Table 5.2.1 Classification of Farm Household

1) By place of residence

	No.	%
Cité Agricole (Campus I)	60	43.8
(Campus II)	6	4.4
Other in F/S Area	6	4.4
San Pédro city	59	43.1
Other places	6	4.4
Total	137	100.1

2) By nationality

	No.	%
Ivoirien	79	57.7
Malien	27	19.7
Burkinabé	12	8.8
Guinean	4	2.9
Others	1	0.7
Unknown	14	10.2
Total	137	100

3) By ethnic group

	No.	%
Sénoufo	23	16.8
Yacouba	25	18.2
Baoulé	9	6.6
Wobé	7	5.1
Others	54	39.4
Unknown	19	13.9
Total	137	100

4) Mode of access to the plot in the Project Area

	No.
Distributed by supervising organizations	52
By GVCs	37
By OCTIDE	3
Independent of the family or inherited	12
Not clear	9
No land in the developed area	24
Total	137

5) Experience in irrigated paddy cultivation

Yes	96	No	41

Table 5.2.2 Crop Production and Income in the Project Area in 1998

Classification of Land	Crop	Area Cultivated (ha)	Area Cultivated (%)	Yield (kg/ha)	Production (kg)	Production (%)	Unit Price (F/kg)	Gross Income (F/Area)	Production Cost (F/ha) Including Labor Cost	Production Cost (F/ha) Excluding Labor Cost	Production Cost (F/Area) Including Labor Cost	Production Cost (F/Area) Excluding Labor Cost	Net Income(F/Area) Excluding Labor Cost	Net Income(F/Area) (%)	Net Income(F/Area) Including Labor Cost	Net Income(F/Area) (%)
Plain Lowland (66 farmers)	Paddy	58.70	32.7	1,171	68,740	28.2	157	10,792,180	228,292	54,112	13,400,740	3,176,374	▲ 2,608,560	▲ 33.7	7,615,806	29.2
	Egg plant	0.30	0.2	5,500	1,650	0.7	61	100,650	550,210	46,680	165,063	14,004	▲ 64,413	▲ 0.8	86,646	0.3
	Ground Nuts	0.31	0.2	710	220	0.1	207	45,540	149,810	8,000	46,441	2,480	▲ 901	▲ 0.0	43,060	0.2
	Cabbage	0.03	0.0	14,333	430	0.2	250	107,500	161,400	30,500	4,842	915	102,658	1.3	106,585	0.4
	Piment	0.25	0.1	416	104	0.0	(200)	20,800	215,900	30,000	53,975	7,500	▲ 33,175	▲ 0.4	13,300	0.1
	Tomato	0.12	0.1	7,419	920	0.4	489	449,858	585,587	79,307	72,613	9,834	377,246	4.9	440,024	1.7
	Sub-total	59.71	33.3	-	72,064	29.5	-	11,516,528	1,891,199	248,599	13,743,674	3,211,107	▲ 2,227,146	▲ 28.8	8,305,421	31.9
Valley Bottom Lowland (22 farmers)	Paddy	7.15	4.0	682	4,875	2.0	157	765,375	228,292	54,112	1,632,288	386,901	▲ 866,913	▲ 11.2	378,474	1.5
	Cucumber	1.00	0.6	2,000	2,000	0.8	113	226,000	263,376	89,216	263,376	89,216	▲ 37,376	▲ 0.5	136,784	0.5
	Tomato	0.50	0.3	2,000	1,000	0.4	489	489,000	585,587	79,307	292,794	39,654	196,207	2.5	449,347	1.7
	Sub-total	8.65	4.8	-	7,875	3.2	-	1,480,375	1,077,255	222,635	2,188,457	515,770	▲ 708,082	▲ 9.2	964,605	3.7
Uplant (52 farmers)	Cassava	29.21	16.3	4,222	123,325	50.5	83	10,235,943	92,860	2,000	2,712,441	58,420	7,523,503	97.2	10,177,523	39.1
	Maize	40.61	22.6	701	28,468	11.7	117	3,330,710	13,058	1,438	530,285	58,397	2,800,425	36.2	3,272,313	12.6
	Yam	0.75	0.4	5,000	3,750	1.5	100	375,000	295,620	32,500	221,715	24,375	153,285	2.0	350,625	1.3
	Tomato	0.35	0.2	(2,000)	700	0.3	489	342,300	585,587	79,307	204,955	27,757	137,345	1.8	314,543	1.2
	Potato	0.85	0.5	(1,714)	1,457	0.6	127	185,026	69,520	0	59,092	0	125,934	1.6	185,026	0.7
	Ground Nuts	0.90	0.5	1,000	900	0.4	207	186,300	149,810	8,000	134,829	7,200	51,471	0.7	179,100	0.7
	Egg plant	0.25	0.1	1,600	400	0.2	61	24,400	550,210	46,680	137,553	11,670	▲ 113,153	▲ 1.5	12,730	0.0
	Okra	0.25	0.1	800	200	0.1	(150)	30,000	265,680	46,680	66,420	11,670	▲ 36,420	▲ 0.5	18,330	0.1
	Cucumber	0.01	0.0	40,000	400	0.2	113	45,200	263,376	89,216	2,634	892	42,566	0.6	44,308	0.2
	Sub-total	73.18	40.7	-	159,599	65.4	-	14,754,880	2,285,721	305,821	4,069,924	200,382	10,684,956	138.1	14,554,498	55.9
Tree Crop Land (32 farmers)	Coffee(Young)	16.30	9.1	0	0	0.0	582	0	25,230	9,395	411,249	153,139	▲ 411,249	▲ 5.3	▲ 153,139	▲ 0.6
	Coffee(Born)	8.00	4.5	494	3,952	1.6	582	2,300,064	178,835	9,395	1,430,680	75,160	869,384	11.2	2,224,904	8.5
	Cacao(Young)	7.25	4.0	0	0	0.0	504	0	31,811	1,634	230,630	11,847	▲ 230,630	▲ 3.0	▲ 11,847	▲ 0.0
	Cacao(Born)	2.00	1.1	250	500	0.2	504	252,000	245,651	1,634	491,302	3,268	▲ 239,302	▲ 3.1	248,732	1.0
	Banana	3.00	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-
	Avocado	0.50	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cola	0.50	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
	Palm Tree	0.50	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-total	38.05	21.2	-	4,452	1.8	-	2,552,064	481,527	22,058	2,563,861	243,413	▲ 11,797	▲ 0.2	2,308,651	8.9
Total		179.59	100	-	243,990	100	-	30,303,848	5,735,702	799,113	22,565,916	4,170,673	7,737,932	100.0	26,133,175	100
Average per Farmer(n=70)		2.57	-	-	-	-	-	432,912	-	-	322,370	59,581	110,542	-	373,331	-

Source: F/S survey, JICA Study Team Note: ▲ minus

Table 5.2.3 Farmers' Organizations and Other Groups in the Project Area

Group	Status	No. of Members	Age group	Creation	Support	Objectives	Activities	Way of Working	Common Equipment	Funds	Problems	Plan for Project	Expected Training
GVC FCA	official	18	24-45	1994	UNFPA	To help the men in difficulties after the failure in last irrigated paddy project	Market gardening (in dry season) Food crops (in rainy season)	Individual In group	Sprays and all kind of tools	Mutual aid fund Contribution according to cropped area	Lack of available / suitable land for maize Lack of fund	Having common plot in the Area to cultivate rice and vegetables	Rice culture Market gardening Breeding Read and write Sewing
GVC Femmes	unofficial	31	18-55	1998	DES WFP	To support school canteen	Rice Cassava Market gardening	In group Individual In project	Using FCA's equipment	Contribution for each cropping cycle	Lack of fund Lack of technical support	Mutual aid fund Fish raising Having common plot in the Area	Read and write Market gardening Breeding Family economy
Pupils' Associa-tion	official	177	5-14		PTA	To experience farming works To raise funds for its activities	Market gardening Contract works	In group	Nothing Brought by each one	All profits going to association's funds	Lack of farm tool No fixed plot	Helping parents	
Young farmers group	unofficial	15	15-34	1998	-	To help each other in work To have mutual aid fund	Contract works Maize	In group	Nothing Brought by each one	Common fund pooling profits from contract works	Lack of farming techniques Plot on lease	Market gardening Poultry Sports activities	Irrigated rice Organization management
GVC Nord	official	13		1991 / 1995	-	To find new sources of funds or credits	(irrigated rice) No activity for now		Nothing	No fund No credit	No irrigation water No fund	Resumption of irrigated rice cultivation	Retraining on irrigated rice Market gardening Machine operation
Sud		27											
Centre		18											
Ouest		15											
Lyceé Prof.		24		1985	-	To get input & machines in credit	Rainfed rice Market gardening	Partially in group Individual	2 moto-culteurs	"	"	"	"

Relations between GVCs and external conditions during/after the former project

	1976 - 1985	1985 - 1991	1991-
Coordination unit	Meeting of representatives of 13 GVCs	CCGR (Comité Central de Gestion et Redressement)	Union of GVCs (4GVC s by bloc)
Its president	-	Primary : S/O , Secondly : farmer (1989 -)	Representative of farmers
Cropping calendar	Given by supporting organization (S/O)	Proposed by supporting organization	Programmed by Union, approved by S/O
Water management	Controlled by Taiwanese expert	Managed by Ivorien stuff from the supporting organization and watching group of farmers	
Source of funds	Subsidy from the State (until '92) / Loan from BNDA (until '88)	Direct acquisition of input on credit from the manufactures	
Payment of loan	Joint responsibility in the GVC	Joint responsibility in the CCGR	Individual responsibility (CCGR-farmer)

Table 5.2.4 Identification of Project Objectives by Farmers (SEPO)

	SUCCESS	FAILURE	POTENTIALITIES	OBJECTIVES
Natural, Political and Human Condition	A lot of rain	Lack of rain San-Pédro river drying-up for second cropping	**Existence of the San-Pédro river**	
		Land problem Land ownership was not ensured Policy of mono-culture Government subsidies stopped	The irrigated rice cultivating farmers are available in the area Expanding family	To take a census of existing farmers To settle new young farmers
Initial State		**Incomplete development** insufficient land leveling Non concrete lining canals	**Area of 330 ha (irritable); 650ha (developed)** Fields of cassava and vegetable	**To develop again the lowlands** To concrete the canals To improve the land development by leveling
Factors of Production	**The irrigation water was ensured**	**Lack of water**		**To have enough water**
	Newly developed plots	Degradation of plots		To develop again the existing lands
		Irrigation canals becoming too old for work		To concrete the irrigation canals
		Deteriorated pump Irrigation by pump was very expensive Lack of fuel		To use dam water instead of pump
	Plots in the proximity of pumping station **Irrigation was suitable**	Bad coordination between water users Negligence of water distributors' duty Departure of the Taiwanese experts Bad organization of farmers for water management Stealing water **Impossible Irrigation**		To create water management and maintenance committee To realize good water management To establish rules for water management
	Credit for getting a power tiller Obtaining a power tiller Combine-Harvester was available	Break down of farming material No means for plowing No means for quick harvesting Problem of harvest planning and utilization of harvester		**To mechanize agriculture** To have individual power tiller
	Enough input to make good use of plot Variety 184 of short growing period	**Lack of input** Appearance of weeds Crop affected by diseases	Proximity to the market for input Existing some varieties Variety of short growing period	**To supply chemical products**
Human Resources	**Experience in agriculture with 2 harvests / year**	**Not enough training** The training was not followed up Knowledge acquired from the training was not put into practice	Experience in paddy culture Knowledge of agricultural techniques Sénoufo women know well how to do transplanting Women trained by their husbands know irrigated paddy	**To train farmers for cooperative & water management** To be well trained To visit the other farmers
Organization and Mentality	Training of farmers for cooperative	Undisciplined farmers in GVCs The rules were not applied	Training for cooperative Constructive / Cooperative idea	To reorganize existing GVCs To create cooperative with independent manager
	Always in the plot	Ethnic groups Dishonesty of farmers Lack of understanding of farmers Indifference towards the other farmers	**Existing GVCs** Two women's GVCs One Young farmers' GVC Many friends working in group Courageous people who like working	**To organize a well established cooperative** To creation small work groups To reach mutual understanding
Supporting System		**Bad system of supervision** No participatory management Supervisors were ignorant of the reality of plots Lack of transparency in supervisory organism Confusion of roles: both financial management and technical support were done by the same supervisory organism No evaluation system on the Project		**To have good supporting system** To establish communication between supervisory organism and farmers
		Lack of accommodation near the plots		
Direct Results	**Abundant harvest with enough money** 18 to 20 tons of paddy on 4 ha 2 tons of paddy per season 3,5 t/ha (average)	**Bad production** **Ceasing completely farm activities**		To resume the work To realize double rice cropping **To produce a lot of rice**
Indirect Results	**Construction of houses** **Marriage after harvesting** Purchase of a motorbike Honda 100, television and many cloths Creation of Plantation coffee-cocoa	**Too much debts** Bad payers of credits Credit to farmers was not well managed by the supervisory organism No transparency in financial management No receipt for delivered paddy from the supervisory organism Lack of financial autonomy **No financial means**	**Village exists** Semi-modern village Village of reception 45 houses Water tour	**To organize the paddy marketing** To have milling machine, storage & transport of products To diversify crops To create tree crop plantation To have drinking water To have wide stable road to the city To electrify the village
	Contribution to build a three-rooms school **Schooling our children**	Unschooled children	School	To take good care of children To dress children well
	Taking good care of my family	**Break-up of families**		**To ensure food self-sufficiency to the family**
	Stabilization of farmers **Creation of new communities by the farmers themselves** Dynamism of farmers' community life	No infirmary service Hearth problem **Death of farmers**	Building of infirmary	To have an infirmary service **To be happy farmers in future**

Table 5.3.1 Project Components and Lowland Agricultural Developmet

Sector	Proposed Project/Program in Master Plan For Integrated Rural Development In San-Pédro Plain	Target Area			Conclusion of Workshop applied PCM		Components of the Project
		Hilltop and Sloped Area	Bas Fonts	Lowland	Outputs	Actions	
Farmers Organization	Formulation & reinforcement of OPAs	○	○	○	○	2-1 train coop. management, 2-3 obey operation rules of coop., 2-4 introduce the penalty, 2-5 formulate the coop 4-3 create coop.	Formulation regal COOP COOP organization and function COOP as garantor
	Improvement of OPA Management	○	○	○	○	2-2 obey the management rule of coop, 2-6 organize the management of coop 4-2 train farmers on coop. principles 4-5 train coop financing	COOP management Financial plan (member fee, commission) Diversification of activities
Agricultural Development	Paddy Agriculture Development			○	○	1-1 regular technique training 1-5 apply technique 5-1 create condition for purchasing machinery 5-2 train mechanics 5-3 train farmers on machinery operation 5-4 improve condition for machinery contractor	Appropriate sustainable rice cultivation Labour requirement and mechanized farming Proper distribution of cultivation plot Training demonstration
	Upland Agriculture Development		○				
	Tree Crop Development	○					
Agricultural Supporting Services	Improvement Agricultural Extension	○		○	○	1-2 make qualified agent to farmer 1-3 regular evaluation of farmers techniques 1-4 appropriate working load	Training extension workers External technical assistance
	Post-harvest Development			○		4-7 formulate information system	COOP as rice supplier
	Improvement of Marketing		○	○			
	Farmers' Credit		○	○	○	4-1 procurement and application of input 4-4 institute a collective supply system 4-6 create credit system for access inputs 4-8 create saving and credit fund	Farming fund, credit system Access to existing financial institutions
Irrigation & Drainage	Rehabilitation San Oedro Paddy Development Project Area and Demenstration farms			○	○	3-1 Grand Canal construction 3-2 establish irrigation schedule 3-3 respect irrigation schedule 3-4 maintain irrigation system 3-5 on-farm development 3-6 involve canal side villager for canal management	Gravity irrigation by the Grand Canal Proper irrigation & drainage system Complete on-farm works Proper water distribution and maintenance through formulation of water users association
	Installation of Irrigation system Fahé & Cpt. Colonel Areas			○			
Rural Infrastructure	Rural Road Improvement		○				Proper immigrant settlement Development of new settlement area Improvement of present rural infrastructure Improvement of community facilities Formulation and development women, youth and school pupils
	Rural Water Supply	○	○	○			
Social Development	Formulation of Women's Group	○	○	○			
	School Body	○	○	○			
	Formulation of Young Farmers Club	○	○	○			
	Improvement of accessibility to rural facilities	○	○	○			
Environmental Protection	Integrated pest control			○			Appropriate farming
	Improvement public Sanitation			○			Social development
	Conservation of Rapide GrahClassifed Forest			○			Receive immigrants for resettlement
	Survey of the Biodiversity	○	○	○			

Table 5.4.1 Proposed Transplanting Rice Culture for the Project Area

(1) Varieties to be used
WITA 7(128 days, RYMV:5, Yield potential: 8.3 t/ha, 1000 G.W: 25.3 g)
WITA 8(125 days, RYMV:3, Yield potential: 8.6 t/ha, 1000 G.W: 27.6 g)
WITA 9(120 days, RYMV:3, Yield potential: 7.1 t/ha, 1000 G.W: 24.7 g)

(2) Sowing and Harvesting
1st Crop: Sowing- 3/20 to 5/04, Harvesting- 7/26 to 9/09 (128 days variety)
Sowing- 3/20 to 5/04, Harvesting- 7/23 to 9/06 (125 days variety)
Sowing- 3/20 to 5/04, Harvesting- 7/18 to 9/01 (120 days variety)
2nd Crop: Sowing- 9/10 to 10/25, Harvesting- 1/16 to 3/02 (128 days variety)
Sowing- 9/10 to 10/25, Harvesting-1/13 to 2/27 (125 days variety)
Sowing- 9/10 to 10/25, Harvesting-1/08 to 2/22 (120 days variety)

(3) Irrigation to nursery and main field: 20 days before sowing. After irrigation, keep field under submerged condition.

