

Table 14 Projected Food Balance of Rice in Kalimantan Island to 2018

	Base			1998		
	a/	d/	c/	a/	d/	c/
	Popu- lation (‘000)	Per Capita Consump. (kg/year)	Demand/ Produc. (‘000tons)	Popu- lation (‘000)	Per Capita Consump. (kg/year)	Demand/ Produc. (‘000tons)
Demand						
South Kalimantan	2306	145.21	345.0	3000	149.16	460.9
Central Kalimantan	1140	145.21	170.5	1831	149.16	281.2
East Kalimantan	1538	145.21	230.0	2613	149.16	401.4
West Kalimantan	2815	145.21	421.0	3726	149.16	572.4
Total	7799		1166.5	11169		1716.0
Production b/						
South Kalimantan			560.5			832.4
Central Kalimantan			148.4			220.4
East Kalimantan			103.5			153.7
West Kalimantan			413.2			613.7
Total			1225.5			1820.3
Balance						
South Kalimantan			215.5			371.5
Central Kalimantan			-22.1			-60.8
East Kalimantan			-126.5			-247.7
West Kalimantan			-7.9			41.3
Total			59.0			104.3

	2008			2018		
	a/	d/	c/	a/	d/	c/
	Popu- lation (‘000)	Per Capita Consump. (kg/year)	Demand/ Produc. (‘000tons)	Popu- lation (‘000)	Per Capita Consump. (kg/year)	Demand/ Produc. (‘000tons)
Demand						
South Kalimantan	3700	153.00	583.1	4400	156.94	711.3
Central Kalimantan	2220	153.00	349.9	2694	156.94	435.4
East Kalimantan	3169	153.00	499.4	3844	156.94	621.4
West Kalimantan	4520	153.00	712.3	5483	156.94	886.2
Total	13609		2144.7	16420		2654.3
Production b/						
South Kalimantan			1019.7			1249.1
Central Kalimantan			270.0			330.8
East Kalimantan			188.3			230.7
West Kalimantan			751.8			920.9
Total			2229.8			2731.5
Balance						
South Kalimantan			436.6			537.9
Central Kalimantan			-79.9			-104.6
East Kalimantan			-311.1			-390.8
West Kalimantan			39.5			34.7
Total			85.1			77.2

a/: Population increase rates applied are as follows:

	1985-1998	1998-2018
South Kalimantan	2	1.95
Central Kalimantan	4	1.95
East Kalimantan	4	1.95
West Kalimantan	2	1.95

b/: Base year productions are 1981-1985 averages.

c/: Population x Per capita consumption x 1.03 (rate of seed, waste, etc.)

Source: a/: Population Projection 1980-2000, Provincial Statistics Office, South Kalimantan Final Report on the National Urban Development Strategy Project, September 1985, Directorate of City and Regional Planning, Directorate General of Human Settlements, Dept. of Public Works, UNDP and UNCIS

b/: Statistical Yearbook of Indonesia 1986, CBS

d/: Food Balance Sheet in Indonesia 1983, CBS

Table 15 Alternative Water Supply (1/2)

Case 1: New irrigation scheme only

(Unit: ha)

Scheme	Scheme Area	
	Wet Season	Dry Season
1. Pitap	3,734	3,734
2. Batang Alai	6,223	6,223
3. Barabai	2,278	2,278
4. Amandit	6,432	5,393
5. Tapin	5,328	3,452
Total	23,995	21,080

Case 2: Irrigation water supply to the existing drainage scheme

Scheme	Existing Drainage Scheme	Wet Season (ha)	Dry Season (ha)
1. Pitap	1. R. Batu Mandi	-	785
2. Batang Alai	2. Tg. Semanggi Kambat	600	600
3. Barabai	3. Tg. Jaranih	800	800
5. Tapin	4. 5bh Pintu Air	400	400
Total		1,800	2,585

Case 3: Supplemental water supply to the existing irrigation scheme with a water shortage problem in its waer source

Water source/ Scheme	Existing Irrigation Scheme	Wet Season (ha)	Dry Season (ha)
1. Pitap		3,734	3,734
	1. Suapin	267	343
	2. Lok Batu	291	367
	Sub-total	4,292	4,444
2. Batang Alai		6,223	6,223
	3. Intangan	260	743
	4. Kahakan	144	476
	5. Sub-total	6,627	7,442
4. Amandit		6,432	5,393
	5. Tayub	22	-
	6. Nunungin	129	-
	7. Kuangan	92	-
	8. Hawatu	185	-
	9. Taal	182	-
Sub-total	7,042	5,393	
5. Tapin		5,328	3,452
	10. Pampain	490	-
	Sub-total	5,818	3,452
Total	10 Existing Schemes	2,062	1,929

Table 15 Alternative Water Supply (2/2)

Case 4: Water source conversion of the existing irrigation scheme with the same condition of Case 3

Water source/ Scheme	Existing Irrigation Scheme	Wet Season (ha)	Dry Season (ha)
2. Batang Alai		6,223	6,223
	1. Intangan	743	743
	2. Kalakan	476	476
	Sub-total	7,442	7,442
4. Amandit		6,432	5,393
	3. Tayub	200	-
	4. Nunungin	165	-
	5. Kuangan	235	-
	6. Hawatu	256	-
	7. Taal	289	-
	Sub-total	7,577	5,393
5. Tapin		5,328	3,452
	8. Pampain	882	-
	9. Labuhang	300	-
	Sub-total	6,510	3,452
Total	(Alternative Area)	3,546	1,219

Case 5: Maximum utilization of newly developed water source by the neighbouring schemes as much as possible

Water source/ Scheme	Existing Irrigation Scheme	Wet Season (ha)	Dry Season (ha)
4. Amandit		6,432	5,393
	1. Telaga Langsung	2,831	-
	2. Tayub	200	-
	3. Nunungin	165	-
	4. Kuangan	235	-
	5. Pamujaan	350	-
	6. Hawatu	256	-
	7. Taal	289	-
	8. Jaran	294	-
	9. Kayu Habang	347	-
Sub-total	11,399	5,393	
5. Tapin		5,328	3,452
	10. Lok Paikat	452	-
	11. Pampain	882	-
	12. Nupadang	253	-
	13. Pulau Pinang	270	-
	14. Rampanang	146	-
	15. Binuang	1,408	-
	16. Labuhang	300	-
Sub-total	9,039	3,452	
Total	(Alternative Area)	8,678	-

Table 16 Construction Cost for Existing Irrigation Schemes

(Unit : million Rp.)

