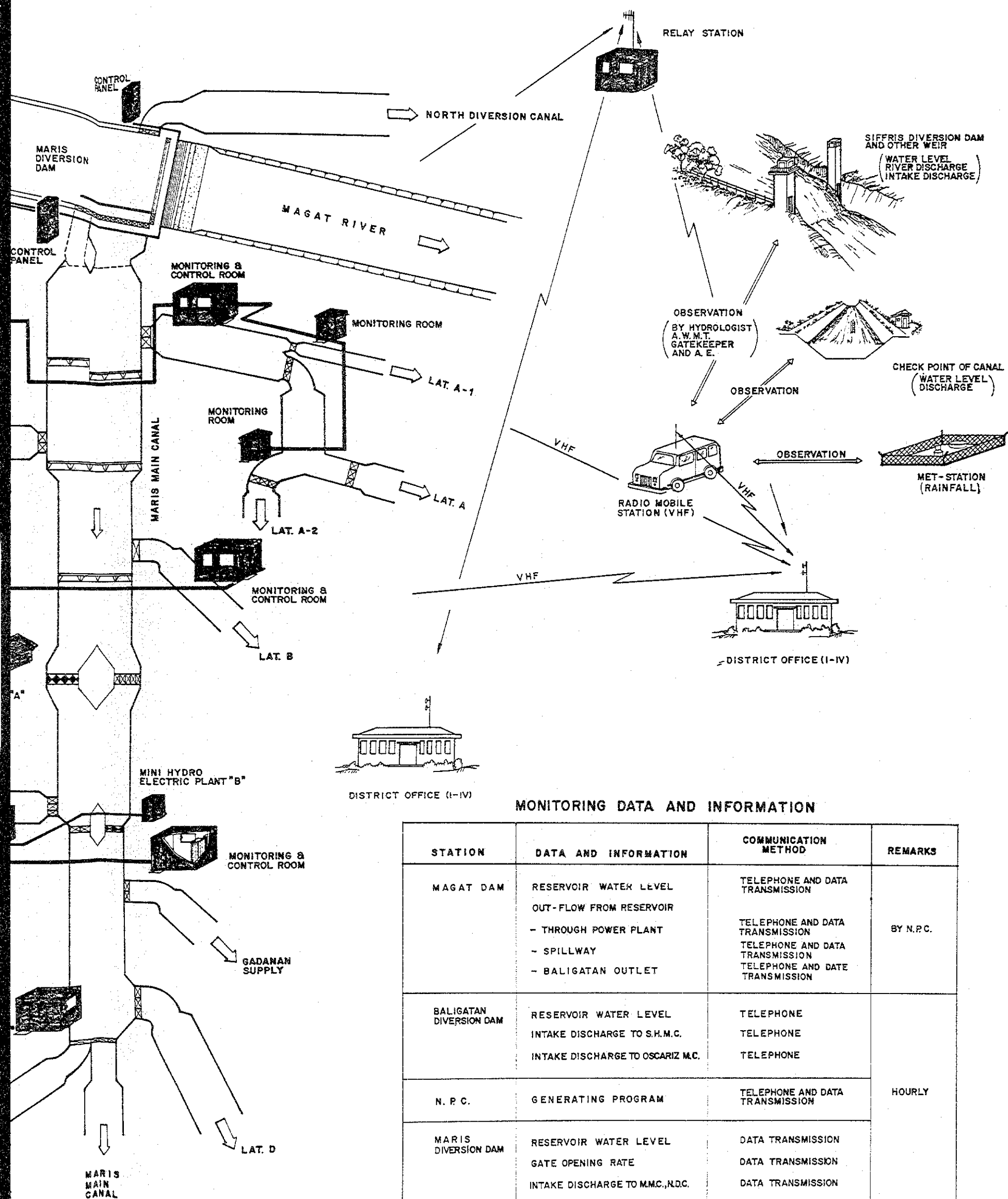
OF MACAÑO AND LADECO WEIRS



- LEGEND:**
-  WEIR TO BE IMPROVED
 -  EXISTING WEIR (NO USE)
 -  PROPOSED HEAD GATE
 -  EXISTING HEAD GATE
 -  EXISTING CANAL
 -  WIDENING
 -  PROPOSED CANAL



CONTROL SYSTEM FOR MRIIS



MONITORING DATA AND INFORMATION


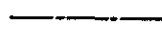
STATION	DATA AND INFORMATION	COMMUNICATION METHOD	REMARKS
MAGAT DAM	RESERVOIR WATER LEVEL OUT-FLOW FROM RESERVOIR - THROUGH POWER PLANT - SPILLWAY - BALIGATAN OUTLET	TELEPHONE AND DATA TRANSMISSION TELEPHONE AND DATA TRANSMISSION TELEPHONE AND DATA TRANSMISSION TELEPHONE AND DATE TRANSMISSION	BY N.P.C.
BALIGATAN DIVERSION DAM	RESERVOIR WATER LEVEL INTAKE DISCHARGE TO S.H.M.C. INTAKE DISCHARGE TO OSCARIZ M.C.	TELEPHONE TELEPHONE TELEPHONE	HOURLY
N. P. C.	GENERATING PROGRAM	TELEPHONE AND DATA TRANSMISSION	
MARIS DIVERSION DAM	RESERVOIR WATER LEVEL GATE OPENING RATE INTAKE DISCHARGE TO MMC, N.D.C.	DATA TRANSMISSION DATA TRANSMISSION DATA TRANSMISSION	
SIFFRIS DIVERSION DAM	RESERVOIR WATER LEVEL RIVER DISCHARGE INTAKE DISCHARGE TO SSMC, SNMC.	TELEPHONE TELEPHONE TELEPHONE	
MRIIS O/M OFFICES	AREA IRRIGATED AND HARVESTED TENANT INFORMATION O/M FEE COLLECTION DATA	TELEPHONE AND DATA TRANSMISSION	DAILY

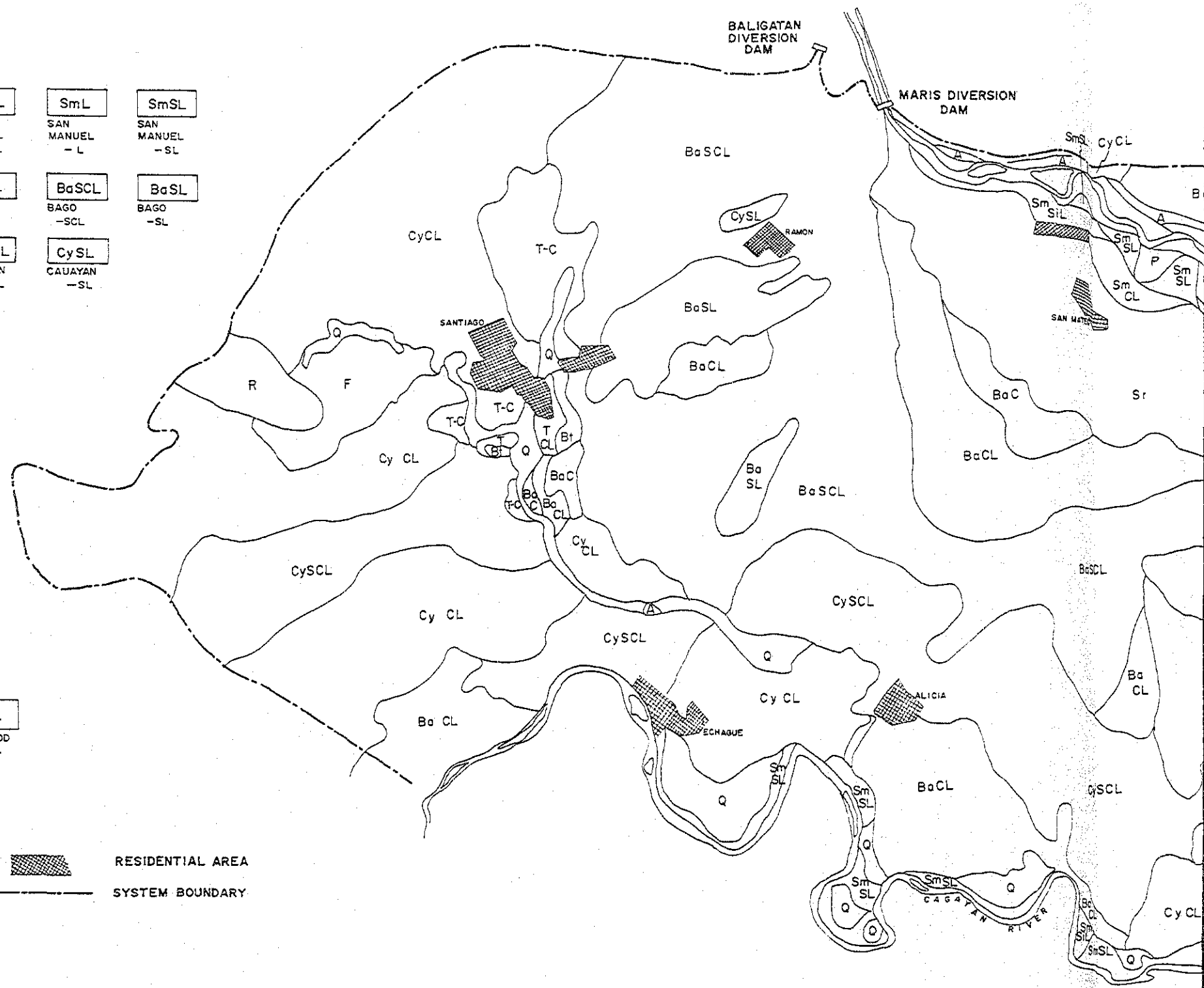
SOIL MAP

LEGEND:

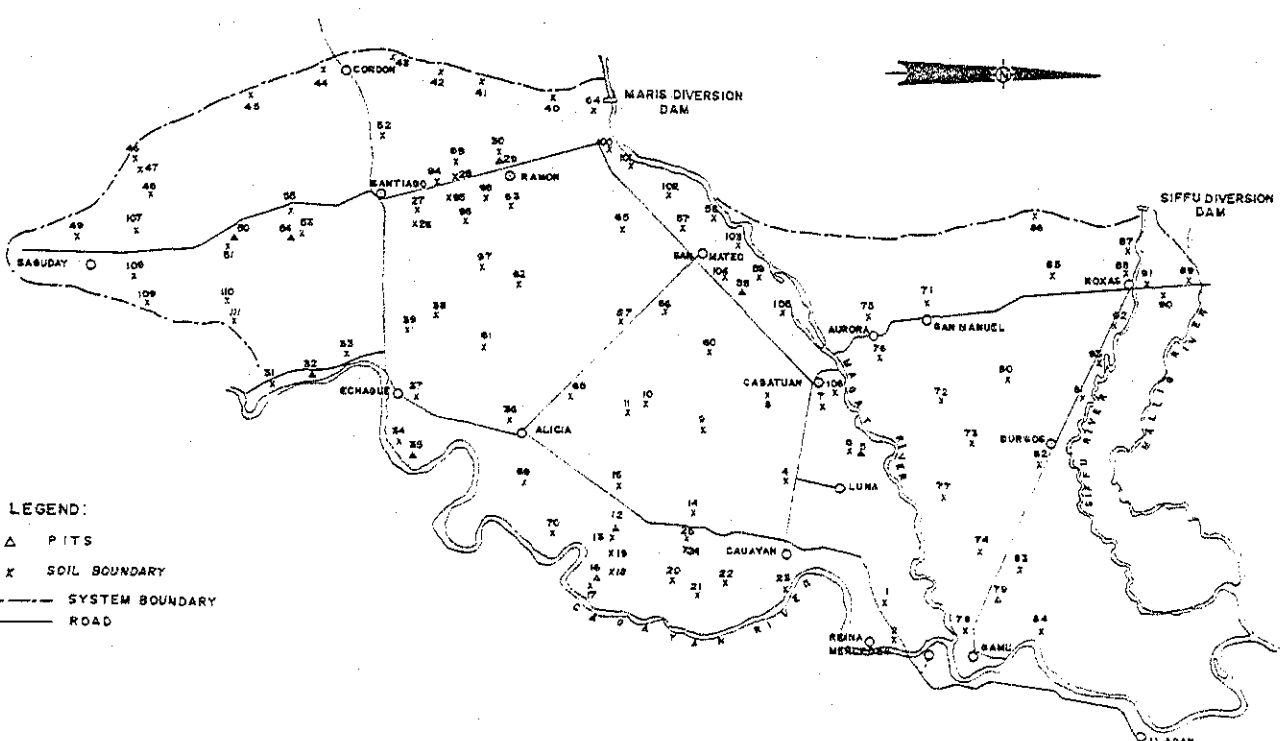
SOIL TYPES

SmCL SAN MANUEL -CL	SmSiL SAN MANUEL -SiL	SmL SAN MANUEL -L	SmSL SAN MANUEL -SL
BaC BAGO -C	BaCL BAGO -CL	BaSCL BAGO -SCL	BaSL BAGO -SL
CyCL CAUAYAN -CL	CySCL CAUAYAN -SCL	CySL CAUAYAN -SL	
P PENARANDA -SL			
A AGUSTIN -SL			
Q QUINGUA -SiCL			
Sr STA. RITA -CL			
Bt BANTOG -CL			
Bg BIGAA -C			
T-C TAGULOD -C	TCL TAGULOD -CL		
F FARAON -CL			
R RUSAO -C			

 RESIDENTIAL AREA
 SYSTEM BOUNDARY



EXAMINATION SITES DISTRIBUTION

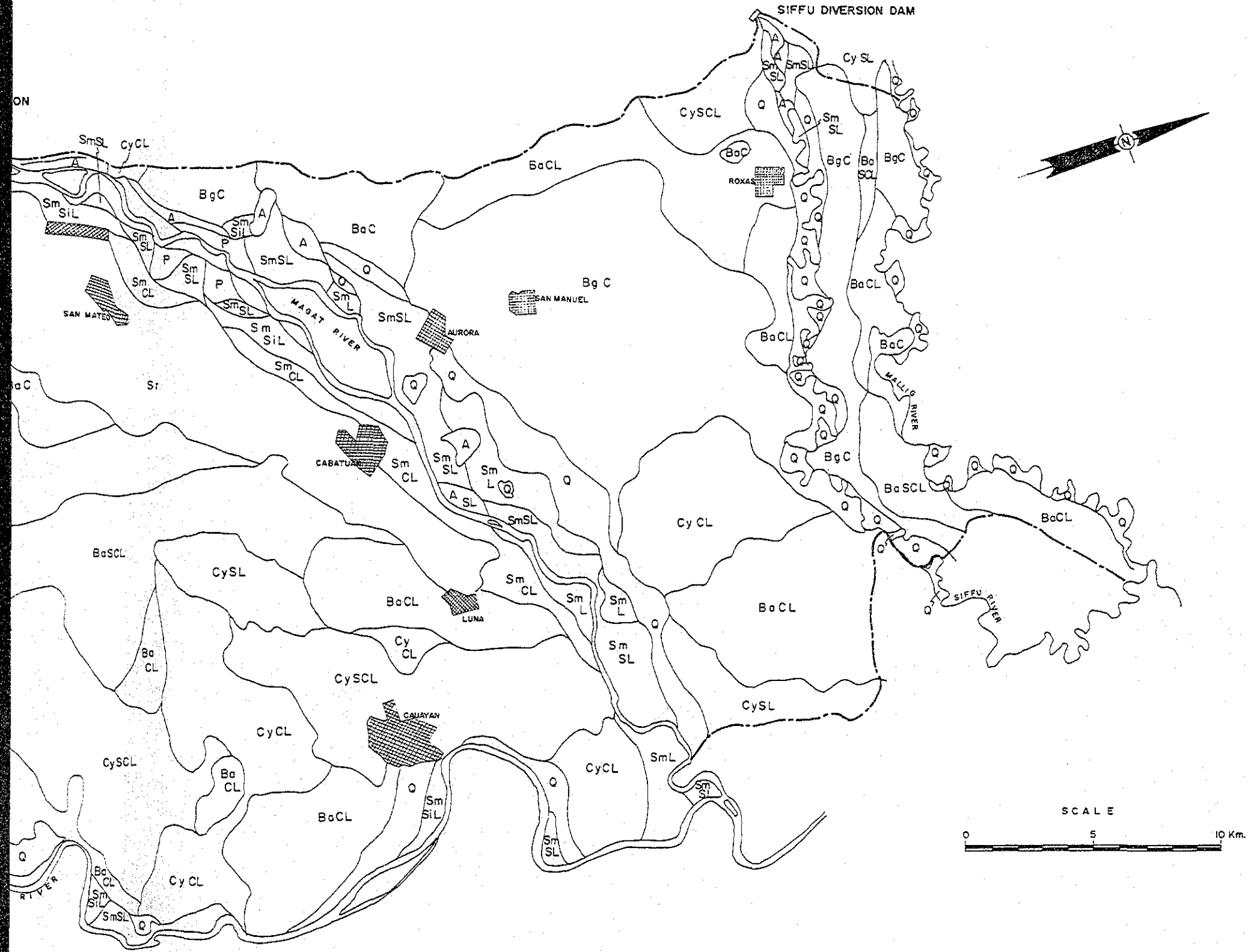


LEGEND:
 Δ PITS
 x SOIL BOUNDARY
 --- SYSTEM BOUNDARY
 — ROAD

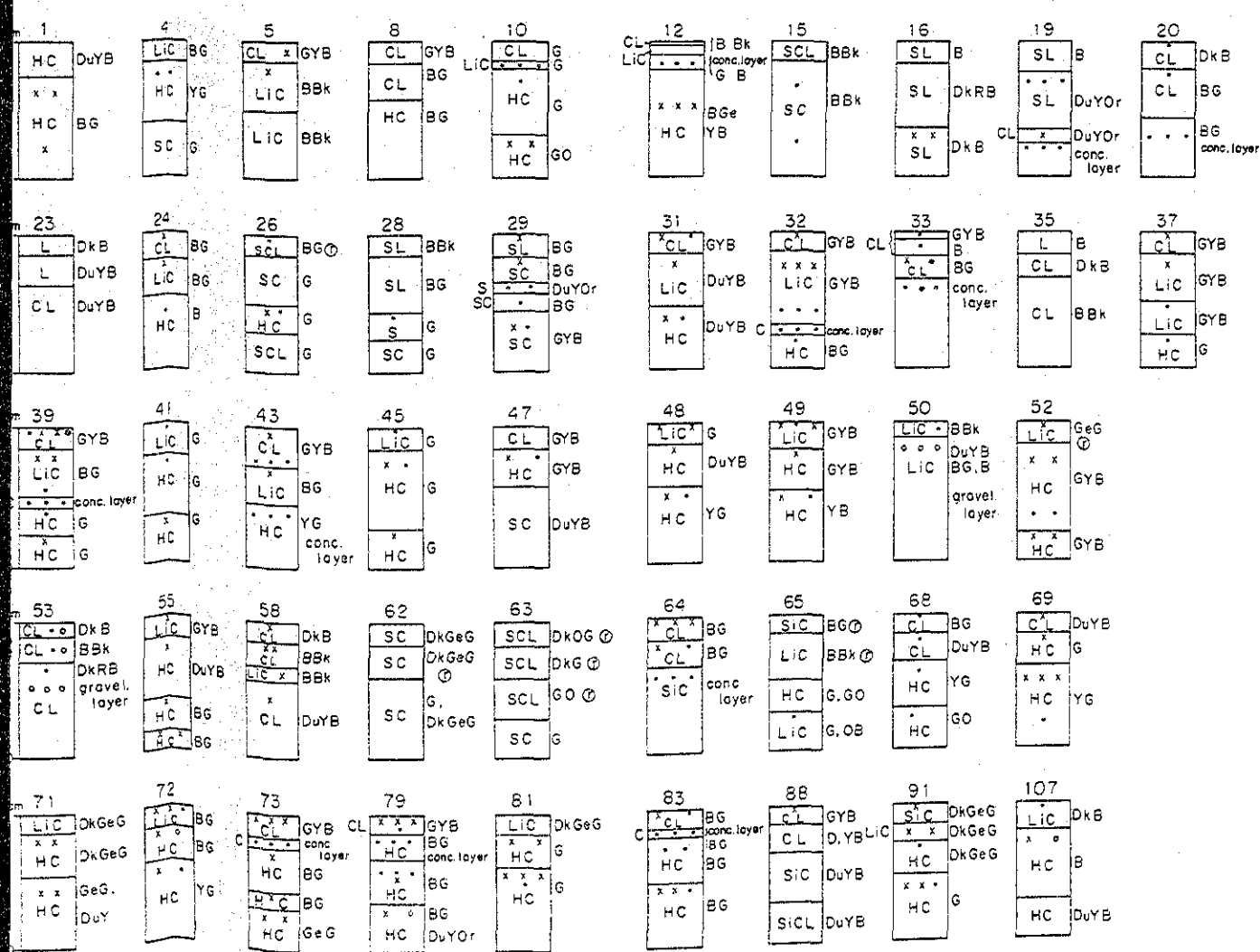
COLUMN

0cm 1 HC x x HC x	DuYB	4 LIC HC SC	BG YG G	5 CL LIC LIC
100				
0cm 23 L L CL	DkB DuYB DuYB	24 CL LIC HC	BG BG B	26 SC SC HC SCL
100				
0cm 39 LIC LIC HC HC	GYB BG G G	41 LIC HC HC	G G G	43 CL LIC HC
100				
0cm 53 CL CL CL	DkB BBk DkRB CL gravel layer	54 LIC HC HC	GYB DuYB BG BG	58 CL LIC CL
100				
0cm 71 LIC HC HC HC	DkGeG DkGeG GeG DuY	72 LIC HC HC	BG BG YG	73 CL HC HC HC
100				

SOIL MAP



COLUMNAR DIAGRAMS OF SOIL PROFILE



- LEGEND (COLOR)**
- B- Brown, Brownish
 - G- Gray, Grayish
 - Y- Yellow, Yellowish
 - Bl- Bluish
 - Bk- Black
 - Ge- Greenish
 - O- Olive
 - Or- Orange
 - P- Purplish
 - R- Reddish
 - Bt- Bright
 - Dk- Dark
 - Du- Dull
 - Lt- Light
 - Pa- Pale
- (TEXTURE) (TOMMERUP Method)**
- S- Sand, Sandy
 - L- Loom, Loomy
 - Si- Silty
 - C- Clay
 - H- Heavy
 - Li- Light
- (MOTTLES)(CONCRE- (GRAVELS) TIONS)**
- x x x o Few
 - x x . . . o Common
 - x x x . . . o Many
 - ⊙ - Strong Reduction

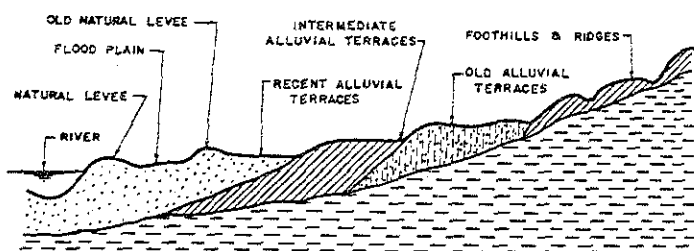
CHARACTERISTICS OF SOIL SERIES

Soil Series (Soil Type)	Exam. Point	Soil Order (USDA)	Land Form	Soil Texture (Surface soil, Subsoil)	Characteristics	Land Use
1 Penaranda (Penaranda-SL)		Entisols	Flood plains (Flat)	SL S-Gravel	Have a sandy or gravelly layer, coarse textured; excessively drained soils with low holding capacity of water and plant nutrients, occasional floodings.	Undeveloped land Upland field
2 Agustin (Agustin-SL)		Entisols	Flood plains (Flat)	L-SiL S	Coarse to medium textured, somewhat excessively drained, low holding capacity of water and plant nutrients.	Upland field Undeveloped land
3 San Manuel (San Manuel-SL) (San Manuel-L) (San Manuel-SiL) (San Manuel-CL)	16,23	Entisols	Flood plains (Flat-gently undulating)	SL-CL SL-CL	Near neutral in reaction and rich in plant nutrients; subject to occasional flooding but well drained, fertile, good for diversified crop production.	Upland field Paddy field
4 Quingua (Quingua-SiCL)	35,58	Inceptisols	Flood plains (Gently undulat.)	L-SiCL SiCL-CL	Similar to the San Manuel soils; well drained, fertile soils, valued highly for diversified crop production.	Upland field
5 Santa Rita (Santa Rita-CL)	5	Inceptisols	Recent alluvial terrace (Flat)	CL CL-C	Near neutral in reaction, fertile, the most productive paddy soils in the project area; not subject to flooding; do not have as good drainage as the flood plain soils; valued also for diversified crop production.	Paddy field Upland field
6 Bago (Bago-SL) (Bago-SCL) (Bago-CL) (Bago-C)	*	Alfisols	Intermediate alluvial terraces (Flat-undulating)	SL-C C	Very extensive soils; have a compact heavy subsoil imperfectly drained; surface soil is hard and difficult to till when fine textured and dry; slightly acid, somewhat deficient in nutrients, under irrigation, capable of producing two good rice crops per year.	Paddy field
7 Bantog (Bantog-CL)		Alfisols	Intermediate alluvial terraces (Flat)	L-CL C	Slightly acid or near neutral in reaction; compact clay subsoil, imperfectly drained; with irrigation, productive and can produce two good rice crops per year.	Paddy field
8 Bigaa (Bigaa-C)	71,72 91	Vertisols	Intermediate alluvial terraces (Flat)	C C	Very fine textured throughout the profile, surface soil is hard and difficult to till when dry; slightly acid, fertile; imperfectly drained; under irrigation, productive and expected considerably high yield of rice crop.	Paddy field
9 Tagulod (Tagulod-C) (Tagulod-CL)		Inceptisols	Intermediate alluvial terraces (Flat)	CL-C CL	Deep, nearly level and imperfectly drained; near neutral in reaction, fertile and expected high yield of rice crop under irrigation.	Paddy field
10 Cauayan (Cauayan-SL) (Cauayan-SCL) (Cauayan-CL)	**	Alfisols	Old alluvial terraces (Undulat.-rolling)	SL-CL C	Excessive external drainage, very poor internal drainage, show evidence of considerable erosion in steeper portion; more acid in reaction and less fertile than most of the other soils; but in gently undulating area, with irrigation can produce two rice crops per year; sometimes having Fe-Mn nodules and pan in subsoil; they impede plowing and hinder the soils from being developed.	Grassland Paddy field
11 Faraon (Faraon-CL)		Alfisols	Old alluv. terraces (Undulat.-rolling)	C C	Parent material is derived from coralline limestone; imperfectly drained, somewhat rich in organic matter, fertile and productive soils for rice production.	Grassland Paddy field
12 Rugao (Rugao-C)		Alfisols	Old alluv. terraces (Rolling)	C C	Derived from calcareous parent material, neutral in reaction, sometimes deficient in potassium; poor internal drainage, excessive external drainage; subject to considerable erosion; not cultivated much and used for pasture.	Grassland Woodland

Examination Points

- * 4, 8, 10, 20, 26, 28, 31, 32, 41, 62, 63, 64, 65, 68, 69, 79, 81, 83, 88
 ** 1, 12, 15, 19, 24, 29, 33, 37, 39, 43, 45, 48, 49, 50, 53, 55, 73, 107

REPRESENTATIVE SOIL PROFILE DESCRIPTIONS



Copy From "MARP FEASIBILITY REPORT" (1975)

EXPLANATION:

- SILTS, SANDS, and GRAVELS
- SILTS, CLAYS
- CLAYS WITH SOME SANDS OR GRAVELS
- RESIDUAL AND COLLUVIAL CLAYS, SILTS, SANDS
- SEDIMENTS - SANDSTONES, SILTSTONES, SHALES

Profile No. 5 Soil Name: Sta. Rita series
 Soil Taxonomy (USDA): Inceptisols
 Date of Examination: June 10, 1986
 Location: Puroc, LUNA Elevation: 47.5 m
 Land Form: Recent Alluvial Terrace, Flat
 Land Use: Paddy field
 Soil Drainage Class: Moderately Well Drained

Profile Description

- 0-13 cm Grayish yellow brown (10YR 4/2) moist, with few fine faint brown mottles, clay loam; moderate medium angular blocky structure; sticky, plastic, slightly friable moist, hard dry; compactness* 27, few fine pores, abundant fine roots; clear, smooth boundary.
- 13-50 cm Brownish black (10YR 3/2) moist, with few fine dark brown mottles, light clay; strong coarse angular blocky structure; sticky, plastic, firm moist; compactness 29, moderately thick cutans on most ped surfaces; few fine vertical pores; common fine roots; gradual, smooth boundary.
- 50-100+cm Brownish black (10YR 3/2) moist, light clay; strong very coarse angular blocky structure; sticky, plastic, very firm moist; compactness 27; moderately thick cutans on most ped surfaces; few fine continuous vertical pores; few fine roots.