(4) 1st plowing of nursery plot and main field: 15 days before sowing

(5) Preparation of nursery:
Net area of seed bed: 1.7 m x 10 m x 20 beds = 340 m^2/ha
2nd plowing and making bed
Basal application of fertilizer: 8 kg of NPK(10-20-20) to 340 m^2
Application of herbicide: 4 lit/ha of Ronstar 25 EC at before sowing
Amount of seeds to be sown (Selected seeds with salt): 35 kg/ha

(6) Top-dressing: Apply 5 kg of Urea to 340m^2 of seed bed at 15 days after sowing

(7) Land preparation of main field : One day before transplanting
Basal application of fertilizer: Apply 200 kg /ha of NPK(10-20-20) before plowing
Application of herbicide: 4 L/ha of Ronstar 25 EC at before sowing

(8) Transplanting:
Use 20 to 25 days seedlings
Planting density: 20 cm x 25 cm (20 hills/m^2)
Number of seedlings to be transplanted per hill: 3 seedlings/hill

(9) 1st top-dressing: Apply 50 kg/ha of Urea at 25 days after transplanting

(10) Weeding: Take immediately after 1st top-dressing by manual

(11) 2nd top-dressing: Apply 50 kg/ha of Urea at 25 days before heading or (Panicle initiation stage)
The days before heading is differ by varieties as below;
WITA 7: around 52 days after transplanting
WITA 8: around 47 days after transplanting
WITA 9: around 42 days after transplanting

(12) Disease and Pest control
If necessary, application method is followed by ANADER direction

(13) In field water management
Keep 5 to 8 cm of water depth during the growing period of paddy until 10 days before harvesting, and drain water at 10 days before harvesting

(14) Expected Yield
5.5 tons/ha in paddy

Table 5.4.2 Proposed Direct-Sowing Rice Culture for the Project Area

(1) Varieties to be used
WITA 7(128 days, RYMV:5, Yield potential: 8.3 t/ha, 1000 G.W: 25.3 g)
WITA 8(125 days, RYMV:3, Yield potential: 8.6 t/ha, 1000 G.W: 27.6 g)
WITA 9(120 days, RYMV:3, Yield potential: 7.1 t/ha, 1000 G.W: 24.7 g)
* Note: the above growing periods are shortened by around 5 days by direct sowing

(2) Sowing and harvesting
1st Crop: Sowing- 3/20 to 5/04, Harvesting- 7/21 to 9/04 (WITA 7)
Sowing- 3/20 to 5/04, Harvesting- 7/18 to 9/01 (WITA 8)
Sowing- 3/20 to 5/04, Harvesting- 7/13 to 8/27 (WITA 9)
2nd Crop: Sowing-9/10 to 10/25, Harvesting- 1/11 to 2/25 (WITA7)
Sowing-9/10 to 10/25, Harvesting- 1/08 to 2/22 (WITA8)
Sowing-9/10 to 10/25, Harvesting- 1/03 to 2/17 (WITA9)

(3) Irrigation: Same as transplanting fields (20 days before nursery sowing)

(4) Land preparation
1st plowing : 5 days after irrigation
2nd plowing(Puddling and leveling) :19 days after irrigation under shallow submerged conditions.

(5) Basal application of fertilizer: Apply 200 kg/ha of NPK(10-20-20) before 2nd plowing

(6) Drain water in the field

(7) Application of herbicide: 5 L/ha of Ronstar 25 EC at after 2nd plowing

(8) Sowing:
Seed rate: 60 kg/ha in clean seeds
Use pre-greminated seeds (Soak seeds in the water for 24 hours, than keep them in moist condition for around one day until seeds germinate to 2 mm)
Sow the seeds uniformly of broad casting under wet soil condition of the field.
Guard from birds after sowing

(9) Water management
Keep wet soil condition for 3 to 4 days after sowing, then keep shallow water depth around 2.5 cm for around 10 days, then after keep water in 5 to 8 cm until 10 days before harvesting.
Drain water in the field at 10 days before harvesting.

(10) 2nd weed control: Apply Ronstar PL or Garil EC or Basagran PL 2B EC by 4 to 6 L/ha at 15 to 20 days after sowing

(11) 1st top-dressing: Apply 50 kg/ha of Urea at 30 days after sowing.

(12) 2nd top-dressing: Apply 50 kg/ha of Urea at 25days before heading, the days before heading differs by variety as below;
WITA 7: around 68 days after sowing
WITA 8: around 65 days after sowing
WITA 9: around 60 days after sowing

(13) Disease and Pest control (If necessary, application method is followed by ANADER's direction

(14) Expected Yield : 4.5 tons/ha in paddy

Table 5.4.3 Estimated Income and Expenditure of the Proposed Rice Production

	Transplanting Rice Cultivatin				Direct Sowing Rice Cultivation			
	Item	Details	Cost (FCAF/ha)		Item	Details	Cost (FCAF/ha)	
			Materials*	Labor			Materials	Labor
Material Cost	Seed cost	35 kg/ha x 300 F/kg	10,500		Seed	60 kg/ha x 300 F/kg	18,000	
	Fertilizer cost				Fertilizer	NPK: 200 kg(10-20-20) x 190 F/kg	38,000	
	For nursery	NPK: 8kg(10-20-20) x 190 F/kg	1,520			Urea: 100 kg(N46) x 170 F/kg	17,000	
		Urea: 5 kg(N46) x 170 F/kg	850					
	For main field	NPK: 200 kg(10-20-20) x 190 F/kg	38,000					
		Urea: 100 kg(N46) x 170 F/kg	17,000					
	Herbicide cost	Ronstar 7,000 F/L x 4 L	28,000		Herbicide	1st appli: Ronstar 7,000 F/L x 5 L	35,000	
						2nd: Basagran PL 2B EC 5,500 F/L x 5 L/h	27,500	
	Insecticide cost**(if necessar	Furadan 5G: 1,800 F/kg x 28 kg/ha	(50,400)		Insecticide (if necessar	Furadan 5G: 1,800 F/kg x 28 kg/ha	(50,400)	
	Power tiller cost				Plowing by power tiller		65,100	
	For nursery	2 round, including operator charge	3,300					
	For main field	"	65,100					
Labor Costs	1st plowing	1.5men x 1,100 F/day		1,650	1st plowing	1.5men x 1,100 F/day		1,650
	Nursery preparation	2men x 1,100 F/day		2,200	2nd plowing	1.5men x 1,100 F/day		1,650
	Sowing	1 man x 1,100 F/day		1,100	Sowing	3 men x 1,100 F/day		3,300
	Top-dressing to nursery	0.7 men x 1,100 F/day		770	Fertilizer application	For basal: 2men x 1,100 F/day		2,200
	Basal fertilizer to main field	2men x 1,100 F/day		2,200		For top-1: 1 man x 1,100 F/day		1,100
	2nd plowing	1.5man x 1,100 F/day		1,650		For top-2: 1 man x 1,100 F/day		1,100
	Transplanting	40 men x 1,500 F/day		60,000	Weeding	Application of herbicide: 2men x 1,100 F/day x 2		4,400
	Application of herbicide	2men x 1,100 F/day		2,200	Bird control	3men x 25days x 750 F/day		56,250
	1st top-dressing to main field	2men x 1,100 F/day		2,200	Harvesting	40 men x 1,100 F/day		44,000
	Manual weeding	10men x 1,100 F/day		11,000	Threshing	10 men x 1,100 F/day		11,000
	Insecticide application	4men x 1,800 F/day		7,200				
	2nd top-dressing to main field	1man x 1,100 F/day		1,100				
	Bird control	3 men x 25days x 750 F/day		56,250				
	Harvesting	40 men x 1,100 F/day		44,000				
	Thresing	10 men x 1,100 F/day		11,000				
	3) Water charge	50,000 F/ha/season		50,000	3) Water charge	50,000 F/ha/season		50,000
Total			164,270	254,520	Total		200,600	176,650
Production cost			418,790		Production cost		377,250	
Gross income	5,500 kg/ha x 157 F/ha***		863,500		Gross income	4,500 kg/ha x 157 F/ha	706,500	
Net income			444,710		Net income		329,250	

* Material costs: KR-II price in 1998

** Insecticide cost is not included.

*** Farm gate price of paddy : current average

Source: JICA Study Team

Tbale 5.4.4 Estimated Income and Expenditure of the Proposed Tomato and Lettuce Cultivation in the Project Area

	Tomato Cultivation				Lettuce cultivation			
	Item	Details	Cost (FCAF/ha)		Item	Details	Cost (FCAF/ha)	
			Materials*	Labor			Materials*	Labor
Material Cost	Seed (Variety: SODEF	300g/ha x 133 F/g	40,000		Seeds		45,000	
	Fertilizer	NPK: 500 kg(10-20-20) x 190 F/kg	95,000		Fertilizer		76,500	
		Urea: 200 kg(N46) x 170 F/kg	34,000					
		Chloride potash: 400 kg/ha x 140 F/kg	56,000					
	Fungicide	Manebu: 5,000 F/kg x 24 kg/ha	120,000		Chemical		66,000	
					Sprayer	1 unit	50,000	
	Insecticide	Decis: 6 L/ha x 4,000 F/L	24,000		Watering can (Local)	3,500 x 1	3,500	
	Plastic for packing		150,000		Rake	2,000 x 2	4,000	
	Sprayer	1 unit	50,000		Hoe	2000 x 5	10,000	
	Watering can (Local)	3,500 x 1	35,000		Balance(10 kg)	15,000 x 1	15,000	
	Rake	2,000 x 2	4,000		Barrow(Single wheel)	35,000 x 1	35,000	
	Hoe	2000 x 5	10,000					
	Balance(10 kg)	15,000 x 1	15,000					
	Barrow(Single wheel)	35,000 x 1	35,000					
Labor Costs	Plowing by power tiller			65,100	Plowing by power tiller			65,100
	Land preparation	30 men x 1,100 F/day		22,000	Land preparation	20 men x 1,100 F/day		22,000
	Transplanting	30 men x 1,100 F/day		22,000	Transplanting	30 men x 1,100 F/day		33,000
	Weeding	30 men x 1,100 F/day		22,000	Fertilizer application	2 men x 3 x 1,100 F/day		6,600
	Fertilizer application	2men x 3 x 1,100 F/day		6,600	Weeding	30 men x 1,100 F/day		33,000
	Plant protection	4 men x 6 x 1,400 F/day		33,600	Plant protection	3 men x 6 x 1,400 F/day		25,200
	Wtering	1 man x 25 x 1,100 F/day		27,500	Harvesting	2 men x 10 x 1,100 F/day		22,000
	Harvesting	2 men x 10 x 1,100 F/day		22,000	Packing	2 men x 10 x 1,100 F/day		22,000
	Packing	2 man x 10 x 1,100 F/day		22,000				
	3) Water charge	50,000 F/ha/season	50,000		Water charge	50,000 F/ha/season	50,000	
	Total		718,000	242,800	Total		305,000	228,900
Production cost			960,800		Production cost		533,900	
Gross income		20,000kg/ha x 700 F/kg	14,000,000		Gross income	20,000kg/ha x 100 F/k	2,000,000	
Net income			13,039,200		Net income		1,466,100	

1) Production cost: Quoted IDESSA data

2) Material costs: KR-II price in 1998

3) Unit price of product: Average wholesale price(SODEFO) at San-Pedro in 1998

Table 5.4.5 Farm-Economy of An Average Household in the Project Area
(Satellite Farm)

Average household: Family size is six and economically active member are three

(1) Unit (ha/season) Cost and Income with Transplanting Method

Unit yield is 5.5 ton/ha, and unit farm gate price is 157 F.CFA/kg

(Unit: F.CFA)

Production Cost		Sale	
Hire Charge of Cultivator*2	98,400	Paddy	863,500
Seed	10,500		
Fertilizer + Herbicide	85,370		
Labour for canal O&M	204,520		
Water charge	50,000		
Total Cost	448,790	Net Income	414,710
		Net Income*1	619,230

Notes:
*1:Labor fully managed by family and COOP.
*2 Depreciation cost of cultivator (30,000 F.CFA/ha) is included

(2) Unit (/ household) Cash-flow from Paddy Double Cropping

Assumption : Harvest area 1.5 ha, production 16.5 ton/year and self-consumption 0.2 ton/head/year (1.2 ton/year/household), then marketable paddy is estimated at 15.3 ton/year/household

(Unit: F.CFA)

Sale Paddy	15.3	ton
Gross Income = Sale	2,402,100	CFA franc
Production Cost =1.5ha x (448,790 – 204,520)	-732,810	
Irrigation Water Rate*	-8,000	
Co-op Membership Fee/year	-12,000	
Co-op Commission (1 % of Sale)	-24,021	
Net Farm Income	1,625,269	CFA franc
Amortization (15 Years) =(3,000,000 x 0.9)/15	180,000	
Interest Payment (2%/year)	54,000	(First Year)
Debt Service of Housing Loan	234,000	14%
Saving (10% of Net Farm Income)	162,527	10%
Annual Disposable Income	1,228,742	76%

Notes : *: =10bil(dam) X 1%(of useful life) X 5%(allocated for irrigation) X 60.5% (=575/950:area ratio) /384(households)

Table 5.5.1 Irrigation and Drainage Facilities for Priority Project Area

1. Irrigation Canal and Structure

Description	Specification	Unit	Grand Canal	Primary Canal				Secondary Canal						Grand Total
				Primary Canal	West Primary Canal	East Primary Canal	Total	West Secondary Canal	Central Secondary Canal	East Secondary Canal	South Secondary Canal	North Secondary Canal	Total	
Canal Length		m	18,200	1,400	2,800	1,500	5,700	1,700	2,000	1,300	1,400	1,100	7,500	31,400
Intake Works		nos	1.0											1.0
Canal Lining	Concrete	m	18,200	1,400	2,800	1,500	5,700	1,700	2,000	1,300	1,400	1,100	7,500	31,400
Related Structure														
Diversion		nos	3.0	7.0	10.0	6.0	23.0	5.0	3.0	3.0	3.0	2.0	16.0	42.0
Spilway		nos	3.0	1.0	4.0	2.0	7.0	2.0	1.0	2.0	1.0	1.0	7.0	17.0
Cross Drain	Box Culvert	nos	13.0	1.0	3.0		4.0							17.0
Cross Drain	Pipe Culvert	nos	16.0		3.0	3.0	6.0	1.0	2.0	2.0	1.0	1.0	7.0	29.0
Siphon		nos	8.0											8.0

2. Drainage Canal and Structure

Description	Specification	Unit	Primary Drainage Canal	Secondary Drainage					Grand Total
				West Secondary Drainage	Central Secondary Drainage	East Secondary Drainage	North Secondary Drainage	Total	
Canal Length		m	3,400	2,600	1,700	4,800	1,150	10,250	13,650
Related Structure									
Cross Drain	Sluce Gate	nos	1.0				1.0	1.0	2.0
Cross Drain	Box Culvert	nos		2.0	2.0	3.0		7.0	7.0

3. Project Road

Description	Specification	Unit	Primary Road	Secondary Road	Inspection Road	Others	Total
Road Length		m	22,500	21,100	3,100		46,700
Flood Control Dike		nos				4.0	4.0
Related Structure		nos					
Cross Drain		nos	2.0	2.0			4.0
Cross Drain	Flap Gate	nos	1.0	3.0		4.0	8.0

4. Farm Land Reclamation

Description	Specification	Unit	1 Block (24 ha)	Unit Quantity (1.0 ha)	Total (574.5 ha)
Land Reclamation		ha	24.0	1.0	574.5
Tertiary Canal	Wth Road	m	840.4	35.0	20,117
Irrigation Ditch		m	1,239.2	51.6	29,663
Drainage Ditch		m	1,394.1	58.1	33,371
Tertiary Drainage		m	840.4	35.0	20,117

Table 5.6.1 An Example of the COOP Finance

Balance Sheet at the Opening (Unit: F.CFA)

Debit		Credit	
Items	Amount	Items	Amounts
Assets		Capital and Liabilities Contribution**	3,830,000
Current Assets Bank a/c	4,894,000	Deposit Water Rate (=8,000 x 383)	3,064,000
Fixed Assets Office Equip	200,000		
Initial Expenditure*	1,800,000		
	6,894,000		6,894,000

Office room available in Campus II, and 383 members

Note : *: =3x(200,000x2+100,000)+300,000: Holding office for 3 months

** : =10,000 F.CFA x 383 members

Balance Sheet after One Crop (after 6 months) (Unit: F.CFA)