Kabupaten	Scheme Name	Irrigation Area (ha)	Rehabilitation	Renewal of Structures	Construction of Main, Tertiary and Drain System	Land Acquisition	Total
Tabalong	1) Jaro	625	8	-	-	-	8
	2) Jaro Bawah	200	-	82	506	32	620
	3) Gumba	254	6	106	243	6	361
	Sub-Total	1,079	14	188	749	38	989
H.S.U	1) Paran	188	3	84	257	14	358
	2) Tundakan	268	2	138	223	6	369
	3) Suapin	383	1	93	366	9	469
	4) Lok Batu	407	21	220	390	11	641
Sub-Total	1,246	27	535	1,236	40	1,838	
H.S.T	1) Talong	165	5	158	158	5	326
	2) Tapuk	186	11	76	178	5	270
	3) Tamiyang	166	10	110	159	4	283
	4) Baruh Hawang	160	5	12	210	10	237
	5) Intangan	1,180	44	43	1,129	27	1,243
	6) Kahakan	777	4	121	744	18	887
	7) Mangunang	515	20	61	493	12	586
	8) Haruyan Dayak	1,486	4	158	1,422	35	1,619
Sub-Total	4,635	103	739	4,493	116	5,451	
H.S.S	1) Telaga Langsat	2,831	52	303	2,710	66	3,131
	2) Tayub	200	1	53	191	5	250
	3) Nunungin	165	1	95	158	4	258
	4) Kuanga	235	7	101	225	6	339
	5) Pamujaan	350	3	53	335	8	399
	6) Hawatu	256	-	104	649	41	794
	7) Taal	289	2	206	276	8	492
	8) Jurau	294	8	6	76	7	97
Sub-Total	4,620	74	921	4,620	145	5,760	
Tapin	1) Lok Paikat	452	1	67	727	44	839
	2) Pampain	882	3	161	844	21	1,029
	3) Nupadang	253	1	6	488	34	529
	4) Tatakan	99	2	75	94	3	174
	5) Pulau Pinang	270	2	-	258	6	266
	6) Rampunang	146	1	30	140	3	174
	7) Binuang	1,408	17	110	2,544	168	2,839
Sub-Total	3,510	27	449	5,095	279	5,850	
Study Area		15,090	245	2,832	16,193	618	19,888

Table 17 Construction Cost for New Irrigation Schemes

(Unit : million Rp.)

Kabupaten	Scheme Name	Irrigation Area (ha)	Head Works	Main System	Tertiary
Tabalong	1) Sungai Kati	280	-	463	206
	2) Namun	64	27	106	47
	3) Kinarum	408	175	675	300
	4) Mihim	203	87	336	149
	5) Batupulut	225	-	372	165
	6) Bilas	643	276	1,064	473
	7) Banyu Tajun	750	322	1,241	551
	Sub-Total	2,573	887	4,257	1,891
H.S.U.	1) Balangan	2,172	934	9,924	1,596
	2) Pitap	4,519	1,942	23,892	3,321
	Sub-Total	6,691	2,876	33,816	4,917
H.S.T	1) Bt.Alai	6,823	2,933	37,142	5,015
	2) Barabai	3,078	1,323	14,064	2,262
	Sub-Total	9,901	4,256	51,206	7,277
H.S.S.	1) Kayu Habang	347	149	574	255
	2) Amandit	6,432	4,506	29,389	4,728
	Sub-Total	6,779	4,655	29,963	4,983
Tapin	1) Labuhan	300	129	496	221
	2) Tapin	5,728	3,577	27,004	4,210
	Sub-Total	6,028	3,706	27,500	4,431
Study Area		31,972	16,380	146,742	23,499

Kabupaten	Scheme Name	Drain	Supply Canal	Land Acquisition	Total
Tabalong	1) Sungai Kati	76	-	45	790
	2) Namun	17	-	10	207
	3) Kinarum	110	-	65	1,325
	4) Mihim	55	-	32	659
	5) Batupulut	61	-	36	634
	6) Bilas	174	-	103	2,090
	7) Banyu Tajun	202	-	120	2,436
	Sub-Total	695	-	411	8,141
H.S.U.	1) Balangan	586	-	348	13,388
	2) Pitap	1,220	3,557	772	34,704
	Sub-Total	1,806	3,557	1,120	48,092
H.S.T	1) Bt.Alai	1,841	5,371	1,197	53,499
	2) Barabai	831	-	492	18,972
	Sub-Total	2,672	5,371	1,689	72,471
H.S.S.	1) Kayu Habang	94	-	56	1,128
	2) Amandit	1,736	73	1,033	41,465
	Sub-Total	1,830	73	1,089	42,593
Tapin	1) Labuhan	81	-	48	975
	2) Tapin	1,546	-	917	37,254
	Sub-Total	1,627	-	965	38,229
Study Area		8,630	9,001	5,274	209,526