* Index of YAMANAKA'S Hardness Tester

Profile No. 12 Soil Name: Cauayan series
 Soil Taxonomy (USDA): Alfisols
 Date of Examination: June 10, 1986
 Location: Ramona, ANGADANAN Elevation: 70 m
 Land Form: Old Alluvial Terrace Undulating
 Land Use: Grassland
 Soil Drainage Class: Moderately Well Drained

Profile Description

- 0-3 cm Brownish black (5YR 3/1) moist, clay loam; in humus; moderate fine granular; slightly slightly plastic, friable moist, slightly hard common fine and medium roots; clear, smooth boundary
- 3-11 cm Brownish black (7.5YR 3/2) moist, light in humus; moderate fine granular; sticky, plastic, firm moist; few fine vertical pores; common medium roots; clear smooth boundary
- 11-22 cm Grayish brown (7.5YR 4/2) moist, dark brown spherical iron-manganese nodules dominant la sticky, non plastic, few fine roots; clear smooth boundary
- 22-100+cm Brownish gray (10YR 5/1) and Yellowish 5/6), with many brown fine mottles, heavy clay very coarse blocky structure; brown thin cut ped faces; very sticky, very plastic, very firm no root

DATA OF CHEMICAL ANALYSIS

Soil Series	Soil Series	pH (H ₂ O)	pH (KCl)	Avail. P	Org. C	Exch. Cation me/100g					Extra. acidity	CEC	Soil Series	Soil Series	pH (H ₂ O)	pH (KCl)	Avail. P	Org. C	Exch. Cation me/100g					Extra. acidity	CEC
						Ca	Mg	K	Na	Sum									Ca	Mg	K	Na	Sum		
1-1 Cy	1-1 Cy	5.0	4.5	13.5	1.54	7.1	3.3	0.14	0.36	10.9	10.0	20.9	49-1 Cy	49-1 Cy	5.6	5.3	31.0	2.12	19.7	11.3	0.36	1.10	32.4	14.3	46.7
4-1 Ba	4-1 Ba	5.2	4.8	16.5	1.24	5.8	2.8	0.10	0.57	9.3	8.7	18.0	50-1 Cy	50-1 Cy	5.6	5.4	21.0	2.72	24.9	6.8	0.24	0.34	32.3	18.6	50.9
5-1 St.R	5-1 St.R	5.1	4.8	38.5	1.92	18.4	9.0	0.42	0.55	28.4	15.1	43.5	52-1 Tg	52-1 Tg	5.7	5.5	33.0	1.70	11.3	7.5	0.07	0.33	19.2	13.0	32.1
5-2	5-2	5.5	5.2	25.5	1.63	22.5	13.9	0.29	0.59	37.3	14.3	51.5	53-1 Cy	53-1 Cy	5.6	5.4	26.5	1.63	6.0	2.6	0.20	0.23	9.0	10.8	19.8
8-1 Ba	8-1 Ba	5.3	4.8	22.5	2.20	15.3	7.2	0.14	0.47	23.1	12.5	35.6	53-2	53-2	5.5	5.3	30.0	1.85	5.7	2.6	0.69	0.18	9.1	10.0	19.1
10-1 Ba	10-1 Ba	4.9	4.7	16.0	1.92	13.3	6.5	0.13	0.33	20.2	12.9	33.1	55-1 Cy	55-1 Cy	5.5	5.4	17.0	2.19	30.2	11.3	0.19	0.68	42.4	19.5	61.8
12-2 Cy	12-2 Cy	5.8	4.4	8.5	1.95	4.8	2.5	0.16	0.14	7.6	12.1	19.7	58-1 Q	58-1 Q	6.1	6.1	38.0	1.92	18.8	7.6	0.23	0.66	27.3	11.7	39.0
12-4	12-4	5.5	5.3	8.5	1.67	10.1	4.8	0.13	0.44	15.5	9.1	24.6	58-2	58-2	5.2	5.1	33.0	1.03	18.0	10.5	0.18	0.66	29.3	10.4	39.7
15-1 Cy	15-1 Cy	5.6	5.4	10.0	0.94	4.9	1.3	0.10	0.14	6.5	6.1	12.5	58-3	58-3	5.8	5.7	26.5	2.11	21.3	10.9	0.30	0.73	33.1	10.0	43.1
16-1 Sm	16-1 Sm	6.3	6.1	28.3	1.35	13.9	7.9	0.79	0.31	22.9	6.1	29.0	62-1 Ba	62-1 Ba	6.1	6.1	28.5	1.52	11.1	2.1	0.03	0.48	13.8	6.9	20.7
16-2	16-2	6.3	6.1	38.5	1.38	20.6	8.7	0.68	0.34	30.3	8.2	38.5	63-1 Ba	63-1 Ba	5.4	5.1	21.0	1.92	7.2	2.1	0.13	0.29	9.7	8.7	18.3
19-1 Cy	19-1 Cy	5.4	4.2	8.5	1.08	1.2	1.1	0.06	0.06	2.4	6.1	8.5	64-1 Ba	64-1 Ba	5.0	4.8	28.5	1.57	4.7	0.5	0.03	0.36	5.6	6.9	12.5
20-1 Ba	20-1 Ba	4.7	4.5	11.0	1.52	5.0	2.6	0.10	0.13	7.8	7.4	15.1	65-1 Ba	65-1 Ba	4.8	4.7	20.0	2.00	12.3	5.0	0.08	0.38	17.8	12.1	29.9
23-1 Sm	23-1 Sm	5.5	5.4	22.5	1.95	21.3	7.5	0.46	0.25	29.4	9.1	38.5	68-1 Ba	68-1 Ba	5.7	5.7	35.0	1.68	5.8	3.6	0.05	0.34	9.8	7.4	17.1
24-1 Cy	24-1 Cy	5.2	4.1	15.0	1.79	7.3	1.3	0.10	0.21	8.9	12.1	21.0	69-1 Ba	69-1 Ba	6.0	6.0	19.0	1.84	8.6	3.8	0.06	0.34	12.7	9.1	21.8
26-1 Ba	26-1 Ba	5.7	5.4	15.0	1.81	5.8	2.0	0.13	0.23	8.2	6.5	14.7	71-1 Bg	71-1 Bg	5.7	5.7	21.5	2.31	17.7	17.2	0.08	0.70	35.6	19.5	55.1
28-1 Ba	28-1 Ba	5.6	5.4	11.5	0.84	2.7	1.9	0.08	0.18	4.9	4.3	9.2	72-1 Bg	72-1 Bg	5.7	5.6	18.0	2.75	18.4	18.1	0.39	1.62	38.6	19.5	58.0
29-1 Cy	29-1 Cy	5.7	5.5	12.5	0.86	2.7	1.0	0.08	0.15	4.0	6.1	10.0	73-1 Cy	73-1 Cy	4.5	4.4	19.0	2.27	5.2	3.8	0.16	0.48	9.6	12.5	22.2
29-2	29-2	5.8	5.5	10.0	0.83	7.2	1.7	0.08	0.33	9.3	5.6	14.9	79-1 Ba	79-1 Ba	5.3	5.0	15.5	2.03	6.2	5.5	0.14	0.50	12.4	13.4	25.8
29-5	29-5	6.0	5.8	11.5	0.58	9.3	4.4	0.08	0.55	14.3	5.2	19.5	79-3	79-3	5.6	5.5	28.5	1.38	11.3	14.4	0.19	0.62	26.5	15.1	41.6
31-1 Ba	31-1 Ba	5.8	4.2	14.0	1.67	6.6	5.4	0.17	0.23	12.4	12.9	25.3	81-1 Ba	81-1 Ba	5.4	5.2	23.5	3.29	19.6	15.2	0.82	0.88	36.5	21.6	58.1
32-1 Ba	32-1 Ba	4.9	3.7	8.5	1.43	3.2	1.3	0.10	0.20	4.7	10.4	15.1	83-1 Ba	83-1 Ba	5.1	5.0	20.0	1.41	5.3	4.7	0.01	0.43	10.5	9.1	19.5
32-2	32-2	4.5	4.1	8.5	1.00	5.3	3.4	0.07	0.21	9.0	8.7	17.6	88-1 Ba	88-1 Ba	6.5	6.4	19.0	2.20	24.1	24.0	0.05	0.82	49.0	14.3	63.2
33-2 Cy	33-2 Cy	4.3	4.0	7.0	1.07	1.7	1.4	0.08	0.09	3.2	8.7	11.9	91-1 Bg	91-1 Bg	6.2	6.1	40.5	3.04	25.7	17.0	0.79	1.13	44.6	18.2	62.8
33-3	33-3	5.3	4.1	9.5	1.41	1.5	2.1	0.05	0.18	2.1	4.8	8.6	107-1 Cy	107-1 Cy	4.9	4.8	10.0	2.27	21.4	10.6	0.86	0.47	33.3	20.3	53.6
35-1 Q	35-1 Q	5.7	5.5	27.5	1.24	19.8	8.6	0.65	0.17	29.1	8.7	37.8	Analyzed by the Soil and Water LAB. SERV., NIA.												
35-2	35-2	5.6	5.5	31.0	1.10	14.9	15.0	0.50	0.23	30.6	8.2	38.9	Analytical Methods												
35-3	35-3	6.0	5.7	31.5	1.62	19.7	11.4	0.60	0.34	32.0	8.2	40.2	pH(H ₂ O) Soil:Water 1:2.5												
37-1 Cy	37-1 Cy	4.8	3.8	8.5	1.68	4.0	3.8	0.08	0.13	8.0	9.5	17.5	pH(KCl) Soil:Soln. 1:2.5												
39-1 Cy	39-1 Cy	5.0	4.0	9.5	1.40	3.0	1.3	0.14	0.13	4.6	5.6	10.2	Available phosphorous ; Olsen's method												
41-1 Ba	41-1 Ba	6.2	5.9	23.5	2.08	23.8	23.6	0.75	0.32	48.4	17.7	66.1	Exchangeable cations ; 1N Amm. Acetate extractable												
43-1 Cy	43-1 Cy	4.5	4.3	8.5	1.14	3.7	2.2	0.20	0.22	6.3	10.8	17.1	Extractable acidity ; BaCl ₂ -TEA at pH8.2												
45-1 Cy	45-1 Cy	5.7	5.4	35.5	2.17	13.6	13.3	0.52	0.86	28.3	8.6	46.9	C E C (Cation exchange capacity); Sum of exch. cations + Extract. acidity												
47-1 Rg	47-1 Rg	6.5	6.2	16.5	1.43	13.6	5.5	0.07	0.34	19.5	11.2	30.8													
48-1 Cy	48-1 Cy	5.9	5.6	19.0	2.30	28.4	13.9	0.41	0.65	43.3	21.6	64.9													

Profile No. 16 Soil Name: San Manuel series
 Soil Taxonomy (USDA): Entisols
 Date of Examination: June 11, 1986
 Location: Viga, ANGADANAN Elevation: 48 m
 Land Form: Flood Plain, Gently Undulating
 Land Use: Upland field
 Soil Drainage Class: Well Drained

Profile Description
 0-16 cm Brown (7.5YR 4/3) moist sandy loam; weak fine granules; non sticky, non plastic, friable moist; compactness* 15; common fine and medium roots; clear smooth boundary.
 16-64 cm Dark reddish brown (5YR 3/2) moist, sandy loam; weak fine to medium blocky structure; non sticky, non plastic friable moist; compactness 20; very few fine roots; gradual, smooth boundary
 64-90+cm Dark brown (7.5 YR3/3) moist, with common medium faint brown mottles, sandy loam; weak medium blocky structure; non sticky, non plastic, friable moist; compactness 22; very few fine roots

Profile No. 32' Soil Name: Bago series
 Soil Taxonomy (USDA): Alfisols
 Date of Examination: June 17, 1986
 Location: Garit Sur, ECHAGUE Elevation: 78 m
 Land Form: Intermediate Alluvial Terrace, Flat
 Land Use: Paddy field
 Soil Drainage Class: Well Drained

Profile Description
 0-16 cm Grayish yellow brown (10YR 5/2) moist, with common filmy and tube like brown mottles, clay loam; moderate coarse angular blocky structure; slightly sticky, slightly plastic, firm moist; compactness* 17; abundant fine roots; gradual, smooth boundary
 16-69 cm Grayish yellow brown (10YR5/2) moist, with many fine yellow brown mottles, light clay; moderate medium to fine subangular blocky structure; sticky, plastic, very firm moist; compactness 20-17; many fine vertical pores; frequent fine dark brown spherical nodules around 35 cm depth; common fine roots; abrupt wavy boundary
 69-78 cm Grayish yellow brown (10YR 5/2) moist, heavy clay; small iron-manganese nodules dominant layer; non sticky, non plastic; water gushing; abrupt wavy boundary
 78-100+cm Brownish gray (10YR 5/1) moist, heavy clay; structureless, massive, very sticky, very plastic, very firm moist; few small brownish black nodules

Profile No. 58 Soil name: Quingua series
 Soil Taxonomy (USDA): Inceptisols
 Date of Examination: June 10, 1986
 Location: Marasat Pequeno, SAN MATEO Elevation: 70 m
 Land Form: Flood Plain, Flat
 Land Use: Paddy field
 Soil Drainage Class: Moderately Well Drained

Profile Description
 0-14 cm Dark brown (10YR 3/3) moist, few fine distinct clear brown mottles, clay loam; moderate medium angular blocky structure; sticky, plastic, friable moist; compactness* 18; few fine vertical pores; abundant fine roots; gradual smooth boundary
 14-32 cm Brownish black (10YR 3/2) moist, few fine distinct clear brown mottles, clay loam; strong medium angular blocky structure; sticky, plastic, firm, moist; compactness 22; few fine vertical pores; few fine roots; gradual smooth boundary
 32-42 cm Brownish black (10YR 2/3) moist, few fine distinct clear brown mottles, light clay; moderate medium angular blocky structure; sticky, plastic, firm, moist; compactness 21; common fine vertical pores; few fine roots, gradual smooth boundary
 42-100+cm Dull yellowish brown (10YR 4/3) moist, few fine distinct clear mottles, clay loam; strong coarse blocky structure; sticky, plastic, firm, moist; compactness 20; continuous moderately thick cutans on vertical ped faces; few fine continuous vertical pores; very few fine roots

DESCRIPTIONS

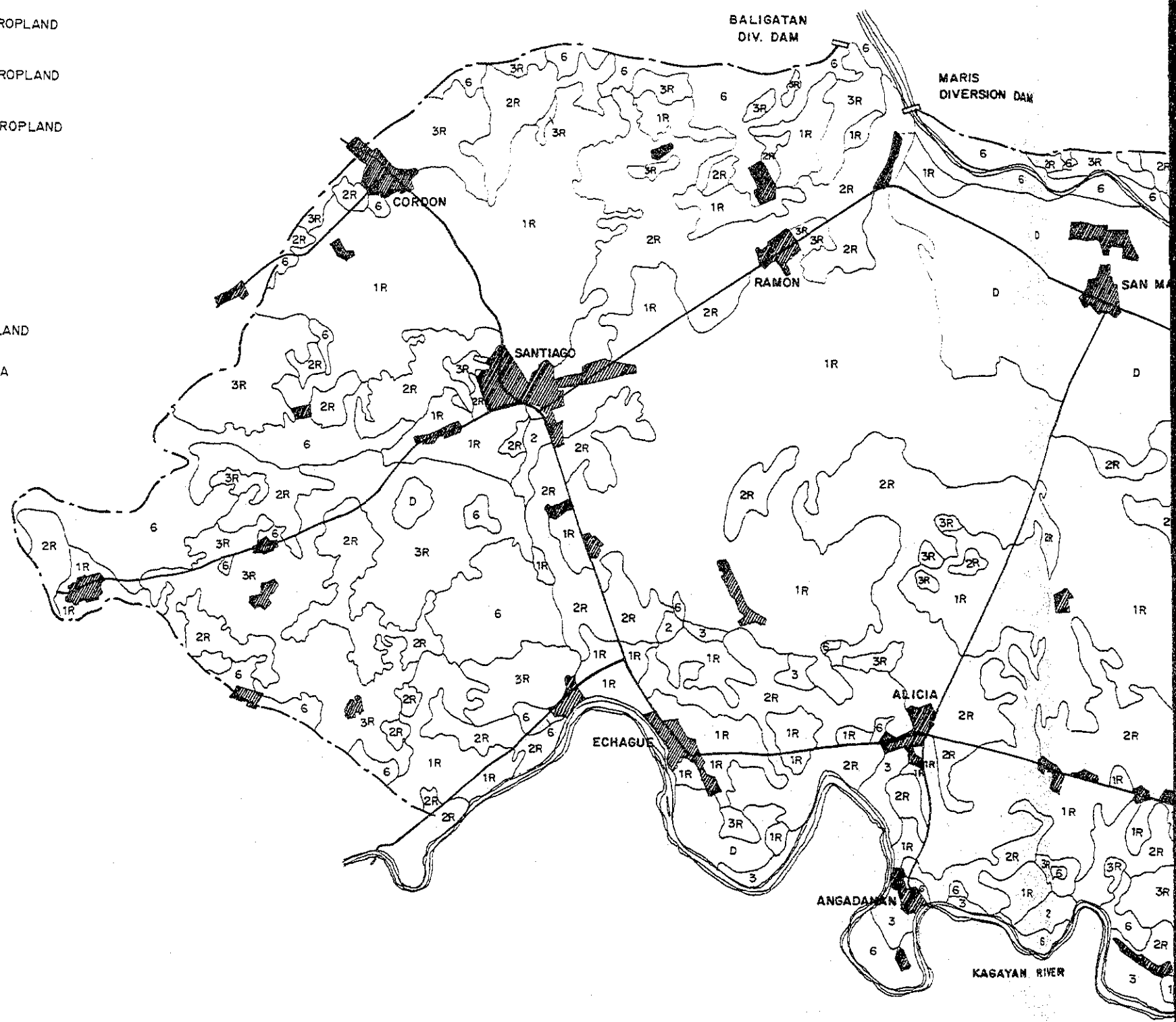
Soil Name: Cauayan series
 Soil Taxonomy (USDA): Alfisols
 Date of Examination: June 10, 1986
 Location: Viga, ANGADANAN Elevation: 70 m
 Land Form: Alluvial Terrace, Undulating
 Land Use: Upland field
 Soil Drainage Class: Moderately Well Drained

Profile Description
 0-16 cm Ash black (5YR 3/1) moist, clay loam; very rich in iron-manganese nodules; moderate fine granular; slightly sticky, slightly plastic, friable moist, slightly hard dry; common fine and medium roots; clear, smooth boundary
 16-69 cm Ash black (7.5YR 3/2) moist, light clay, rich in iron-manganese nodules; moderate fine granular; sticky, plastic, friable moist; few fine vertical pores; common fine and medium roots; clear smooth boundary
 69-78 cm Ash brown (7.5YR 4/2) moist, dark brown small, frequent iron-manganese nodules dominant layer; non sticky, non plastic, few fine roots; clear smooth boundary
 78-100+cm Brownish gray (10YR 5/1) and Yellowish brown (10YR 5/2) moist, with many brown fine mottles, heavy clay; weak coarse blocky structure; brown thin cutans on some vertical ped faces; very sticky, very plastic, very firm moist;

LAND CLASSIFICATION

LEGEND

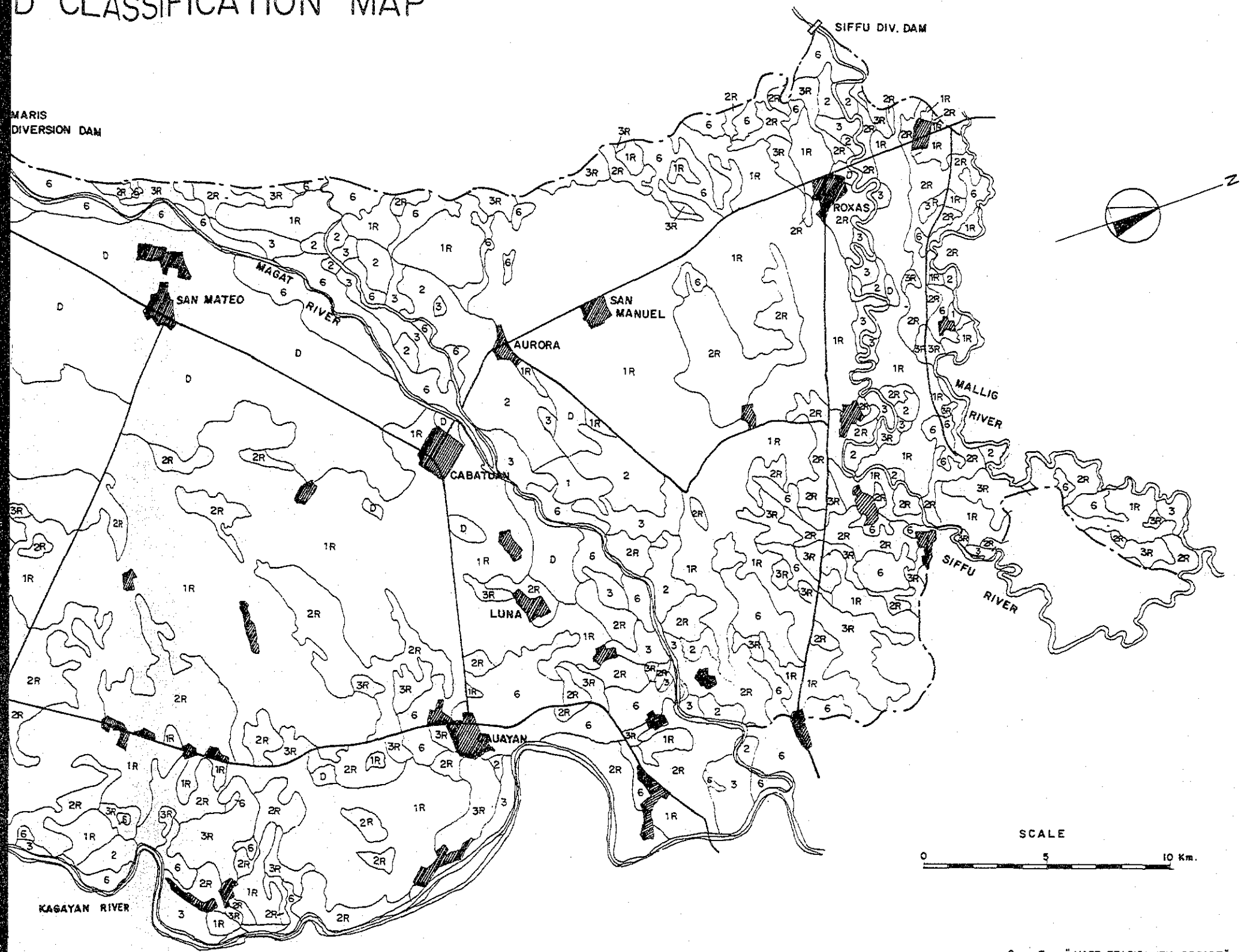
- 1 CLASS 1 DIVERSIFIED CROPLAND
- 2 CLASS 2 DIVERSIFIED CROPLAND
- 3 CLASS 3 DIVERSIFIED CROPLAND
- 1R CLASS 1R RICE LAND
- 2R CLASS 2R RICE LAND
- 3R CLASS 3R RICE LAND
- D DUAL CLASS LAND
- 6 CLASS 6 NON-ARABLE LAND
- MAIN RESIDENTIAL AREA
- SYSTEM BOUNDARY
- MAIN ROAD



LAND CLASSIFICATION

Land class	Principal Soil Series	MARP F.S. Area	MARIS Service Area	Characteristics
Rice Land		ha	ha	
1 R	Bago Bigas Tagulod	55,910	53,900	Located on flat alluvial terraces with slope not over 2 percent; fine textured good deep soils; will provide readily; restricted internal drainage; slightly acid and favorable exchangeable base status; would require little cost of land development; with projected yields of 90 - 100 cavans.
2 R	Cauayan Bago Bigas	31,930	25,400	Have moderate deficiencies such as sandy texture, 2 to 5 percent slope or occasional floodings which reduce rice yields below class 1R level; prior to irrigation, will require moderate terracing cost.
3 R	Cauayan	20,920	10,800	Have relatively serious deficiencies than class 2R soils, mostly undeveloped land on rolling or gently rolling areas, with slope 5 - 8 percent; could be terraced prior to irrigation if soils are deep; projected yield is 80 - 70 cavans.
Diversified Cropland				
1	San Manuel Quingua	310	-	Medium textured, good deep soils, well drained, flat slope not over 2 percent.
2	San Manuel Quingua	4,430	-	Similar to class 1 soils except for undulating or irregular surface, occasional floodings or short time inundations.
3	San Manuel Augustin	5,630	-	Have more serious physical limitations such as subject to occasional floodings, gently rolling surface which cannot be corrected by leveling, or less than 90 cm effective depth of soil.
Dual Class Land				
1 R (2) 2 R (3)	Sta. Rita	10,750	7,300	Could be drained for diversified crops at feasible cost; without subsurface drainage similar to class 1R or 2R for rice; with surface drainage suitable for diversified crops.
Nonable lands				
6	Cauayan San Manuel	35,480	-	Not suited for irrigation development because of serious physical or economic limitations; rolling areas with slope over 8 percent and difficult to irrigate economically; undulating lands with soils too shallow for leveling and lands in low positions subject to serious floodings.
Total		189,360 ^{ha}	87,400 ^{ha}	

D CLASSIFICATION MAP



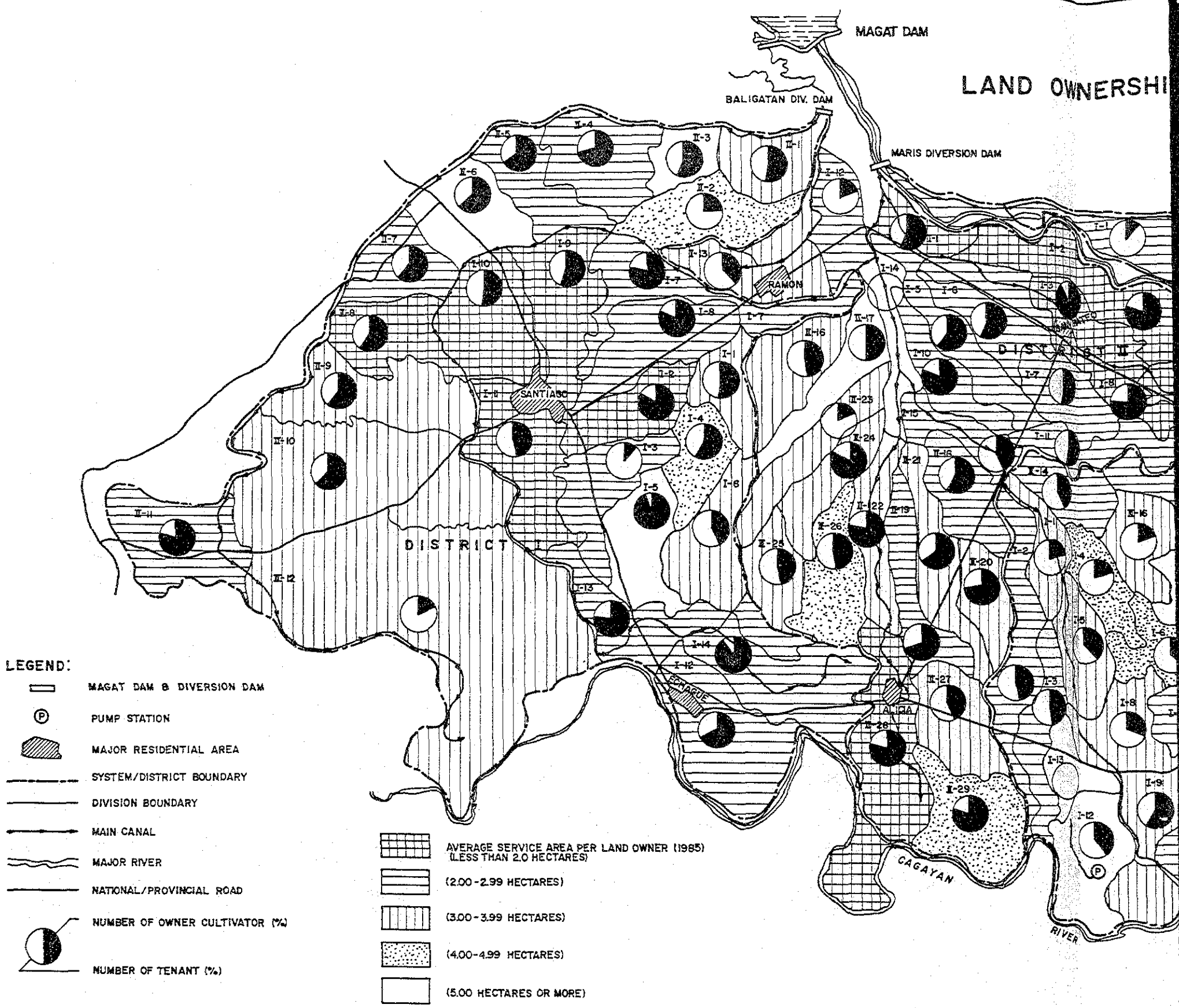
Copy From "MARP FEASIBILITY REPORT" (1975)

VARIOUS AREAS IN EACH DISTRICT

	Total Area	Irrigation Service Area		Drainage Problem Area	Dual Land Area	High Permeability Area ²⁾	Rolling Land Area	Clayey Soil Area
		Projected	Actual ¹⁾					
District I	42,800	24,054	22,860	129	250	-	11,800	21,600
District II	33,800	24,465	23,980	213	6,500	5,850	180	11,700
District III	50,200	24,793	22,280	387	200	-	5,200	23,000
District IV	31,400	24,087	20,230	757	350	250	1,360	10,800
Total	158,200	97,402	89,350	1,486	7,300	6,100	18,540	67,100

1) in 1965 A.D.
2) in paddy field

LAND OWNERSHIP



LEGEND:

- MAGAT DAM & DIVERSION DAM
- PUMP STATION
- MAJOR RESIDENTIAL AREA
- SYSTEM/DISTRICT BOUNDARY
- DIVISION BOUNDARY
- MAIN CANAL
- MAJOR RIVER
- NATIONAL/PROVINCIAL ROAD
- NUMBER OF OWNER CULTIVATOR (%)
- NUMBER OF TENANT (%)