Debit		Credit	
Items	Amount	Items	Amount
Assets		Capital and Liabilities Contribution*	3,830,000
Current Assets Bank A/C	6,898,688	Legal Fund**	2,004,688
Fixed Assets Office Equip	200,000	Sub total	5,834,688
Initial Expenditure	1,800,000	Deposit of Water Rate	3,064,000
Total	8,898,688	Total	8,898,688

Note: * : =10,000 F.CFA x 383 members

**: the amount is fixed yearly by the general assembly (Article 17, the COOP Law)

Profit and Loss Statement after one crop (after 6 months) (Unit: F.CFA)

Loss		Profit	
Items	Amount	Items	Amount
Salary (6 months)		Membership Fee *4	2,298,000
Secretary	1,200,000		
Accountant	1,200,000		
Honorarium 25	1,250,000	Commission on Paddy Sale (1%)*2	4,600,021
Board Compensation*1	3,120,000	Commission on Input(5%)*3	2,452,253
Office Expenses	600,000		
Profit (this term)	1,980,274		
	9,350,274		9,350,274

Notes: 1) Paddy Unit price: 157 F.CFA/kg

2) No prepayment of O/M of canals is shown for convenience' sake

*1: Board Compensation+cost=6*13*(1000*30+10000)

*2: =15.3/2 x 1,000 x 157 x 383 x 1%

*3: =85,370 x 1.5 x 383 x 5%

*4: =10,000 F.CFA x 383 members

Table 5.9.1 Responsibilities for the Project Implementation

Items	Activities	Responsibility		External Assistance
		GOCI	Farmers'	
Project Preparation	Detailed design	O		* required
	Tendering	O		
	Supervision of construction	O		
	Finance for investment	O		* required
	Project Office formulation	O		
	Project Office management	O		
Agricultural Development	Training cultivation technique	O		* required
	Technical extension	O(ANADER)		
	Technology research	O (CNRA)		WARDA
	Cultivation/production		O	
	Monitoring & evaluation	O		
	Quality seeds distribution		O	KR-II,WARDA
Participation to Project and Immigration	Application to be candidate		O	
	Selection of immigrant	O		
	Consolidation of settlement area	O		
	Community infrastructure	O	partial	FRAU/Project
	Housing	credit	O	FSH
Farming Fund, Credit	Agricultural inputs	credit	O	KR-II, etc.
	Machinery procurement	credit	O	KR-II, etc.
	Post-harvest facilities	credit	O	KR-II, etc.
Farmers' Organization COOP	Formulation	guidance	O	
	Registration	guidance	O	
	Management	guidance	O	
	Installation storage of COOP	O		
	Commercialization of products	guidance	O	
Irrigation & Drainage	Main system construction	O	participation	
	On-farm works construction	O	participation	
	Formulation of WUA	guidance	O	
	Schedule arrangement	guidance	O	
	Operation by schedule	guidance	O	
	Maintenance & minor repair		O	
	Large scale repair or re-installation	O	participation	
Rural/ Community Infrastructure	Rural road construction	O		
	Rural road O&M	O		
	Community road installation	subsidy	O	FIAU
	Community road O&M		O	
	Community water supply	subsidy	O	AfDB, FIAU
Social Development	Women's paddy cultivation		O	
	School lunch assistance		O	WFP
	Pupils' activity support		O	
	Educational facility improvement	subsidy	O	FIAU
	Clinic rehabilitation	subsidy	O	FIAU
	Community center	subsidy	O	FIAU
	Literacy school		O	

Table 5.10.1 Project Cost

I. Investment Costs

(unit : 1,000 F.CFA)

Item	Local Currency	Foreign Currency	Non Taxed	Taxes	Total
I-1 Irrigation and Drainage Facilities	823,875	3,462,156	4,286,031	531,340	4,817,371
Preparatory Works	76,222	304,887	381,109	46,643	427,752
Irrigation Facilities	187,254	749,018	936,272	119,505	1,055,777
Drainage Facilities	54,487	158,409	212,896	26,686	239,582
Farm Land Preparation	47,256	573,617	620,873	75,205	696,078
Farm Road Works	39,204	71,105	110,309	14,874	125,183
Flood Protection Dike	7,078	59,328	66,406	7,874	74,280
Grand Canal	326,283	1,305,134	1,631,417	185,830	1,817,247
Inspection Roads	42,930	100,169	143,099	25,013	168,112
Intake Facilities	10,691	42,702	53,393	7,272	60,665
Temporary Works	2,570	33,854	36,424	4,171	40,595
Project Office	27,400	63,933	91,333	18,267	109,600
Compensation Fees	2,500	0	2,500	0	2,500
I-2 Post-harvest Facilities	59,076	84,433	143,509	15,208	158,717
Store House	45,818	68,727	114,545	11,455	126,000
Dry Yard	11,622	13,251	24,873	3,344	28,217
Office	1,636	2,455	4,091	409	4,500
I-3 Land Development for New Settlement Area	35,742	16,002	51,744	8,820	60,564
Land Grading	294	7,938	8,232	1,008	9,240
Road Works	35,448	8,064	43,512	7,812	51,324
I-4 Village Water Supply	7,157	15,598	22,755	2,420	25,175
Existing Housing Area	1,973	7,822	9,795	980	10,775
New Housing Area	5,184	7,776	12,960	1,440	14,400
I-5 Village Public Facilities	22,000	33,000	55,000	5,500	60,500
Primary School	20,909	31,364	52,273	5,227	57,500
Dispensary	1,091	1,636	2,727	273	3,000
I-6 Detailed Design and Supervision	46,544	418,895	465,439	46,544	511,983
Consulting Services	46,544	418,895	465,439	46,544	511,983
I-7 Project Administration and Supporting Service	373,759	95,370	469,129	47,234	516,363
Project Executing Unit	372,641	93,160	465,801	46,580	512,381
Extension Services	118	0	118	12	130
Training	1,000	2,210	3,210	642	3,852
Total	1,368,153	4,125,454	5,493,607	657,066	6,150,673
Physical contingencies	136,815	412,545	549,361	65,707	615,067
Grand Total	1,504,969	4,537,999	6,042,968	722,773	6,765,740

II. Annual Operation and Maintenance Costs for Irrigation and Drainage Facilities

(Unit: 1,000 F.CFA)

Item	Local Currency	Foreign Currency	Non Taxed	Taxes	Total
Maintenance Cost (1%of direct cost)	11,831	19,707	31,538	3,871	35,408
Operation Expenses	32,612	850	33,462	1,631	35,092
Office Administration (Chief+4Admi.)	12,600	0	12,600	630	13,230
Gate Operator (5 operators)	8,640	0	8,640	432	9,072
Transportation (motor cycles & pick up)	5,000	0	5,000	250	5,250
Tools etc.(20%of labour costs)	4,248	850	5,098	212	5,310
Others Expenses (10% of Labour costs)	2,124	0	2,124	106	2,230
Total	44,443	20,557	65,000	5,501	70,501

Table 5.11.1 Calculation of Economic Price of Rice

			Financial Price	SCF 0.87	Coefficient Eco/Fin	Economic Price
FOB Bangkok*1	US$/MT		270		1.00	270
IF*2	US$/MT		42.7		1.00	42.7
CIF San Pedro	US$/MT		313		1.00	313
	US$/kg		0.313		1.00	0.313
*3	CFA/$		594.8		1.00	594.8
			186		1.00	186
Import duties*4			33.7	18.1%	0.0	0
Stevedore			10.2	5.5%	0.50	5.1
Package + Warehouse			10.2	5.5%	0.87	8.9
Interest + Insurance			7.4	4.0%	1.00	7.4
Port Margin			37.2	20.0%	0.87	32.4
Port gate*5			285	53.1%		240
Transport	*	0.10	2.5	25.0	0.87	2.2 */kg/km
Margin: wholesale + retail			25.6	9.0%	1.00	25.6
Rice: retail price			313			268
Mill Charge			20.0	65%*6	0.87	17.4 65%*6
Paddy at mill gate			183			157
Transport	*	0.10	-0.5	5.0	0.87	-0.4 */kg/km
Commission			-8.7	5%	1.00	-8.7
Paddy at farm gate			**174**			**147**

Note:
*1: White 25% super; Bht35.6/$ as of 5th Nov.
*2: Freight US$40/MT; Insurance 1%
*3: Exchange Rates US$1.00=¥120.15=594.8F.CFA, 1.00F.CFA=¥0.202 (as March 1, 1999)
*4: 18.1% of duty rate is applicable to rice whose rate of broken rice is more than 16 %.
*5: Government Indicative Price: 283.4 CFA franc as of Sep.'98.
*6: conversion factor from paddy to milled rice

Table 5.11.2 Evaluation of the Effects on the Natural Environment

Evaluation items	Plain Forest	Swamps and Water Runoff	Wildlife
Possible undesirable effects induced by the irrigation perimeters	Clearing of 117ha of forest.	None.	Loss of wildlife refuge (forest, bush).
Possible undesirable effects induced by the irrigation water canal with access road	Clearing of 5ha of forest in total, half belonging to the plain forest.	- Clearing of negligible surface (less than 1ha). - Perturbation of the normal runoff and water flowing pattern between the San Pédro river and the swamps.	- Accelerating the human presence (noise, hunting). - Accelerating the loss of wildlife refuges due to partitioning of the existing territory between San Pédro river and national road.
Reason why the effect is or could be considered as being undesirable	Loss of tropical forest.	- Flooding of crops land. - Loss of nutrients for fishes of the San Pédro river, and disruption of ecological conditions for fish.	- Existence of valuable species as stated by the hunting law: up to 5 species of 1st priority value (mainly swamp crocodile) and up to 9 species of 2nd priority value (mainly buffalo and python). - Wildlife is a source of bush meet for villagers, specially common species like Duikers for example.
Factors minimizing the effects	- Surface of concern is negligible (less than 5% of total forest in the Study area). - Forest of concern is broken into small pieces which minimize their value as wildlife habitat. - Existing forests have been degraded by forestry and hunting activity. - The environmental value of forest affected by the project (biodiversity, regulation of water runoff, climate) is not significant.	- Swamp clearing is less than 1ha, affecting the Escabe south swamp, which is 26ha wide in total.	- Wildlife is in the process of extinction due to the loss of habitats (clearing of upland forest) and practice of hunting and poaching. - The project does not significantly touch the swamps neither the IDEFOR forest, which are the essential pieces for wildlife refuging in the Study area.
Factors maximizing the effects	None.	- Swamps lying on the right side of the canal collect and retain the runoff water of corresponding watershed; since upland forest is under irreversible clearing, the role of swamps for regulating runoff will increase; in this context, drainage culverts under the canal could be insufficient to drop out water if large swamps of the Study area are not protected against development.	- Human settlements, proximity of the city of San Pédro, development of agriculture. - Absence of clear rules and supervision of hunting and fishing.
Measures minimizing the effects	None.	- Drainage culverts and pipes will ensure the normal conditions of water exchange between both sides of the canal. - No effect if major swamps supplying the San Pédro river are protected on the long term.	- Only measures providing better conditions for the survival of wildlife are possible, with limited effects however; they are the protection of swamps, as potential habitats or refuges for wildlife, and the regulation of hunting.
Acceptability of the effects	- Obviously acceptable.	- Technical measures for drainage ensure the low significance or absence of effects at present. - Long term protection of swamps is however strongly recommended for durability purpose.	- The project is not the cause of present extinction of species, but accelerates the process. It is reasonable to accept this side effect because it concerns the rural area where policy priority is development and not nature conservation.
Acceptability level (good, fair, bad)	GOOD	GOOD	GOOD

Table 5.11.3 Evaluation of the Effects on the Social Environment (1/2)

List of main social environment issues	Possible undesirable effects induced by the project	Factors minimizing or maximizing the effects	Measures minimizing the effects / Acceptability of the effects
1. Social life			
Traditional resources (Cité Agricole)	- The living area is not liable to provide enough traditional resources (fish, bush meet and snails, housing materials, firewood) compared with the previous living area of newcomers. - Firewood shortage should be experimented as the highest constraint with implications on quality of life, since women will have to spend more time and efforts to satisfy the needs. - Indirectly increases deforestation pressure and degradation of San Pédro river banks. - On a whole, contributes to widening the gap between the perception of the quality of life by the farmers and the increased net income, which could impair satisfaction about achievement of the objectives.	Maximizing factors: - Firewood availability is firstly determined by the right to use land, which is a basic constraint for newcomers who in principle have no highland fields. - Access to firewood on north-east side will be made more difficult during rainy season with flooding of lowlands due to the embankment of runoff on the eastern side of the perimeter at Cité Agricole.	- The community could organize itself in view of finding community response to such problems. - The project will provide at least enough revenue for higher standard of living, giving access to comfortable cooking fuel, and then starting a long term process of economic conversion. - Shifting to new life style pattern is required, which is potentially possible since target population is expected to be young and motivated. - Upgrading income will induce two types of fuel supply: a) motorized transportation of fuelwood on long distance; and b) use of charcoal as a substitute for fuelwood.
Spontaneous settlements (Cité Agricole)	- The worth case in terms of settlement and living standards could be resulting from the elimination of farmers from the community when production rules have not been respected. Then there could be at term a small part of population without land to use but still living in the village and contributing to the demographic increase.	Minimizing factors: - Strong organization of farmers is a prerequisite for paddy cultivation. - Incentive rules of quota of paddy production. - There is no more possibility of land clearing to sustain spontaneous settlement. - All the conditions for selecting the most motivated and capable people for success of the project will be applied	- The risk of constitution of a marginal population is minimized by the criteria and requirements of social organization for access to paddy cultivation.
Land reclamation	- Loss of agricultural land and crops for construction of the water canal. - Substitution of hevea crops land for paddy in the Fahé plain.	Maximizing factors: - Existing tradition of "free hold" ownership of the land by the settler. - Fahé people have experimented land related conflicts in the past (Rapide Grah forest, siting of the dam) and are potentially reticent to any concession.	- Nationwide trends toward clear rules of land ownership; - Strong and long term awareness campaign is needed to convince about the advantage to shift toward paddy cultivation - Financial compensation of the farmers for damages to crops (cocoa, coffee) caused by the siting of the water canal must be considered.
Land use (Newcomers)	- Absence of cash crops or food providing crops upland could be perceived as a loss compared with the benefit expected by new settlers. It is also a strong factor of insecurity feeling affecting the quality of life. - Although limited by shortage of free land, additional pressure on San Pédro riverbanks could occur, accentuating the existing trends of erosion of banks;	Maximizing factors: - Farmers having received irrigation plots would not easily move their mind to accept buying basic products like cassava or maize. - Consumption products are expensive in the area of San Pédro, which strengthens the will of self-sufficiency.	- The project provides a plan to intensify upland crops cultivation, and also to develop vegetables cultivation, which is a way to adapt to the local shortage of land. - Need to allocate land parcels to women for vegetables cultivation in view of providing settlers with sufficient degree of security.