Table 18 Upgrading and Rehabilitation of Existing Drainage Schemes

Kabupaten	Scheme	Cultivable	Existing	Grade up [1]	Grade up [2]	Rehabil- itation
		Area [ha]				
Tabalong	1 S.Gampa	1,500	B		D	-
	2 S.Rampang	600	C		E	0
	3 S.Paliat	475	B		D	0
	4 S.Pimping	150	B		D	0
	5 S.Bintro	100	B		D	-
	6 S.Nanti	200	B		D	0
	Sub-Total	3,025				
H.S.U	7 S.Pinang Habang	1,995	A		D	0
	8 R.Batu Mandi	1,360	A	D	E	-
	Sub-Total	3,355				
H.S.T	9 Tg.Jararih	1,194	C		E	0
	10 Tg.Semmangi Kambat	2,640	C		E	0
	11 R.Taras	300	A		D	0
	12 R.Bangkau	900	A	D	E	0
	Sub-Total	5,034				
H.S.S	13 Tg.Lungau	2,005	C		E	-
	14 Tg.Pengaubau	500	C		E	0
	15 S.Kajang	1,500	A		D	0
	16 S.Tirtabahalayung	600	C		E	0
	17 S.Taniran	300	A		D	0
	18 R.Negara	5,200	A	D	E	0
	19 S.Bulum	600	A		D	-
Sub-Total	10,705					
Tapin	20 5 bh Pintu Air	400	C		E	-
	21 S.Udul	1,000	A		D	0
	22 R.Muning	8,000	D	D	E	0
	23 S.Garis Harat	1,000	A		D	0
	24 S.Tapin Gadung	1,000	A		D	0
	25 S.Pinang Babaris	300	D	D	E	0
	26 R.Belanti	2,750	D	D	E	0
	27 S.Damar	1,250	A		D	0
	28 S.Selai	400	A		D	0
	29 S.Masira	150	A		D	0
Sub-Total	16,250					
Study Area		38,369				

Table 19 Construction Cost for Planned and New Drainage Schemes

		(Unit: Rp. million)						
Kabupaten	Scheme	Scheme Area [ha]	Drainage System		Construction Cost			
			First Stage	Grade Up	First Stage	Grade Up	Total	
Planned Schemes								
H.S.U.	30.	Pinang Kara	4,600	A	D	4,495	7,397	11,892
H.S.T.	31.	R.Bangkau II	600	D		1,372		1,372
H.S.S.	32.	R.Angkinang	1,500	D		3,525		3,525
	33.	R.Garis	1,500	D		3,525		3,525
	34.	R.Negara II	500	D		1,067		1,067
Tapin	35.	R.Bahanau	2,000	D		3,991		3,991
	36.	R.Muning II	2,000	D	E	3,991	2,091	6,082
Total			12,700			21,966	9,488	31,454
New Schemes								
Tabalong	37.	R.Tanunti	150	E		585		585
	38.	Bangkiling	400	E		1,457		1,457
	39.	Pulau Kuu	280	E		1,033		1,033
H.S.T.	40.	S.Sirung	2,500	D		5,719		5,719
	41.	S.Binjai	800	D		1,833		1,833
H.S.S.	42.	S.Hdangan	3,800	A	D	2,522	5,573	8,095
	43.	S.Batang Alai	1,500	A	D	996	2,199	3,195
	44.	S.Tinjau langit	5,000	A	D	3,319	7,333	10,652
Tapin	45.	R.Muning III	2,000	D	E	3,929	2,091	6,020
Total			16,430			21,393	17,196	38,589

Table 20 Construction Cost for Existing Drainage Schemes

Kabupaten	Project Name	Scheme Area [ha]	Drainage System		Cost (Rp. million)			Total
			Existing	Grade up	Rehabilitation	Extention	Grade up	
Tabalong	1. S.Gampa	1,500	B	D		241	3,112	3,353
	2. S.Rampang	600	C	E	57	82	747	886
	3. S.Paliat	475	B	D	51	37	649	737
	4. S.Pimping	150	B	D	13	10	286	309
	5. S.Bintoro	100	B	D		3	172	175
	6. S.Nanti	200	B	D	48	22	300	370
	Sub-Total	3,025			169	395	5,266	5,830
H.S.U.	7. S.Pinang Habang	1,995	A	D	446	533	2,212	3,191
	8. R.Batu Mandi	1,360	A	D		210	1,636	1,846
	Sub-Total	3,355			446	743	3,848	5,037
H.S.T.	9. Tg.Jaranih	1,194	C	E	212	200	1,098	1,510
	10. Tg.Semmanggi Kambat	2,640	C	E	65	1,192	2,105	3,362
	11. R.Taras	300	A	D	17	39	708	764
	12. R.Bangkau	900	A	D	137	178	1,458	1,773
	Sub-Total	5,034			431	1,609	5,369	7,409
H.S.S.	13. Tg.Lungau	2,005	C	E		237	2,758	2,995
	14. Tg.Pengambau	500	C	E	38		1,097	1,135
	15. S.Kajang	1,500	A	D	24		1,820	1,844
	16. S.Tirtabahalayung	600	C	E	229	98	921	1,248
	17. S.Taniran	300	A	D	59		640	699
	18. R.Negara	5,200	A	D	2,027		4,202	6,229
	19. S.Balum	600	A	D		29	876	905
	Sub-Total	10,705			2,377	364	12,314	15,055
Tapin	20. 5 bh Pintu Air	400	C	E			627	627
	21. S.Udul	1,000	A	D	74		1,338	1,412
	22. R.Muning	8,000	D	E	533	653	10,470	11,656
	23. S.Garis Halat	1,000	A	D	130	139	1,199	1,468
	24. S.Tapin Gadung	1,000	A	D	401	118	1,220	1,739
	25. S.Pinang Babaris	300	D	E	35	10	546	591
	26. R.Belanti	2,750	D	E	1,112		3,093	4,205
	27. S.Damar	1,250	A	D	74	158	1,514	1,746
	28. S.Selai	400	A	D	33	39	526	598
	29. S.Masera	150	A	D	33		282	315
	Sub-Total	16,250			2,425	1,117	20,815	24,357
Total		38,369			5,848	4,228	47,612	57,688

Table 21 Construction Cost for Polders

Kabupaten	Scheme	Scheme Area (ha)	Construction Cost (1000 Rp)	Remarks
Tabalong	Ampukung	418	347,718	rehabilitation
	Tigaron	144	283,434	rehabilitation
	Sub-total		631,152	
H.S.U	Padang Gusti	468	1,643,625	rehabilitation
	Bakar	2,344	1,722,519	rehabilitation
	Pakacangan	1,694	2,048,614	rehabilitation
	Kaludan	2,300	26,298	rehabilitation
	Murung Bayur	1,737	0	
	Simpang Empat	1,274	39,447	rehabilitation
	Alabio	4,500	8,216,664	rehabilitation
	Lampihong	2,800	24,391,395	new construction
Sub-total		38,088,562		
H.S.S	Kalumpang	600	7,733,073	new construction
Study Area		18,279	46,452,787	