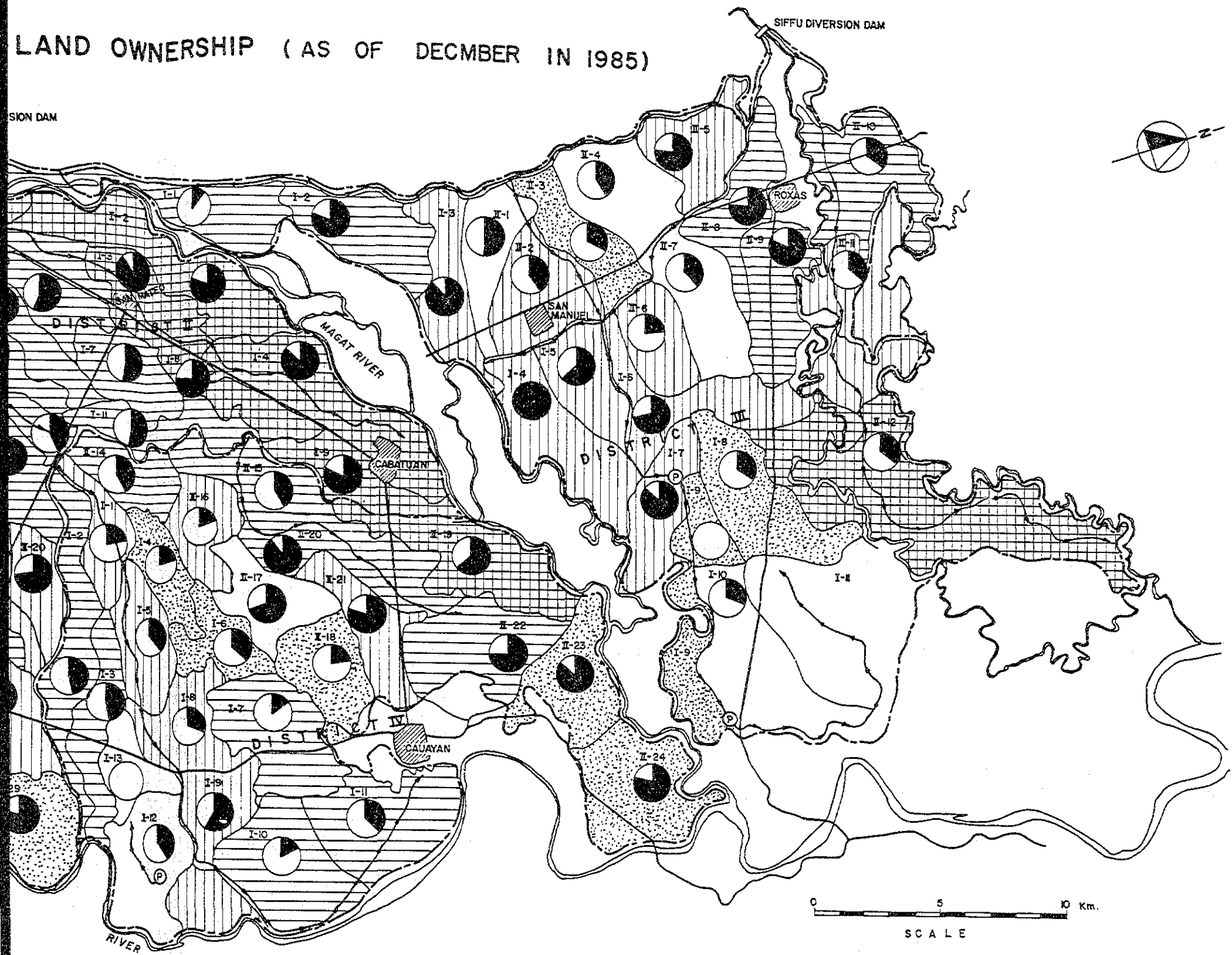
- AVERAGE SERVICE AREA PER LAND OWNER (1985) (LESS THAN 2.0 HECTARES)
- (2.00-2.99 HECTARES)
- (3.00-3.99 HECTARES)
- (4.00-4.99 HECTARES)
- (5.00 HECTARES OR MORE)

DISTRICT I									
WM Division	No. of Land-Owner	Average Service Area/Owner (ha)	Number of Cultivator					Lessee	Sharing Tenant and Others
			Total	Owner	Amortizing Owner With CLT	Owner CLT Under Verification	Lessee		
I-1	246	3.1	692	205	103	44	307	33	
2	480	1.8	423	257	56	50	0	60	
3	354	2.3	320	25	15	0	100	280	
4	174	4.3	338	78	64	47	107	42	
5	160	5.3	184	158	16	0	0	10	
6	236	3.4	436	108	82	8	236	2	
7	388	2.4	265	121	58	14	40	32	
8	359	2.8	378	195	59	59	45	20	
9	608	1.9	624	325	26	28	21	224	
10	652	1.6	669	304	24	32	57	252	
11	426	1.9	601	87	142	53	156	163	
12	392	2.7	375	120	30	50	75	100	
13	305	2.0	486	292	26	18	83	67	
14	379	2.2	490	250	147	28	50	15	
II-1	225	3.7	318	120	29	15	128	26	
2	181	4.4	395	81	65	5	78	166	
3	108	7.5	300	105	20	10	120	45	
4	387	2.2	418	250	15	10	70	73	
5	272	2.9	324	184	0	0	140	0	
6	136	5.5	233	120	14	3	88	8	
7	296	2.7	410	237	32	0	49	82	
8	276	1.5	654	363	40	19	0	232	
9	216	3.7	456	212	20	15	79	130	
10	242	3.5	634	242	15	123	100	154	
11	439	2.7	775	171	60	50	15	479	
12	336	3.3	770	192	55	22	276	255	
Total	8,673	2.6	11,968	4,802	1,192	684	2,370	2,920	

DISTRICT II										
WM Division	No. of Land-Owner	Average Service Area/Owner (ha)	Number of Cultivator					Lessee	Sharing Tenant and Others	WM Division
			Total	Owner	Amortizing Owner With CLT	Owner CLT Under Verification	Lessee			
I-1	484	1.7	569	298	8	0	250	13	I-1	
2	603	1.6	544	274	104	0	164	12	2	
3	512	1.5	554	491	21	0	42	0	3	
4	591	1.6	636	406	141	0	89	0	4	
5	417	2.2	776	417	48	0	311	0	5	
6	368	2.3	268	141	23	0	104	0	6	
7	375	2.2	625	266	5	0	294	58	7	
8	465	1.9	1,112	460	242	0	405	3	8	
9	355	1.9	478	282	0	73	109	14	9	
10	294	2.5	792	266	29	0	445	52	10	
11	256	2.8	330	130	44	0	156	0	11	
12	309	2.5	1,120	309	11	68	257	495	12	
13	225	3.8	419	100	5	18	0	296	13	
14			(No WM is Assigned)						14	
15	252	2.9	359	115	39	0	205	0	15	
16	280	3.7	605	280	20	0	305	0	16	
17	171	5.6	319	115	44	0	160	0	17	
18	303	2.7	406	117	57	0	232	0	18	
19	318	2.2	498	258	60	0	180	0	19	
20	198	3.8	268	126	59	0	83	0	20	
21	235	3.5	423	145	103	0	155	20	21	
22	198	3.6	557	80	281	0	80	196	22	
23	256	3.5	723	205	32	12	459	15	23	
24	264	3.1	344	120	114	0	110	0	24	
25	298	3.0	407	93	41	16	257	0	25	
26	207	4.0	450	166	36	0	248	0	26	
27	256	3.0	543	244	16	0	283	0	27	
28	458	1.6	926	334	310	21	146	115	28	
29	240	4.3	466	114	666	0	76	210	29	
Total	9,188	2.6	15,517	6,354	1,595	208	5,701	1,295	Total	

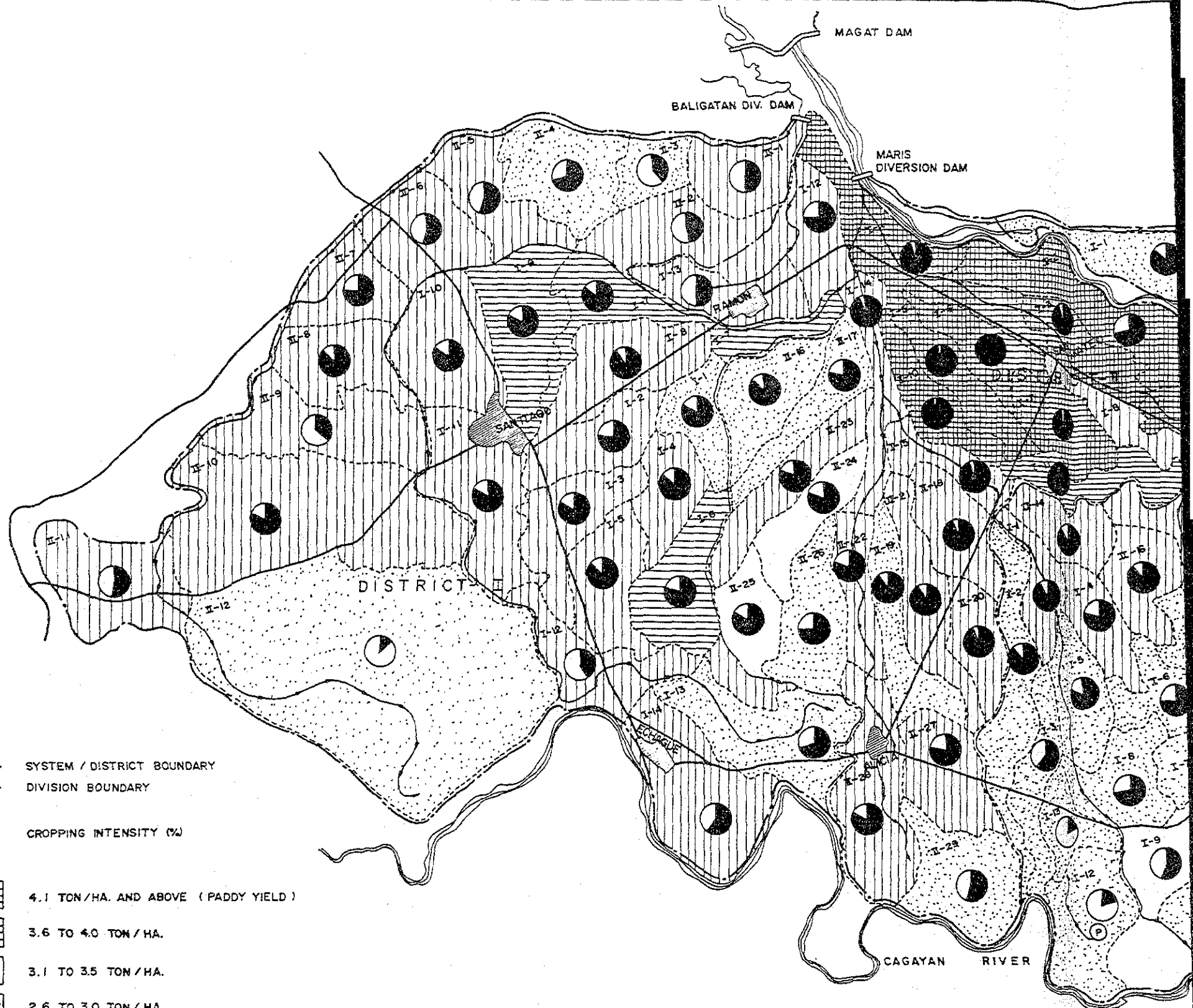
Note: 1. Average Service Area per Owner = Actual Service Area (1985) ÷ No. of Landowner
 2. The total number of cultivator for the WM I-9 in District III are estimated from the figured in the other WM Divisions.
 Source: MRLIS District Offices

LAND OWNERSHIP (AS OF DECEMBER IN 1985)



		DISTRICT III									
		WM Division	No. of Land-Owner	Average Service Area/Owner (ha)	Number of Cultivator					Lessee	Sharing Tenant and Others
Leasee	Sharing Tenant and Others				Total	Owner	Amortizing Owner		CLT Under Verification		
250	13	I-1	346	2.0	1,414	100	4	10	300	1,000	
164	12	2	322	2.4	513	319	45	15	39	75	
42	0	3	211	3.6	529	123	111	208	87	-	
89	0	4	324	3.1	725	262	244	119	-	-	
311	0	5	275	3.6	579	156	161	60	154	48	
104	0	6	298	3.0	128	-	25	58	35	10	
294	58	7	321	3.1	306	180	35	-	21	70	
405	5	8	245	4.2	376	94	24	24	84	150	
109	14	9	159	4.5	701	-	(Not Available)	-	-	-	
445	52	10	268	5.0	1,074	247	30	-	47	750	
156	0	11-1	193	5.0	241	100	20	21	50	50	
237	495	2	314	3.1	623	273	20	5	-	325	
-	296	3	203	4.6	450	103	-	-	-	347	
205	0	4	184	5.5	331	119	4	32	46	130	
305	0	5	256	3.5	296	90	75	50	45	36	
160	0	6	288	3.6	1,191	379	-	-	406	406	
232	0	7	230	5.0	600	163	40	613	36	-	
180	0	8	498	2.0	567	363	14	20	-	170	
83	0	9	349	2.6	212	105	11	34	-	62	
155	20	10	302	2.8	638	225	22	-	351	40	
80	196	11	270	3.0	476	167	110	17	152	30	
459	15	12	386	1.9	777	254	56	15	91	361	
110	0										
257	0										
248	0										
283	0										
146	115										
76	210										
5,701	1,295	Total	6,232	3.3	12,674	4,055	1,115	795	2,402	4,307	

		DISTRICT IV									
		WM Division	No. of Land-Owner	Average Service Area/Owner (ha)	Number of Cultivator					Lessee	Sharing Tenant and Others
Leasee	Sharing Tenant and Others				Total	Owner	Amortizing Owner		CLT Under Verification		
210	0	I-1	210	3.8	338	45	51	54	238	0	
324	0	2	324	2.8	513	175	63	7	140	128	
267	0	3	267	2.7	398	137	47	9	100	105	
153	0	4	153	4.5	357	34	33	9	125	156	
268	0	5	268	3.1	675	162	103	21	297	98	
205	0	6	205	4.0	407	60	101	15	150	75	
323	0	7	323	2.8	468	100	50	8	172	75	
213	0	8	213	3.5	417	65	90	15	305	5	
251	0	9	251	3.3	523	168	100	15	170	70	
351	0	10	351	2.4	580	55	30	35	310	150	
274	0	11	274	2.9	455	140	20	12	186	97	
187	0	12	187	8.9	456	33	84	97	177	75	
(Transferred to WM No. 12)											
261	0	II-14	261	2.9	383	120	65	142	56	0	
346	0	15	346	2.6	549	200	35	20	294	0	
217	0	16	217	3.8	295	35	50	10	200	0	
137	0	17	137	6.3	676	256	166	0	188	66	
208	0	18	208	4.2	168	64	51	0	53	0	
599	0	19	599	1.6	1,110	204	437	0	469	0	
423	0	20	423	2.6	423	216	98	25	54	30	
211	0	21	211	3.8	264	725	59	0	80	0	
321	0	22	321	2.6	357	172	58	45	82	0	
210	0	23	210	8.5	363	246	0	66	51	0	
180	0	24	180		223	123	0	40	60	0	
Total			6,139	3.3	16,448	2,935	1,782	502	9,966	1,262	
Grand Total			30,232	2.9	56,643 (100%)	18,146 (32%)	6,084 (11%)	2,190 (4%)	20,439 (36%)	9,784 (17%)	

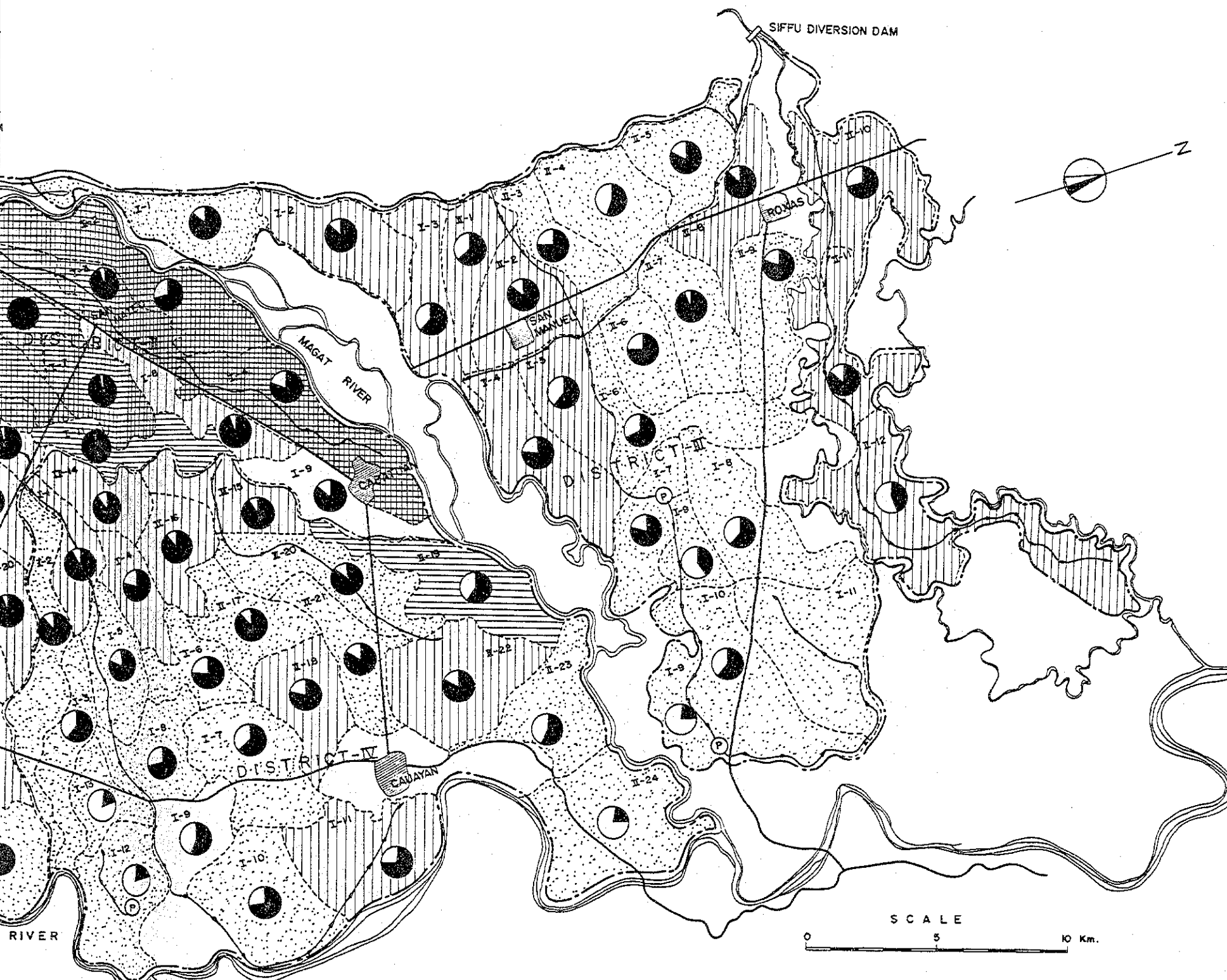


PRESENT CROPPING INTENSITY AND PADDY YIELD

WM Division	Cropping Intensity (%)	DISTRICT I										DISTRICT II										WM Division	Cropping Intensity (%)	Planted Area (ha)								
		TOTAL		FIRST CROP (DRY)				SECOND CROP (WET)				TOTAL		FIRST CROP (DRY)				SECOND CROP (WET)							YIELD CROP							
	(%)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)	Planted Area (ha)	Total Production (ton)	Yield (ton/ha)				
I-1	176	1,322	3,766	2.8	659	2,175	3.3	3.3	3.2	663	1,591	2.4	1-1	193	1,565	7,195	4.6	772	3,706	4.8	5.5	4.4	793	3,489	4.4	4.6	4.3	I-1	166	1,223		
2	149	1,260	4,084	3.2	596	2,026	3.4	3.4	3.3	664	2,058	3.1	2	133	1,297	5,931	4.6	616	2,526	4.1	4.7	4.1	681	3,406	5.0	5.3	4.6	2	174	1,466		
3	159	1,275	3,668	2.9	612	2,010	3.3	3.4	3.3	663	1,658	2.5	3	188	1,489	7,222	4.9	746	3,730	5.0	5.6	5.1	743	3,492	4.7	5.1	4.2	3	128	1,300		
4	178	1,322	4,164	3.1	661	2,247	3.4	3.4	3.3	661	1,917	2.9	4	153	1,455	5,969	4.1	743	3,121	4.2	4.9	3.7	712	2,848	4.0	4.2	3.7	4	151	1,775		
5	174	1,488	4,827	3.2	725	2,538	3.5	3.5	3.4	763	2,289	3.0	5	199	1,809	7,598	4.2	936	3,986	4.4	4.5	4.1	903	3,612	4.0	4.6	4.0	5	127	1,269		
6	161	1,304	4,181	3.1	669	2,403	3.6	3.7	3.4	635	1,778	2.8	6	200	1,674	7,616	4.5	836	4,013	4.8	5.1	4.4	836	3,603	4.3	4.7	3.3	6	137	1,440		
7	177	1,640	5,407	3.3	814	3,012	3.7	3.7	3.6	826	2,395	2.9	7	193	1,585	7,450	4.7	798	3,751	4.7	5.1	4.3	787	3,699	4.6	4.7	4.6	7	156	1,525		
8	183	1,862	6,143	3.3	922	3,135	3.4	3.6	3.2	940	3,008	3.2	8	188	1,671	5,601	3.4	825	2,640	3.2	3.3	3.0	846	2,961	3.5	3.7	3.3	8	129	1,330		
9	160	1,851	5,724	3.1	912	3,283	3.6	3.7	3.5	939	2,441	2.6	9	164	1,095	4,437	4.1	522	2,038	4.0	4.4	4.2	573	2,349	4.1	4.5	3.7	9	89	640		
10	161	1,581	5,717	3.4	846	2,961	3.5	3.6	3.4	835	2,756	3.3	10	194	1,403	5,825	4.1	710	3,053	4.3	4.9	3.7	693	2,772	4.0	4.4	3.5	10	130	1,733		
11	172	1,395	4,212	3.0	658	2,369	3.6	3.8	3.3	737	1,843	2.5	11	198	1,421	5,116	3.6	708	2,620	3.7	4.0	3.5	713	2,496	3.5	3.5	3.5	11	125	1,364		
12	78	822	2,626	3.2	400	1,360	3.4	3.5	3.3	422	1,266	3.0	12	140	1,070	3,503	3.3	489	1,760	3.6	3.7	3.5	581	1,743	3.0	3.5	2.6	12	167	1,637		
13	142	1,096	3,168	2.9	524	1,624	3.1	3.3	2.8	572	1,544	2.7	13	107	923	2,912	3.1	419	1,299	3.1	3.6	2.6	504	1,613	3.2	3.6	2.9	13	152	1,581		
14	126	1,068	3,480	3.2	562	1,911	3.4	3.6	3.3	506	1,569	3.1	14	187	1,415	4,530	3.2	713	2,424	3.4	3.5	3.2	702	2,106	3.0	3.1	2.8	14	108	1,189		
II-1	100	882	2,738	3.1	383	1,341	3.5	3.7	3.3	499	1,397	2.8	15	192	1,379	4,342	3.1	685	2,329	3.4	3.4	3.4	694	2,013	2.9	3.2	2.5	15	155	1,528		
2	112	891	2,751	3.1	383	1,379	3.6	3.9	3.2	508	1,372	2.7	16	174	1,808	5,066	2.8	806	2,237	2.9	3.2	2.7	712	1,638	2.3	2.3	2.4	16	153	1,609		
3	77	630	1,842	2.9	282	902	3.2	3.2	3.2	348	940	2.7	17	158	1,518	3,975	2.6	806	2,350	3.1	3.3	2.9	736	1,914	2.6	2.6	2.6	17	185	2,187		
4	138	1,359	3,813	2.8	552	1,932	3.5	3.7	3.3	607	1,881	3.1	18	186	1,494	4,264	2.9	758	2,350	3.1	3.3	2.9	736	1,914	2.6	2.6	2.6	18	168	1,744		
5	117	923	3,026	3.3	413	1,445	3.5	3.8	3.2	510	1,581	3.1	19	190	1,353	3,654	2.7	678	1,966	2.9	3.0	2.8	675	1,688	2.5	2.5	2.5	19	168	1,624		
6	116	862	2,840	3.3	419	1,467	3.5	3.6	3.4	443	1,373	3.1	20	189	1,441	4,044	2.8	729	2,406	4.0	3.6	3.1	712	1,688	2.3	2.7	2.0	20	148	1,457		
7	110	891	2,939	3.3	437	1,486	3.4	3.4	3.3	454	1,453	3.2	21	180	1,491	5,232	3.5	759	3,036	4.0	3.4	3.2	520	1,456	2.8	2.9	2.7	21	168	1,548		
8	158	1,159	4,548	3.3	670	2,412	3.6	3.6	3.5	689	2,136	3.1	22	159	1,142	3,509	3.1	622	2,695	3.3	3.4	3.2	630	1,764	2.8	2.9	2.7	22	118	1,274		
9	70	554	1,798	3.2	268	911	3.4	3.4	3.4	286	887	3.1	23	156	1,400	4,459	3.2	770	2,053	3.3	3.4	3.2	623	1,308	2.1	2.5	1.7	23	168	1,624		
10	67	558	1,814	3.2	291	960	3.6	3.3	3.0	267	854	3.2	24	156	1,272	3,125	2.4	649	1,817	2.8	3.0	2.6	623	1,308	2.1	2.5	1.7	24	168	1,624		
11	113	1,335	4,207	3.2	652	2,021	3.1	3.1	3.1	683	2,186	3.2	25	160	1,459	3,725	2.5	737	2,137	2.9	3.2	2.6	722	1,588	2.2	2.7	1.8	25	168	1,624		
12	23	252	739	2.9	83	249	3.0	3.0	3.0	168	490	2.9	26	148	1,231	3,568	2.9	612	1,897	3.1	3.3	3.0	619	1,671	3.1	2.7	2.3	26	168	1,624		
Total	130	29,582	94,222	3.2	14,393	49,559	3.4			15,289	44,663	2.9	Total	168	40,373	140,328	3.5	20,360	74,120	3.6			19,986	66,086	3.3			47	122	2.6	N.A	N.A

Notes: 1. Cropping intensity ... the percentage of planted area to the total of actual irrigation service area in 1985.
2. Yield ... converted yield to dry paddy (14% MC, more than 95% purity 42.8 kg/cavan for dry season paddy and 38.2 kg/cavan for wet season)