Table 5.11.3 Evaluation of the Effects on the Social Environment (2/2)

List of main social environment issues	Possible undesirable effects induced by the project	Factors minimizing or maximizing the effects	Measures minimizing the effects / Acceptability of the effects
		Minimizing factors: - Land use is saturated and impairs the possibility of further land clearing - Land competition is such that the advantage of buying food products could appear as there are favorable conditions like the locally developed market economy and the capacity to pay for them	- The motivation to definitively shift to paddy cultivation is partly determined by the constraint of renouncing to the previously owned crops land, when this is institutionally feasible like in Rapide Grah area outside the enclaves, under SODEFOR jurisdiction. Resettlement of new settlers should deal with the family unit instead of individuals.
Frustration and Conflicts (Cité Agricole)	The social implications of the project are more significant for the new settlers than for the already established people. On both sides there could be frustration, and possibly conflicts because: - Loss of rice production land for the indigenous people - Loss of traditional complementary resources for newcomers. - Also loss of cash crops previously owned by the settlers coming from Rapide Grah	Maximizing factors: - Ethnic differences are factors proper to enhance such problems. - Context of competition for resources like firewood, fisheries.	Basically, the shift in mentality will be more necessary for newcomers who will completely depend on rice production than for present inhabitants who already benefit of housing and upland crops.
Life style (Cité Agricole)	- This is the most remarkable effect of the project. Because of the social and environmental constraints that are inherent to the paddy cultivation and livelihood of Cité Agricole, only a shift in mentality and life style will permit to take the full benefits of the project, otherwise leading to frustration and possibly conflicts.	- Strong and new type of social and environmental constraints for the new settlers coming from traditional living area.	- Preparation to such change in life style, consumption patterns, and mentality is a priority for enhancing acceptance of the new environmental constraints by the newcomers. - This point is considered within the set conditions for selecting people who will receive paddy plots (young people able to keep with the intensive mono-activity of rice).
2. Health and sanitation			
Use of agrochemical products (pesticides and fertilizers)	- Large quantities of insecticides and pesticides are expected to be used by the farmers. This would impair water quality and at worst contaminate wildlife and later fishing products and field game. - Excessive use of fertilizers could impair the quality of San Pédro river downstream, as this seems to be already the case in the dam reservoir of Fahé.	Maximizing factors: - Pesticides are often used without conformity with regulations. Furadan, which is a commonly used insecticide for paddy cultivation, did not receive agreement for such purpose. - Application of pesticides is made without respecting the security conditions, which leads to common intoxication of farmers by inhalation. - Absence of supervision authority. - Lake like conditions of the San Pédro river downstream increase sensitivity to fertilizers and pesticides.	- Use of pest resistant varieties of paddy - Educating farmers to use appropriate products - Encouraging the use of insecticides only in case of apparent damage of crops, and encouraging hand weeding in case of transplanting crops - Improving diffusion and reliability of information about pesticides - Improving the institutional side for appropriate control and management of pesticides. If such basic measures are taken, potential effect is minimized to acceptable level.
Water borne diseases	- Malaria, Ulcer of Buruli are liable to find good conditions for development in the irrigated area. - The project should also create conditions for increasing the nuisance generated by the presence of mosquitoes.	Maximizing factors: - Endemic and severe malaria, occurrence of shistosomiasis and Ulcer of Buruli diseases in background; - Directly exposed population will be increased with newcomers, while malaria vectors can be propagated to the San Pedro city.	- Technical and sanitation preventive and curative measures are necessary to put these possible effects at acceptable level;

Table 5.11.4 Environmental Acceptability

	Global environment standpoint	Environmental space standpoint	Sustainability standpoint
Definition	This is a large scale and long term consideration of the indirect implications of the project on valuable world patrimony (forest, biodiversity);	This is a consideration of the space productivity aspect, which means that land use on which humans depend on can be evaluated in terms of environmental accounting, showing more or less sustainability according to use and potentials ;	This is consideration and integration of the environmental constraints or potentials that determine the quality of the results expected from the project (evaluation of the importance of effects);
Significance for the project	The project contributes to resettling people living in the Rapide Grah forest. This involves 2 types of positive effects: - Contributes to shifting toward a more environmental forestry. - Contributes to decreasing the potential human pressure liable to affect the Taï national park, that lies besides the Rapide Grah forest; Taï forest is unquestionably a world natural patrimony of primary importance.	Within the project area, there is the simple observation that the project obviously contributes to rehabilitate unproductive and impoverished land: - In Cité Agricole, the plain liable to irrigation represents more than half of the development area; this area has a low environmental value without being economically productive; since rehabilitation of original value (tropical forest) is not possible, enhancing economic value is desirable. - Dam reservoir and plain area at Fahé show a poor economic / environmental productivity.	- Natural environment: The project does not significantly impair the natural environment. - Social environment: Success of the project is linked to the capacity to change life style and mentality together with the capacity to manage global issues like environment and health management. These new constraints toward modern economy and society are acceptable as being the conditions for development.
Conditions of application	The project will have a global environment significance if Sodefor agency achieves its objectives as regards to the population resettled in the project area. It means that fields left by this population should be returned to and properly managed by Sodefor.	The project provides intensification of extensively used land, which is now in Côte d'Ivoire a necessary condition toward achievement of nature conservation nationwide.	Improving the institutional capacity and management efficiency to set conditions for implementing the measures that ensure sustainability of the project.
Level of environmental acceptability (good, bad, or fair)	GOOD	GOOD	GOOD

Table 5.11.5 Review of Protection Measures and Planning Tools

	Objectives	Implementation measures for fulfilling acceptability conditions	Improvement plan/Implementation plan/Complementary plan
Conservation of natural resources	Conservation of larger swamps is the main point since it provides several targets: - wildlife habitats and refuge; - conservation of water runoff conditions; - conservation of other environmental functions Complementary objectives are: Conservation of water quality and protection of the river environment at regional level; Protection of the most valuable wildlife species.	- Installation of the drainage culverts with sufficient capacity in sensitive sites along the irrigation water canal;	- Institutional coordination for basic water related tasks in accordance with the water law requirements: Conservation of the San Pédro up-stream forest land, conservation of main swamps and rivers, conservation of water quality. - Regulation and control of hunting.
Control of water borne diseases	- Providing an easy access to medical care for early diagnosis of disease and medical treatment. - Prevention of water borne diseases. - Prevention of nuisances generated by mosquitoes proliferation.	- Reduction of mosquito contact through diffusion of the impregnated nest against mosquitoes. - Taking measures that could contribute to discourage development of malaria and shistosomiasis vectors like a) preventing the proliferation of plants in water canal b) ensuring sufficient turbidity of irrigation water, c) practice of intermittent irrigation. - Public awareness heightening actions in the irrigation perimeter.	- Rehabilitation of the Health Center at Cité Agricole; - Observation and follow-up of water borne diseases epidemiology in the area and specially in the irrigated perimeter area; - Application of measures recommended by the National Program Against Malaria, which implies a better coordination between the Sanitary District and the Regional Antenna for Hygiene and Sewerage. - Developing human resources and laboratory capacity of the Regional Antenna for Hygiene and Sewerage.
Control of agrochemical products (pesticides)	- The first objective can be resumed as using the correct dose at the right time for the right purpose. - Developing a paddy cultivation with high yields and low chemical inputs.	- Use of pesticides in strict accordance with the agreement rules. This primarily means a drastic shift from the commonly used Furadan product toward a pesticide agreed for protection of paddy crops. - Farmers should coordinate their efforts together with the guidance of ANADER to establish a code of good practice for the proper handling of products, choice of best products, and strict respect of dosage.	- Direction of Agriculture has the duty to organize crops protection; 1st set of actions: restoring the Service of Control of Vegetation with an expert supervisor and appropriate human resources; training of ANADER staff; 2nd set: organizing the control of pesticides and their storage on the market, the control of use conditions, the production and diffusion of reliable information (instructions, guidelines), the launching of awareness activities, with close coordination with ANADER. - Institutional coordination (environment, agriculture, health) in view of observation and follow up of pesticides related health damages, and ultimately existing damages on water and aquatic life.
Conditions of resettling people	- Providing settlers with sufficient degree of security. - Increasing the value of the project in terms of global environment.	None.	- Settlement plan: housing parcels for the families; land parcels for cultivation of vegetables by the women; water supply deep wells; - Land recovery plan for would-be settlers of the Rapides Grah forest (SODEFOR);

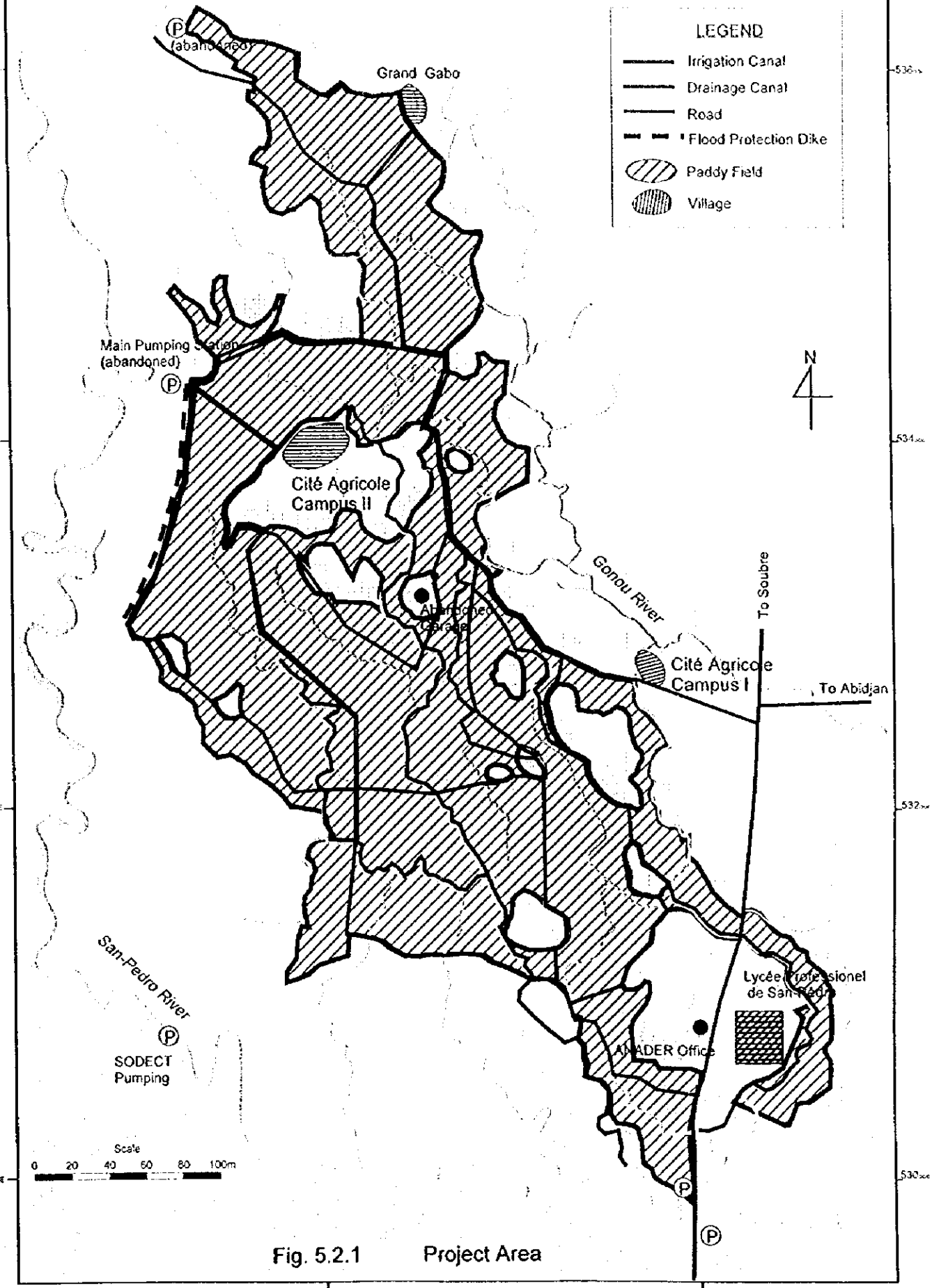


Fig. 5.2.1 Project Area

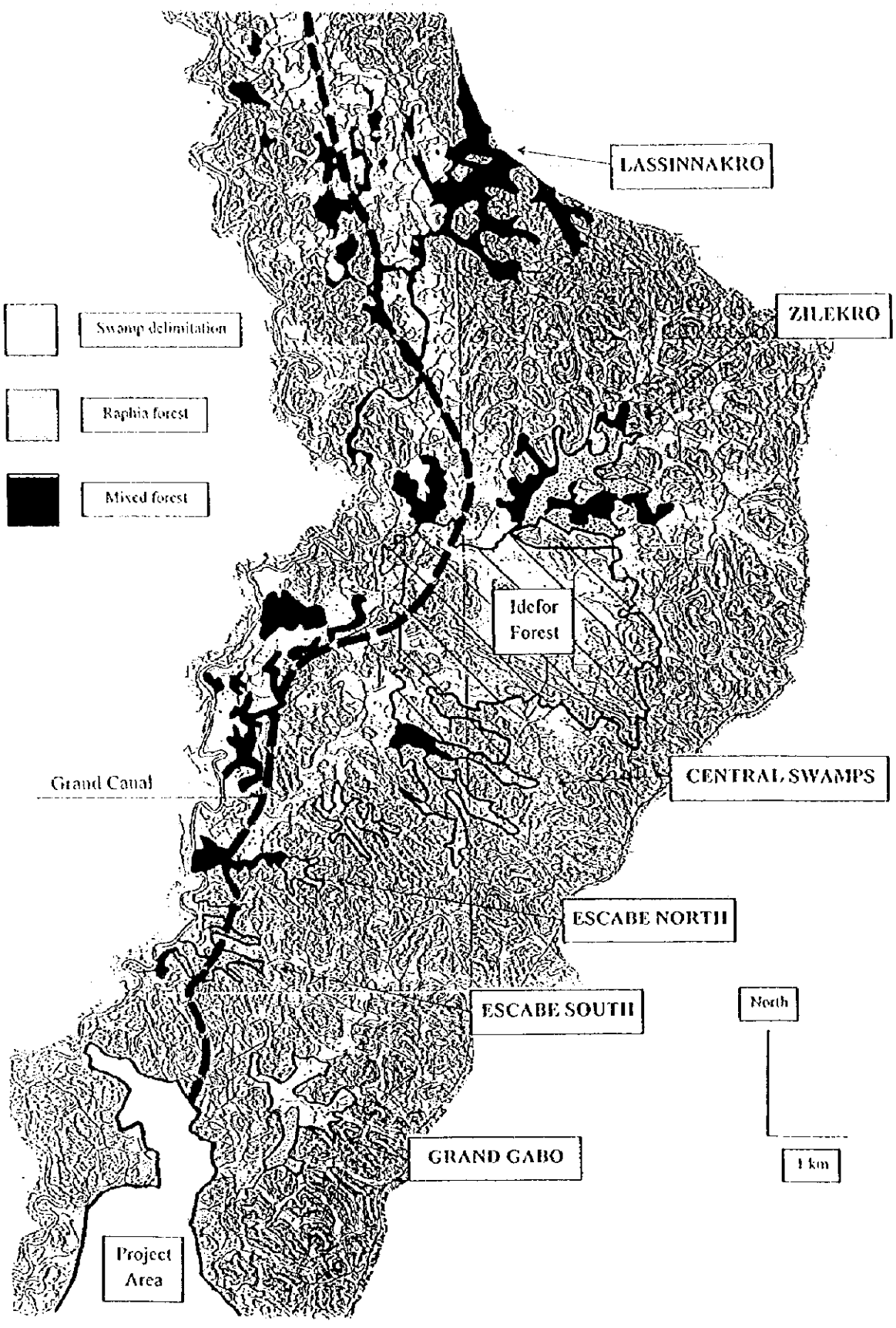
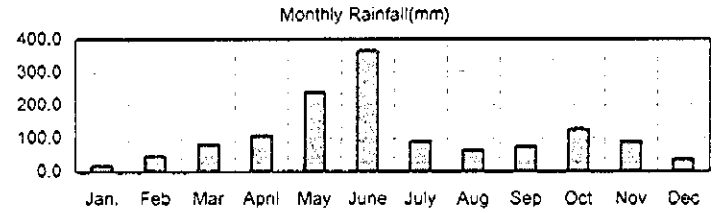


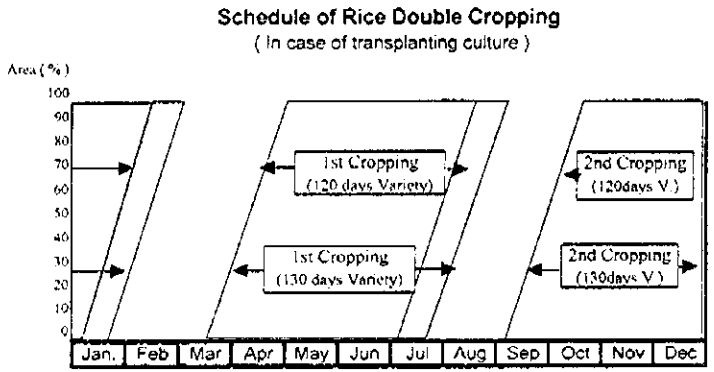
Fig.5.2.2 Main Swampy Forest Area along the Grand Canal

Monthly Meteorological Data of the Study Area

	Jan.	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Total/Ave
Rainfall(mm)	17.5	48.3	82.9	108.0	239.7	366.9	91.4	66.5	76.2	128.4	90.3	38.8	1,354
Temp (Ave)	26.5	27.2	27.7	27.5	27.0	25.7	24.8	24.7	25.4	25.7	26.4	26.3	26.2
Humidity(%)*	81.0	81.9	81.8	83.1	85.3	87.2	85.6	87.7	87.6	86.4	85.7	83.3	84.7
Sunshine(hour)	4.9	5.5	5.3	6.1	5.2	3.3	3.5	3.1	3.7	5.9	6.3	4.9	4.8

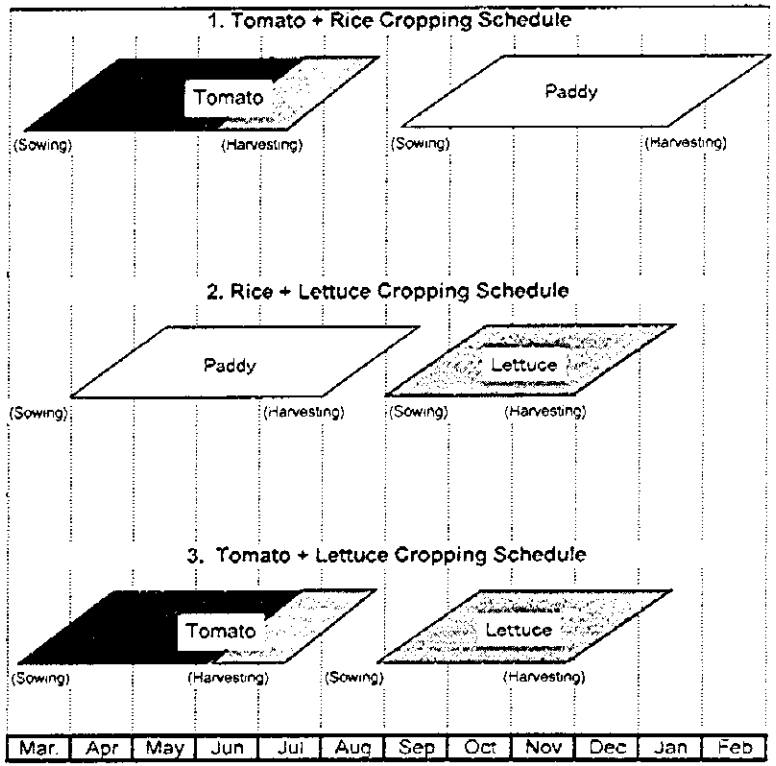
Source: IDEFOR, San-Pedro Station and San-Pedro Airport( )*