Table 22 Future Paddy Field Distribution by Type of Field Condition

Type of Paddy Field	Kabupaten					Strip along the Barito	Study Area
	Tabalong	H.S.U.	H.S.T.	H.S.S.	Tapin		
(Unit: ha)							
1. Swamps							
- Poldered	560	17,120	-	600	-	-	18,280
- Drained	3,860	7,960	8,930	24,500	22,250	-	67,500
- Rainfed	230	7,520	4,450	10,880	6,610	300	29,990
Sub-total	4,650	32,600	13,380	35,980	28,860	300	115,770
2. Alluvial plains							
- Irrigated	3,650	6,560	12,730	9,200	8,290	-	40,430
- Rainfed	3,350	600	25,030	3,300	1,090	-	33,370
Sub-total	7,000	7,160	37,760	12,500	9,380	-	73,800
3. Alluvial valleys							
- Rainfed	-	2,330	-	-	-	-	2,330
Total	11,650	42,090	51,140	48,480	38,240	300	191,900

Table 23 Seasonal Paddy and Palawija Crop Planted Area in Future by Type of Field Condition

Type of Paddy Field	Kabupaten					Strip along the Barito	Study Area
	Tabalong	H.S.U.	H.S.T.	H.S.S.	Tapin		
(Unit: ha)							
1. Wet Season Paddy							
- Poldered	-	4,500	-	-	-	-	4,500
- Drained	2,360	7,960	8,030	23,900	21,700	-	63,950
- Irrigated	3,650	6,560	12,730	9,200	8,290	-	40,430
- Rainfed	-	300	-	1,650	550	-	2,500
- (Alluvial plains)	(-)	(300)	(-)	(1,650)	(550)	-	(2,500)
Sub-total	6,010	19,320	20,760	34,750	30,540	-	111,380
2. Wet Season Palawija							
- Rainfed	3,350	2,630	25,030	1,650	540	-	3,320
- (Alluvial plains)	(3,350)	(300)	(25,030)	(1,650)	(540)	(-)	(30,870)
- (Alluvial valleys)	(-)	(2,330)	(-)	(-)	(-)	(-)	(2,330)
3. Dry Season Paddy							
- Poldered	560	17,120	-	600	-	-	18,280
- Drained	1,500	-	900	600	550	-	3,550
- Irrigated	2,900	5,440	11,890	6,310	4,580	-	31,120
- Rainfed	230	7,520	4,450	10,880	6,610	300	29,990
- (Swamps)	(230)	(7,520)	(4,450)	(10,880)	(6,610)	(300)	(29,990)
Sub-total	5,190	30,080	17,240	18,390	11,740	300	82,940
4. Dry Season Palawija							
- Drained	2,360	7,960	8,030	23,900	21,700	-	63,950
- Irrigated	750	1,120	840	2,890	3,710	-	9,310
Sub-total	3,110	9,080	8,870	26,790	25,410	-	73,260
Total Planted Area	17,660	61,110	71,900	81,580	68,230	300	300,780
Total Paddy Field	11,650	42,090	51,140	48,480	38,240	300	191,900
Cropping Intensity (%)	152	145	141	168	178	100	157

Table 24 - Future Land Use Pattern in Study Area

(Unit: ha)

Land Use Paddy Field	Swamps	Alluvial Plains	Alluvial Valleys	Plains	Hills	Mountains	Total
Forest	145,093	707	1,060	24,748	90,241	216,404	478,253
Bush	91,743	225	-	23,284	36,338	45,585	197,175
Grasland	44,759	-	273	-	-	-	45,032
Paddy	115,769	73,800	2,326	-	-	-	191,895
Estate	-	37,686	35,027	136,362	-	-	209,075
Upland & shifting	-	4,004	113	1,075	-	-	5,192
Towns & Others	9,382	24,552	4,735	97,723	-	-	136,392
Water	5,254	-	-	-	-	-	5,254
Total	412,000	140,974	43,534	283,192	126,579	261,989	1,268,268

Table 25 Breakdown of Financial Construction Cost and Estimate of Economic Construction Cost for Irrigation Project