Source: MARIIS District Offices, MIA

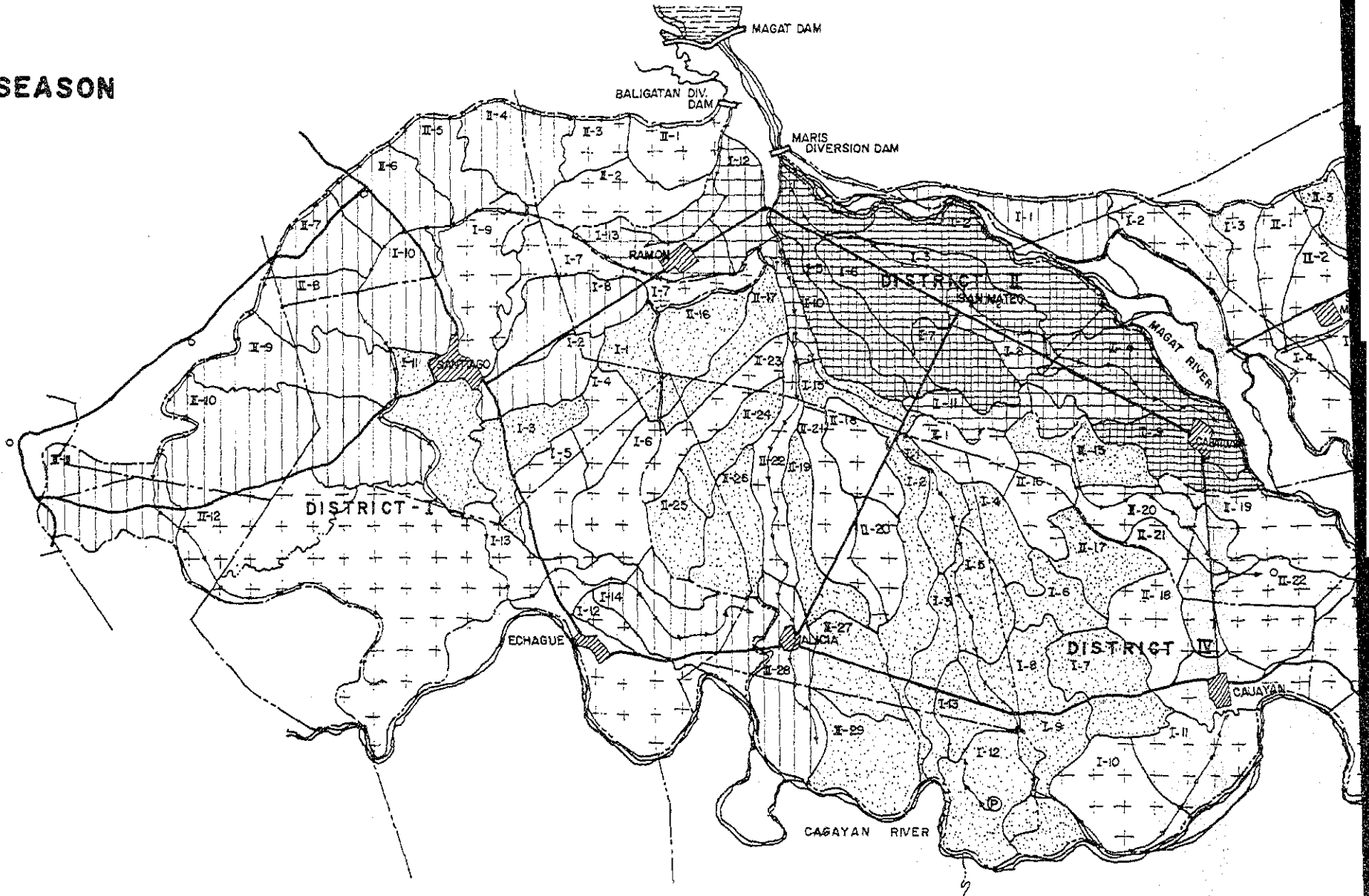


IRRIGATION AND PADDY YIELD

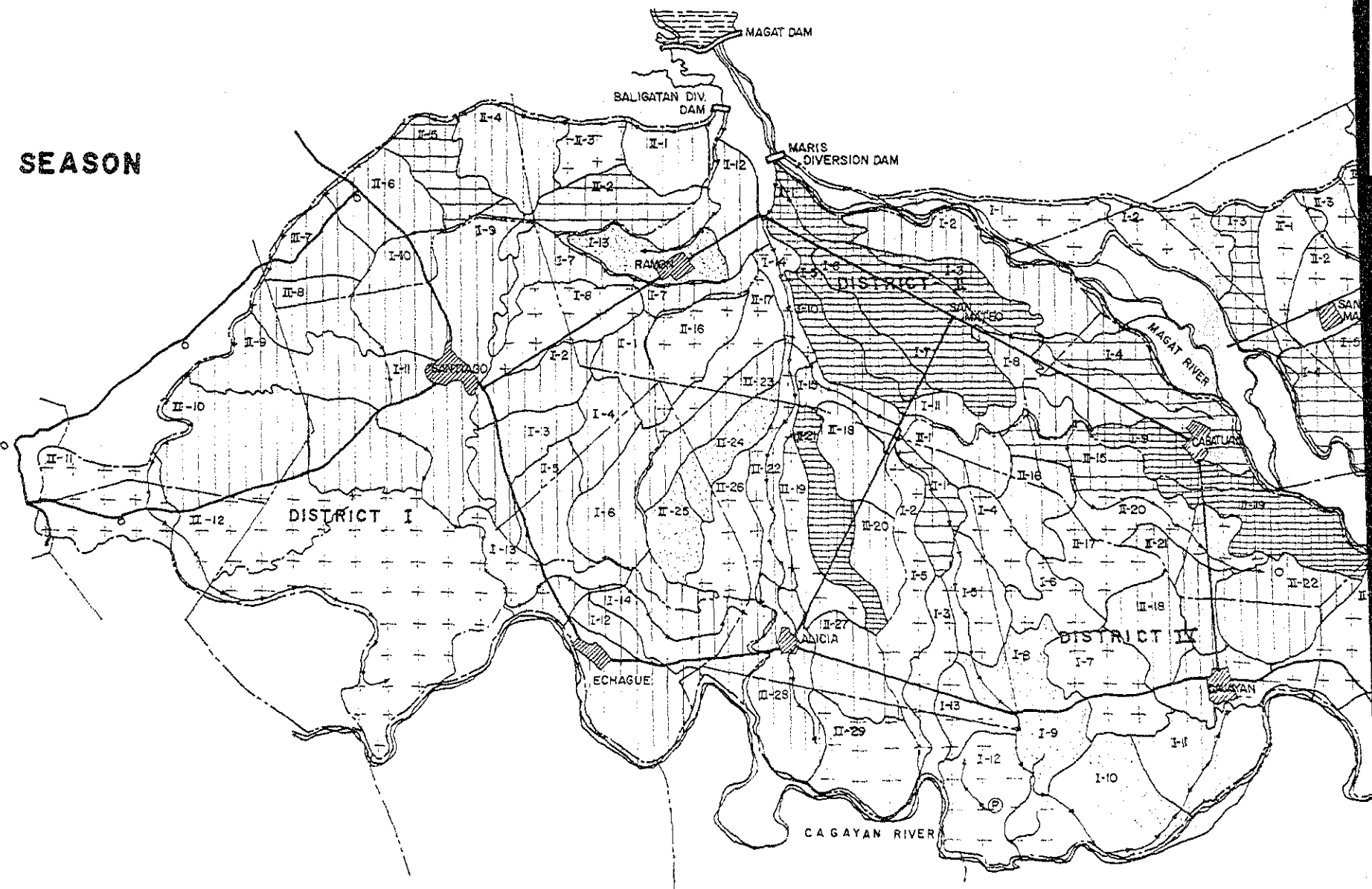
DISTRICT III													DISTRICT IV																		
THIRD CROP			TOTAL			FIRST CROP (DRY)			SECOND CROP (WET)			TOTAL			FIRST CROP (DRY)			SECOND CROP (WET)			THIRD CROP										
WM	Crop- Divi- sion	Plan- ting Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)	WM	Crop- Divi- sion	Plan- ting Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)	Total Pro- duc- tion (ton)	Yield (ton/ha)	Plan- ted Area (ha)								
I-1	166	1,223	3,669	3.0	611	1,711	2.8	3.2	2.2	612	1,958	3.2	3.3	3.1	I-1	191	1,539	5,304	3.4	763	2,976	3.9	3.9	3.9	776	2,328	3.0	3.5	2.2		
2	174	1,466	4,473	3.1	754	2,337	3.1	3.2	3.0	712	2,136	3.0	3.3	2.7	2	182	1,642	4,977	3.0	801	2,643	3.3	3.4	3.2	789	2,209	3.1	2.8	2.4		
3	128	1,300	4,443	3.4	679	2,580	3.8	4.4	3.2	621	1,863	3.0	3.3	2.6	3	122	996	2,836	2.8	494	1,531	3.1	3.2	3.0	502	1,305	2.6	2.9	2.3		
4	151	1,775	5,560	3.1	945	3,402	3.6	4.7	2.6	830	2,158	2.6	2.6	2.5	4	161	1,101	3,033	2.7	557	1,782	3.2	3.2	3.2	544	1,251	2.3	2.9	1.7		
5	127	1,369	4,364	3.2	805	2,898	3.6	4.2	2.6	564	1,466	2.6	2.7	2.5	5	169	1,393	3,905	2.8	704	2,182	3.1	3.4	3.1	689	1,723	2.5	3.0	2.1		
6	137	1,440	4,158	2.9	828	2,567	3.1	3.4	2.6	612	1,591	2.6	2.6	2.6	6	161	1,314	3,748	2.8	661	2,115	3.2	3.4	3.0	653	1,653	2.5	3.0	2.0		
7	156	1,525	4,641	3.0	750	2,850	3.8	3.8	3.2	775	2,015	2.6	2.8	2.5	7	127	1,147	3,340	2.9	590	1,947	3.3	3.4	3.2	557	1,393	2.5	3.0	2.1		
8	129	1,330	3,952	3.0	627	2,195	3.5	4.2	2.7	703	1,757	2.5	2.5	2.4	8	152	1,122	2,918	2.6	562	1,630	2.9	3.4	2.3	560	1,288	2.3	3.0	1.6		
9	89	640	1,794	2.8	322	1,063	3.3	4.0	2.7	318	731	2.3	2.4	2.3	9	118	967	2,602	2.7	460	1,334	2.9	3.2	2.6	507	1,268	2.5	2.9	2.1		
10	130	1,733	4,057	2.3	708	1,699	2.3	2.6	2.0	1,025	2,358	2.3	2.6	2.0	10	147	1,345	3,765	2.8	665	1,929	2.9	3.2	2.6	660	1,836	2.7	2.8	2.7		
												11	168	1,429	4,431	3.1	718	2,369	3.3	3.3	3.3	711	2,062	2.9	2.9	2.9					
												12	40	483	1,271	2.6	200	620	3.1	283	651	2.3	2.7	2.0							
												13	(Transferred to WM No. 12)																		
												14	185	1,435	4,445	3.1	711	2,417	3.4	3.5	3.4	692	1,938	2.8	3.0	2.7	32	90	2.8		
												15	186	1,648	5,192	3.1	825	3,052	3.7	3.8	3.6	823	2,140	2.6	3.0	2.3					
												16	181	1,501	4,728	3.1	751	2,553	3.4	3.4	3.4	750	2,175	2.9	3.0	2.7					
												17	178	1,548	4,567	2.9	775	2,480	3.2	3.2	3.2	773	2,087	2.7	3.1	2.3					
												18	159	1,480	4,657	3.1	734	2,496	3.4	3.4	3.4	725	2,102	2.9	3.0	2.8	21	59	2.8		
												19	120	1,158	4,622	4.0	569	2,561	4.5	5.4	3.6	589	2,061	3.5	4.2	2.6					
												20	178	1,976	5,835	2.9	1,006	3,119	3.1	3.3	3.0	970	2,716	2.8	2.9	2.6					
												21	190	1,429	4,294	3.0	723	2,458	3.4	3.4	3.4	706	1,836	2.6	2.7	2.6					
												22	173	1,478	4,523	3.1	761	2,587	3.4	3.5	3.4	717	1,936	2.7	2.7	2.7					
												23	118	826	2,404	2.9	500	1,556	3.1	3.3	3.0	326	848	2.6	2.7	2.6					
												24	39	272	734	2.7	-	-	-	-	272	734	2.7	2.7	2.7						
												Total			148	29,229	88,131	3.0	14,530	48,337	3.3	14,594	39,520	2.7	105	274	2.6				
												Grand Total			148	131,438	419,737	3.2	65,722	226,470	3.4	65,564	192,871	2.9	152	396	2.6				

PRODUCTION COST AND INCOME FROM P

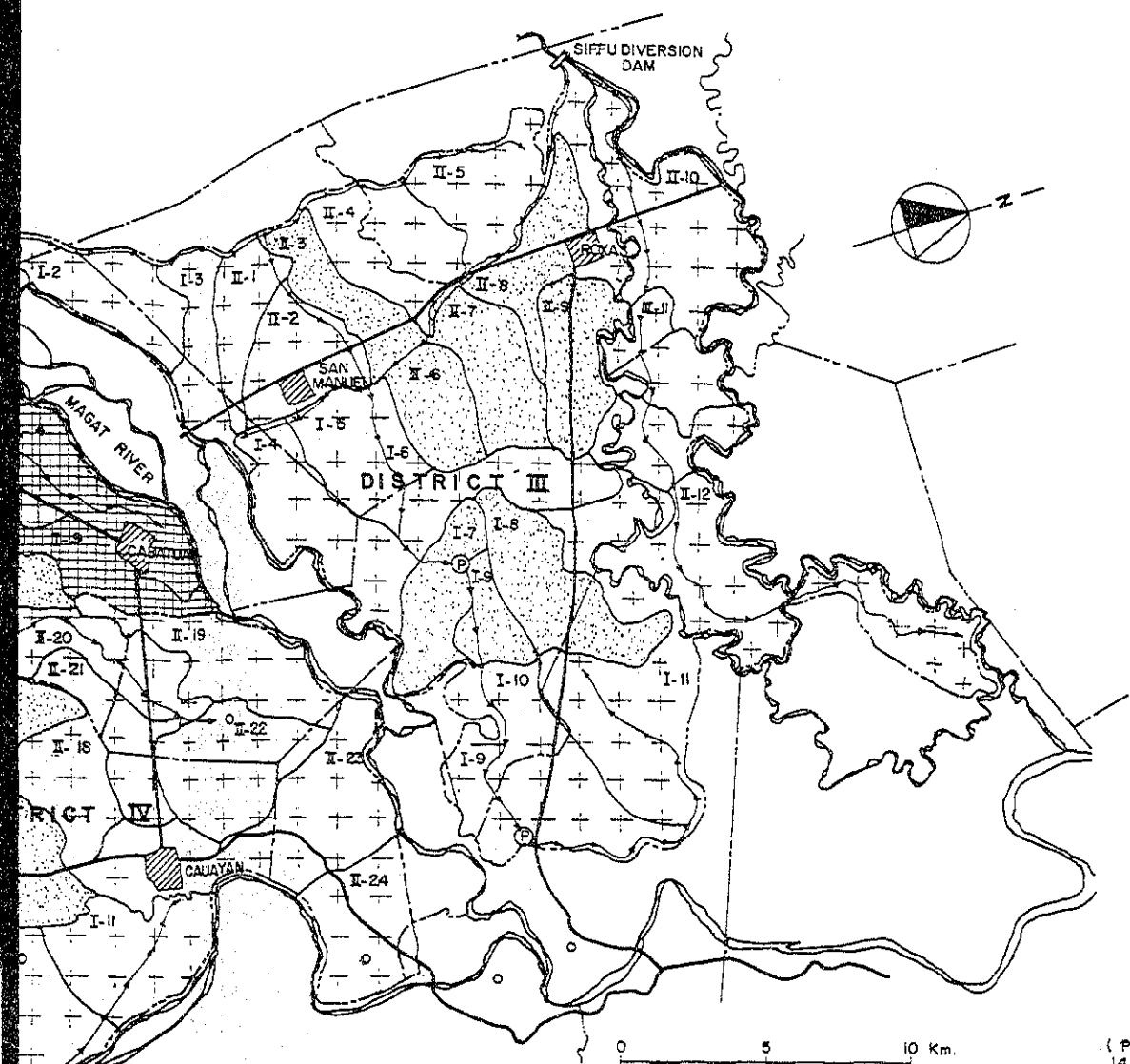
WET SEASON



DRY SEASON

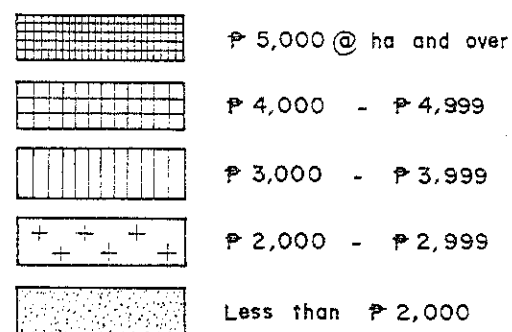


INCOME FROM PADDY CULTIVATION

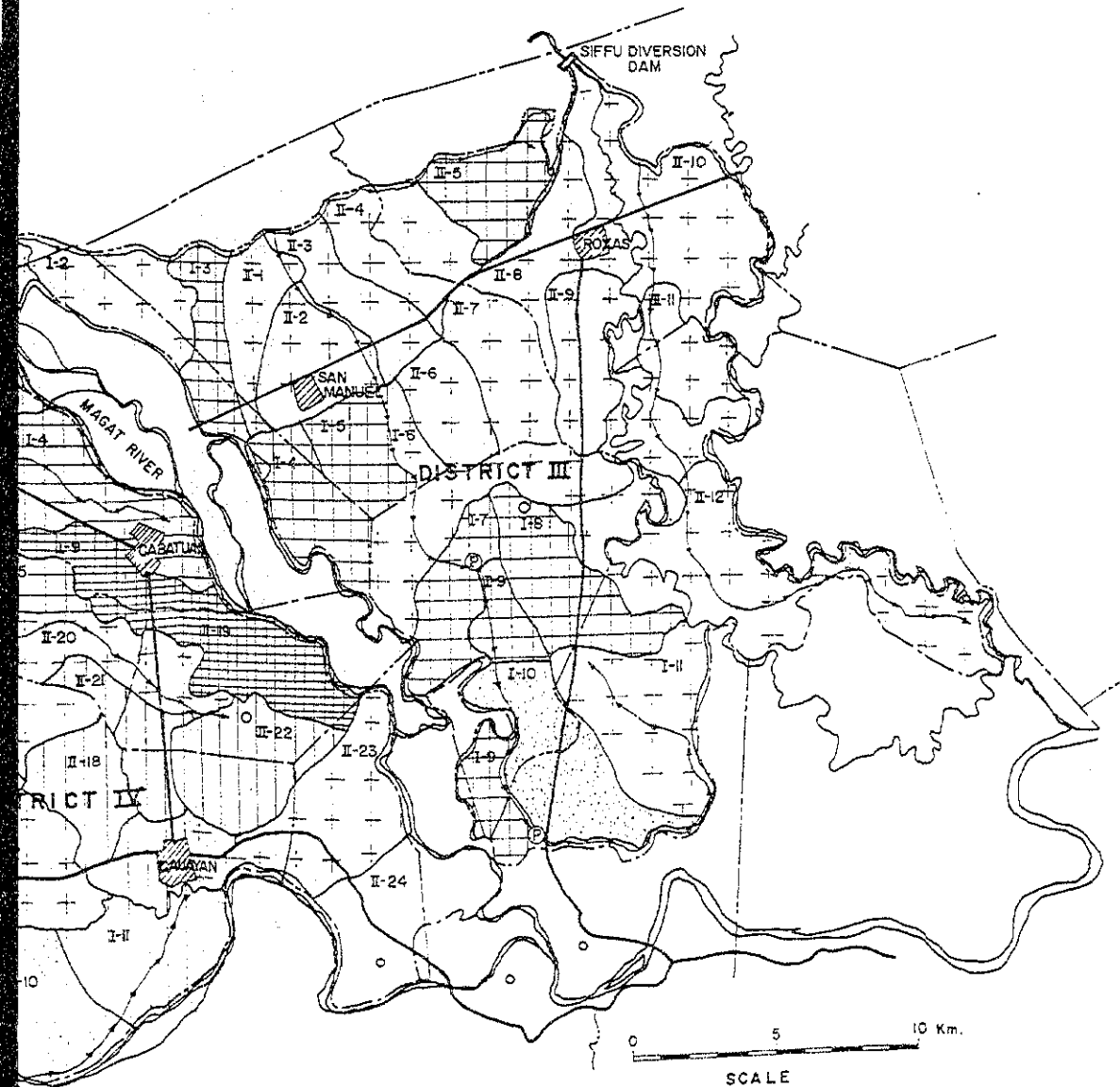
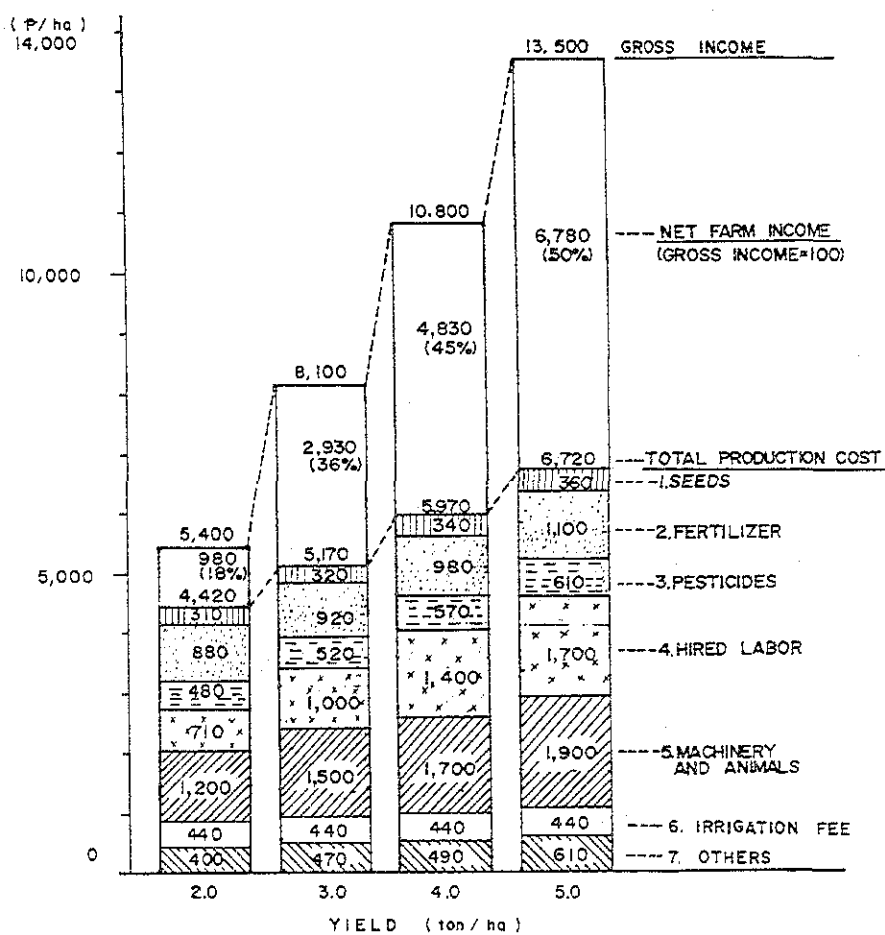


NET INCOME PER HECTARE FROM PADDY CULTIVATION

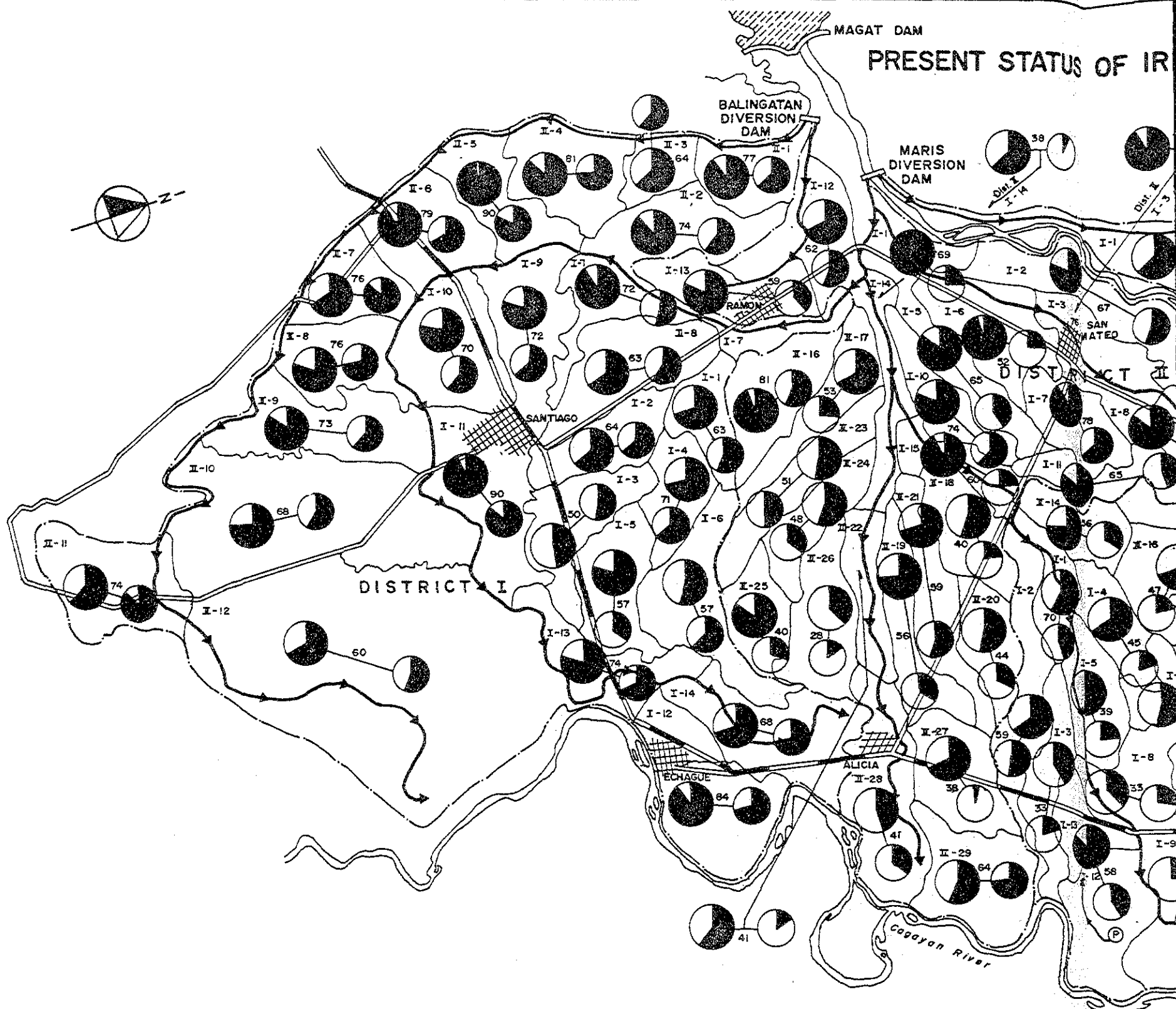
LEGEND :



PADDY PRODUCTION COST AND INCOME BY YIELD CLASS AVERAGE OF WET AND DRY SEASON PADDY



PRESENT STATUS OF IR



DISTRICT I													
DIVISION NO.	PROJECTED SERVICE AREA (ha)	IRRIGATED AREA (ha)			BENEFITED AREA (ha)			COLLECTED IRRIGATION FEE (%)					
		WET	DRY	TOTAL	WET	DRY	TOTAL	WET (%)	DRY (%)	TOTAL (%)			
I-1	803	663	660	1,323	630	660	1,290	120,959	55	193,477	70	314,436	63
2	826	664	596	1,260	628	596	1,224	140,484	64	143,011	64	283,495	64
3	899	663	612	1,275	644	612	1,256	117,021	52	117,172	48	234,193	50
4	808	661	661	1,322	617	661	1,278	137,919	64	200,356	77	338,255	71
5	855	763	725	1,488	737	725	1,462	95,102	35	228,634	79	323,736	57
6	955	635	669	1,304	611	669	1,280	129,832	61	144,938	54	274,770	57
7	1,036	826	814	1,640	806	814	1,620	148,258	53	290,695	90	438,953	72
8	1,049	940	922	1,862	914	922	1,836	188,406	59	241,209	66	429,615	63
9	1,241	939	912	1,851	928	912	1,840	206,942	64	288,756	80	495,698	72
10	1,173	835	846	1,681	819	846	1,665	175,952	61	262,954	78	438,906	70
11	861	737	658	1,395	728	658	1,386	197,577	86	219,741	93	417,318	90
12	1,001	422	400	822	421	400	821	106,390	72	150,814	95	257,204	84
13	765	572	523	1,095	564	523	1,087	134,931	68	166,434	80	301,365	74
14	796	506	562	1,068	483	562	1,045	111,802	66	154,120	70	265,922	68
Sub-Total	13,068	9,826	9,560	19,386	9,530	9,560	19,090	2,011,575	61	2,802,291	74	4,813,866	68
II-1	899	499	383	882	488	383	871	83,060	63	106,242	92	189,302	77
2	961	507	383	890	491	383	874	102,150	61	134,019	88	236,169	74
3	734	348	282	630	348	282	630	61,821	61	63,079	66	124,900	64
4	828	607	552	1,159	607	552	1,159	156,036	74	167,222	87	343,258	81
5	800	510	413	923	510	413	923	108,606	82	116,611	99	225,217	90
6	904	443	419	862	443	419	862	92,895	68	127,265	89	220,160	79
7	603	454	437	891	439	437	876	134,293	87	113,940	66	248,233	76
8	795	689	670	1,359	666	670	1,336	168,001	72	210,937	79	378,938	76
9	790	286	267	553	286	267	553	58,422	61	89,245	84	147,667	73
10	869	267	291	558	233	291	524	47,500	58	87,321	75	134,821	68
11	1,736	683	652	1,335	672	652	1,324	203,055	86	160,577	62	363,632	74
12	1,067	169	83	252	169	83	252	32,834	56	21,896	67	54,730	60
Sub-Total	10,986	5,462	4,832	10,294	5,352	4,832	10,184	1,248,673	72	1,418,354	79	2,667,027	76
TOTAL	24,054	15,288	14,392	29,680	14,882	14,392	29,274	3,260,248	65	4,220,645	76	7,480,893	70

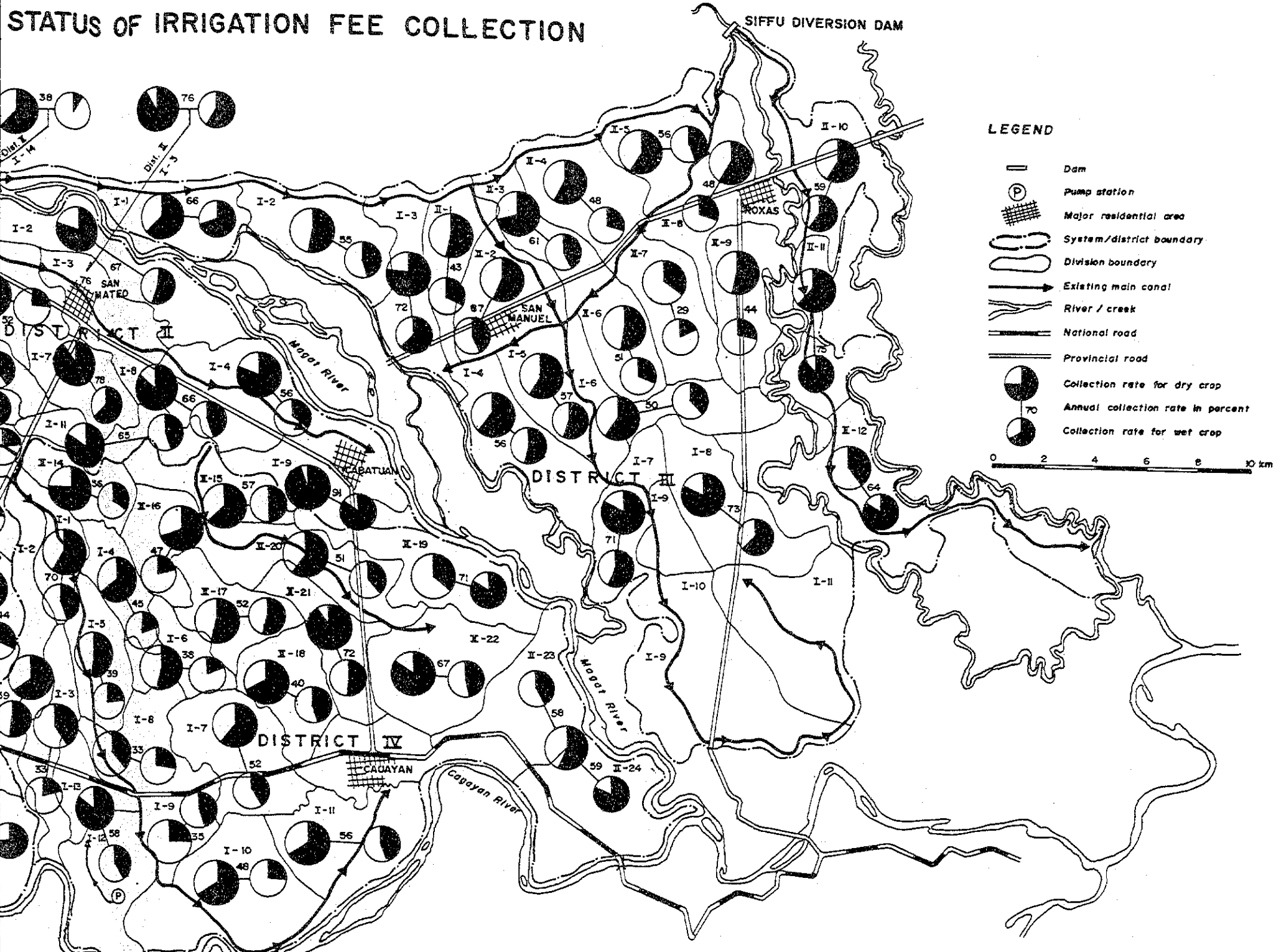
DISTRICT II													
DIVISION NO.	PROJECTED SERVICE AREA (ha)	IRRIGATED AREA (ha)			BENEFITED AREA (ha)			COLLECTED IRRIGATION FEE (%)					
		WET	DRY	TOTAL	WET	DRY	TOTAL	WET (%)	DRY (%)	TOTAL (%)			
I-1	813	793	772	1,565	793	772	1,565	56,988	25	310,481	100	367,469	69
2	978	687	616	1,297	681	616	1,297	133,429	56	192,243	79	325,672	67
3	791	744	747	1,491	738	747	1,485	152,087	59	272,205	92	424,292	76
4	948	712	643	1,355	665	643	1,308	80,976	35	206,111	81	287,087	56
5	909	903	906	1,809	899	906	1,805	129,640	41	305,850	85	435,490	65
6	845	838	836	1,674	833	836	1,669	75,688	26	247,761	95	323,449	52
7	820	787	798	1,585	785	798	1,583	174,447	64	286,441	90	460,888	78
8	902	846	825	1,671	840	825	1,665	130,881	45	282,043	86	412,929	66
9	666	573	522	1,095	573	522	1,095	172,610	86	197,371	95	369,981	91
10	726	692	715	1,407	687	710	1,397	149,640	62	228,835	81	387,475	74
11	719	713	708	1,421	713	708	1,421	112,792	45	232,355	83	345,147	65
12	833	581	489	1,070	581	489	1,070	113,990	56	131,550	68	245,540	62
13	863	504	419	923	504	419	923	67,241	38	134,955	81	202,196	59
14	750	702	713	1,415	702	713	1,415	20,729	8	177,800	63	198,529	38
15	729	694	686	1,380	676	685	1,361	53,758	23	253,515	93	307,273	60
Sub-Total	12,292	10,764	10,395	21,158	10,670	10,389	21,059	1,624,896	47	3,459,516	84	5,084,412	65
II-16	1,040	916	914	1,830	894	914	1,808	206,704	57	342,586	94	549,290	81
17	958	712	806	1,518	712	806	1,518	83,432	26	215,826	67	299,258	53
18	805	753	756	1,509	736	756	1,492	56,517	22	166,250	55	222,767	40
19	760	685	678	1,363	675	678	1,353	80,698	34	200,159	74	280,857	56
20	778	714	729	1,443	712	729	1,438	80,853	32	154,278	53	235,131	44
21	830	755	759	1,514	732	759	1,491	117,879	55	212,062	70	329,941	59
22	716	581	622	1,203	520	622	1,142	28,097	15	147,727	60	175,824	41
23	898	715	770	1,485	630	770	1,400	110,665	50	159,620	52	270,285	51
24	815	676	655	1,331	623	649	1,272	76,126	35	142,298	55	218,426	46
25	914	722	737	1,459	722	736	1,458	72,663	29	147,299	84	219,962	40
26	830	619	612	1,231	619	612	1,231	35,049	16	91,940	38	126,989	28
27	855	507	572	1,139	557	572	1,129	5,659	3	158,379	68	160,038	38
28	737	577	684	1,259	552	684	1,234	69,997	36	120,816	45	190,813	41
29	1,240	545	564	1,109	539	564	1,103	137,427	73	128,318	57	265,745	64
Sub-Total	12,176	9,537	9,856	19,393	9,223	9,849	19,069	1,161,271	36	2,383,550	61	3,544,826	50
TOTAL	24,468	20,301	20,251	40,551	19,893	20,235	40,128	2,786,167	40	5,843,071	72	9,233,324	62