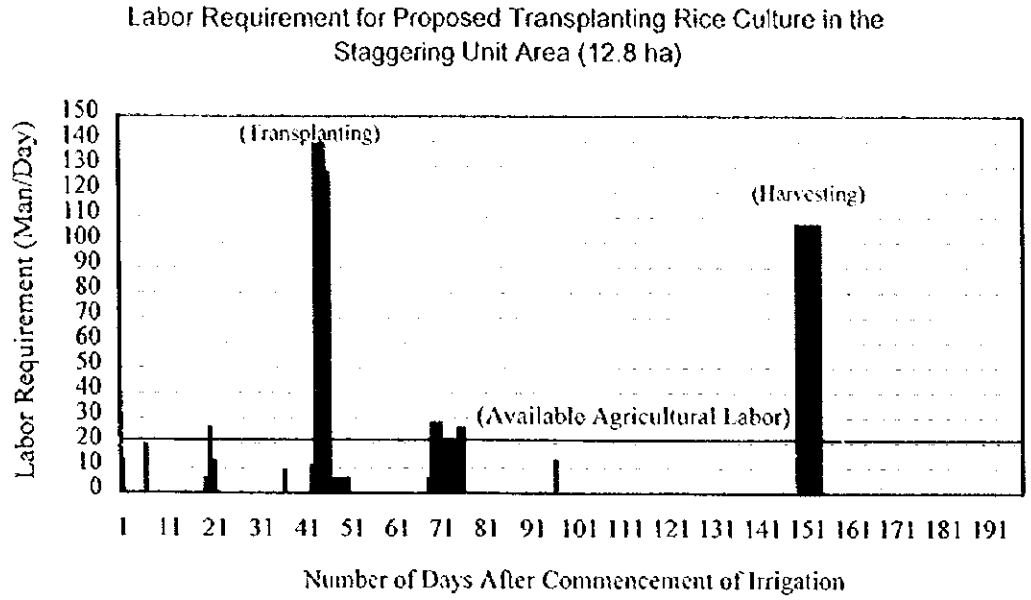
Cultivation Method	Variety tobe use (No. of days)	1st Cropping Sowing	1st Cropping Harvesting	Fllow Period	2nd Cropping Sowing	2nd Cropping Harvesting	Fllow Period
Trans-planting	WITA 7(128)	3/20-5/04	7/26-9/09	46 days	9/10-10/25	1/16-3/02	63 days
	WITA 8(125)	3/20-5/04	7/23-9/06	49 days	9/10-10/25	1/13-2/27	66 days
	WITA 9(120)	3/20-5/04	7/18-9/01	54 days	9/10-10/25	1/08-2/22	71 days
Direct-Sowing	WITA 7(123)	3/20-5/04	7/21-9/04	51 days	9/10-10/25	1/11-2/25	68 days
	WITA 8(120)	3/20-5/04	7/18-9/01	54 days	9/10-10/25	1/08-2/22	71 days
	WITA 9(115)	3/20-5/04	7/13-8/27	59 days	9/10-10/25	1/03-2/17	76 days

Fig.5.4.1 Proposed Rice Double Cropping Schedule In the Project Area



Cropping	Variety to be Used		1st Cropping Sowing	1st Cropping Harvesting	2nd Cropping Sowing	2nd Cropping Harvesting
Rice + Rice	WITA 7	WITA 7	3/20-5/04	7/26-9/09	9/10-10/25	1/16-3/02
Tomato + Rice	SODEFO	WITA 7	3/10-4/24	6/10-8/31	9/10-10/25	1/16-3/02
Rice + Lettuce	WITA 7	-	3/20-5/04	7/26-9/09	9/01-10/15	11/30-1/14
Tomato + Lettuce	SODEFO	-	3/10-4/24	6/10-8/31	9/01-10/15	11/30-1/14

Fig. 5.4.2 Proposed Rice and Vegetable Cropping Schedule for the Project Area



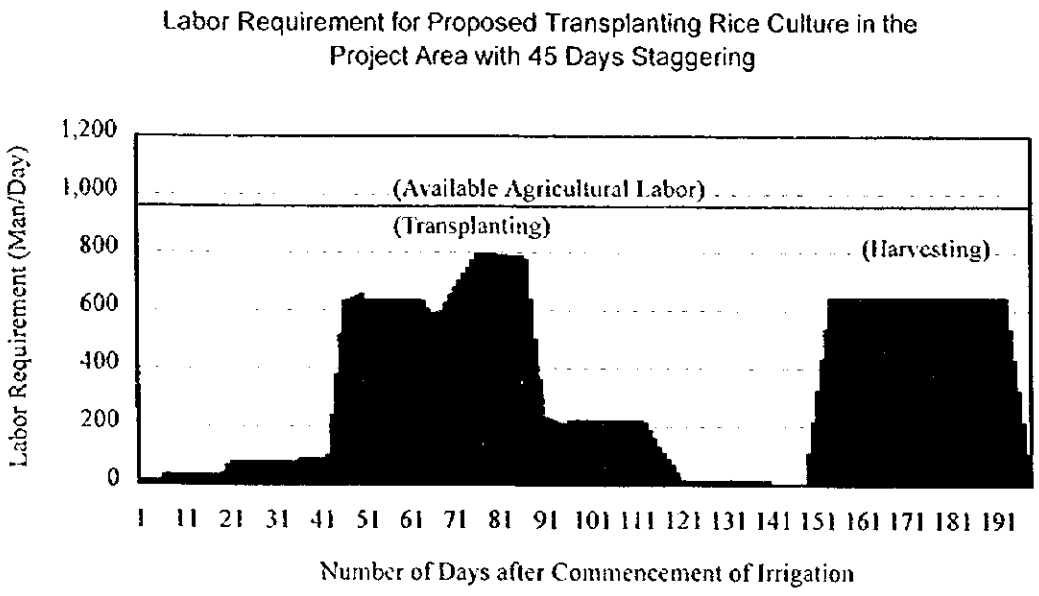


Fig. 5.4.3 Labor Requirement for Proposed Transplanting Rice Culture and Availavle Labor in the Project Area