Kabupaten/ Name of Subzone	Area (ha)	Type of Scheme	Present to W/O #	Without Project (W/O) to With Project (W/P)			Total Cost (Percent to W/P) (Rp./MN)	Economic Construction Cost (Rp./MN)
				Rehabilita- tion (Rp./MN)	On-line Grading-up (Rp./MN)	New Constr- uction (Rp./MN)		
TABALONG								
1 Jare	625	Exist	0	8	-	8	8	6
2 Jare Bawah	200	Exist	3-5	82	591	273	305	218
3 Guriba	254	Exist	0	112	243	355	361	284
4 Sungai Kari	280	New	0	-	745	745	790	596
5 Ngaran	64	New	0	-	197	197	207	158
6 Kintan	408	New	0	-	1,260	1,260	1,325	1,008
7 Mihin	205	New	0	-	627	627	659	502
8 Bantupit	225	New	0	-	598	598	634	478
9 Ehas	843	New	0	-	1,986	1,986	2,089	1,589
10 Banyu Tj. u.	750	New	0	-	2,367	2,367	2,487	1,894
HULU SUNGAI UTARA								
1 Pesta	188	Exist	77	87	180	267	281	214
2 Tondak	293	Exist	0	140	223	363	369	290
3 Sapat	116	Exist	0	94	110	204	207	153
4 Lok Sani	116	Exist	0	241	110	351	355	281
5 Beringin	2,172	New	0	-	13,040	13,040	13,388	10,432
6 Plog	3,794	New	0	-	22,418	22,418	23,015	17,954
HULU SUNGAI TENGAH								
1 Telag	165	Exist	0	163	158	321	326	257
2 Tapak	186	Exist	0	87	178	265	270	212
3 Tanyars	166	Exist	0	120	159	279	283	223
4 Barah Hawang	160	Exist	57	17	153	170	180	136
5 Hangan	920	Exist	0	87	1,130	1,217	1,244	974
6 Kanakar	693	Exist	0	125	606	731	746	585
7 Mangmas	515	Exist	0	81	493	574	586	459
8 Hanyam Dayak	1,486	Exist	0	162	1,422	1,584	1,619	1,267
9 Banting Alai	6,223	New	0	-	57,758	37,758	38,754	30,206
10 Barabai	2,278	New	0	-	13,677	13,677	14,041	10,942
HULU SUNGAI SELATAN								
1 Teage Lunat	1,534	Exist	0	356	1,468	1,824	1,861	1,459
2 Tavab	178	Exist	0	34	191	245	250	196
3 Nhangin	36	Exist	0	95	158	253	257	202
4 Kuegan	146	Exist	0	108	225	333	339	265
5 Panyujan	214	Exist	0	56	335	391	399	313
6 Hawar	71	Exist	403	105	245	350	391	280
7 Tasi	107	Exist	0	208	277	485	493	388
8 Jasi	145	Exist	0	14	76	90	97	72
9 Kaye Habang	347	New	0	-	1,072	1,072	1,128	858
10 Akradi	6,452	New	0	-	40,558	40,558	41,387	32,286
TAPIN								
1 Lok Pata	392	Exist	294	67	375	442	484	354
2 Pampain	392	Exist	0	134	375	509	549	431
3 Nisandang	253	Exist	246	242	242	249	283	199
4 Tandan	99	Exist	0	77	259	172	174	138
5 Pulau Piang	270	Exist	0	2	259	261	267	209
6 Kempanang	146	Exist	0	30	140	170	175	136
7 Banting	1,106	Exist	1,106	90	1,059	1,149	1,310	919
8 Tapin	5,328	New	0	-	34,107	34,107	34,960	27,286
9 Labuhan	300	New	0	-	927	927	975	742

Note: # Construction cost only for main system

Table 26 Breakdown of Financial Construction Cost and Estimate of Economic Construction Cost for Drainage Project

Kategori/ Name of Scheme	Type of Scheme	Level of Improvement	Area (ha)	Present to W/O P. (Rp.MN)	Improvement Stage			Type D to Type E (Rp.MN)	Sub-Total (Rp.MN)	Total Cost of All Stages (Rp.MN)	Economic Construction Cost (Rp.MN)
					W/P to W/P (Rp.MN)	W/O to Type A (Rp.MN)	W/O to Type D (Rp.MN)				
TAMALONG											
1 S.Gumpa	Exist	W/O to T-D	1,500	241	3,112	-	-	-	3,112	3,353	2,490
2 S.Rampung	Exist	W/O to T-E	600	82	504	-	-	-	804	886	643
3 S.Palati	Exist	W/O to T-D	475	37	700	-	-	-	700	700	560
4 S.Pinang	Exist	W/O to T-D	150	10	299	-	-	-	299	309	239
5 S.Beraco	Exist	W/O to T-D	100	5	172	-	-	-	172	178	138
6 S.Nanti	Exist	W/O to T-E	200	22	348	-	-	-	348	370	278
7 Tarami	New	W/O to T-E	150	0	585	-	-	-	585	585	468
8 Bangkling	New	W/O to T-E	400	0	1,457	-	-	-	1,457	1,457	1,166
9 Pulau Kiu	New	W/O to T-E	230	0	1,457	-	-	-	1,457	1,457	1,166
HULU SUNGAI UTARA											
1 S.Pirang Habang	Exist	W/O to T-D	1,995	533	2,658	-	-	-	2,658	3,191	2,126
2 R.Bun Merdi	Exist	W/O to T-D	1,360	210	1,636	-	-	-	1,636	1,846	1,309
3 R.Puang Kara	Planned	W/O to T-A	4,600	0	4,495	-	-	-	4,495	-	3,596
	-do-	T-A to T-D	4,600	0	-	7,397	-	-	7,397	11,892	5,918
HULU SUNGAI TENGAH											
1 R.Taras	Exist	W/O to T-D	300	39	725	-	-	-	725	764	580
2 R.Bangkau	Exist	W/O to T-D	900	178	1,595	-	-	-	1,595	-	1,276
3 Tg.Jamali	Exist	W/O to T-E	1,194	0	1,510	-	-	-	1,510	1,510	1,048
4 Tg.Seranggi Kumbur	Exist	W/O to T-E	2,640	0	3,362	-	-	-	2,170	2,170	1,735
5 R.Bangkau Extension	Planned	W/O to T-D	600	0	-	1,372	-	-	1,372	1,372	1,098
6 S.Sirang	New	W/O to T-D	2,500	0	-	5,719	-	-	5,719	5,719	4,575
7 Bukit	New	W/O to T-D	800	0	-	1,833	-	-	1,833	1,833	1,466
HULU SUNGAI SELATAN											
1 Tg.Lungku	Exist	W/O to T-E	2,005	237	2,758	-	-	-	2,758	2,995	2,206
2 Tg.Pengribau	Exist	W/O to T-E	500	0	1,135	-	-	-	1,135	1,135	908
3 S.Kajang	Exist	W/O to T-D	1,500	0	1,844	-	-	-	1,844	1,475	1,475
4 S.Tera Bahalayu	Exist	W/O to T-E	600	98	1,150	-	-	-	1,150	1,248	920
5 S.Tamin	Exist	W/O to T-D	300	0	699	-	-	-	699	699	559
6 R.Negara	Exist	W/O to T-D	5,200	0	-	6,229	-	-	6,229	6,229	4,983
7 S.Bahau	Exist	W/O to T-D	600	29	876	-	-	-	876	905	701
8 R.Ambang	Planned	W/O to T-D	1,500	0	-	3,525	-	-	3,525	3,525	2,820
9 R.Garis	Planned	W/O to T-D	1,500	0	-	3,525	-	-	3,525	3,525	2,820
10 R.Negara Extension	Planned	W/O to T-D	500	0	-	1,067	-	-	1,067	1,067	854
11 S.Hadangan	New	W/O to T-A	3,800	0	-	2,522	-	-	2,522	-	2,918
	-do-	T-A to T-D	3,800	0	-	-	5,573	-	5,573	8,095	4,458
12 S.Batang Arai	New	W/O to T-A	1,500	0	-	996	-	-	996	-	797
	-do-	T-A to T-D	1,500	0	-	-	2,199	-	2,199	3,195	1,759
13 Tanjung Langit	New	W/O to T-A	5,000	0	-	3,319	-	-	3,319	-	2,655
	-do-	T-A to T-D	5,000	0	-	-	7,333	-	7,333	10,652	5,866
TAPIN											
1 S.Udul	Exist	W/O to T-D	1,000	0	1,412	-	-	-	1,412	1,412	1,130
2 R.Muning	Exist	W/O to T-E	8,000	653	11,003	-	-	-	11,003	11,656	8,802
3 S.Garis Halat	Exist	W/O to T-D	1,600	139	1,529	-	-	-	1,529	1,468	1,063
4 S.Tapan Gadung	Exist	W/O to T-D	1,600	13	1,621	-	-	-	1,621	1,739	1,297
5 S.Pinang Babaris	Exist	W/O to T-E	300	10	581	-	-	-	581	591	465
6 R.Belant	Exist	W/O to T-E	2,750	0	4,205	-	-	-	4,205	4,205	3,564
7 S.Damar	Exist	W/O to T-D	1,250	155	1,588	-	-	-	1,588	1,746	1,270
8 S.Selai	Exist	W/O to T-D	400	39	559	-	-	-	559	598	447
9 S.Masira	Exist	W/O to T-D	150	0	315	-	-	-	315	315	252
10 Ssh Para Air	Exist	W/O to T-E	400	0	627	-	-	-	627	627	502
11 R.Babara	Planned	W/O to T-D	2,000	0	-	3,991	-	-	3,991	3,991	3,195
12 R.Muning Extension	Planned	W/O to T-D	2,000	0	-	-	2,091	-	-	6,082	1,673
	-do-	T-D to T-E	2,000	0	-	-	-	2,091	-	-	3,143
13 R.Muning 2nd Extension	New	W/O to T-D	2,000	0	-	3,929	-	-	3,929	-	1,673
	-do-	T-D to T-E	2,000	0	-	-	2,091	-	2,091	6,020	1,673