DIVISION NO.	PROJECT SERVICE AREA (ha)
I-1	737
2	843
3	1,019
4	1,188
5	1,089
6	1,062
7	1,283
8	1,143
9	1,177
10	1,506
11	1,506
Sub-Total	12,536
II-1	1,088
2	98
3	1,046
4	1,023
5	92
6	1,07
7	1,18
8	1,01
9	1,02
10	1,05
11	87
12	96
Sub-Total	12,25
TOTAL	24,79

SOURCE: MRIS District Office

NOTE: Only two crops paddy is used for this analysis of irrigation fee collection rate

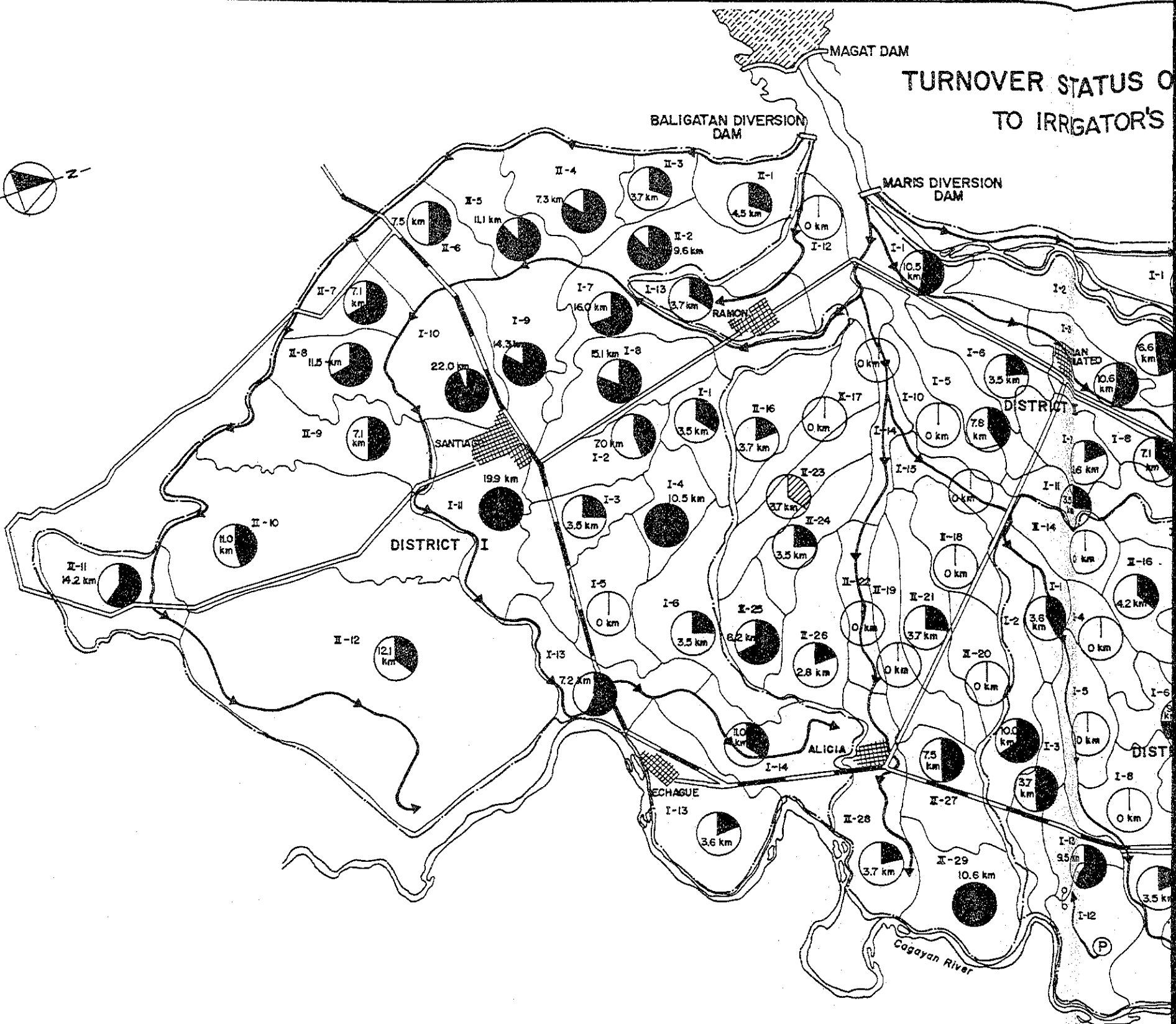
STATUS OF IRRIGATION FEE COLLECTION



FEE (P)		DISTRICT III													
TOTAL	(%)	DIVISION NO.	PROJECTED SERVICE AREA (ha)	IRRIGATED AREA (ha)			BENEFITED AREA (ha)			COLLECTED IRRIGATION FEE (P)					
				WET	DRY	TOTAL	WET	DRY	TOTAL	WET (%)	DRY (%)	TOTAL (%)			
367,469	69	I-1	737	668	638	1,306	615	610	1,225	149,606	70	152,727	63	302,322	
325,672	67	2	843	782	764	1,546	712	754	1,466	113,949	46	186,608	63	300,557	
424,292	76	3	1,019	699	683	1,382	622	679	1,301	140,312	64	208,870	77	349,182	
287,087	56	4	1,186	1,007	1,004	2,011	830	945	1,775	156,121	54	229,546	61	385,667	
435,490	65	5	1,089	950	938	1,888	564	605	1,369	108,536	55	184,095	58	292,631	
323,499	52	6	1,062	885	873	1,758	612	828	1,440	81,057	38	193,091	59	274,148	
460,888	78	7	1,283	846	785	1,631	775	770	1,545	250,841	57	388,518	83	639,359	
412,929	66	8	1,143	813	694	1,507	727	648	1,375	272,170	62	359,133	83	631,303	
369,981	91	9	1,176	329	322	651	318	322	640	-	-	-	-		
387,475	74	10	1,500	1,134	795	1,929	1,026	712	1,738	278,549	46	258,325	69	536,874	
345,147	65	11	1,500	-	-	-	-	-	-	27,505	44,959	72,464	-		
245,540	62	Sub-Total	12,538	8,113	7,496	15,609	6,801	7,073	13,877	1,578,647	51	2,205,871	71	3,784,518	
202,196	59														
198,529	38	II-1	1,088	888	848	1,736	683	683	1,366	74,012	31	147,493	54	221,505	
307,273	60	2	981	933	890	1,823	787	850	1,637	119,054	43	190,137	56	330,691	
5,084,412	65	3	1,041	863	868	1,731	746	835	1,581	129,465	42	220,709	71	350,174	
549,290	81	4	1,029	748	677	1,425	569	620	1,189	70,668	29	142,362	58	213,030	
299,258	53	5	925	809	781	1,590	756	772	1,528	138,785	45	180,690	59	319,475	
222,767	40	6	1,076	995	1,010	2,005	670	909	1,579	111,739	31	190,988	53	302,727	
280,857	56	7	1,180	1,146	1,147	2,293	1,043	1,144	2,187	82,077	38	157,984	35	240,061	
235,131	44	8	1,010	990	972	1,962	853	891	1,744	105,012	30	210,655	59	315,667	
329,941	59	9	1,028	892	881	1,773	787	837	1,624	92,586	28	176,106	53	286,692	
175,824	41	10	1,058	818	825	1,643	700	757	1,457	146,981	60	174,955	58	321,936	
270,285	51	11	879	818	799	1,617	775	773	1,548	242,023	89	191,694	62	433,717	
218,426	48	12	960	706	726	1,492	525	360	885	153,463	84	55,988	39	209,450	
219,962	40	Sub-Total	12,255	10,626	10,424	21,050	8,894	9,431	18,325	1,465,864	47	2,039,761	54	3,505,625	
126,989	28														
160,038	38	TOTAL	24,793	18,739	17,920	36,659	15,695	16,504	32,199	3,044,510	51	4,245,635	62	7,290,145	
190,813	41														
265,745	64														
3,544,826	50														
(806,886)															
9,235,324	62														

FEE (P)		DISTRICT IV													
TOTAL	(%)	DIVISION NO.	PROJECTED SERVICE AREA (ha)	IRRIGATED AREA (ha)			BENEFITED AREA (ha)			COLLECTED IRRIGATION FEE (P)					
				WET	DRY	TOTAL	WET	DRY	TOTAL	WET (%)	DRY (%)	TOTAL (%)			
1,080	776	763	1,539	776	763	1,539	122,017	45	277,719	92	399,736	70			
1,111	794	801	1,595	789	801	1,520	146,901	52	208,350	65	355,251	59			
1,095	501	494	955	501	494	955	28,762	21	80,861	41	109,623	33			
918	544	557	1,011	544	557	1,011	38,941	20	147,118	66	186,059	45			
1,104	689	705	1,394	689	705	1,394	58,359	24	146,772	52	205,131	39			
1,044	653	661	1,314	653	661	1,314	46,553	20	137,813	53	184,366	38			
1,153	557	591	1,148	557	591	1,148	81,729	42	142,389	61	224,118	52			
993	560	562	1,122	560	562	1,122	53,825	27	84,863	38	138,688	33			
1,200	622	460	1,082	507	460	967	83,538	46	45,444	25	128,982	35			
1,234	680	665	1,345	680	665	1,345	57,998	27	172,753	65	230,751	48			
1,190	712	768	1,480	712	718	1,430	108,660	44	192,499	66	301,159	56			
1,667	287	212	499	283	201	484	63,614	41	89,509	84	153,123	59			
1,667	287	212	499	283	201	484	63,614	41	89,509	84	153,123	59			
Sub-Total	13,779	7,375	7,239	14,614	7,251	7,178	14,429	890,897	35	1,720,090	60	2,610,987	48		
850	693	711	1,324	693	711	1,324	84,168	35	211,645	75	295,813	56			
918	824	826	1,650	823	826	1,649	144,206	50	208,147	63	352,593	57			
850	750	767	1,517	750	751	1,501	55,479	21	212,061	70	267,540	47			
898	801	789	1,590	773	775	1,548	143,893	33	169,731	54	304,624	52			
960	764	740	1,214	725	740	1,215	119,679	47	198,014	68	217,693	40			
1,000	593	569	1,162	590	569	1,159	171,573	83	135,041	36	306,614	71			
1,138	1,032	1,038	2,072	970	1,006	1,976	133,785	39	243,139	61	376,924	51			
900	718	723	1,241	705	723	1,228	126,153	51	258,946	91	385,095	72			
1,028	736	764	1,500	717	761	1,478	118,963	47	253,757	84	372,720	67			
888	332	843	843	328	828	47,786	42	112,465	57	238,270	58				
888	272	511	272	272	500	272	78,019	82	112,465	57	238,270	58			
Sub-Total	10,308	7,515	7,438	14,953	7,346	7,362	14,708	1,223,704	45	2,002,946	68	3,226,650	59		
TOTAL	24,087	14,890	14,677	29,567	14,597	14,540	29,137	2,114,601	41	3,723,036	64	5,837,637	53		

TURNOVER STATUS OF TO IRRIGATOR'S



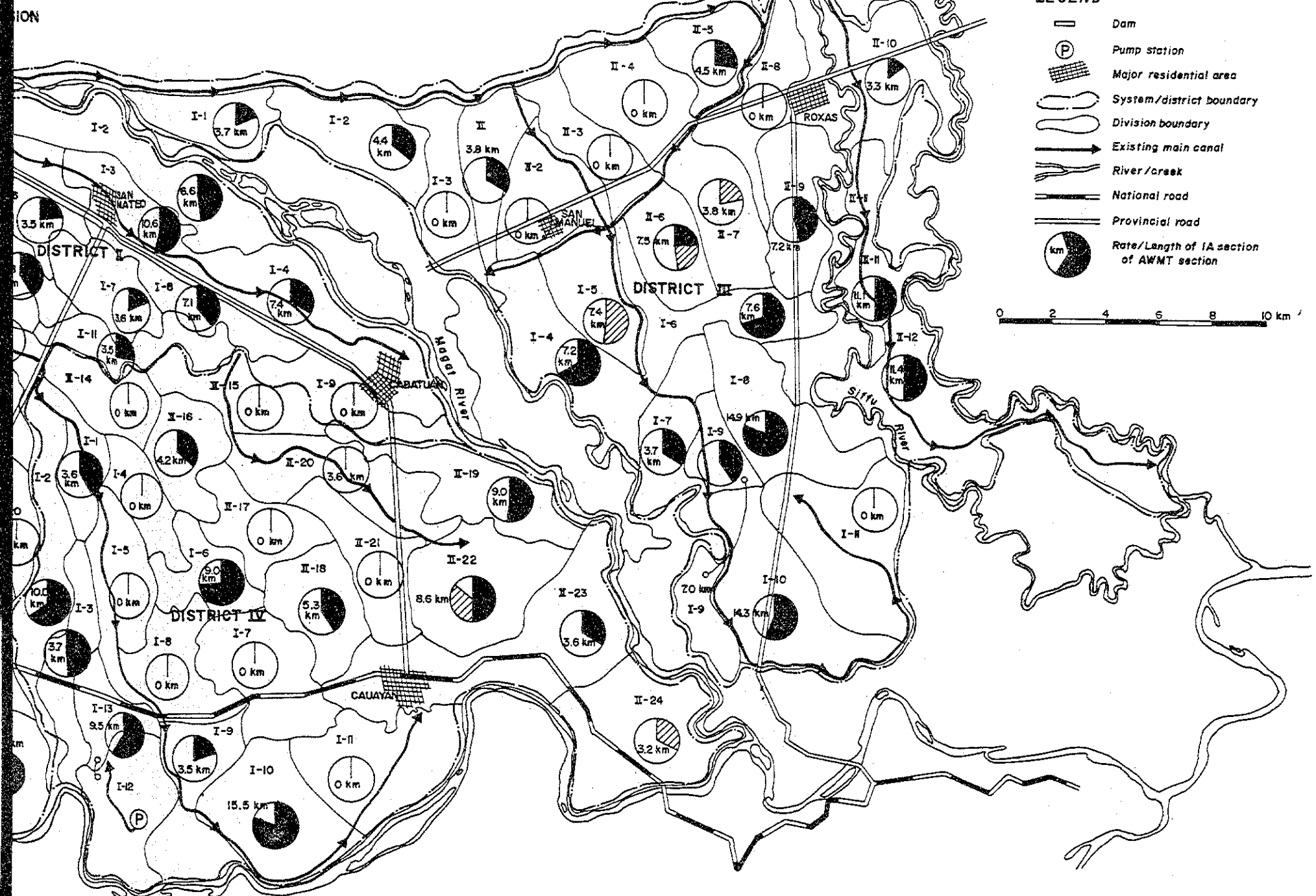
DIVISION I															
Division No.	No. of Section	Service Area (ha)	Canal Length (m)	No. of O/M Personnel/IA, etc.						Canal Length of Each Section (m)					
				WMT	DT	OK	IA	Barangay	Individual	NIA	(%)	IA	(%)	Others	(%)
I-1	3	803	10,659	1	2	-	1	-	-	7,154	67	3,505	33	-	-
2	5	826	16,174	1	2	1	1	2	Sec.	9,174	56	7,000	44	-	-
3	4	900	14,648	1	3	-	1	-	-	10,968	75	3,500	25	-	-
4	4	808	10,533	1	-	1	2	3	Sec.	-	0	10,533	100	-	-
5	3	855	10,603	1	3	-	-	-	-	10,603	100	-	-	-	-
6	4	955	14,473	1	3	1	-	-	-	10,973	76	3,500	24	-	-
7	7	1,035	23,568	1	1	2	4	-	-	7,800	32	15,968	68	-	-
8	5	1,049	18,603	1	2	-	2	3	Sec.	3,900	19	15,103	81	-	-
9	6	1,241	17,350	1	-	2	4	-	-	3,020	17	14,330	83	-	-
10	7	1,173	23,527	1	-	1	5	8	Sec.	4,500	6	22,027	94	-	-
11	7	961	19,862	1	-	1	6	-	-	-	-	19,862	100	-	-
12	4	1,001	12,619	1	1	1	2	-	-	5,381	43	7,238	57	-	-
13	6	765	19,192	1	2	1	1	-	-	15,630	81	3,562	19	-	-
14	5	796	16,742	1	1	1	3	-	-	5,674	34	11,068	66	-	-
Sub-total	70	13,068	226,373	14	20	11	33	37	Sec.	91,177	40	137,196	60	-	-
II-1	4	899	15,041	1	2	1	1	-	-	10,541	70	4,500	30	-	-
2	3	961	11,024	1	1	-	2	-	-	1,462	13	9,572	87	-	-
3	4	734	12,292	1	2	1	1	-	-	8,580	70	3,712	30	-	-
4	3	828	8,781	1	-	1	2	-	-	1,500	17	7,281	83	-	-
5	4	800	12,708	1	-	1	3	-	-	1,604	13	11,104	87	-	-
6	4	904	14,824	1	2	-	2	-	-	7,355	50	7,469	50	-	-
7	3	603	10,630	1	1	-	2	-	-	3,524	33	7,106	67	-	-
8	5	795	17,188	1	1	1	3	-	-	5,697	33	11,491	67	-	-
9	4	791	14,058	1	2	-	2	-	-	7,000	50	7,058	50	-	-
10	8	869	24,425	1	2	1	3	-	-	13,451	55	10,974	45	-	-
11	6	1,736	23,723	1	2	-	4	-	-	9,560	40	14,163	60	-	-
12	10	1,066	34,891	1	3	1	3	-	-	22,830	65	12,061	35	-	-
Sub-total	58	10,986	199,585	12	18	7	28	-	-	93,094	47	106,491	53	-	-
Total	128	24,054	427,958	26	38	18	61	-	-	184,271	43	243,687	57	-	-

Note: 8 - Sections

DIVISION II															
Division No.	No. of Section	Service Area (ha)	Canal Length (m)	No. of O/M Personnel/IA, etc.						Canal Length of Each Section (m)					
				WMT	DT	OK	IA	Barangay	Individual	NIA	(%)	IA	(%)	Others	(%)
I-1	6	613	19,726	1	3	1	2	-	-	9,220	47	10,506	53	-	-
2	5	978	17,602	1	3	-	2	-	-	10,974	62	6,628	48	-	-
3	6	791	18,430	1	2	1	3	-	-	7,794	42	10,636	58	-	-
4	6	948	21,694	1	4	-	2	-	-	14,322	66	7,372	34	-	-
5	6	909	18,767	1	3	1	2	-	-	10,985	59	7,782	41	-	-
6	4	845	15,060	1	3	-	1	-	-	11,541	77	3,519	23	-	-
7	5	820	18,504	1	4	-	1	-	-	14,904	81	3,600	19	-	-
8	5	902	18,073	1	3	-	2	-	-	10,924	61	7,149	39	-	-
9	4	666	13,325	1	4	-	-	-	-	13,325	100	-	-	-	-
10	3	726	10,500	1	3	-	-	-	-	10,500	100	-	-	-	-
11	3	719	9,338	1	2	-	1	-	-	5,838	63	3,500	27	-	-
12	3	833	10,670	1	3	-	-	-	-	10,670	100	-	-	-	-
13	3	863	11,100	1	2	-	1	-	-	7,400	67	3,700	33	-	-
14	4	750	12,090	1	4	-	-	-	-	12,090	100	-	-	-	-
15	3	729	9,952	1	3	-	-	-	-	9,952	100	-	-	-	-
Sub-total	66	12,292	226,821	15	46	3	17	-	-	162,429	72	64,392	28	-	-
II-16	5	1,040	13,218	1	4	-	1	-	-	15,566	81	3,652	19	-	-
17	4	958	15,666	1	4	-	-	-	-	15,666	100	-	-	-	-
18	3	805	12,069	1	3	-	-	-	-	12,069	100	-	-	-	-
19	2	760	10,794	1	2	1	-	-	-	10,794	100	-	-	-	-
20	2	778	7,831	1	2	-	-	-	-	7,831	100	-	-	-	-
21	4	830	14,191	1	4	-	-	-	-	10,466	74	3,725	26	-	-
22	3	716	8,516	1	2	1	-	-	-	8,516	100	-	-	-	-
23	3	898	10,960	1	2	-	-	-	-	7,260	66	-	-	3,700	34
24	4	815	14,260	1	3	-	-	-	-	10,760	75	3,500	25	-	-
25	3	914	12,200	1	1	-	2	-	-	4,000	33	8,200	67	-	-
26	4	830	14,580	1	3	-	1	-	-	11,760	81	2,820	19	-	-
27	5	855	13,392	1	2	1	2	-	-	7,896	51	7,496	49	-	-
28	6	737	17,320	1	3	1	1	-	-	3,620	79	3,700	21	-	-
29	4	1,240	10,565	1	-	1	3	-	-	-	-	10,565	100	-	-
Sub-total	52	12,176	183,562	14	35	5	17	-	-	136,204	74	43,658	24	3,700	2
Total	118	24,468	410,383	29	81	8	38	-	-	298,633	73	108,050	26	3,700	1

Division No.	No. of Section
I-1	7
2	4
3	4
4	3
5	4
6	3
7	3
8	5
9	5
10	7
11	4
Sub-total	49
II-1	3
2	4
3	4
4	3
5	4
6	4
7	5
8	6
9	4
10	7
11	4
12	6
Sub-total	54
Total	103

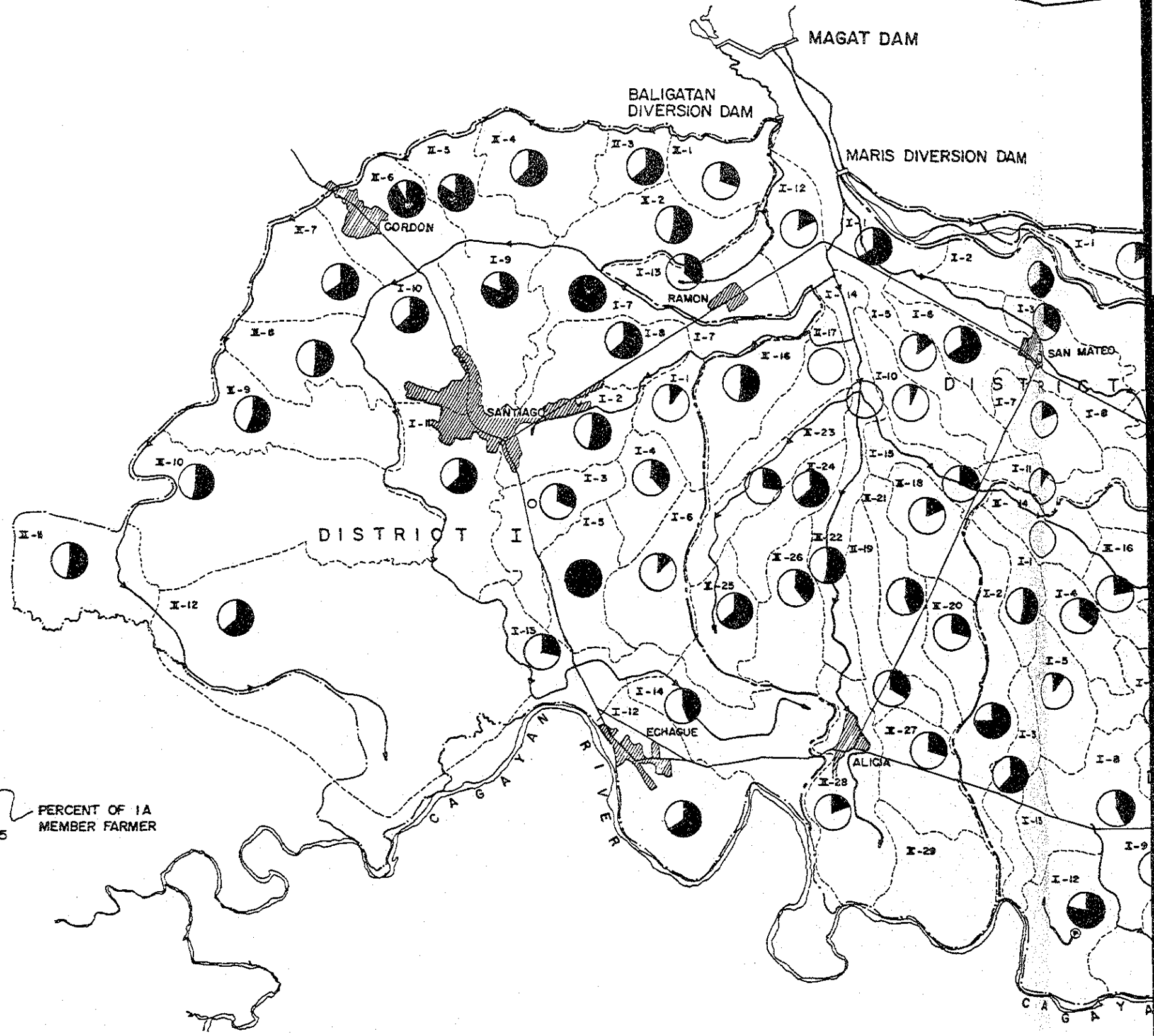
OVER STATUS OF LATERAL CANAL
TO IRRIGATOR'S ASSOCIATION



Others (%)	34
3,700	2
3,700	1

DIVISION III													
Division No.	No. of Section	Service Area (ha)	Canal Length (m)	No. of O/M Personnel/IA, etc.						Canal Length of Each Section (m)			
				WMT	DT	OK	IA	Barangay Individual	NIA (%)	IA (%)	Others (%)		
I-1	7	737	19,576	1	6	-	-	-	15,696	81	3,680	19	-
I-2	4	843	12,589	1	3	-	-	-	8,119	84	4,470	36	-
I-3	4	1,019	12,292	1	4	-	-	-	12,292	100	-	-	-
I-4	3	1,186	10,780	1	1	-	2	-	3,580	33	7,200	67	-
I-5	4	1,089	14,181	1	(2)	-	-	2	6,827	48	-	7,354	52
I-6	3	1,062	10,906	1	1	-	2	-	3,311	30	7,595	70	-
I-7	3	1,263	10,903	1	2	-	1	-	7,253	67	3,650	33	-
I-8	5	1,143	18,388	-	-	-	4	-	3,531	19	14,857	81	-
I-9	5	1,176	17,556	(1)	3	-	2	-	10,532	60	7,024	40	-
I-10	7	1,500	25,050	1	3	-	4	-	10,726	43	14,324	57	-
I-11	4	1,500	13,684	(1)	2	-	0	-	13,684	100	-	-	-
Sub-total	49	12,538	165,905	9	22	-	23	-	95,731	58	62,800	38	7,354
II-1	3	1,088	10,795	1	2	-	1	-	7,017	65	3,778	35	-
II-2	4	981	12,987	1	4	-	-	-	12,987	100	-	-	-
II-3	4	1,041	14,759	1	4	-	-	-	14,759	100	-	-	-
II-4	3	1,029	11,092	1	3	-	-	-	11,092	100	-	-	-
II-5	4	925	15,249	1	3	-	-	-	11,279	74	3,970	26	-
II-6	4	1,076	13,463	1	2	-	1	-	7,591	52	3,697	24	3,775
II-7	5	1,180	17,909	1	3	-	-	-	14,109	79	-	3,800	21
II-8	6	1,010	18,080	1	5	-	-	-	18,080	100	-	-	-
II-9	4	1,028	15,261	1	2	-	2	-	8,053	53	7,168	47	-
II-10	7	1,058	22,520	1	5	-	1	-	19,223	85	3,297	15	-
II-11	4	879	14,616	1	1	-	3	-	3,500	24	11,116	76	-
II-12	6	960	22,748	1	3	-	3	-	11,386	50	-	-	-
Sub-total	54	12,255	191,479	12	37	-	3	12	139,516	73	44,386	23	7,575
Total	103	24,793	357,384	21	59	-	3	35	235,247	66	107,186	30	14,929