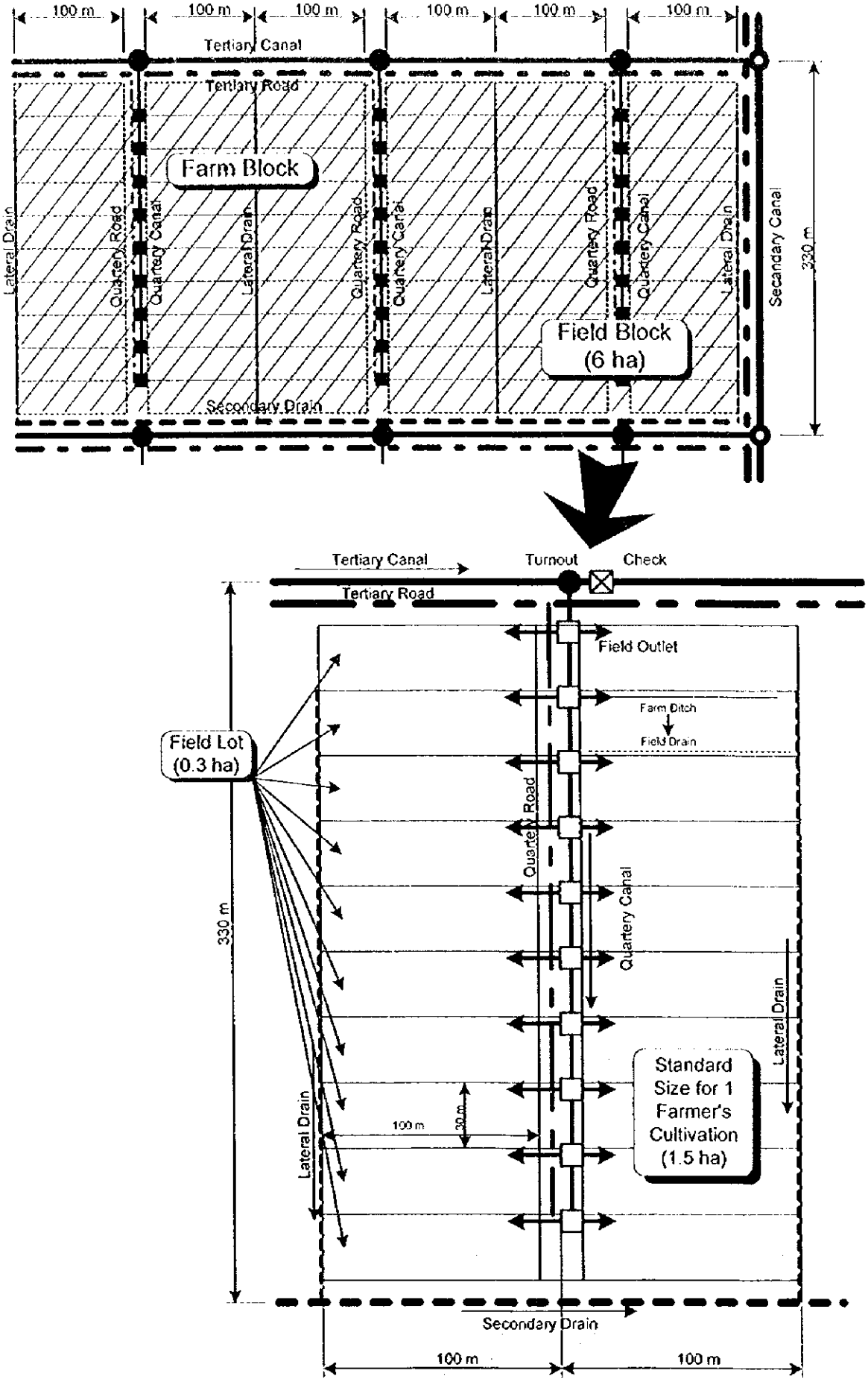


Fig. 5.5.1 Arrangement Of Farm Land

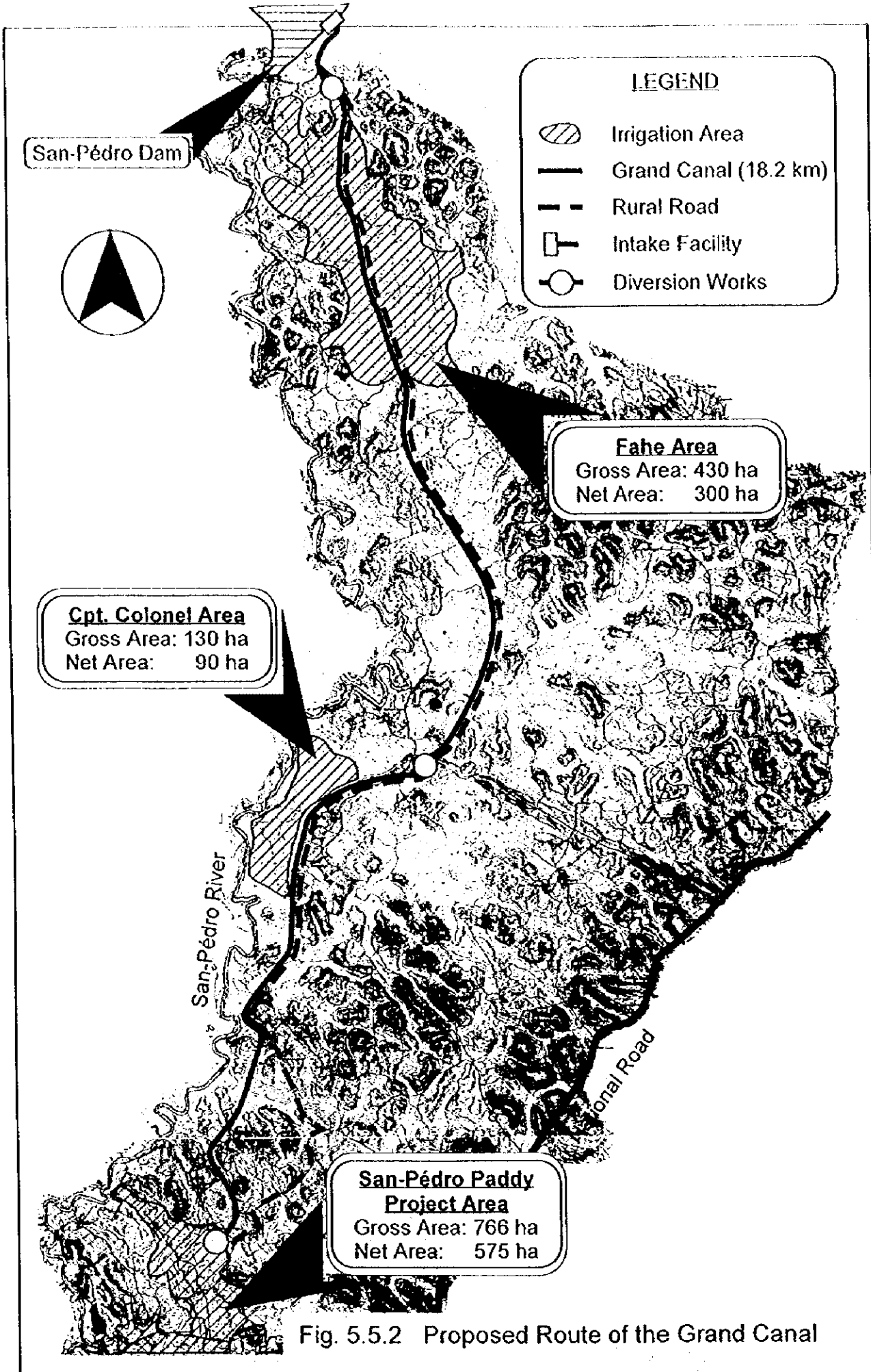


Fig. 5.5.2 Proposed Route of the Grand Canal

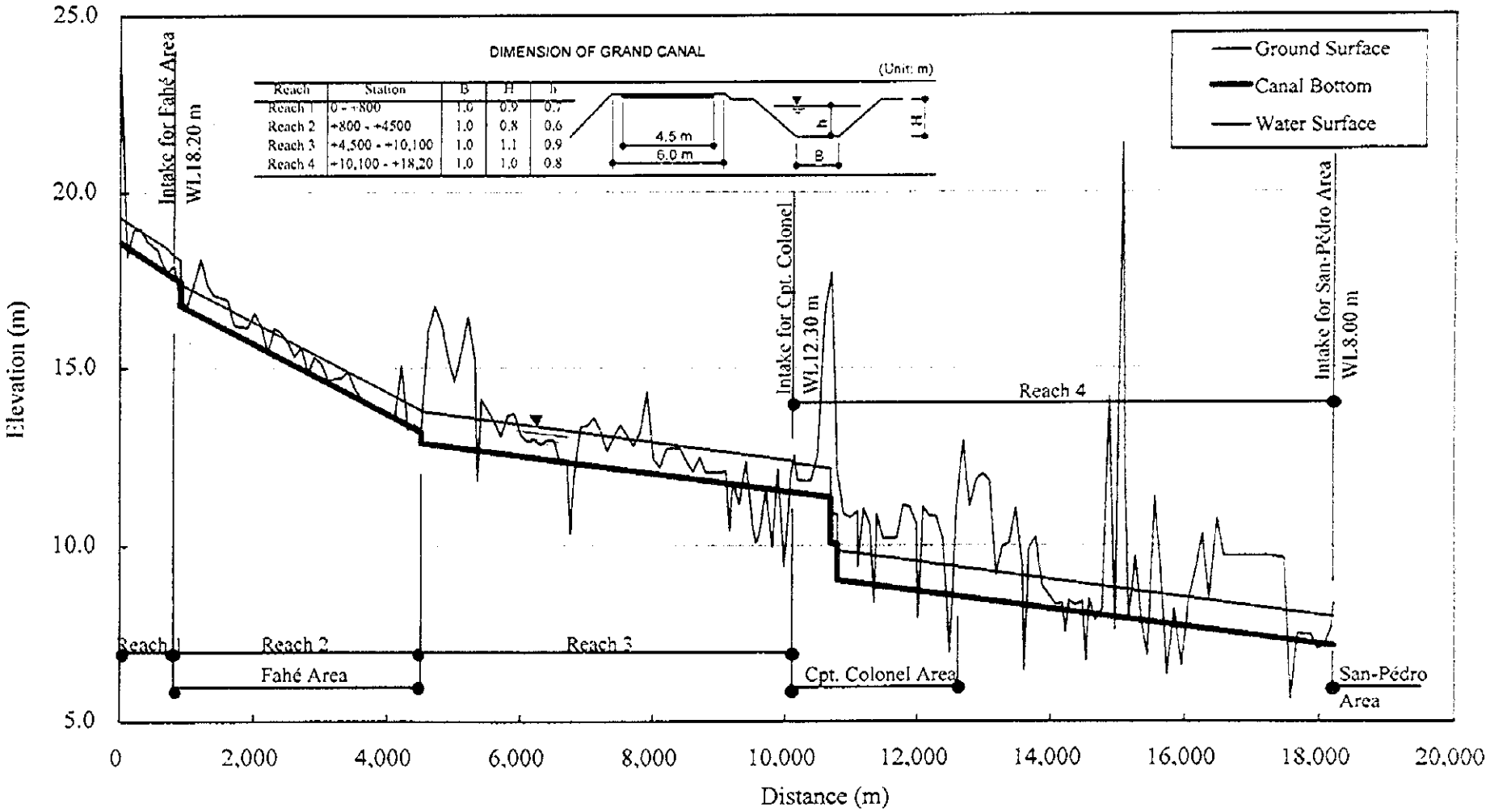


Fig. 5.5.3 Longitudinal Profile and Cross Section of the Grand Canal

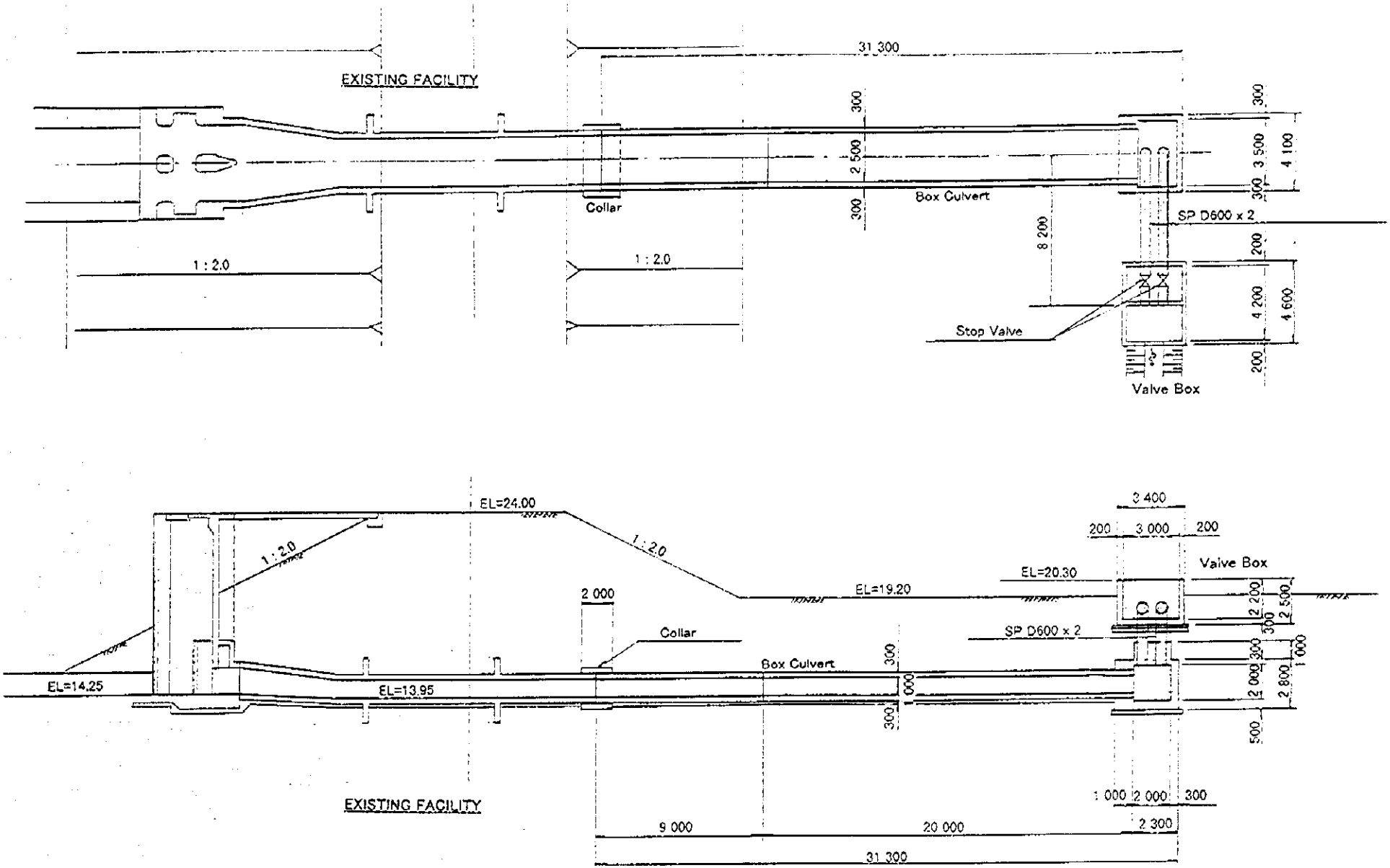


Fig. 5.5.4 Plan of Intake Structure

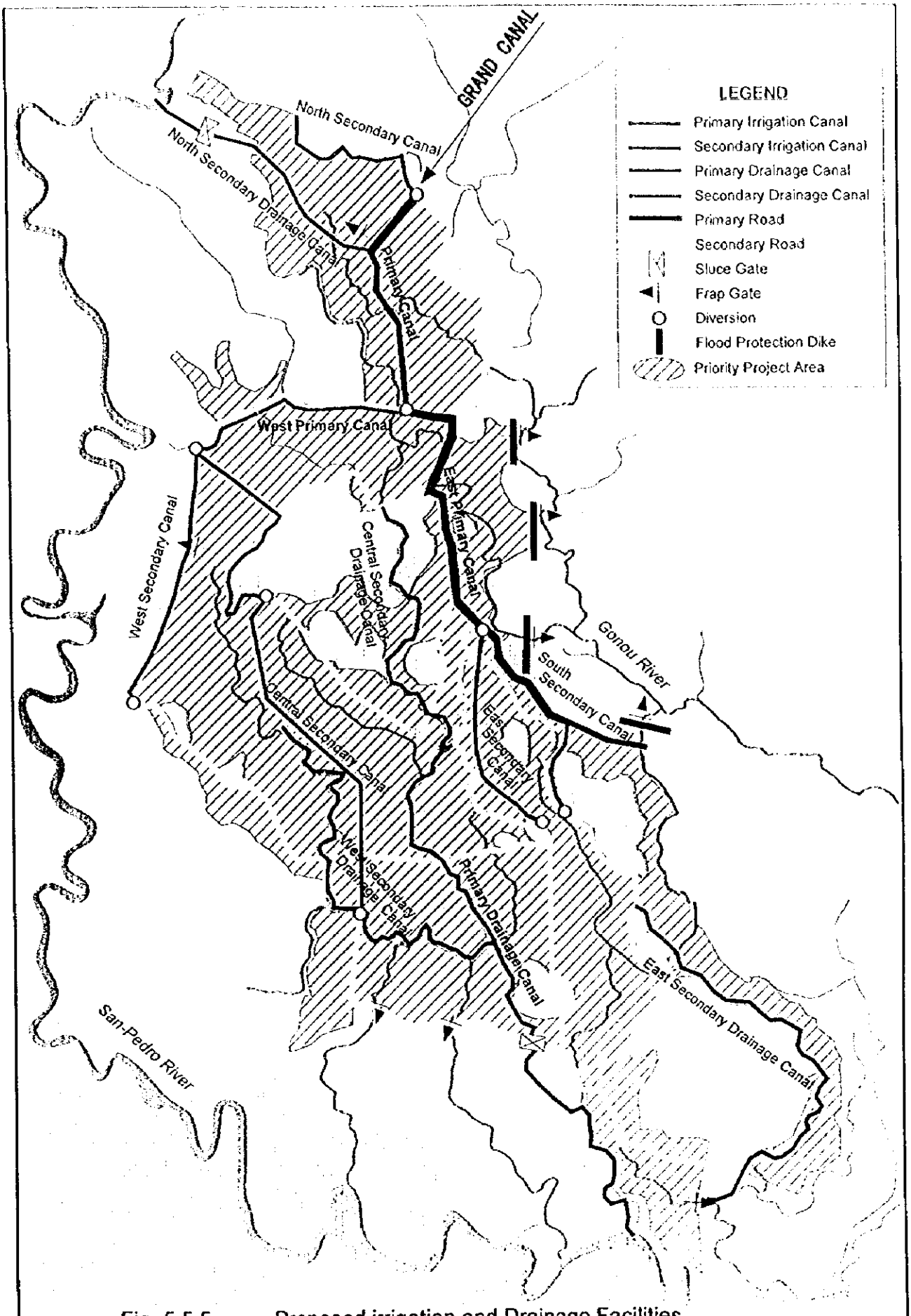


Fig. 5.5.5 Proposed Irrigation and Drainage Facilities

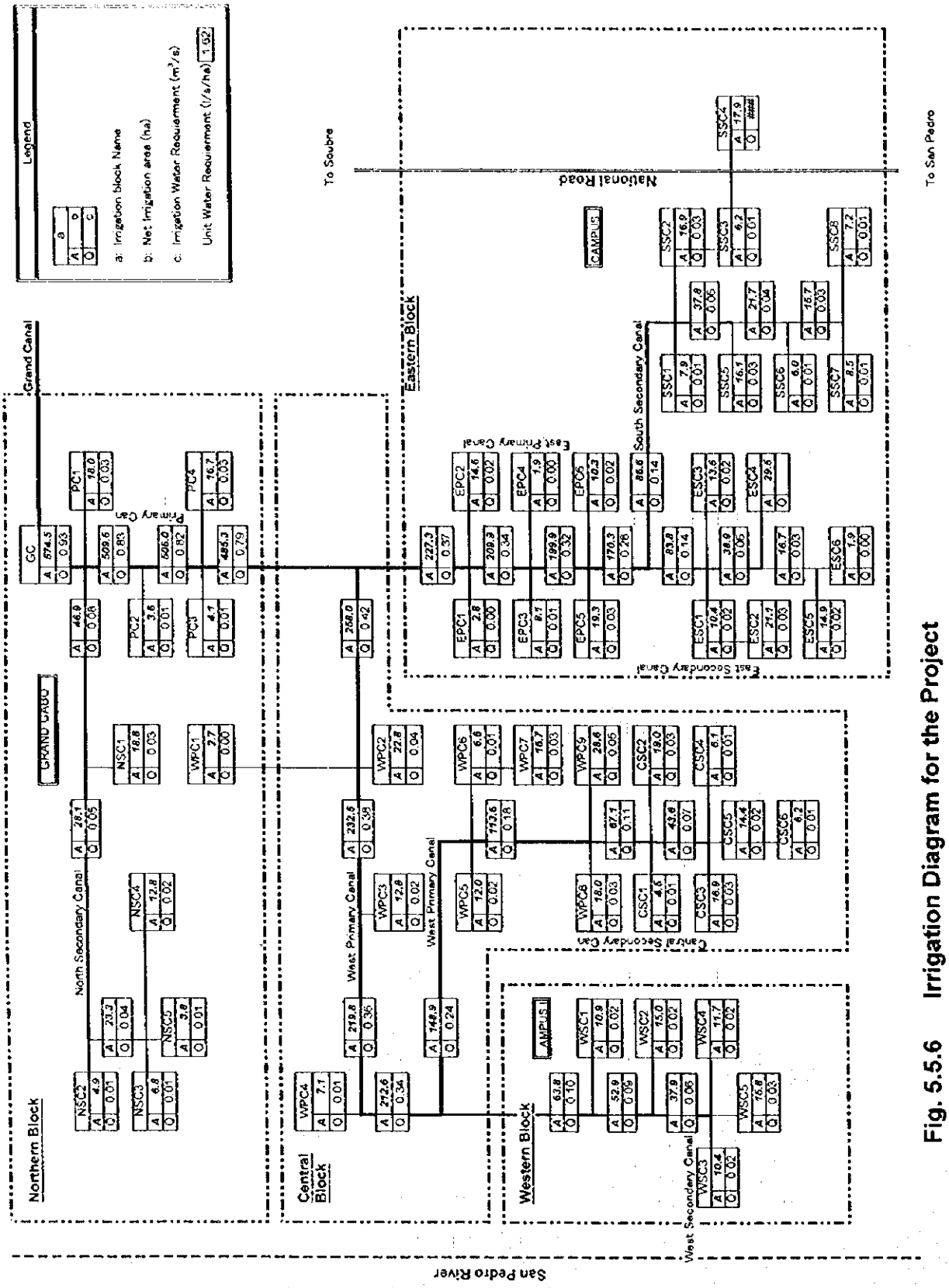


Fig. 5.5.6 Irrigation Diagram for the Project

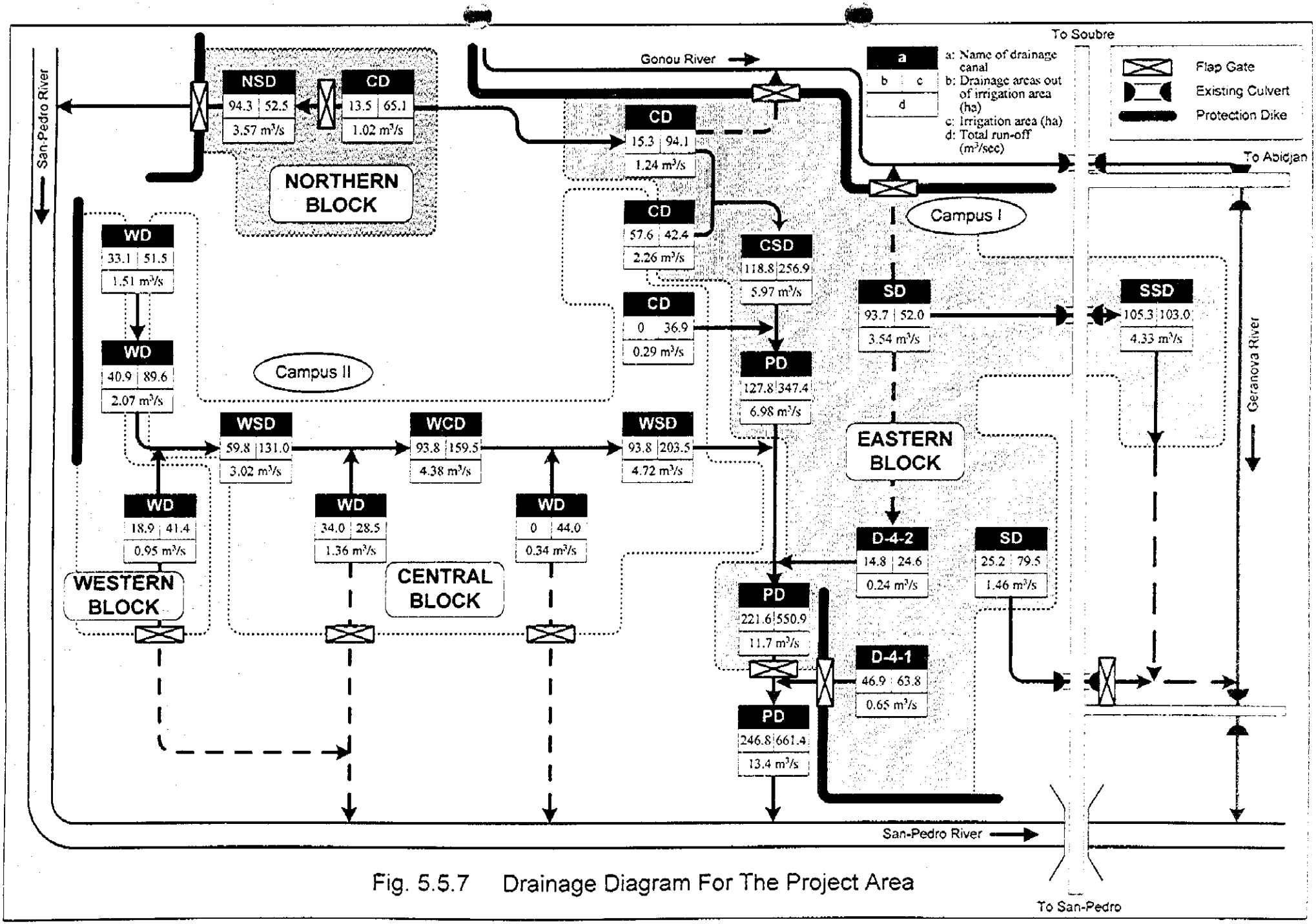
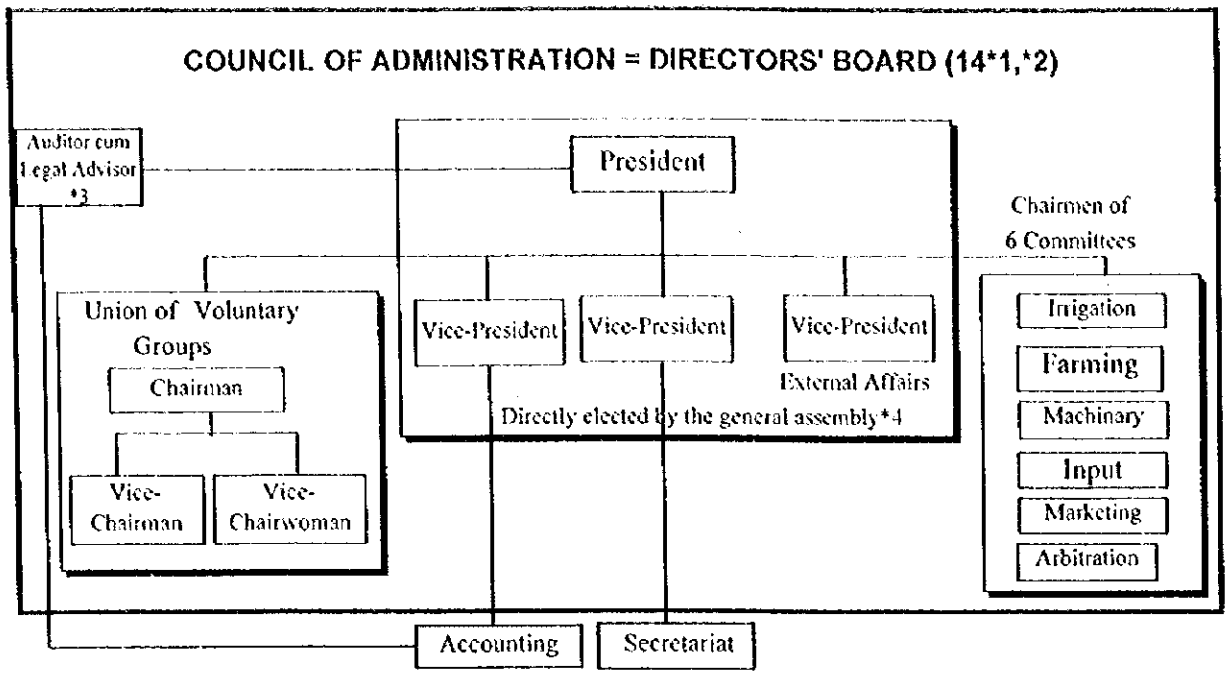
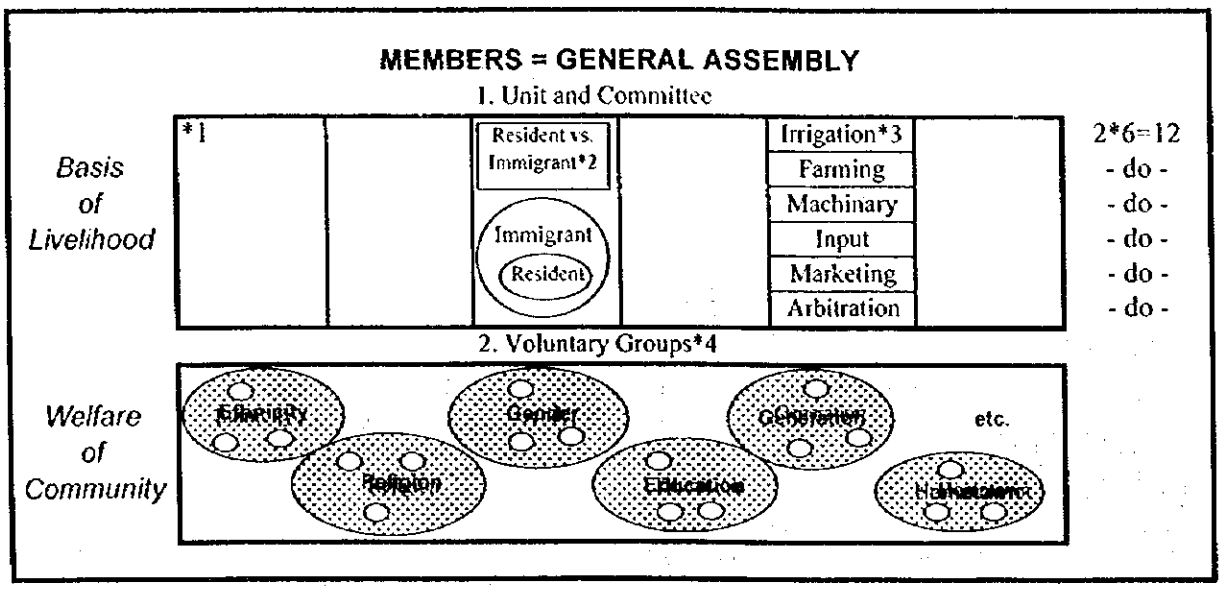