Table 27 Breakdown of Financial Construction Cost and Estimate of Economic Construction Cost for Polder Project

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Present to W/O (Rp.MN)		Without Project (W/O) to With Project (W/P)			Total Cost to W/P (Rp.MN)	Economic Construction Cost (Rp.MN)
			Rehabil. & Renewal (Rp.MN)	On-farm Grading-up (Rp.MN)	Sub-Total	Land Acquisition (Rp.MN)	Total		
TABALONG									
1	Amipukung	418	0	348	0	348	0	348	278
2	Tigaron	144	0	283	0	283	0	283	226
HULU SUNGAI UTARA									
1	Padang Gusti	468	0	1,644	0	1,644	0	1,644	1,315
2	Bakar	2,344	0	1,723	0	1,723	0	1,723	1,378
3	Pakacangan	1,694	0	2,049	0	2,049	0	2,049	1,639
4	Kabudan	2,300	0	26	0	26	0	26	21
5	Murung Bayun a/	1,737	0	-	-	-	-	-	-
6	Simpang Empat	1,274	0	39	0	39	0	39	31
7	Alabio	4,500	0	8,217	0	8,217	0	8,217	6,574
8	Lampihong	2,800	0	23,778	0	23,778	0	23,778	19,022
HULU SUNGAI SELATAN									
1	Katumpang	600	0	7,733	0	7,733	0	7,733	6,186

Table 28 Breakdown of Financial Construction Cost and Estimate of Economic Construction Cost for Fishery Project

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Present to W/O (Rp.MN)		Without Project (W/O) to With Project (W/P)			Total Cost to W/P (Rp.MN)	Economic Construction Cost (Rp.MN)
			Rehabil. & Renewal (Rp.MN)	On-farm Grading-up (Rp.MN)	Sub-Total	Land Acquisition (Rp.MN)	Total		
HULU SUNGAI UTARA									
1	Alabio	100	0	522	0	522	0	522	418
		1,000	0	8,816	0	8,816	0	8,816	7,053
TAPIN									
1	Margasari	0	0	32,448	0	32,448	0	32,448	25,958

Note: a/ Level of development; from without project to with; project of short-term development
b/ Level of development; from with project of short-term development to with; project of medium-term development
c/ Level of development; from without project to with project of long-term development

Table 29 Crop Budget per Hectare under Without Project Condition (Economic Prices)

Item	Unit	(1) Wetland Paddy				(2) Palawija Crops (Mungbeans)				(3) Inland Open Water Fishery				
		(i) Existing Irrigation Scheme		(ii) Existing Drainage and Polder		Qty	Price (Rp.)	Amount ('000Rp)	Qty	Price (Rp.)	Amount ('000Rp)	Qty	Price (Rp.)	Amount ('000Rp)
		Qty	Price (Rp.)	Amount ('000Rp)	Qty									
A. Gross Income														
- Yield	(ton)	3.5	276,000	966.0	1.5	276,000	414.0	0.5	635,000	317.5	0.083	1,316,000	109.3	
B. Production Cost														
1) Farm Input														
- Seed	(kg)	25	330	8.3	20	330	6.6	25	760	19.0	0		0.0	
- Fertilizer														
Urea	(kg)	100	399	39.9	0	399	0.0	0	399	0.0	0		0.0	
TSP	(kg)	50	507	25.4	0	507	0.0	0	507	0.0	0		0.0	
KCl	(kg)	0	325	0.0	0	325	0.0	0		0.0	0		0.0	
- Agro-chemical														
Pesticide	(lit.)	3	7,500	22.5	0	7,500	0.0	0	7,500	0.0	0		0.0	
Rodenticide	(kg)	3	2,200	6.6	0	2,200	0.0	0		0.0	0		0.0	
(Sub-Total)				102.6			6.6			19.0			0.0	
2) Labour Requirement (m/d)		140	2,100	294.0	120	2,100	252.0	50	2,100	105.0	15.5	2,100	32.6	
3) Miscellaneous a/ (% of Sub-Total 1 + 2)		10		39.7	10		25.9	5		6.2			31.1	
Total Production Cost				436.3			284.5			130.2			63.7	
C. Net Return				529.7			129.5			187.3			45.6	

Note: a/ For inland open water fishery, fishing gear purchase, boat depreciation cost etc.