DIVISION IV													
Division No.	No. of Section	Service Area (ha)	Canal Length (m)	No. of O/M Personnel/IA, etc.						Canal Length of Each Section (m)			
				WMT	DT	OK	IA	Barangay Individual	NIA (%)	IA (%)	Others (%)		
I-1	3	1,080	8,504	1	1	-	1	-	4,972	58	3,577	42	-
I-2	4	1,111	15,260	1	2	-	2	-	5,301	35	9,959	65	-
I-3	2	1,095	7,525	1	1	-	-	-	3,807	51	3,718	49	-
I-4	2	918	7,168	1	2	-	-	-	7,168	100	-	-	-
I-5	4	1,104	12,251	1	4	-	-	-	12,251	100	-	-	-
I-6	3	1,044	12,854	1	1	-	2	-	3,808	26	9,046	74	-
I-7	3	1,153	11,195	1	3	-	-	-	11,195	100	-	-	-
I-8	3	993	10,554	1	3	-	-	-	10,554	100	-	-	-
I-9	5	1,200	17,631	1	4	-	1	-	14,110	80	3,521	20	-
I-10	4	1,224	19,104	1	1	-	3	-	3,626	19	15,478	81	-
I-11	8	1,190	17,451	1	6	-	1	-	14,931	86	-	2,520	14
I-12	3	1,657	16,009	1	-	-	3	-	6,481	40	9,528	60	-
Sub-total	44	13,779	155,506	12	28	-	13	-	98,159	63	54,827	35	2,520
II-14	3	850	10,700	1	3	-	-	-	10,700	100	-	-	-
II-15	4	918	14,210	1	4	-	-	-	14,210	100	-	-	-
II-16	3	850	11,509	1	2	-	1	-	7,359	64	4,150	36	-
II-17	3	898	9,521	1	3	-	-	-	9,521	100	-	-	-
II-18	4	950	12,256	1	2	-	2	-	7,280	59	4,976	41	-
II-19	5	1,000	17,351	1	2	-	2	-	8,352	48	8,999	52	-
II-20	5	1,138	16,465	1	4	-	1	-	12,888	78	3,577	22	-
II-21	4	900	14,063	1	4	-	-	-	14,063	100	-	-	-
II-22	3	1,028	10,118	1	1	-	1	-	1,500	15	4,956	49	3,662
II-23	3	888	10,972	(1)	1	-	-	-	7,352	67	3,620	33	-
II-24	3	888	10,332	1	2	-	1	-	7,101	69	-	3,231	31
Sub-total	40	10,308	137,597	11	26	-	8	-	100,426	73	30,278	15	6,893
Total	84	24,087	293,103	23	54	-	21	-	198,585	68	85,105	29	9,413

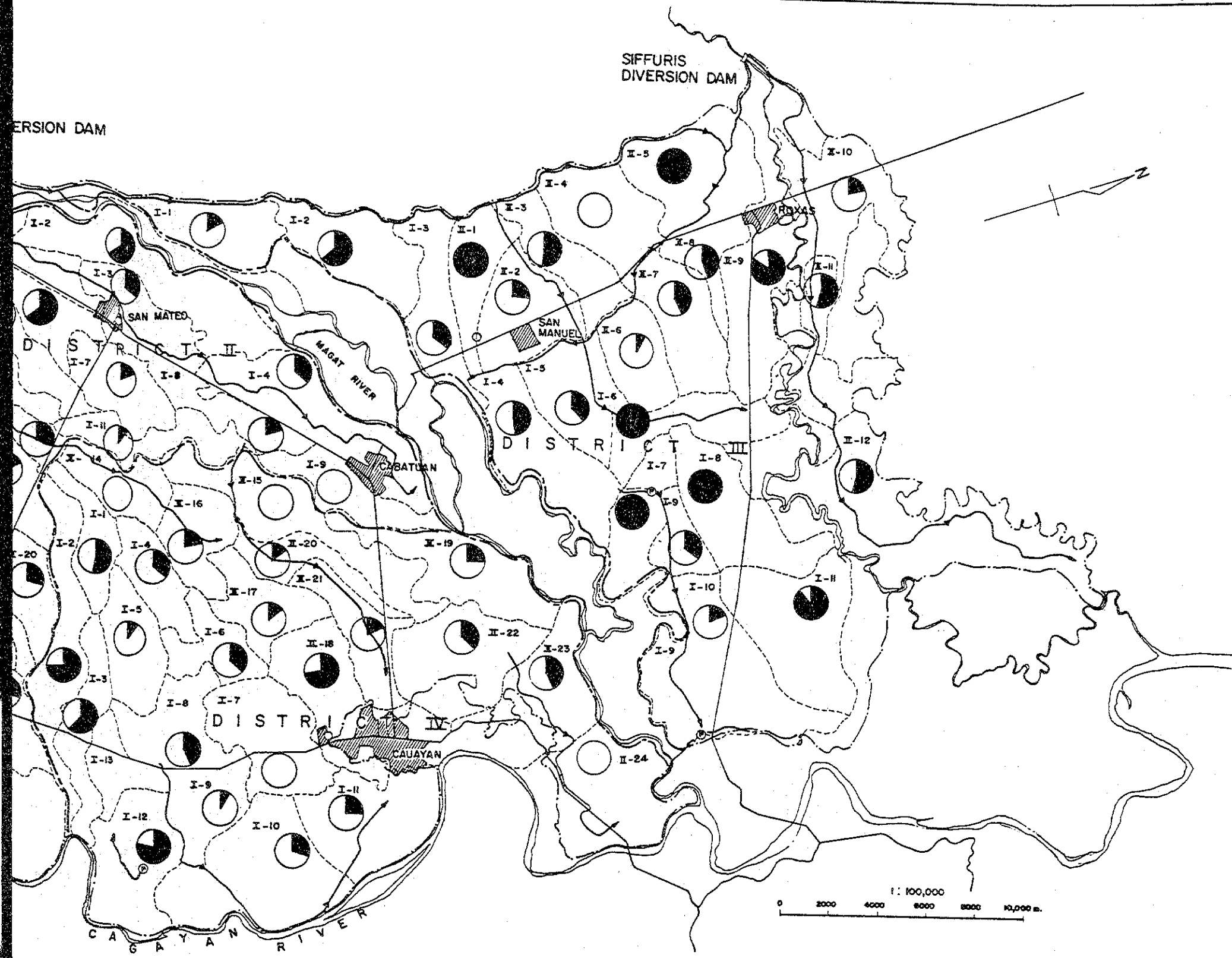


ESTABLISHMENT STATUS OF IRRIGATORS ASSOCIATION

DISTRICT I							
WM Division	Target		IA Organized		Member Farmer	Total Farmer	Percent of IA Members
	IA	FIG	IA	FIG			
I-1	3	24	1	7	80	692	12
2	2	22	2	12	253	423	60
3	3	22	2	13	159	430	37
4	4	21	2	16	135	338	40
5	3	26	2	13	234	234	100
6	2	15	19	9	63	436	14
7	5	42	5	21	271	271	100
8	3	49	2	33	257	375	69
9	6	39	5	37	482	624	77
10	6	39	5	30	436	669	65
11	6	37	6	37	371	601	62
12	4	36	4	23	245	375	65
13	3	23	2	19	138	486	28
14	4	42	3	21	223	490	46
II-1	2	21	2	8	101	318	57
2	3	28	2	22	227	395	57
3	4	25	3	14	194	300	65
4	3	24	2	19	269	418	64
5	3	19	3	21	275	324	83
6	3	19	3	18	225	233	97
7	2	22	2	17	176	410	67
8	3	33	3	22	331	654	51
9	4	37	3	23	272	456	60
10	4	51	4	33	343	634	54
11	5	39	4	27	412	775	53
12	4	57	4	37	479	770	62
Sub-Total (Target = 100)	95	812	77 (81%)	562 (69%)	6,751	12,131*	56

DISTRICT II							
WM Division	Target		IA Organized		Member Farmer	Total Farmer	Percent of IA Members
	IA	FIG	IA	FIG			
I-1	3	29	2	15	394	569	69
2	3	25	3	27	370	544	68
3	2	46	2	16	198	554	36
4	4	51	3	21	231	636	36
5	3	31	1	11	100	776	13
6	4	28	2	12	184	268	69
7	4	39	1	10	125	625	20
8	4	25	3	20	240	1,112	22
9	2	38	0	0	0	475	-
10	2	22	1	3	50	792	6
11	2	23	1	2	29	330	9
12	2	32	1	15	218	1,120	19
13	3	32	1	4	131	419	31
14	2	29			(no WM is assigned)		
II-15	3	27	1	7	97	359	27
16	4	33	4	21	346	605	57
17	3	29	0	0	0	319	-
18	3	30	1	4	58	406	14
19	2	22	2	11	159	498	32
20	2	21	1	6	74	268	28
21	3	22	4	14	200	423	47
22	3	41	4	18	287	557	52
23	3	19	2	21	257	723	36
24	2	35	1	10	217	344	63
25	4	31	2	36	272	407	67
26	3	20	3	13	154	450	34
27	2	34	3	12	168	543	31
28	3	22	3	14	148	926	16
Sub-Total (Target = 100)	80	836	52	343	4,707	15,048	31

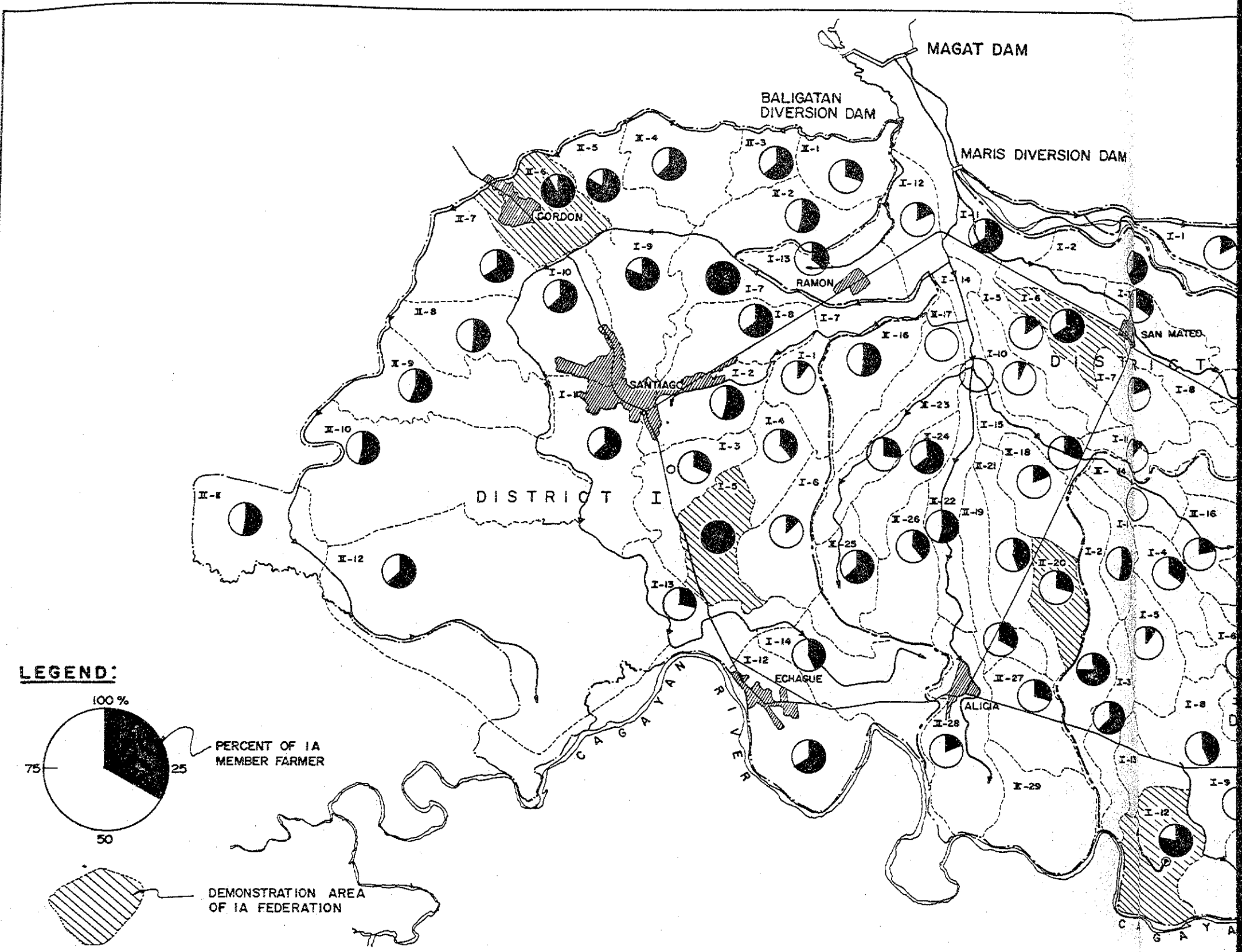
Source: District Office, MRIIS, 1986
 Note: * The total number of farmer by WM division is bigger than the actual number of farmer for the numbers are counted based on each lot.



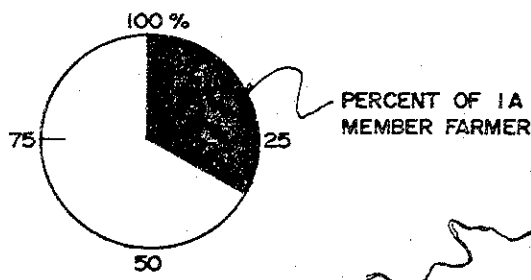
IRRIGATORS ASSOCIATION AND FARMERS IRRIGATORS GROUP, 1986

Percent of IA Members	DISTRICT III							
	WM Division	Target		IA Organized		Member Farmer	Total Farmer	Percent of IA Members
		IA	FIG	IA	FIG			
69	I-1	4	22	4	18	276	1,414	20
68	2	4	16	4	13	323	513	63
36	3	4	21	4	15	192	529	36
36	4	5	26	5	26	307	625	49
13	5	4	35	3	10	196	579	34
69	6	2	22	2	10	120	128	94
20	7	4	35	4	28	508	508	100
22	8	4	37	4	34	400	400	100
-	9	4	23	4	19	234	701	33
6	10	5	24	5	24	192	1,074	18
9	11	5	31	5	30	207	241	86
19	II-1	2	23	2	13	306	306	100
31	2	2	28	3	12	155	623	25
27	3	4	26	3	13	234	450	52
57	4	4	22	0	0	0	331	-
-	5	3	24	3	12	308	308	100
14	6	2	26	2	10	111	1,191	9
32	7	2	33	2	15	275	600	46
28	8	4	28	4	12	268	567	47
47	9	3	40	3	12	171	212	81
52	10	2	24	2	8	140	638	22
36	11	3	30	3	16	272	476	57
63	12	5	28	5	24	425	777	55
67								
34								
31								
16								
31	Sub-Total (Target = 100)	81	624	76 (94%)	374 (60%)	5,620	13,191	42

Percent of IA Members	DISTRICT IV							
	WM Division	Target		IA Organized		Member Farmer	Total Farmer	Percent of IA Members
		IA	FIG	IA	FIG			
53	I-1	1	26	1	6	180	338	53
77	2	3	39	3	33	394	513	77
61	3	2	25	2	18	241	398	61
36	4	1	21	1	10	130	357	36
10	5	1	28	1	5	66	675	10
46	6	2	24	2	21	188	407	46
-	7	1	24	0	0	0	468	-
44	8	2	30	1	9	183	417	44
8	9	3	37	1	6	44	523	8
30	10	2	49	2	16	172	580	30
24	11	2	35	1	6	110	455	24
76	12	3	46	3	41	348	456	76
	13					(Transferred to WM No. 12)		
-	II-14	1	28	0	0	0	385	-
-	15	1	30	0	0	0	549	-
21	16	1	19	1	5	63	295	21
14	17	2	22	2	27	92	676	14
73	18	3	31	3	8	122	168	73
26	19	2	45	2	14	285	1,110	26
14	20	1	46	1	3	58	423	14
16	21	2	26	1	2	43	264	16
40	22	2	30	2	7	143	357	40
42	23	2	29	2	9	154	363	42
-	24	1	24	0	0	0	223	-
29	Sub-Total (Target = 100)	41	714	32 (78%)	226 (32%)	3,016	10,398	29
40	Total (Target = 100)	297	2,986	237 (80%)	1,505 (50%)	20,094	50,768	40



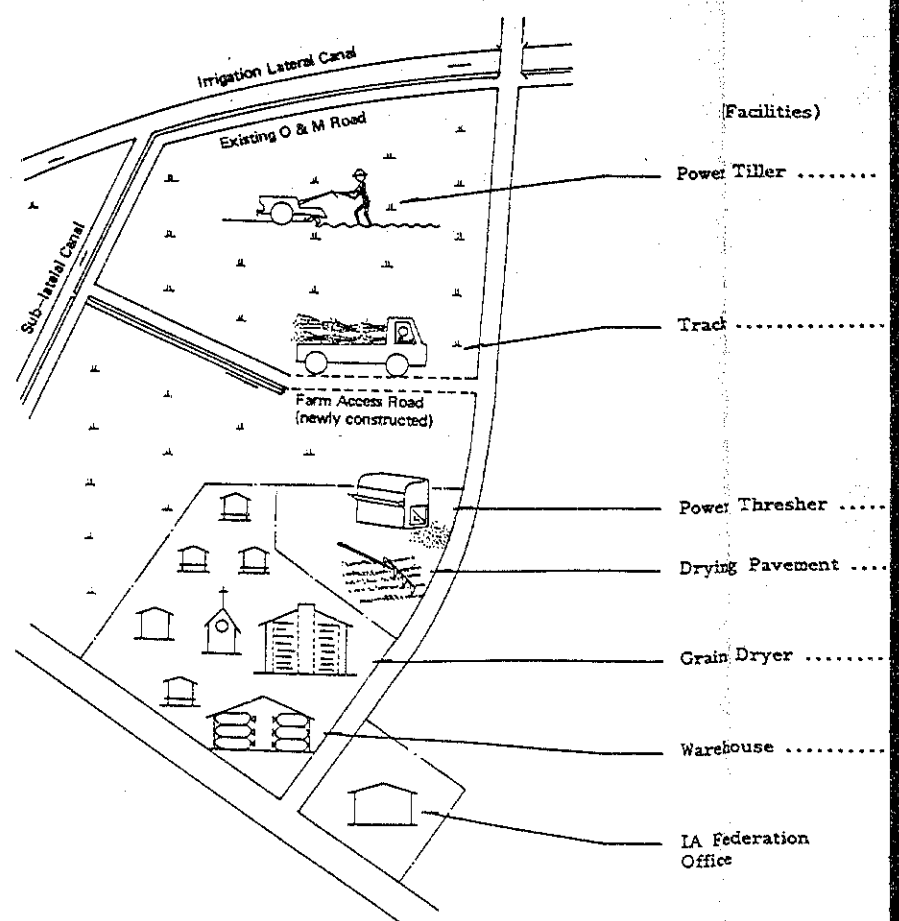
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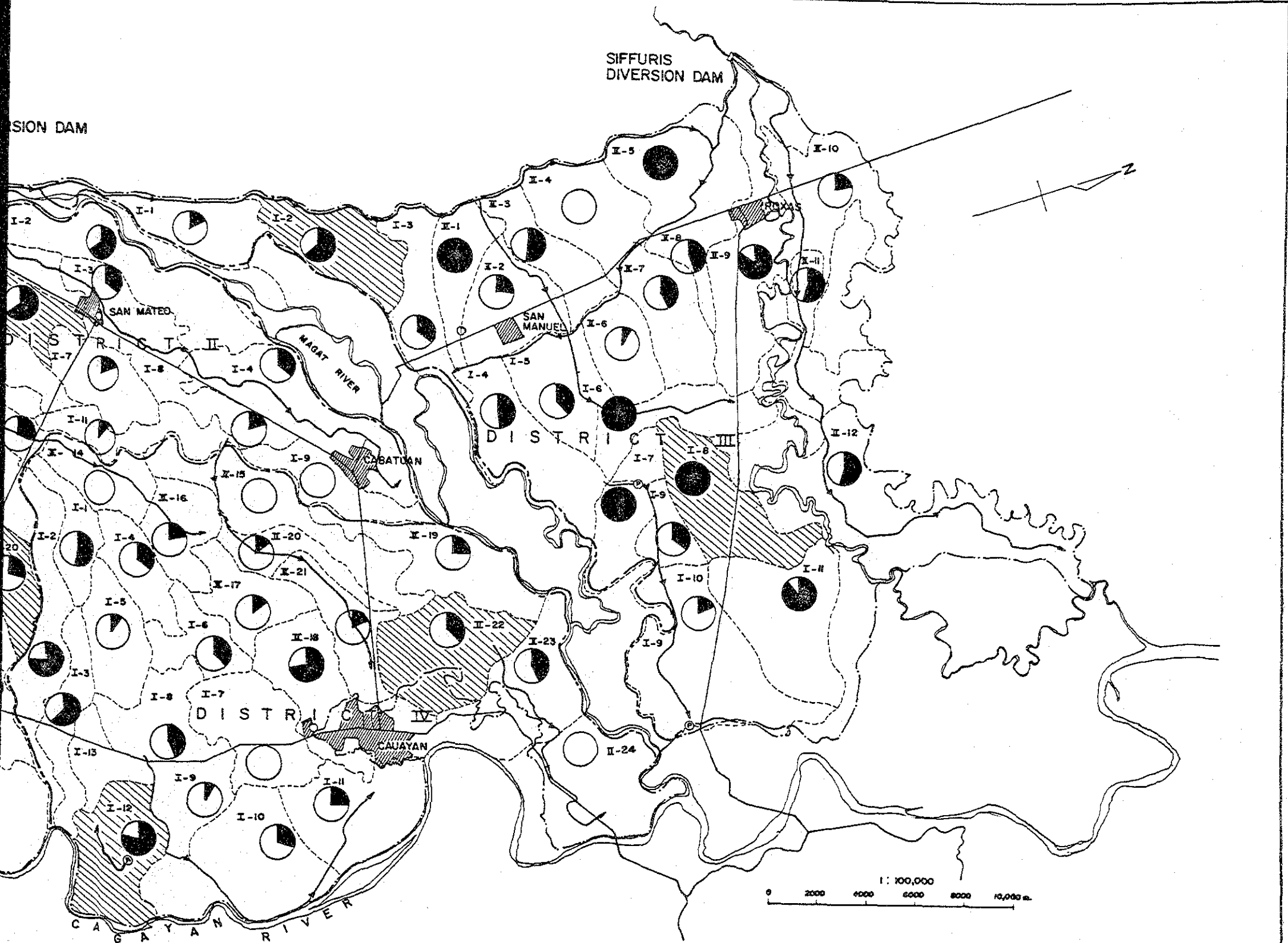


FUNCTION OF IA FEDERATION OFFICE

- (1) To request the cooperation for training of water management, repair and improvement of on-farm facilities, repair of agro-service equipment, etc. to the MRIIS O/M Office.
- (2) To request the fund for procurement and operation of agro-service equipment to banks and NFA.
- (3) To request the improvement of existing farming practices and the introduction of new farming technology to extension service staff dispatched by MAF to the MRIIS area.
- (4) To negotiate with dealers to lower the prices of agricultural equipment and input materials as well as to keep the reasonable price of paddy.
- (5) To borrow the fund required to manage IA.

AGRO-SERVICE FACILITIES AND ITS





SERVICE FACILITIES AND ITS' OBJECTIVES

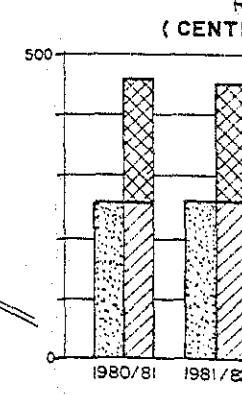
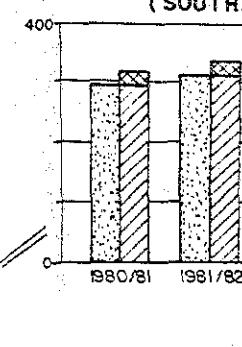
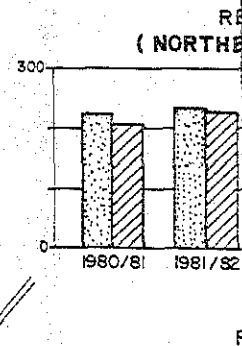
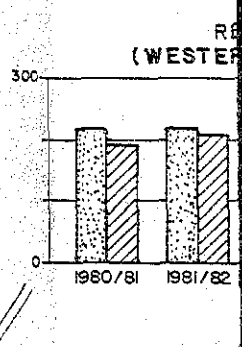
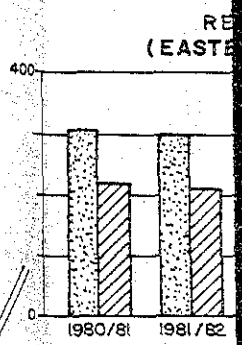
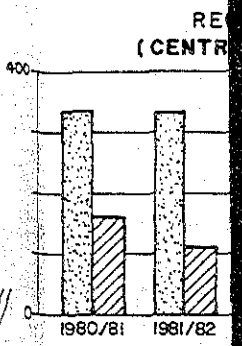
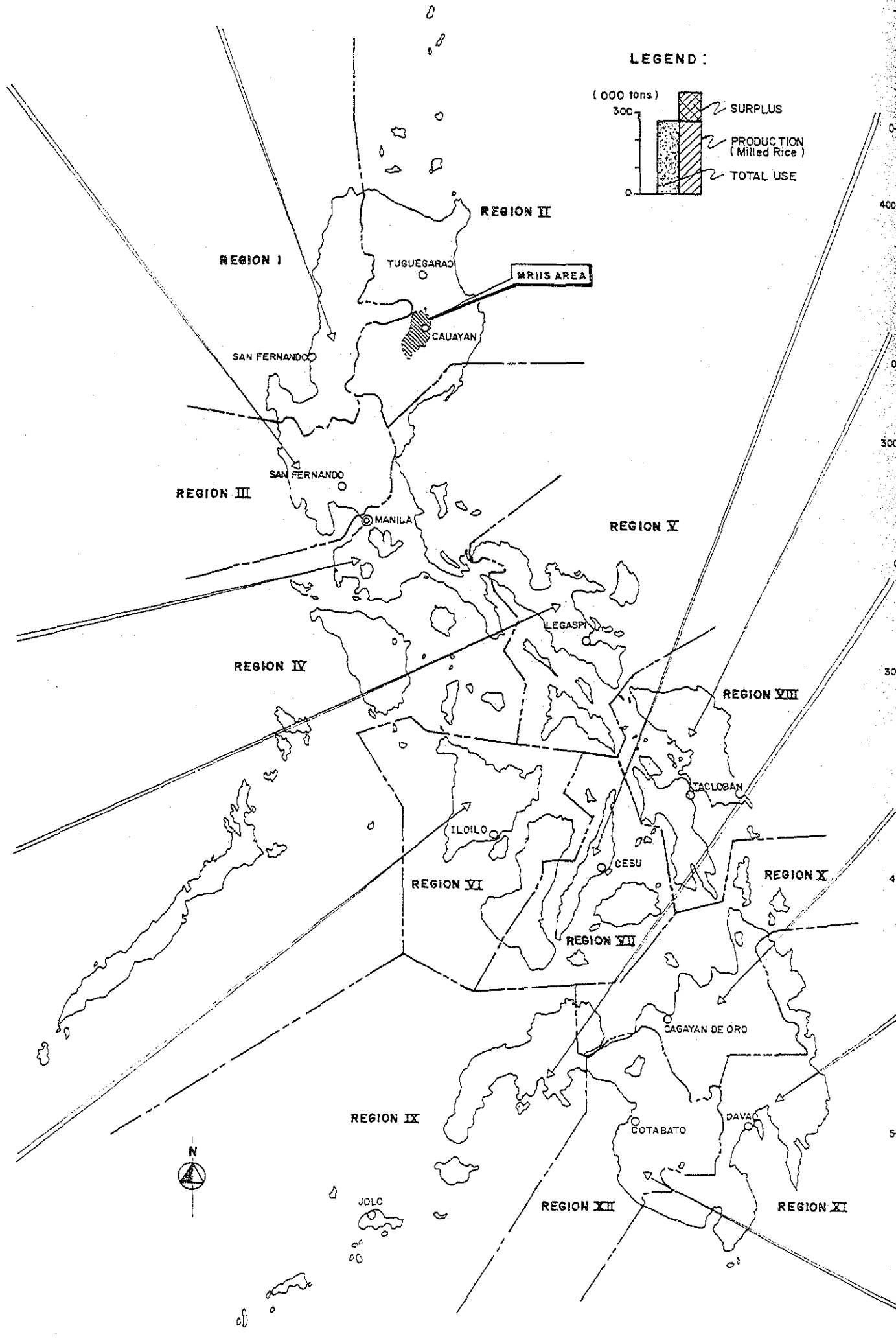
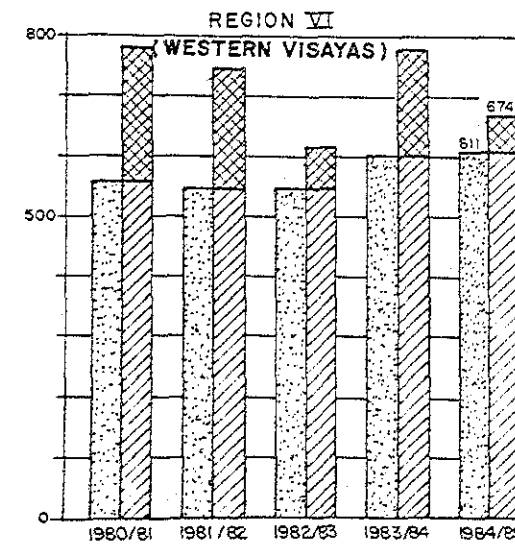
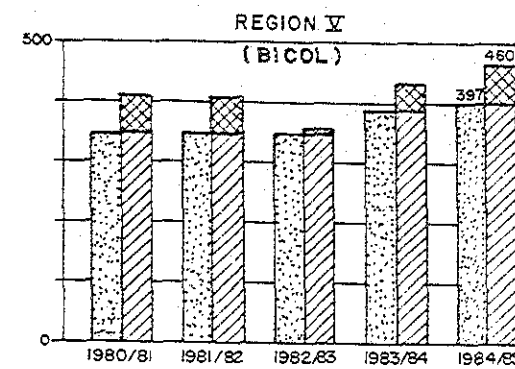
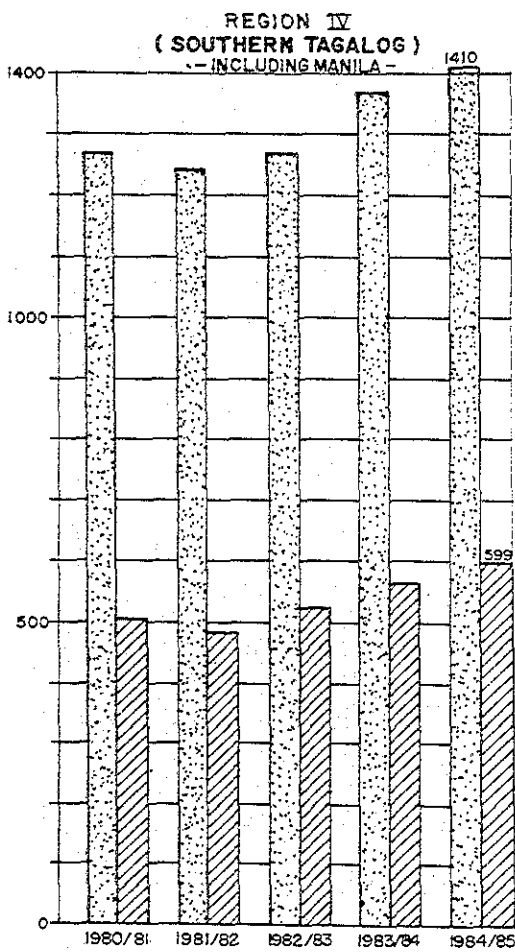
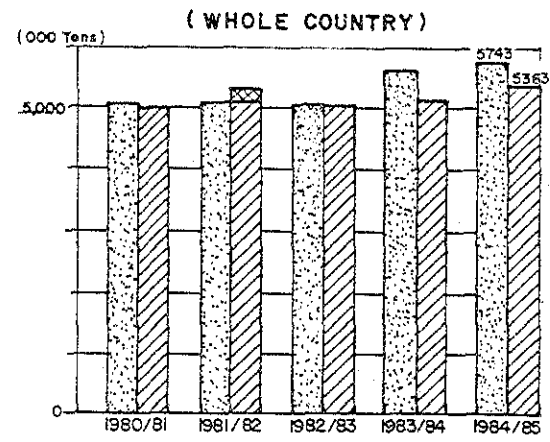
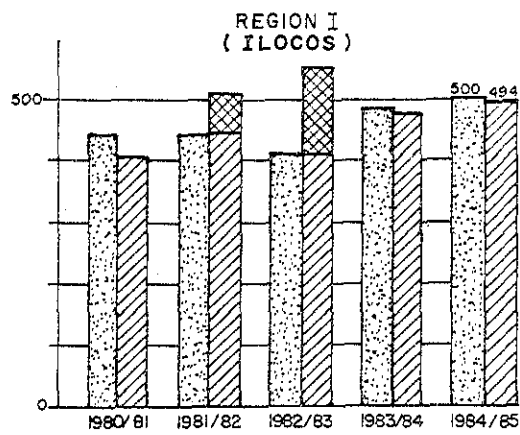
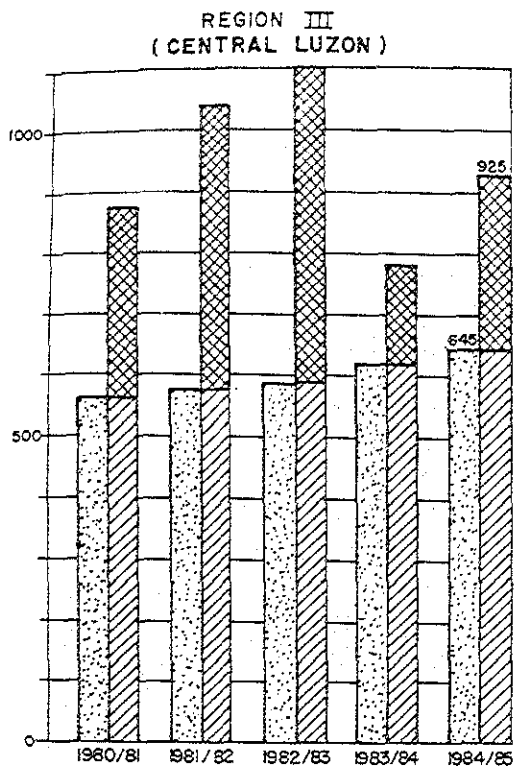
(Facilities)	(Objectives)
Power Tiller	To cultivate farm land in keeping proposed cropping pattern on time and effective water use.
Track	To transport agricultural inputs and products and construction materials for improvement of on-farm works, and to communicate between towns and Barangay.
Power Thresher	To thresh paddy on time after harvesting.
Drying Pavement	To do sun-dry of paddy after threshing on time to prevent paddy quality from deterioration.
Grain Dryer	To do mechanical drying of paddy after threshing on time to supplement the capacity of drying pavement.
Warehouse	To store the dried paddy in good condition until the market price turns favourable to farmers.
IA Federation Office	