Fig. 5.5.7 Drainage Diagram For The Project Area



*1: () =quorum
*2: each post cannot be held concurrently.
*3: nominated by the general assembly from outside the members.(article 22, Co-op law)
*4: minimum quorum is three. (article 13, Co-op law)



*1: 4 or 6 units along the main canals, 60 to 90 households/unit.
*2:Residents form the nucleus of each unit.
*3: the committee consists of 2 members each from sub-committees at unit level.
*4: an example of genres of group. They are registered at the secretariat.

Fig. 5.6.1 ORGANIZATION OF THE PROPOSED COOPERATIVE

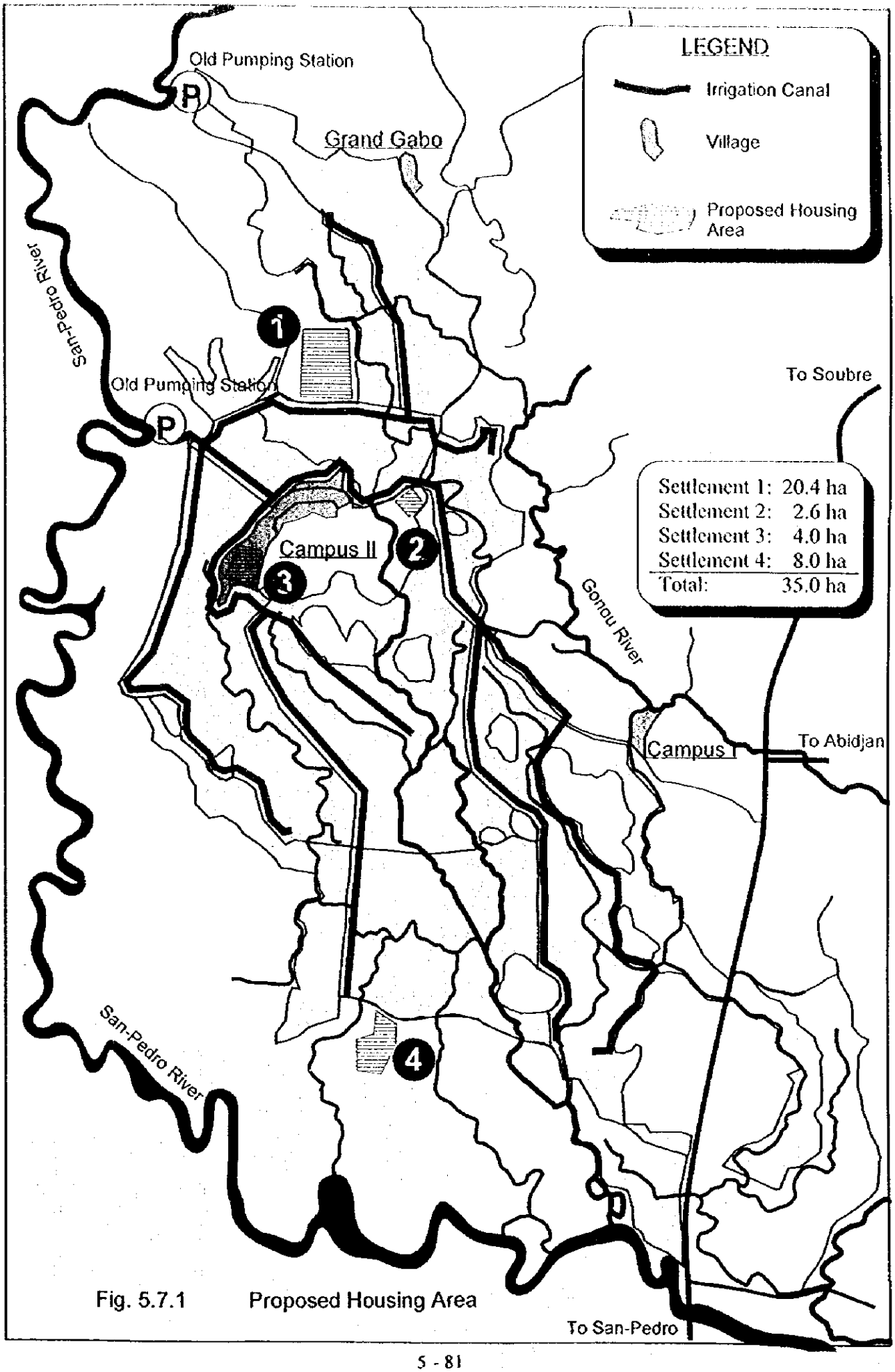


Fig. 5.7.1 Proposed Housing Area

Fig. 5.9.1 Proposed Implementation Schedule of the Project

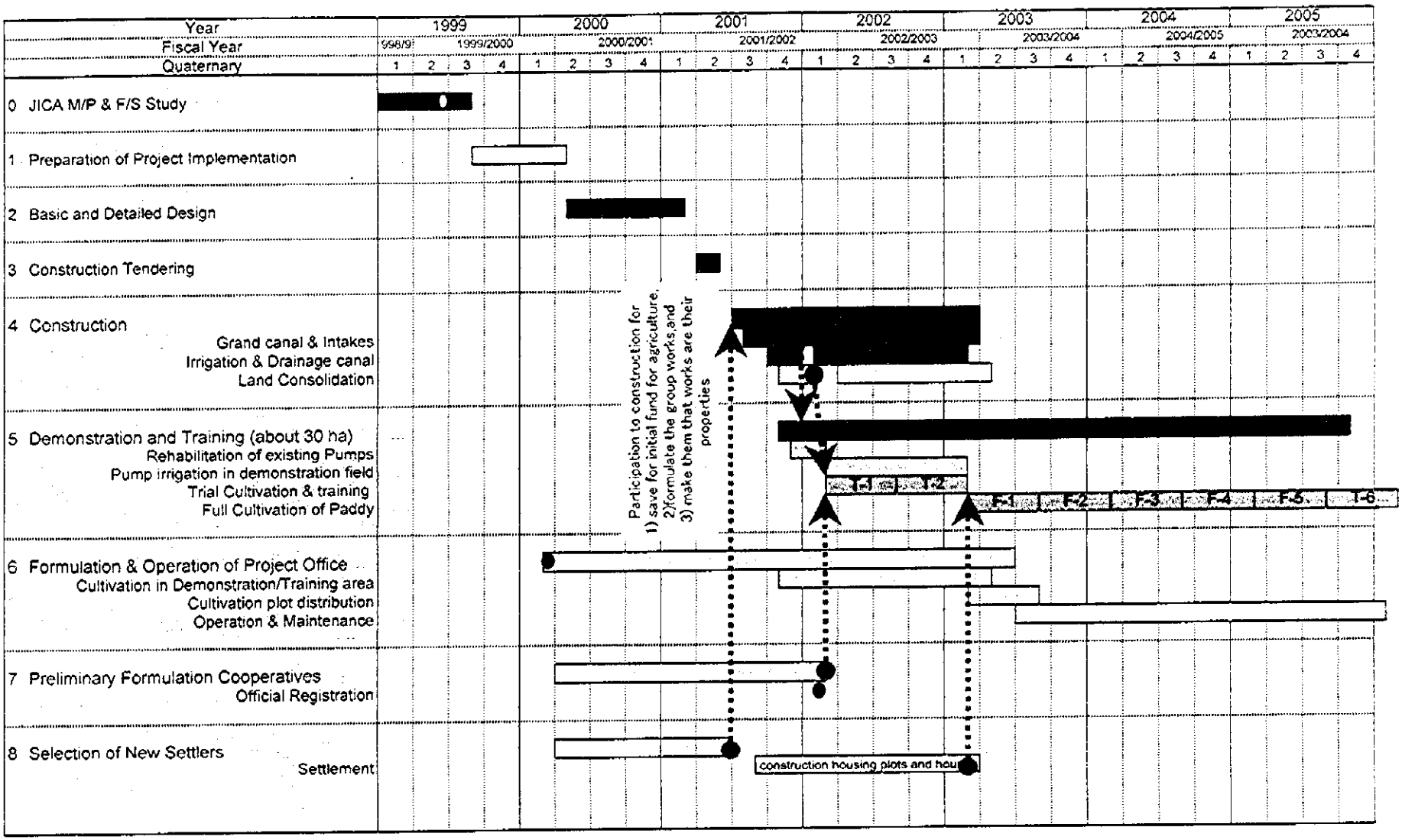
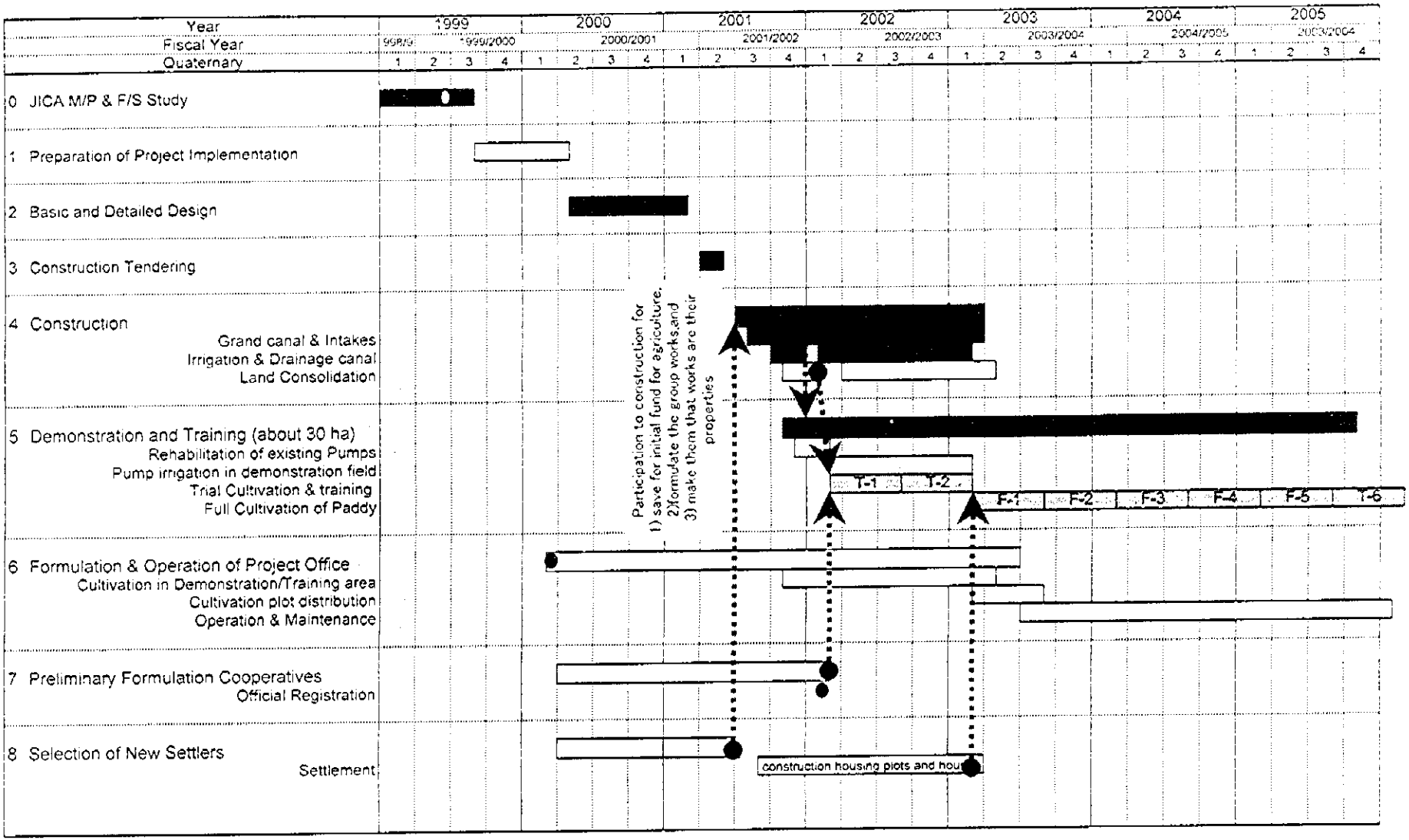


Fig. 5.9.1 Proposed Implementation Schedule of the Project



CHAPTER 6: RECOMMENDATIONS

(1) Early Implementation of the Project

The Project, the components of which have been selected as having high priority for implementation among the ones proposed in the Master Plan, have been proved to be feasible for its implementation from technical, economic and financial points of view. Therefore, early implementation of the Project is strongly recommended in order to improve and stabilize the living standards of the farmers in the area through the improvement of their farming conditions by introducing irrigated rice double cultivation. Furthermore, as the Project is regarded as the pilot one in the Master Plan, the early implementation of the Project is very important for the successful realization of the Master Plan. Earlier implementation of the Project will bring about more benefits to the farmers in the area, resulting in the prosperity of the region.

(2) Participation of the Farmers in the Project

The success or failure of a project always relies on the behavior of the participants in the project. In the case of this Project like agricultural and rural development, the positive participation of the farmers in the Project is indispensable for the successful operation and maintenance of the Project. During the study phase, the farmers living in the Study Area participated in the PCM-applied meetings and cooperated in the interview survey conducted by the Study Team. Therefore, they clearly understand the objectives of the Project and the duties/responsibilities required for them to shoulder during the implementation of the Project. In addition to them, the participating farmers to be selected during the early stage of its implementation shall also take part in the Project from the detailed design and construction stage of the Project in order to confirm the objectives of the Project and the duties/responsibilities required for them.