Table 30 Crop Budget per Hectare under
With Project Condition (Economic Prices)

Item	Unit	(1) Wetland Paddy						(2) Palawija Crops (Mungbeans)		
		(i) Existing Irrigation Scheme			(ii) Existing Drainage and Polder			Q'ty	Price (Rp.)	Amount ('000Rp)
		Q'ty	Price (Rp.)	Amount ('000Rp)	Q'ty	Price (Rp.)	Amount ('000Rp)			
A. Gross Income										
- Yield	(ton)	5.5	276,000	1,518.0	3.0	276,000	828.0	1.5	635,000	952.5
II. Production Cost										
1) Farm Input										
- Seed	(kg)	40	330	13.2	25	330	8.3	40	760	30.4
- Fertilizer										
Urea	(kg)	200	399	79.8	100	399	39.9	100	399	39.9
TSP	(kg)	150	507	76.1	50	507	25.4	100	507	50.7
KCl	(kg)	100	325	32.5	0	325	0.0			
- Agro-chemical										
Pesticide	(lit.)	1	7,500	7.5	1	7,500	7.5	1	7,500	7.5
Rodenticide	(kg)	3	2,200	6.6	3	2,200	6.6	2	2,200	4.4
(Sub-Total)				215.7			87.6			128.5
2) Labour Requirement (m/d)		200	2,100	420.0	150	2,100	315.0	105	2,100	220.5
3) Animal Power (l/d)		15	8,000	120.0	15	8,000	120.0	10	8,000	80.0
4) Miscellaneous (% of Sub-Total 1 to 3)		5		37.8	10		52.3	5		21.5
Total Production Cost				793.4			574.9			450.5
C. Net Return				724.6			253.1			502.1

Item	Unit	(3) Shrimps								
		(i) Short-Term Development in Alabio			(ii) Medium-Term Development in Alabio			(iii) Long-Term Development in Margasari		
		Q'ty	Price (Rp.)	Amount (1000Rp)	Q'ty	Price (Rp.)	Amount (1000Rp)	Q'ty	Price (Rp.)	Amount (1000Rp)
A. Gross Income										
- Yield	(ton)	0.4	7,840,000	3,136.0	1.2	7,840,000	9,408.0	2.4	7,840,000	18,816.0
B. Production Cost										
1) Seed	(Unit)	25,000	7.5	187.5	50,000	7.5	375.0	100,000	7.5	750.0
2) Fertilizer										
Urea	(kg)	120	399	47.9	320	399	127.7	320	399	127.7
3) Chemicals/Others				9.6			25.5			25.5
4) Feeding Stuffs										
- Compound feed	(kg)									
For grow-out		200	1,080	216.0	1,200	1,080	1,296.0	4,800	1,080	5,184.0
For nursery				0.0			259.2			1,036.8
Other feed				43.2			311.0			0.0
5) Labour Requirement (m/d)		25.0	2,100	52.5	366.7	2,100	770.1	600.0	2,100	1,260.0
6) Miscellaneous				156.8			470.4			940.8
Total Production Cost				713.5			3,634.9			9,324.8
C. Net Return				2,422.5			5,773.1			9,491.2