INITIAL INVESTMENT COST FOR IA FEDERATION ESTABLISHMENT

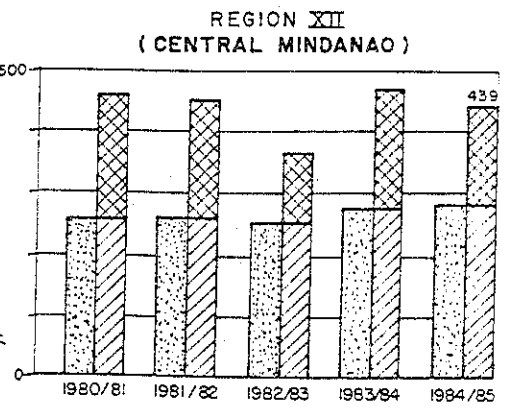
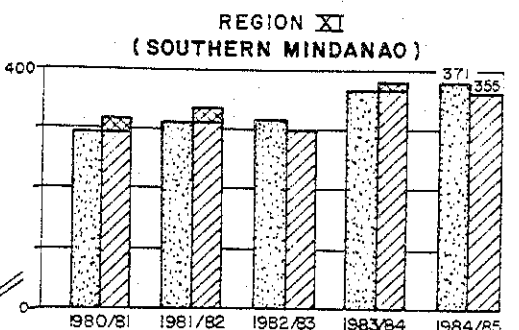
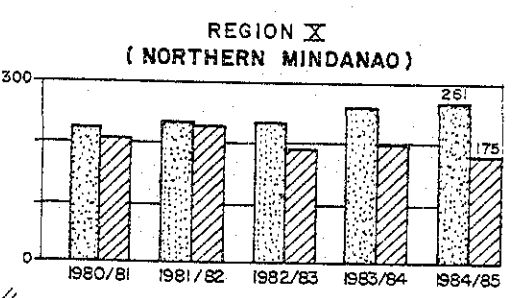
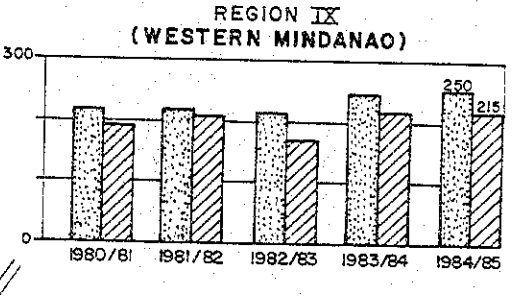
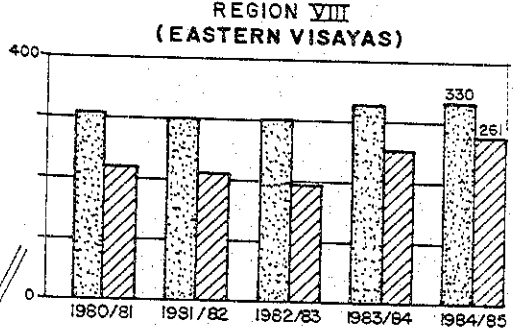
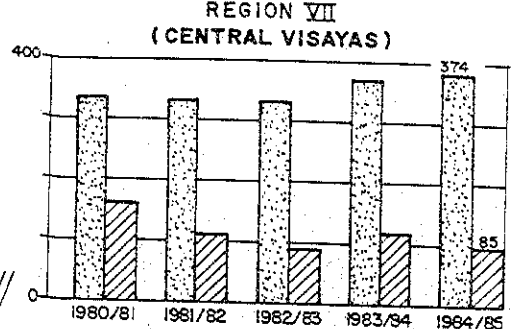
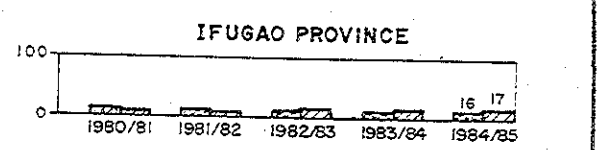
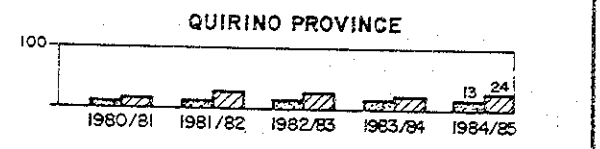
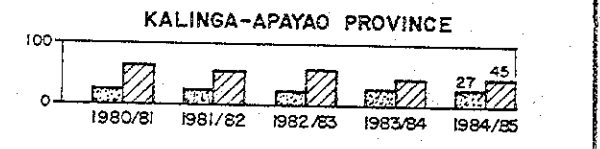
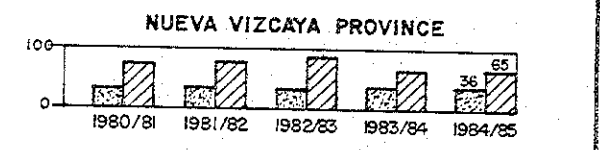
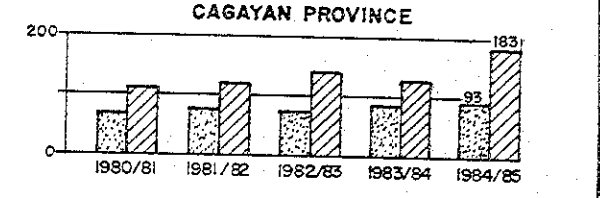
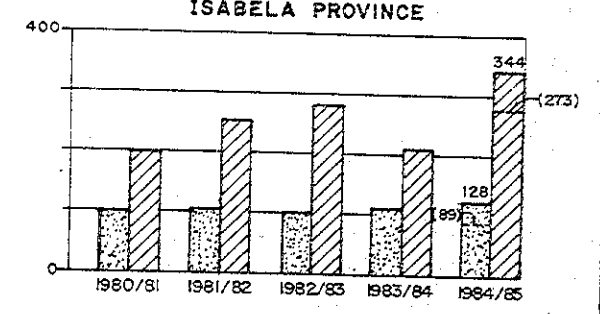
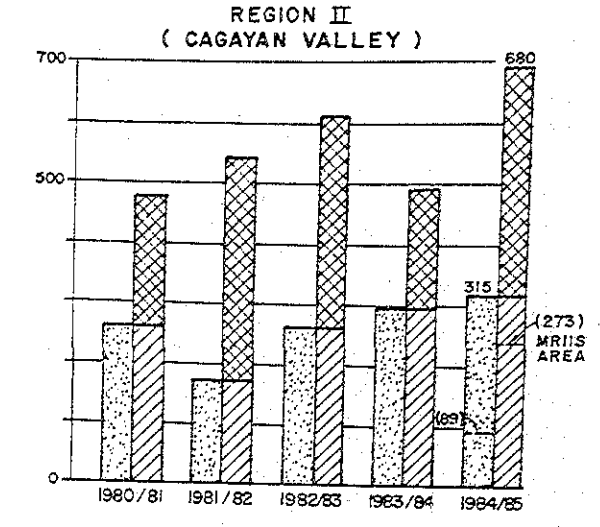
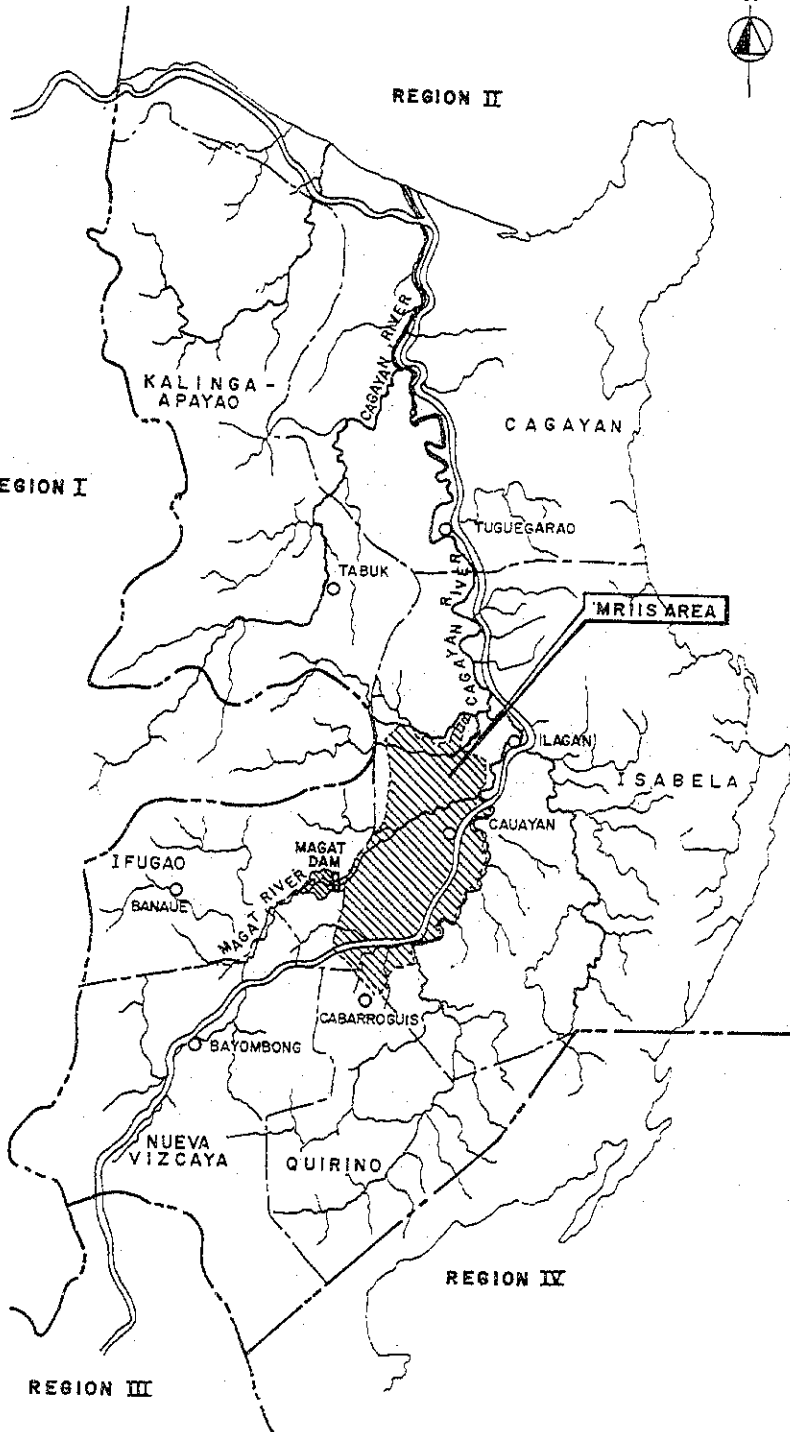
Facilities	Capacity	Number (Unit)	Investment Cost per IA (1,000 P)	Operation Cost (4 ton/ha basis) (P/ha)
Power Tiller	30 hr/ha	25	750	864
Track	2.0 ton	2	300	120
Power Thresher	1.5 ton/hr	3	150	126
Drying Pavement	6 ton/day, 300 sq.m	6	180	18
Grain Dryer	0.5 ton/day	3	48	62
Warehouse	300 sq.m	1	210	48
Miscellaneous		LS	162	32
Management Cost of IA				130
Total			1,800	1,400

ESTABLISHMENT OF IA FEDERATION

DEMAND AND SUPPLY OF RICE BY REGION



OF RICE BY REGION AND IN MRIIS AREA



YEAR	(Unit: Tons)	
	MRIIS SERVICE AREA	REGION II (CROP YEAR)
1975	58,700	503,000
1976	58,600	552,000
1977	101,100	544,000
1978	136,400	575,000
1979	162,900	528,000
1980	162,100	480,000
1981	133,400	544,900
1982	178,000	607,900
1983	169,600	485,200
1984	232,400	679,800
1985	273,300	NO DATA

(Unit: Tons)	
ITEMS	QUANTITY
1. TOTAL PRODUCTION	273,300
2. DEMAND	
(1) Consumption	68,200
(2) Seeds	7,900
(3) Others	13,100
Sub-Total	89,200
3. SURPLUS	184,100

NOTE: TOTAL USE IS INCLUDING FOOD USE, SEEDS, FEED AND WASTE
 SOURCE: 1. REGION AND PROVINCIAL DATA..... "Rice Production and Use Estimate by Region and Provinces" Economic Research Report No.18, September, 1986, Bureau of Agricultural Economics, MAF
 2. PROJECT AREA DATA..... MARIIS OFFICE

DEMAND AND SUPPLY OF AGRICULTURAL PRODUCTS

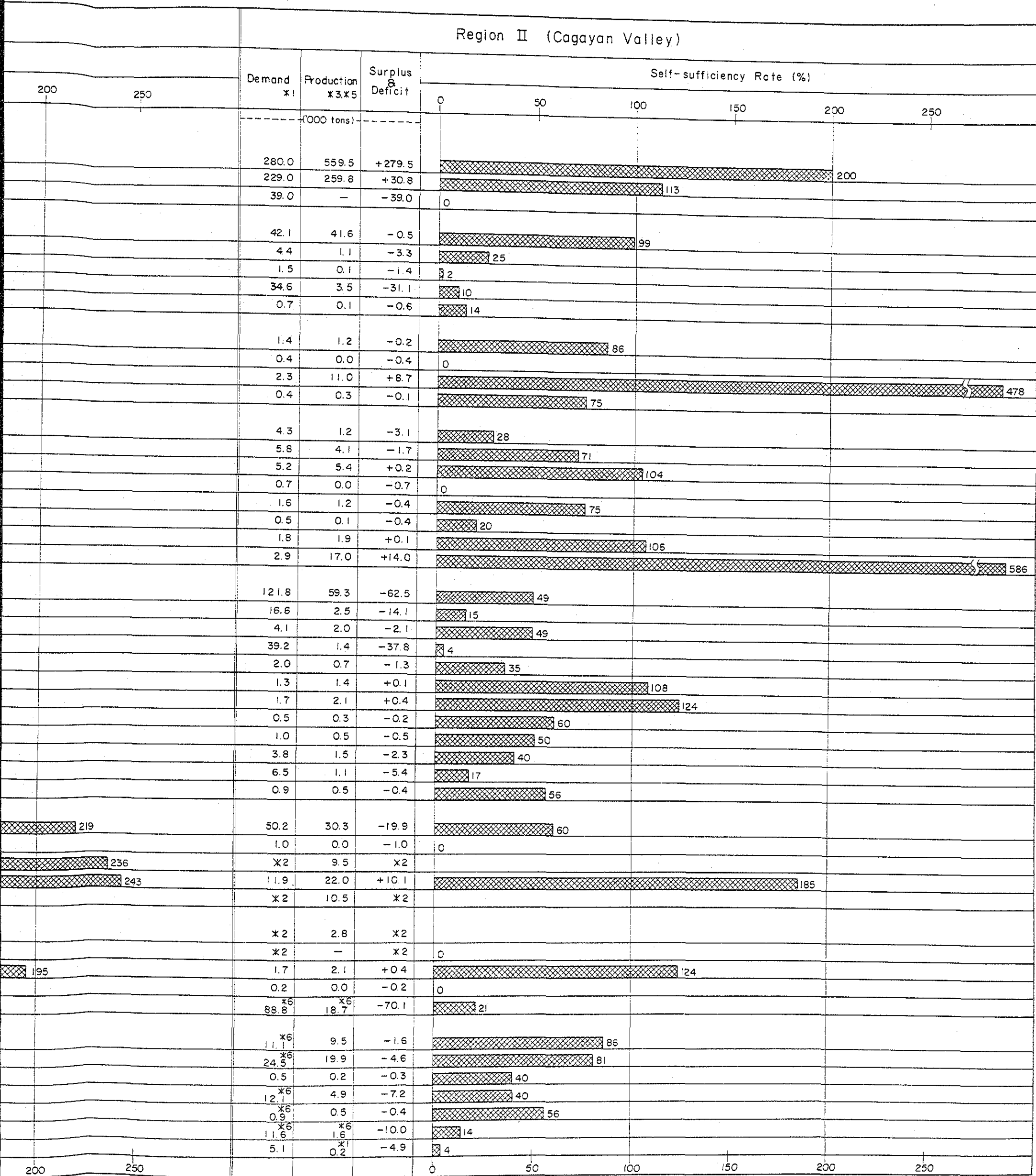
— Average for the Last Five Years (CY 1955-1959)

Crops	Philippines					Self-sufficiency Rate (%)					
	Quantity Traded ^{x5}		Demand x5	Production x3,x5	Surplus & Deficit	0	50	100	150	200	250
	Import	Export									
(000 tons)											
1. Grains											
1-1 Rice (rough rice)	78	45	5,314	5,166	- 148			97			
1-2 Corn (shelled)	340	—	3,566	3,262	- 304			92			
1-3 Wheat (grains)	821	—	827	—	- 827	0					
2. Starchy Roots and Tubers											
2-1 Sweet Potato (Camote)	—	—	904	904	—			100			
2-2 Taro (Gabi)	—	—	105	105	—			100			
2-3 Irish Potato	0	—	39	39	0			100			
2-4 Cassava	0	—	1,687	1,687	0			100			
2-5 Yam (Ubi)	—	—	16	16	—			100			
3. Beans, Seeds and Nuts											
3-1 Mungbeans	0	0	30	30	0			100			
3-2 Soybeans ^{x4}	412	—	440	9	-431	2					
3-3 Peanuts (Shelled)	1	—	29	28	-1			97			
3-4 Other Drybeans	4	0	8	5	-3			63			
4. Vegetable											
4-1 Cabbage and Pechay	—	—	98	98	—			100			
4-2 Tomato	1	0	127	126	-1			99			
4-3 Eggplant	—	—	112	112	—			100			
4-4 Garlic	0	0	18	18	0			100			
4-5 Onion	0	6	38	44	+6			116			
4-6 Radish	—	—	10	10	—			100			
4-7 Ginger	—	—	38	38	—			100			
4-8 Other Vegetable	—	—	348	348	—			100			
5. Fruits											
5-1 Banana	—	810	3,171	3,981	+810			126			
5-2 Mango	—	8	377	385	+8			102			
5-3 Papaya	—	—	92	92	—			100			
5-4 Pineapple	—	578	906	1,484	+578			164			
5-5 Calamansi	—	—	44	44	—			100			
5-6 Mandarin	—	—	28	28	—			100			
5-7 Pomelo	—	—	36	36	—			100			
5-8 Guava (Guyabano)	—	—	10	10	—			100			
5-9 Avocado	—	—	23	23	—			100			
5-10 Jackfruit	—	—	84	84	—			100			
5-11 Water Melon	—	—	145	145	—			100			
5-12 Orange	—	—	21	21	—			100			
6. Sugarcane Products											
6-1 Centrifugal Sugar	—	1,217	1,090	2,387	+1,297			219			
6-2 Panocha	—	—	21	21	—			100			
6-3 Molasses	—	579	388	916	+528			236			
7. Coconuts (copra term)	—	1,651	1,280	3,108	+1,828			243			
8. Tobacco	12	24	42	49	+7			117			
9. Fiber Crops											
9-1 Cotton (lint)	21	—	26	5	- 21			19			
9-2 Abaca (fiber)	—	32	76	107	+ 31			141			
10. Coffee (green beans)	—	24	37	72	+ 35			195			
11. Cacao (beans)	12	12	5	5	0			100			
12. Fish	72	64	1,973	1,965	- 8			100			
13. Livestock, Poultry and Dairy											
13-1 Cattle / Water Buffalo	6	—	117	111	- 6			95			
13-2 Hog	1	0	565	565	0			100			
13-3 Goat	—	—	11	11	—			100			
13-4 Chicken	1	0	171	171	0			100			
13-5 Ducks	0	—	12	12	0			100			
13-6 Eggs	—	—	142	142	—			100			
13-7 Dairy	99	2	98	3	- 95	3					

Note : x1 ---- estimated
x2 ---- no data
x3 ---- excluded stock
x4 ---- included soybean meal
Source : x5 ---- Bureau of Agricultural Economics, MAF
x6 ---- NEQA, Region II

AGRICULTURAL PRODUCTS IN REGION II








Last Five Years (CY 1981 to CY 1985) —

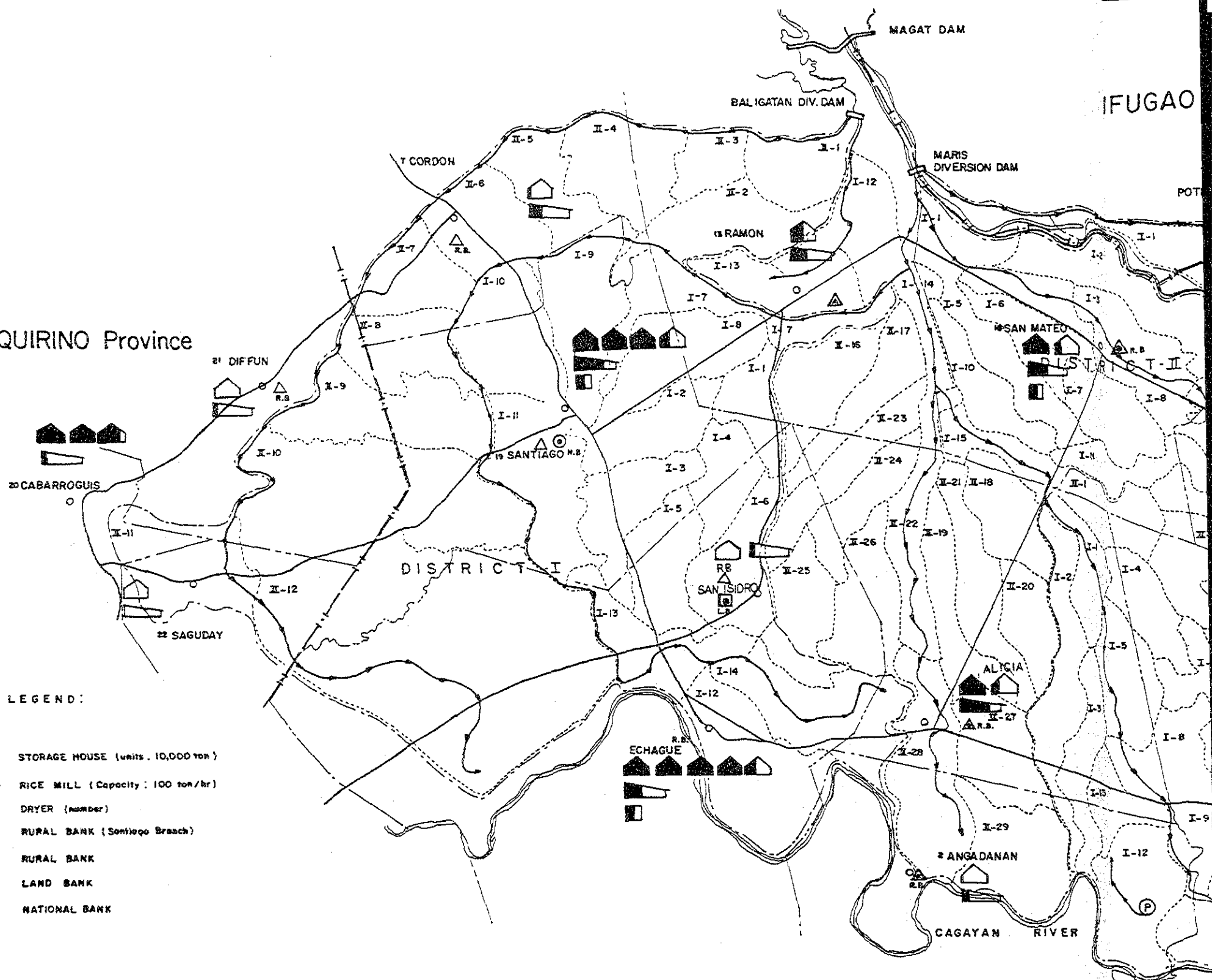


QUIRINO Province

IFUGAO

LEGEND:

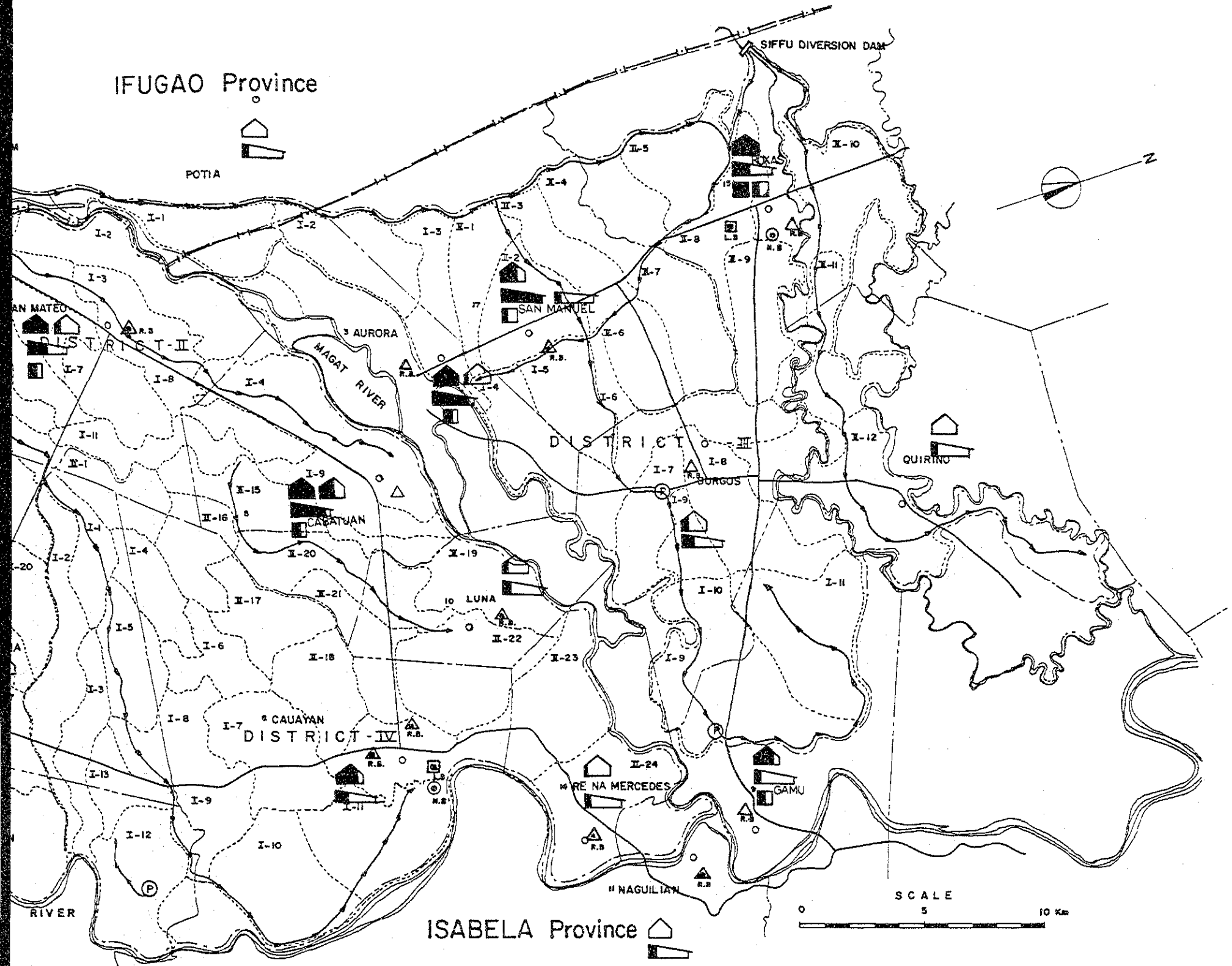
-  STORAGE HOUSE (units, 10,000 ton)
-  RICE MILL (Capacity: 100 ton/hr)
-  DRYER (number)
-  RURAL BANK (Santiago Branch)
-  RURAL BANK
-  LAND BANK
-  NATIONAL BANK



POST HARVEST FAC

Municipality	Covering Farm Land (ha) **	Number of Buying Station			MECHANICAL DRYER (CAP: ton/hour)						STORAGE HOUSE (CAP: tons)					
		NFA	Private	Total	NFA		PRIVATE		TOTAL		NFA		PRIVATE		TOTAL	
					Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
I. ISABELA Province																
1. Alicia	8,983	-	27	27	-	-	-	-	-	-	-	-	57	12,155	57	12,155
2. Angadanan	9,213	-	2	2	-	-	-	-	-	-	-	4	312	4	312	
3. Aurora	5,692	-	21	21	-	-	2	6	2	6	-	37	11,245	37	11,245	
4. Burgos	3,445	-	9	9	-	-	-	-	-	-	-	20	1,350	20	1,350	
5. Cabatuan	4,256	-	18	18	-	-	6	36	6	36	-	52	14,758	52	14,758	
6. Cagayan	19,899	-	40	40	-	-	-	-	-	-	-	80	7,319	80	7,319	
7. Cordon	4,661	-	18	18	-	-	-	-	-	-	-	22	531	22	531	
8. Echague	12,578	1	12	13	5	10	-	-	5	10	NFGC	41,280	21	2,500	24	43,780
9. Samu	4,453	1	19	20	5	10	-	-	5	10	1	5,981	9	720	10	6,701
10. Luna	2,260	-	6	6	-	-	-	-	-	-	-	12	745	12	745	
11. Naguilan	3,149	-	24	24	-	-	-	-	-	-	-	12	886	12	886	
12. Quirino	4,925	-	5	5	-	-	-	-	-	-	-	7	128	7	128	
13. Ramon	5,682	-	30	30	-	-	-	-	-	-	-	41	4,500	41	4,500	
14. Reina Mercedes	2,385	-	1	1	-	-	-	-	-	-	-	8	150	8	150	
15. Roxas	7,288	1	35	35	12	24	1	2	13	26	2	6,121	65	3,886	67	10,007
16. San Isidro	3,456	-	5	5	-	-	-	-	-	-	-	8	150	8	150	
17. San Manuel	5,374	1	17	18	2	4	-	-	2	4	1	3,259	45	2,715	46	6,474
18. San Mateo	9,981	1	36	38	5	15	-	-	5	15	1	4,724	78	7,248	79	11,972
19. Santiago	9,545	1	22	23	4	11	3	8	4	11	3	7,520	70	24,982	73	32,502
Sub-total	127,740	6	377	382	33	74	12	52	42	118	11	69,385	674	96,240	685	165,625
II. QUIRINO Province																
20. Cabarroguis	5,152	1	NA	-	-	-	-	-	-	-	2	6,817	10	21,440	12	28,257
21. Diffun	5,458	-	NA	-	-	-	-	-	-	-	-	-	NA	-	-	
22. Saguday	2,378	-	NA	-	-	-	-	-	-	-	-	-	NA	-	-	
Sub-total	12,988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
III. IFUGAO Province																
23. Potia	4,744	1	NA	-	-	-	-	-	-	-	-	-	NA	-	-	
TOTAL	145,472	8	377	385	33	74	12	52	42	118	13	76,202	684	117,680	697	193,882

Note: ** ... Total farm land in each Municipality



HARVEST FACILITIES AND BANKS

Capacity	TOTAL		RICE MILL (CAP: ton/hour)				Agricultural Input Dealer	Agricultural Machinery Dealer	Workshop Repairshop	BANKS					
	Number	Capacity	NFA Number	NFA Capacity	PRIVATE Number	PRIVATE Capacity				TOTAL Number	TOTAL Capacity	RURAL BANK OF THE PHILIPPINES (RBP)	LAND BANK OF THE PHILIPPINES (LBP)	PHILIPPINE NATIONAL BANK (PNB)	
12,155	57	12,155	-	-	27	64	27	64	8	2	11	0	0	Covered by C	Covered by S
312	4	312	-	-	11	14	11	14	1	-	1	0	-	-do- C	-do- C
11,245	37	11,245	-	-	17	77	17	77	10	-	8	-	-	-do- R	-do- R
1,350	20	1,350	-	-	14	25	14	25	2	-	6	-	-	-do- R	-do- R
14,758	52	14,758	-	-	30	84	30	84	2	1	5	-	-	-do- C	-do- C
7,319	80	7,319	-	-	21	36	21	36	18	1	13	0	-	Cr Cauayan LBP	Cr Cauayan PNB
531	22	531	-	-	17	24	17	24	2	-	5	-	-	Covered by Si	-
2,500	24	43,780	2	16	16	18	20	34	6	-	4	0	-	-do- Si	-
720	10	6,201	-	-	6	11	6	11	3	-	3	-	-	-do- R	Covered by R
745	12	745	-	-	9	18	9	18	4	-	2	0	-	-do- C	-do- C
886	12	886	-	-	12	18	12	18	2	-	0	-	-	-do- C	-
128	7	128	-	-	8	15	8	15	3	-	2	-	-	-do- R	-do- R
4,500	41	4,500	-	-	22	46	22	46	7	-	5	0	-	-do- Si	-do- S
130	8	130	-	-	8	14	8	14	-	-	1	0	-	-do- C	-do- C
3,886	67	10,007	-	-	23	41	23	41	14	5	10	-	-	R: Roxas LBP	R: Roxas PNB
130	8	130	-	-	14	15	14	15	2	-	3	-	-	Si: Sn. Isidro LBP	-
2,715	46	6,474	-	-	34	115	34	115	3	-	6	0	-	Covered by R	Covered by R
7,248	29	11,972	-	-	15	55	15	55	8	3	26	0	-	-do- C	-do- S
24,982	73	32,502	1	5	41	63	42	68	16	13	13	-	-	Consolidated	Si: Santiago PNB
96,240	685	165,625	3	21	347	753	347	753	116	25	124	-	-	-	-
21,440	12	28,257	1	5	12	5	13	10	-	-	5	-	-	-	-
NA	-	-	-	-	13	6	13	6	-	-	6	-	-	-	-
NA	-	-	-	-	8	4	8	4	1	-	1	-	-	-	-
-	-	-	-	-	33	15	34	20	2	-	12	-	-	-	-
NA	-	-	-	-	9	5	9	5	NA	-	-	-	-	-	-
117,680	697	193,882	4	26	389	773	393	799	118	25	136	-	-	-	-

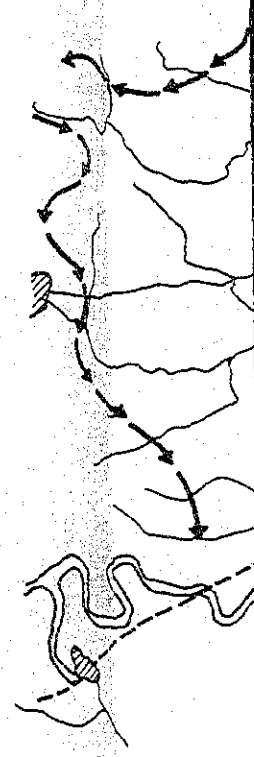
HYDROELECTRIC PLANT AND

OUTLINE OF HYDROELECTRIC PLANT

ITEM	MAGAT PLANT	BALIGATAN PLANT
1. RESERVOIR		
MAX. OPERATION LEVEL (F.S.W.L.) (M)	EL. 193.0	EL. 193.0
MIN. OPERATION LEVEL (M.S.W.L.) (M)	EL. 160.0	EL. 172.0
RATED OPERATION LEVEL (R.S.W.L.) (M)	EL. 185.0	EL. 185.0
GROSS STORAGE VOLUME (MCM)	1,090 (1,250) ↓	NOT DEFINED
ACTIVE STORAGE VOLUME (MCM)	820 (835) ↓	NOT DEFINED
2. DISCHARGE AND HEAD		
MAX. PLANT DISCHARGE (CU.M./ SEC.)	480.00 (120 CU.M./S x 4 UNITS)	23.78 (23.78 CU.M./S x 1 UNIT)
AVE. TAILWATER LEVEL (M)	EL. 103.0	EL. 154.0
RATED DESIGN HEAD (M)	81.0	30.0
3. INSTALLED CAPACITY		
MAX. INSTALLED CAPACITY (MW)	360.0 2/ (90 MW x 4 UNITS)	23.78 (6 MW x 1 UNIT)
AVE. ANNUAL ENERGY IN PLANNING (MWH)	1,200.00	18.55
AVE. ANNUAL PLANT FACTOR IN PLANNING (%)	38.1	35.3
4. TURBINE		
TYPE	FRANCIS TURBINE	KAPLAN TURBINE
RATED CAPACITY (H.P)	126.0 x 10 ³	8.45 x 10 ³
5. MANUFACTURER		
TURBINE	VA (AUSTRIA)	SICHUAN (CHINA)
GENERATOR	TIBB (ITALY)	SICHUAN (CHINA)
6. OPERATION DATE		
		SEPT. 1986

NOTE: ↓ : FIGURES IN PARENTHESIS GIVE STORAGE VOLUME SHOWN IN THE MRMP PROJECT DESIGN REPORT

2/ : ADDITIONAL TWO PENSTOCKS WITH SAME CAPACITY ARE TO BE INSTALLED



LEGEND :

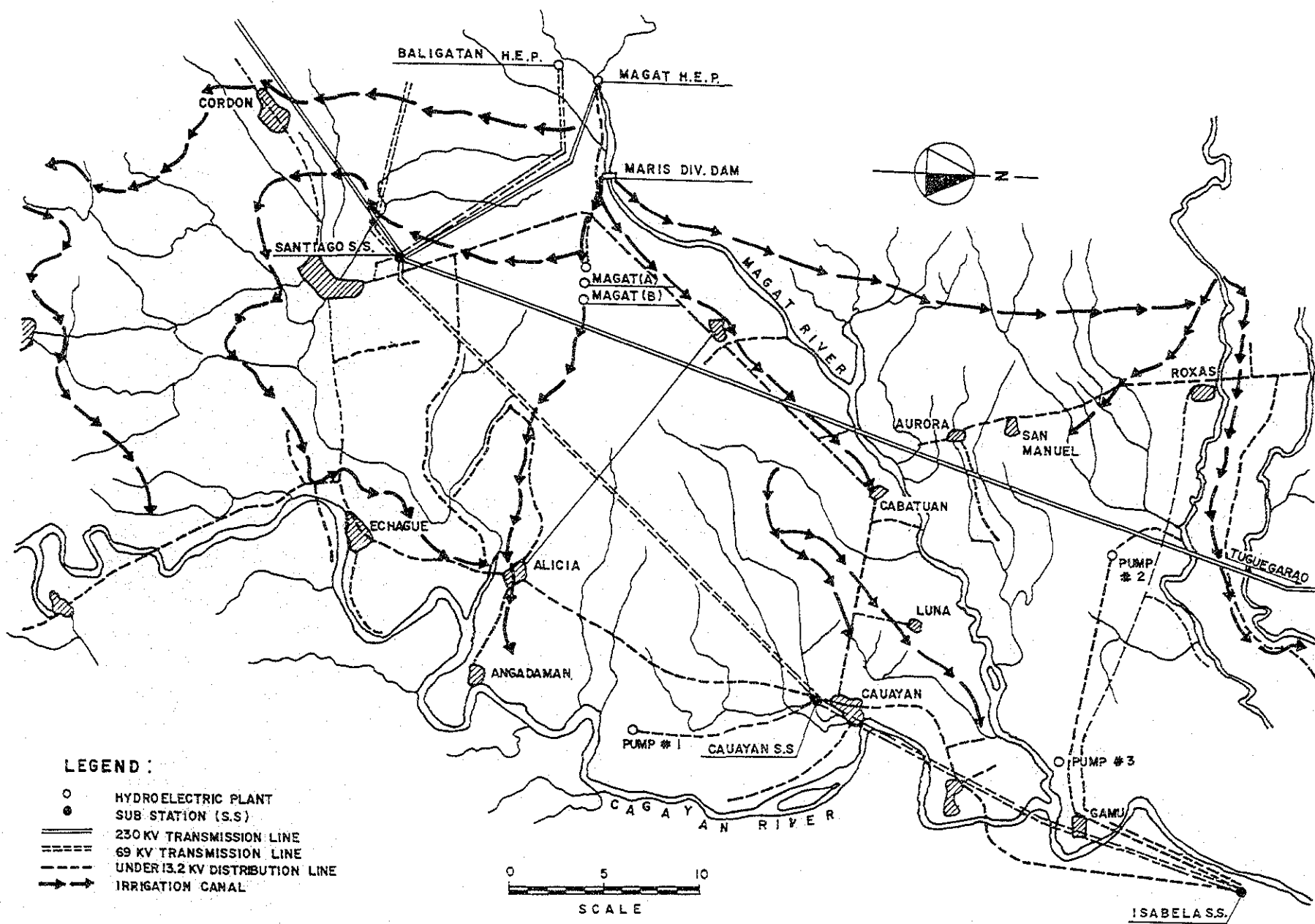
- HYDROELECTRIC PLANT
- SUB STATION
- ==== 230 KV TRANSMISSION LINE
- 69 KV TRANSMISSION LINE
- UNDER 13.2 KV TRANSMISSION LINE
- IRRIGATION CANAL

OUTLINE OF MINI-HYDROELECTRIC PLANT

ITEM	MAGAT (A)	MAGAT (B)
MAXIMUM PLANT DISCHARGE (CU.M./ SEC.)	54.0 (13.5 CU.M./S x 4 UNITS)	41.0 (13.5 CU.M./S x 3 UNITS)
RATED DESIGN HEAD (M)	3.5	3.5
INSTALLED CAPACITY (KW)	1,440 (360 KW x 4 UNITS)	1,040 (360 KW x 3 UNITS)
MINIMUM POWER TO BE GENERATED (KW)	180.0 (360 KW x 0.5)	180.0 (360 KW x 0.5)
MANUFACTURER OF TURBINE AND GENERATOR	NEYRPIC (FRANCE)	NEYRPIC (FRANCE)
OPERATION DATE	FEB. 1984	FEB. 1985

NOTE: MAGAT (C) PLANT IS UNDER PLANNING TO BE GENERATED AT THE UPSTREAM OF MAGAT (A) PLANT

PLANT AND DISTRIBUTION LINE

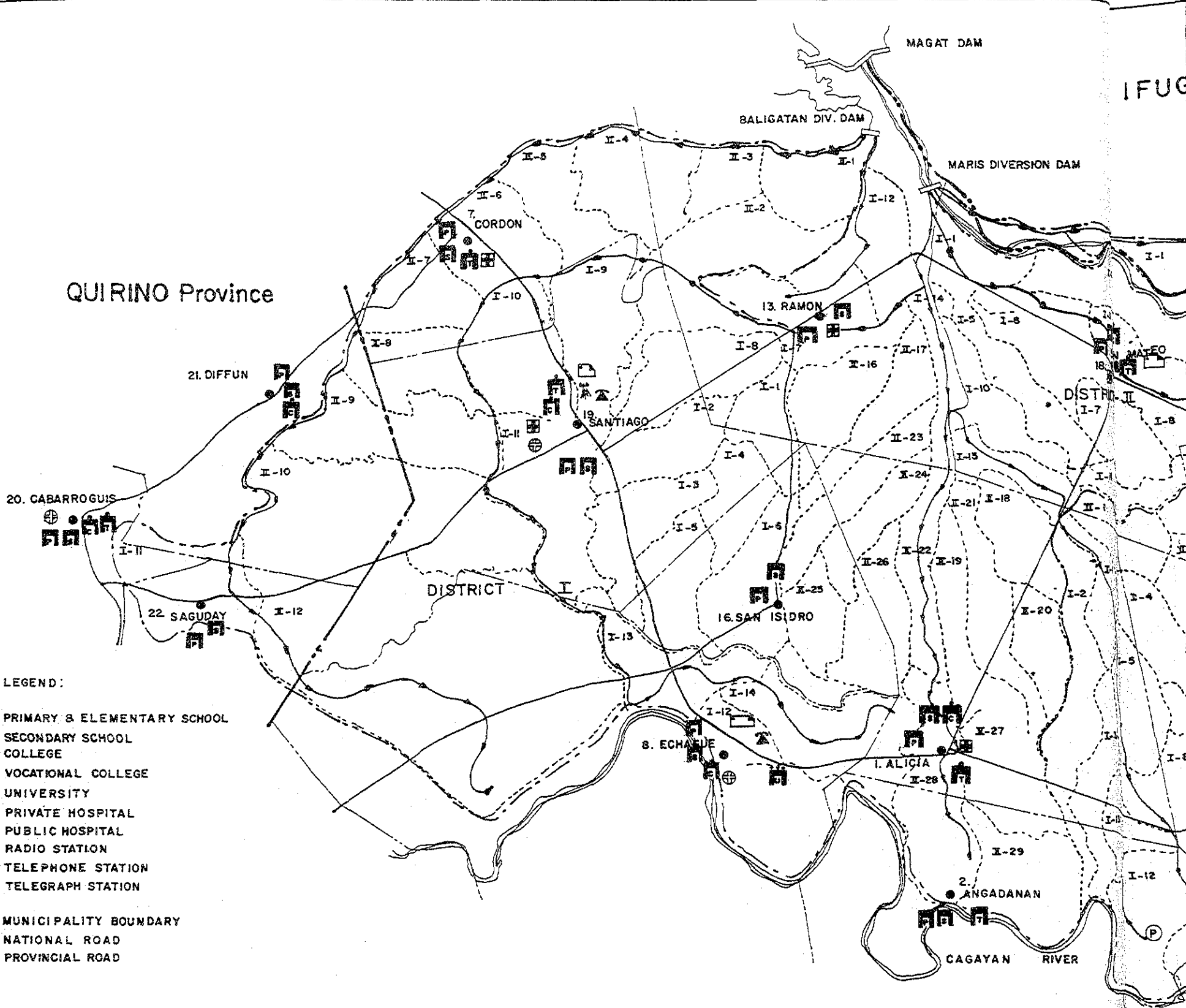


TRANSMISSION NETWORKS OF NPC

TRANSMISSION LINE	VOLTAGE (KV)	NO. OF CIRCUIT	TYPE OF SUPPORTING	LINE LENGTH (KM)
AMBUKULAO - SANTIAGO	230	DC	STEEL TOWER	106.0
SANTIAGO - MAGAT	230	DC	STEEL TOWER	14.5
SANTIAGO - BALIGATAN	69	SC	WOODEN POLE	14.0
SANTIAGO - TUGUEGARAO	230	SC	STEEL TOWER	116.3
SANTIAGO - CAUAYAN	69	SC	WOODEN POLE	41.5
CAUAYAN - ILAGAN	69	SC	WOODEN POLE	30.9
ROXAS - GUM SERVICE POINT	69	SC	WOODEN POLE	31.8

QUIRINO Province

IFUGAO



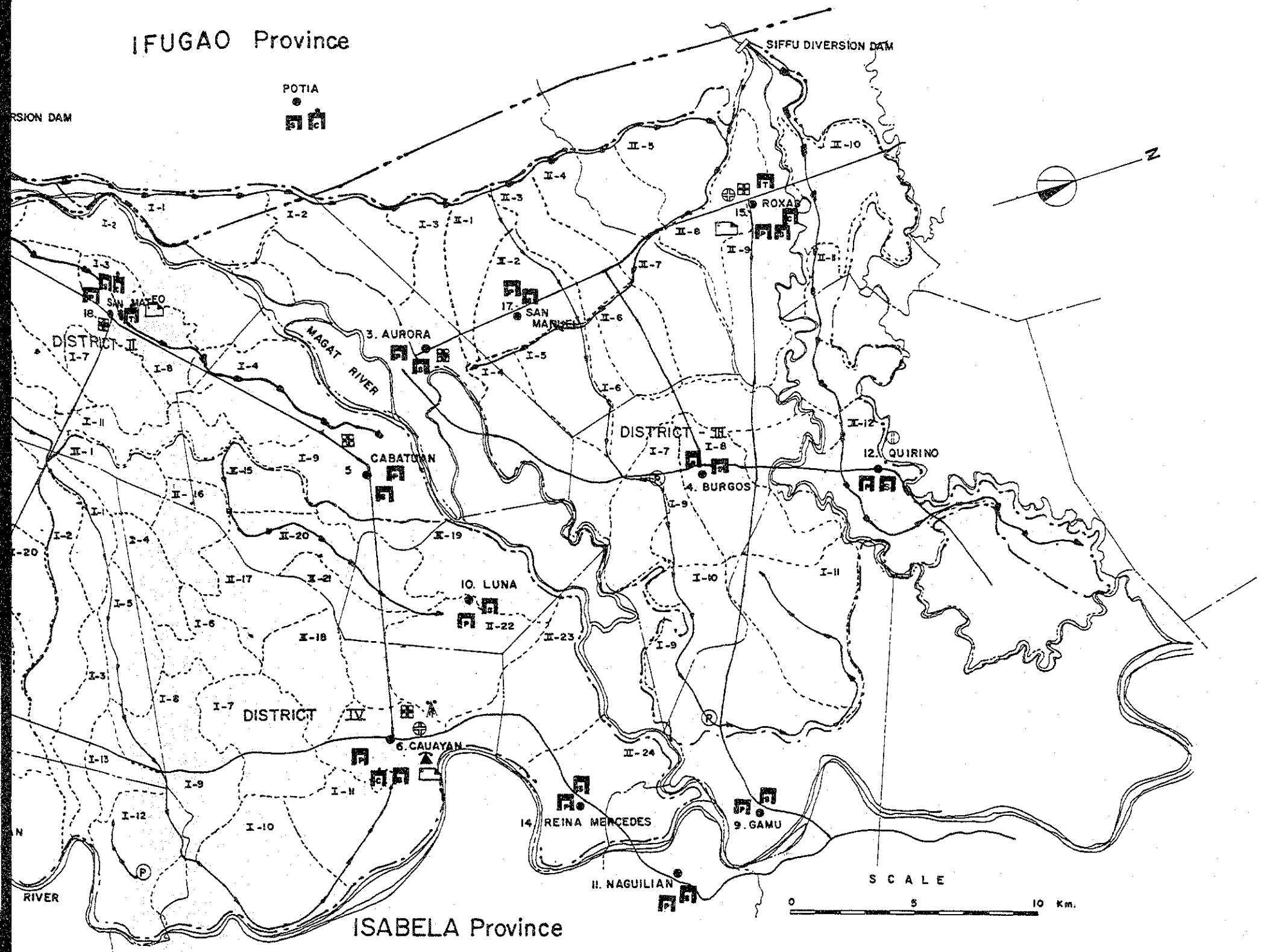
LEGEND:

- PRIMARY & ELEMENTARY SCHOOL
- SECONDARY SCHOOL
- COLLEGE
- VOCATIONAL COLLEGE
- UNIVERSITY
- PRIVATE HOSPITAL
- PUBLIC HOSPITAL
- RADIO STATION
- TELEPHONE STATION
- TELEGRAPH STATION
- MUNICIPALITY BOUNDARY
- NATIONAL ROAD
- PROVINCIAL ROAD

MUNICIPALITY	PRIMARY & ELEMENTARY SCHOOL			SECONDARY SCH.			COLLEGE			VOCATIONAL COL.			UNIVERSITY		PUBLIC HOSPITAL				PRIVATE HO				
	PUB.	PRI.	NO./TEC.	PUB.	PRI.	NO./TEC.	PUB.	PRI.	NO./TEC.	PUB.	PRI.	NO./TEC.	NO./TEC.	NO.	DOC.	NUR.	OTH.	BED.	N.O.	NU.	DOC.		
I. ISABELA Province	(742)	(116)	(4,530)	(46)	(28)	(1,342)	(6)	(7)	(184)	(6)	(7)	(84)	(14)	(237)	(1)	(48)	90	(299)	(440)	(32)	(45)		
1. Alicia	3	3	185	2	3	81	1		14			N.A.									3	3	
2. Angadanan	38		165	3		42				1													
3. Aurora	18		117	1	1	46															1	1	
4. Burgos	12		74	1	1	22																	
5. Cabatuan	18	1	108			28															2	3	
6. Cauayan	46	2	288	2	2	38		2	36					1	5	12	42	50		4	4		
7. Cordon	19		111	3	1	20					1	N.A.									1	2	
8. Echaque	48		249	6	1	105	1		N.A.				1	120	1	5	16	23	25				
9. Gamu	13		88	2		16																	
10. Luna	8		53	1		11																	
11. Naguilian	20		124		1	15																	
12. Quirino	14		64	1		13								1	1	2	3	10					
13. Ramon	16		108	1	1	27															1	1	
14. Reina Mercedes	11		80	1		25																	
15. Roxas	27		148	3	1	71	1		N.A.	1		N.A.	(1)*	(9)*	1	3	14	18	50		1	1	
16. San Isidro	13		53	1		10																	
17. San Manuel	10		79	1		16																	
18. San Mateo	21		194	1	2	76		1	4		1											12	
19. Santiago	42	7	449	2		176		2	59	1	4	72		1	5	8	31	25		4	11		
Sub-total	397	13	2,742	31	15	818	3	5	113	3	7	72	2	129	5	19	52	117	160		+7	38	
II. QUIRINO Province																							
20. Cabarroguis	18			3	2																	1	
21. Diffun	33			1	1																		
22. Saguday	7			1																			
Sub-total	58			5	3		2																
III. IFUGAO Province																							
23. Potia	N.A.			2																			
Sub-total				2			1																
TOTAL	455	13	2,742	47	18	818	6	5	113	4	7	72	2	129	6	19	52	117	160		+8	38	

* Branch of Echoque

IFUGAO Province



ISABELA Province

NO.	HOSPITAL		PRIVATE HOSPITAL & CLINIC				TELEGRAPH STATION		TELEPHONE STATION		RADIO STATION
	UR.	OTH.	N.O.	DOC	NUR.	OTH.	BED	RCPI	P.T&T	LONG DISTANCE	
10	(299)	(440)	(132)	(45)	(63)	(176)	(451)				
			3	3	3	9	15				
			1	1	1	5	10				
			2	3	4	18	10				
12	42	50	4	4	8	16	40	1	1	3 RCPI PT&T PLDT	1 PLDT 2 DZNC DWC-FM
			1	2	6	5	23				
6	23	25						1		1 PLDT	1 PLDT
2	3	10									
			1	1	1	5	25				
4	18	50	1	1	1	5	10	1	1		
				12	11	49	90		1	RCPI PT&T	DZYS DWSI
8	31	25	4	11	18	41	145	1	1	3 BUTEL	3 DWIP-FM
2	117	160	+7	38	53	153	368	4	4	7	3
			1								
			1								
2	117	160	+8	38	53	153	368				

SCHOOLS, HOSPITALS AND TELECOMMUNICATION FACILITIES. 1986

NOTE:
 RCPI RADIO COMMUNICATION OF PHILIPPINES INTERNATIONAL
 PT&T PHILIPPINE TELEFAST AND TELECOMMUNICATION
 PLDT PHILIPPINE LONG DISTANCE TELECOMMUNICATION
 BUTEL BUREAU OF TELECOMMUNICATION
 DZ NC IS DIAL CODE NC IS CAUAYAN
 DW C FM -DO- C IS CAUAYAN
 DZY S -DO- S IS SANTIAGO
 DW SI -DO- SI IS SANTIAGO ISABELA
 DW IP FM -DO- IP ISABELA PHILIPPINES

JICA