(3) Settlement of Land Ownership and Reallocation of Farmland

Prior to the implementation of the Project, the land ownership problem, especially the hilly land area, shall be settled with traditional landowners in the Project Area. The area of the farmland to be allotted to respective participating farmers in the Project is 1.5ha only. Therefore, reallocation of the present farmlands to the selected 383 farmers is necessary. This matter is very critical but essential for implementing the Project. It should be settled prior to the completion of the construction works of the Project with the strong initiative of the Project Office.

(4) Training of Extension Workers

The majority of the farmers who will participate in the Project have no experience on the irrigated rice cultivation. Therefore, it is proposed to perform the training of all the participating farmers on irrigated rice cultivation during the construction stage of the Project. However, for the successful cultivation by the farmers at their allotted own farmlands, the continuous and adequate technical guidance by the extension workers is indispensable. In consideration of the present situation of extension activities in the area, it is strongly recommended that at least two extension workers of ANADER be retrained on irrigated rice cultivation at CFMAG and be solely assigned for the Project. The technical assistance by foreign experts on irrigated rice cultivation will be very helpful not only for the farmers but also for the extension workers in improving irrigated rice cultivation in the Project.

(5) Appropriate Use of Water Resources

General agreement on the mutual use of water in the San-Pédro dam was made among the agencies concerned at the meetings of "Technical Consulting Committee on water use of San-Pédro dam" held during the time of this Study and chaired by the High Commissioner for Hydraulics. The priority order of water use was also given at the same meetings to municipal water supply, irrigation and power generation from the top. However, in order to operate and manage the dam discharge properly, it is definitely required to prepare the detailed operation rules of the San-Pédro dam which are agreeable among the agencies concerned prior to the completion of the Project facilities.

(6) Field Preparation of On-farm Level

The irrigation facilities on the farmlands up to the tertiary level are to be constructed and/or rehabilitated by the Project Office. However, the field preparation of on-farm level has to be performed by the farmers themselves in accordance with the guidance of the extension workers of the Project.

APPENDIXES

SCOPE OF WORK
FOR
THE STUDY
FOR
THE INTEGRATED RURAL DEVELOPMENT PROJECT
IN THE SAN-PÉDRO PLAIN
IN THE REPUBLIC OF CÔTE D'IVOIRE

AGREED UPON
BETWEEN
MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Abidjan, JUNE 24, 1997

Mr. Assanvo N'GUETTA
Deputy-Director of CABINET,
Ministry of Agriculture and Animal Resources

Mr. Satoru TAKEUCHI
Leader of Preparatory Study Team,
Japan International Cooperation Agency

I INTRODUCTION

In response to the request of the Government of the Republic of Côte d'Ivoire (hereinafter referred to as "GOCI"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct Study for the Integrated Rural Development Project in San-Pédro Plain (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the GOJ, will undertake the Study in close cooperation with the authorities concerned of the GOCI.

The present document sets forth the Scope of Work with regard to the Study.

II OBJECTIVES OF THE STUDY

The objectives of the Study are:

1 to formulate Master Plan in the integrated rural development project in the San-Pédro Plain, placing particular emphasis on the paddy - field agricultural development and rural infrastructures,
2 to conduct Feasibility Study of priority area(s) selected during the Master Plan, and
3 to carry out, in the course of the Study, technology transfer to counterpart personnel of the Côte d'Ivoire.

III STUDY AREA

The Study area covers approximately 10,000 ha of land along the San-Pédro river from the existing San-Pédro dam to San-Pédro city. (See location map attached as ANNEX I)

IV SCOPE OF THE STUDY

In order to achieve the above objectives, the Study will consist of two (2) phases and will cover the following items:

1 Phase I

To formulate the Master Plan on an integrated rural development project in the San-Pédro Plain and to select priority area (s).

1-1 to collect and review ;

- relevant data and information
- relevant plan (s) and project (s)

1-2 to prepare the aero-photograph (s) of the study area for formulation of the Master Plan.

1-3 to collect and analyze of the following data and information, through the field survey and interviewing the farmers;

(1) natural condition including,

- location, acreage and topography
- meteorology and hydrology
- geology
- soils
- water quality
- vegetation
- others

(2) socio-economic condition including,

- economic indices (population, birthrate, food situation, etc,.)
- educational system
- social infrastructure
- national, regional and other donor's development plan
- gender
- others

(3) agricultural and agro-economic condition including,

- present land use
- land tenure
- farming practices (cultivation technique, cropping pattern, yield, agricultural machinery, etc.)
- research activities
- agricultural economy
- post-harvest and processing system
- marketing system and analysis
- farmers' organization
- others including

(4) water resources

- existing water resources
- hydrology of San-Pédro River basin

(5) agricultural and rural infrastructure

- existing dam
- irrigation and drainage facilities
- farm road networks
- post-harvest and marketing system
- rural water supply system
- construction materials
- others

(6) agricultural supporting service

- governmental institute
- farmer's organizations
- extension service (extension worker, farmers' recognition levels of irrigation)
- supply of seed, fertilizer and chemicals, agricultural machinery including spare parts
- credit services
- others

(7) operation and maintenance

- water management organizations
- customs of water use, water right, water charge, etc.
- others

(8) environmental aspects

- natural environmental aspects
- social environmental aspects

1-4 to conduct Initial Environmental Examination (IEE)

1-5 to identify development needs, constraints and potential for the study area

1-6 to formulate the M/P

1-7 to select the priority area(s) for the Feasibility Study

1-8 to prepare a topographic map(s) at scale 1/5,000 for the priority area(s)

2 Phase Ⅱ

To conduct the Feasibility Study on priority area(s) selected during the Master Plan.

2-1 Field survey to collect supplementary data and information on the priority area(s)

2-2 Formulation of the optimum integrated rural development plan for the priority area(s) considering following items;

- hydrology and meteorology
- geology
- soil classification and land use
- land tenure
- cropping pattern and yield
- water resources development and water conveyance plan
- irrigation and drainage
- socio-economic and farmer's economy
- post -harvest and marketing
- agro-infrastructure
- rural-infrastructure
- agricultural supporting system
- environmental conditions
- operation and maintenance
- others

2-3 to conduct preliminary design for the major structures

2-4 to formulate operation and maintenance plans

2-5 to conduct environmental impact assessment (EIA), if necessary

2-6 to prepare implementation schedule

2-7 to estimate the project cost and benefits

2-8 to evaluate the project and prepare the recommendations for the project

V STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative schedule.(See ANNEX Ⅱ)

VI REPORTS

JICA shall prepare and submit following reports to the GOCI, which consist of two versions;

- complete English version and,
- French version with English appendixes

In case any doubt arises in interpretation, English text shall prevail.

1 Inception Report

Five (5) copies in English and twenty (20) copies in French at the commencement of the Phase Ⅰ field work.

2 Progress Report Ⅰ

Five (5) copies in English and twenty (20) copies in French at the end of the Phase Ⅰ field work.

3 Interim Report

Five (5) copies in English and twenty (20) copies in French at the commencement of Phase Ⅱ field work.

4 Progress Report Ⅱ

Five (5) copies in English and twenty (20) copies in French at the end of the first part of Phase Ⅱ field work .

5 Progress Report Ⅲ

Five (5) copies in English and twenty (20) copies in French at the end of the second part of Phase Ⅱ field work.

6 Draft Final Report

Five (5) copies in English and twenty (20) copies in French after the home office work in Japan. The GOCI will provide JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report.

7 Final Report

Thirty (30) copies in English and fifty (50) copies in French within two (2) months after receipt of the GOCI's comments on the Draft Final Report.

VII UNDERTAKING OF THE GOVERNMENT OF CÔTE D'IVOIRE

1 To facilitate smooth conduct of the Study, the GOCI shall take necessary measures

1.1 to secure the safety of the Japanese study team,

1.2 to permit the members of the Japanese study team to enter, leave and sojourn in Cote d'Ivoire for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

1.3 to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into Côte d'Ivoire for the conduct of the Study,

1-4. to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study,

1.5 to provide necessary facilities to the Japanese study team for the remittance as well as utilization of the funds introduced into Côte d'Ivoire from Japan in connection with the implementation of the Study,

1.6 to secure permission for entry into private properties or restricted areas for the implementation of the Study,

1.7 to secure permission for the Japanese study team to take all data and documents (including photographs and maps) related to the Study out of Côte d'Ivoire to Japan and

1.8 to provide medical services as needed. Its expense will be chargeable on the members of the Japanese study team.

2 The GOCI shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

3 The Ministry of Agriculture and Animal Resources (hereinafter referred as "MINAGRA") shall act as counterpart agencies to the Japanese Study Team and also as the coordinating body in relation with other governmental organizations and non-governmental organizations concerned for smooth implementation of the Study.

4 MINAGRA shall, at it's own expenses, provide the Japanese study team with the following, in cooperation with other organizations concerned :

4.1 available data and information related to the Study,

4.2 counterpart personnel,

4.3 suitable office spaces with necessary equipment and furniture in Abidjan and San-Pédro,

4.4 credentials or identification cards, and

VIII UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures :

1 to dispatch, at its own expense, study team to Côte d'Ivoire, and

2 to pursue technology transfer to the Côte d'Ivoire counterpart personnel in the course of the Study.

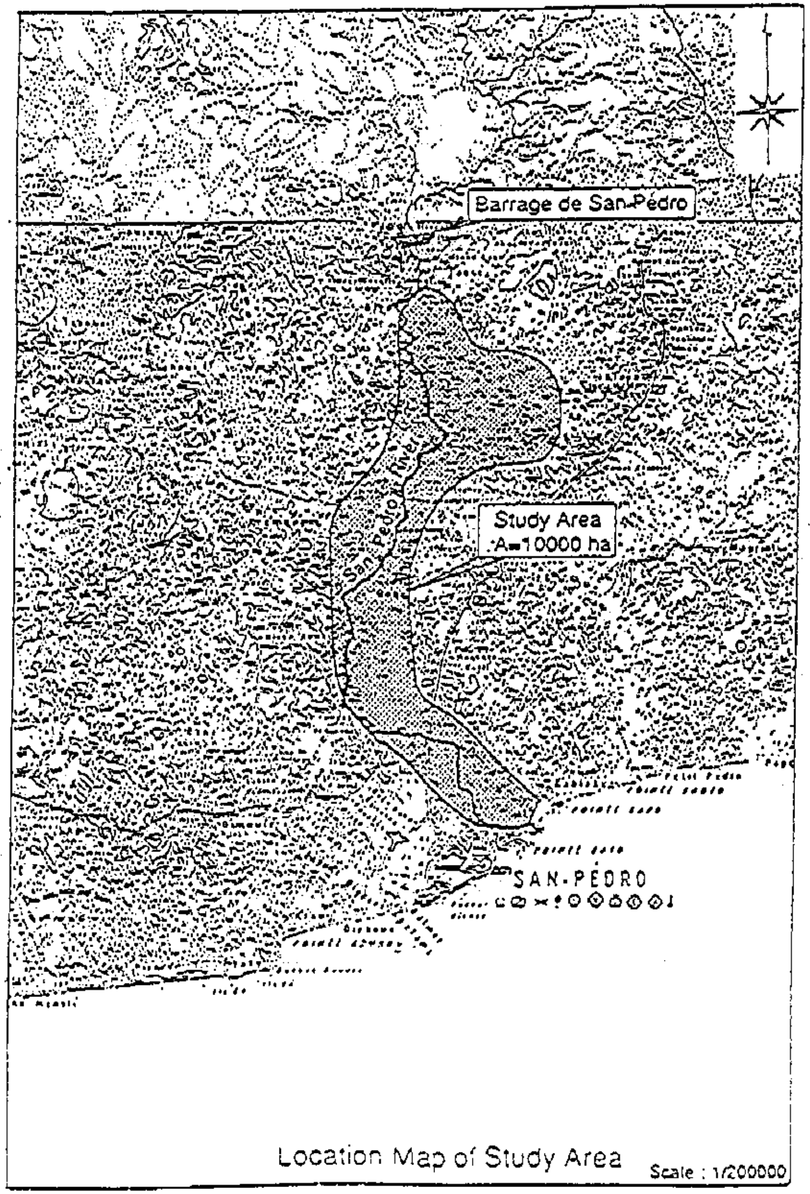
IX LANGUAGE

In case any divergence arises about interpretation of this Scope of Work, which is done in English and French, the English text shall prevail.

X CONSULTATION

JICA and MINAGRA shall consult with each other in respect of any matter that may arise from or in connection with the Study.

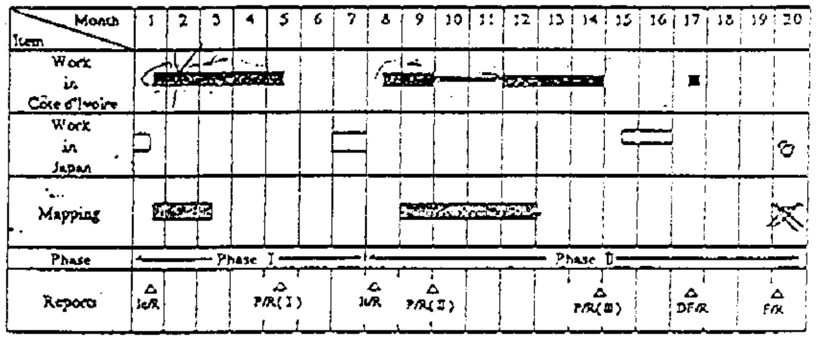
ANNEX I



Location Map of Study Area Scale : 1/200000

ANNEX II

TENTATIVE SCHEDULE



IcR : Inception Report, P/R(I) : Progress Report(I), It/R : Interim Report
P/R(II) : Progress Report(II), P/R(III) : Progress Report(III)
DF/R : Draft Final Report, F/R : Final Report

MINUTES OF MEETING

ON

SCOPE OF WORK

FOR

THE STUDY

FOR

THE INTEGRATED RURAL DEVELOPMENT PROJECT

IN THE SAN-PÉDRO PLAIN

IN THE REPUBLIC OF CÔTE D'IVOIRE

AGREED UPON

BETWEEN

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Abidjan , JUNE 24, 1997

Mr. Assanvo N'GUETTA
Deputy-Director of CABINET,
Ministry of Agriculture and Animal Resources

Mr. Satoru TAKEUCHI
Leader of Preparatory Study Team,
Japan International Cooperation
Agency

A - 6

The preparatory study team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), and headed by Mr. Satoru TAKEUCHI, visited the Republic of Côte d'Ivoire June 16 to 25, 1997 so as to discuss and exchange views on the study with Projet National du Riz (hereinafter reffered to as "PNR") and organizations concerned.

PNR and the Team had a series of discussions on the Scope of Work for Study for the integrated rural development project in the San-Pédro Plain in the Republic of Côte d'Ivoire (hereinafter reffered to as "the Study"). The list of participants in the meetings is attached in the ANNEX I.

PNR and the Team mutually agreed to the Scope of Work for the Study.

The following minutes were prepared to confirm the main issues discussed and matters agreed upon by both sides in connection.

1. PNR requested counterpart training in Japan related to the study to promote an effective technology transfer. The Team promised to convey the request to the JICA headquarters in Tokyo.

2. PNR shall provide offices for the Japanese study team equipped with telephone(s), electricity, water supply and necessary number of desks and chairs in Abidjan and San-Pédro.

3. PNR agreed that the Final Report would be available to any person who is interested in the Study.

4. PNR requested to hold Work Shops in San-Pédro on the Interim Report and the Draft Final Report which explain the results of the Study to organizations concerend and farmers. The Team promised to convey the request to the JICA headquarters in Tokyo.

5. PNR requested that the following equipments and services necessary for the Study be arranged by JICA. The Team promised to convey the request to the JICA headquarters in Tokyo.
   - vehicle(s) with driver(s)
   - photo-copy machine
   - desktop-type and notebook-type computer(s) with software, printer(s)
   - equipments for topographic survey
   - equipments for hydrological survey
   - equipments for design

6. The Team suggested that a Technical Consulting Committee on water use of San-Pédro dam (hereinafter referred to as "the Committee"), be organized by relevant departments and organizations of the Government of the Republic of Côte d'Ivoire.

and be held at least three times on the Inception Report, the Interim Report, the Draft Final Report. PNR agreed with the idea and promised to inform the details and the members of the Commitee to JICA before the commencement of the Study.

ANNEX I

LIST OF PARTICIPANTS

CÔTE D'IVOIREN SIDE

(The Ministry of Agriculture and Animal Resources (MINAGRA))

1	Mr. Joachim TOURE	Cabinet of Minister
2	Mr. Benoit N'DRI Brou	Director of National Project of Rice (PNR)
3	Mr. IRIE Bi Djo	Director General of Agriculture
4	Mr. KOUASSI K. Bernard	Director of Agricultural Land Development (DAR)
5	Mr. VEH Loua	PNR

JAPANESE SIDE

(The Preparatory Study Team, Japan International Cooperation Agency (JICA))

1	Mr. Satoru TAKEUCHI	Team Leader
2	Mr. Takeshi OGASAWARA	Agricultural and Rural Infrastructure
3	Mr. Michihiro HIRAOKA	Agronomy
4	Mr. Sumio SHINDO	Environment
5	Ms. Toshiko SHIBATA	Interpreter
6	Mr. Makoto TAKAHASHI	Coordinator

(Embassy of Japan)

1	Mr. Hiroyuki Suzuki	First Secretary