Table 31 Economic Comparison of Irrigation Project and Selection of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Economic Benefit NPV a/ (Rp.MN)	Economic Cost NPV a/ (Rp.MN)	BRR (%)	B/C a/ b/ (Rp.MN)	B-C/ha a/ b/ (Rp.MN)	B/C a/ b/	Paddy Increment (tons)	Prior Scheme B/C>1.00 (*)
TABALONG										
1 Jaro c/	Exist	625	0.0	109.4	-	(109.4)	(0.18)	0.00	0	
2 Jaro Bawah	Exist	200	1,510.1	214.4	50.75	1,295.8	6.48	7.04	1,700	(*)
3 Gumba	Exist	254	625.2	277.7	22.07	347.4	1.37	2.25	1,020	(*)
4 Sungai Kali	New	280	1,024.9	540.7	18.54	484.2	1.73	1.90	1,070	(*)
5 Namun	New	61	291.0	141.6	14.83	149.4	2.33	2.06	310	(*)
6 Kinarim	New	408	3,080.6	903.5	29.24	2,177.1	5.34	3.41	3,470	(*)
7 Mabin	New	203	1,532.8	449.6	29.24	1,083.2	5.34	3.41	1,730	(*)
8 Batu Pulut	New	225	1,410.6	434.1	28.39	976.5	4.34	3.25	1,570	(*)
9 Bilas	New	643	4,855.0	1,424.1	29.24	3,430.9	5.34	3.41	5,470	(*)
10 Banyu Tajun	New	750	5,662.9	1,694.6	28.79	3,968.3	5.29	3.34	6,380	(*)
Sub-Total		3,652							22,720	
HULU SUNGAI UTARA										
1 Parau	Exist	188	462.7	208.4	21.80	254.3	1.35	2.22	750	(*)
2 Tundakan	Exist	233	384.0	279.5	14.10	104.4	0.45	1.37	620	(*)
3 Supin	Exist	116	192.0	154.6	12.69	37.4	0.32	1.24	310	(*)
4 Lok Batu	Exist	116	192.0	252.1	7.10	(60.1)	(0.52)	0.76	310	
5 Halangan	New	2,172	16,399.8	9,009.4	17.60	7,390.4	3.40	1.82	18,460	(*)
6 Pitap	New	3,734	29,109.0	16,110.6	17.73	12,998.4	3.48	1.81	35,470	(*)
Sub-Total		6,559							55,920	
HULU SUNGAI TENGAH										
1 Talang	Exist	165	406.1	240.4	16.97	165.7	1.00	1.69	660	(*)
2 Tapuk	Exist	186	457.8	206.7	21.74	251.1	1.35	2.21	740	(*)
3 Taniyang	Exist	166	406.1	212.7	19.01	193.4	1.17	1.91	660	(*)
4 Darul Hawang	Exist	160	393.8	139.4	27.07	254.4	1.39	2.83	640	(*)
5 Intangan	Exist	920	487.1	960.3	2.50	(473.2)	(0.51)	0.51	2,040	
6 Kahakan	Exist	633	335.3	590.2	3.50	(255.0)	(0.40)	0.57	1,400	
7 Mangunang	Exist	515	1,267.5	466.4	26.14	801.1	1.56	2.72	2,060	(*)
8 Haruyan Dayak	Exist	1,486	1,066.8	1,298.0	7.59	(231.2)	(0.16)	0.82	4,460	
9 Halang Alai	New	6,223	48,512.4	27,112.6	17.58	21,399.8	3.44	1.79	59,120	(*)
10 Harahal	New	2,278	17,758.5	9,828.9	17.73	7,929.6	3.48	1.81	21,640	(*)
Sub-Total		12,732							93,420	
HULU SUNGAI SELATAN										
1 Telaga Lansat	Exist	1,534	725.4	1,465.1	2.08	(739.7)	(0.48)	0.50	3,030	
2 Tayub	Exist	178	289.2	192.1	15.48	97.1	0.55	1.51	470	(*)
3 Nunungin	Exist	36	57.8	173.8	0.39	(115.9)	(3.22)	0.33	90	
4 Kuarang	Exist	143	231.4	244.7	9.36	(13.3)	(0.09)	0.95	380	
5 Pamujan	Exist	214	347.0	294.9	11.99	52.1	0.24	1.18	560	(*)
6 Hawatu	Exist	71	115.7	243.9	2.97	(128.3)	(1.81)	0.47	190	
7 Taal	Exist	107	173.5	339.5	3.56	(165.9)	(1.55)	0.51	280	
8 Jasau	Exist	143	67.5	83.5	7.05	(16.0)	(0.11)	0.81	280	
9 Kayu Habang	New	347	2,260.9	768.7	26.19	1,492.2	4.30	2.94	2,720	(*)
10 Amandit	New	6,432	45,711.23	28,733.42	15.82	16,977.8	2.64	1.59	55,390	(*)
Sub-Total		9,205							63,390	
TAPIN										
1 Lok Paikat	Exist	392	185.6	358.4	2.47	(172.8)	(0.44)	0.52	780	
2 Pampain	Exist	392	636.2	422.7	15.48	213.5	0.54	1.50	1,030	(*)
3 Nupadang	Exist	253	123.5	207.3	3.80	(83.8)	(0.33)	0.60	520	
4 Tatakan	Exist	99	163.7	130.6	12.82	33.1	0.33	1.25	270	(*)
5 Pulau Pinang	Exist	270	457.8	218.1	21.49	239.7	0.89	2.10	740	(*)
6 Rampanang	Exist	146	101.2	137.1	6.40	(35.8)	(0.25)	0.74	420	
7 Binuang	Exist	1,106	523.0	946.2	3.04	(423.2)	(0.38)	0.55	2,190	
8 Tapin	New	5,328	36,780.0	21,175.5	15.19	12,604.6	2.37	1.52	43,450	(*)
9 Labuhan	New	300	1,612.0	665.0	22.55	947.0	3.16	2.42	1,770	(*)
Sub-Total		8,286							51,170	
Total		40,434							286,620	

Note: a/ At discount rate of 10%

b/ Figures in parentheses indicate minus balance.

c/ Jaro scheme is excluded from the project works, and its works are proposed to be covered by O&M.

Table 32. Economic Comparison of Drainage Project and Selection of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Level of Improvement	Area (ha)	Economic		ERR (%)	B-C a/b (Rp/M)	B-C/a a/b (Rp/M/ha)	B/C a'	Priority Increment (cont)	Prior Scheme B/C=1.00 (*)
				Benefit NPV a/ (Rp/M)	Cost NPV a/ (Rp/M)						
TABALONG											
1 S. Gumpa	Exist	W/O to T-D	1,500	1,149.2	2,119.6	3.53	(970.4)	(0.65)	0.54	2,200	(*)
2 S. Rempang	Exist	W/O to T-E	600	2,255.8	592.9	32.10	1,660.0	2.77	3.79	890	(*)
3 S. Pahat	Exist	W/O to T-D	475	1,775.6	513.8	29.36	1,260.0	2.65	3.45	700	(*)
4 S. Pimping	Exist	W/O to T-D	1,500	560.0	2,139	23.93	346.1	2.31	2.62	220	(*)
5 S. Binro	Exist	W/O to T-D	100	373.5	245.5	24.70	248.9	2.49	3.00	150	(*)
6 S. Nanti	Exist	W/O to T-D	200	1,035.6	251.5	33.65	782.0	3.92	4.12	290	(*)
7 Temuni	New	W/O to T-E	150	546.7	403.5	13.55	143.2	0.95	1.35	200	(*)
8 Bangking	New	W/O to T-E	400	1,457.9	1,007.8	14.40	450.1	1.15	1.45	520	(*)
9 P. Jau Kua	New	W/O to T-E	280	1,020.4	995.3	10.27	25.1	0.09	1.03	370	(*)
Sub-Total			3,855							5,540	
HULU SUNGAI UTARA											
1 S. Pinang Habang	Exist	W/O to T-D	1,995	7,540.9	1,973.7	32.54	5,567.2	2.79	3.82	2,910	(*)
2 R. Bent. Mendi	Exist	W/O to T-D	1,560	2,651.4	1,439.1	18.59	1,212.3	0.89	1.84	1,980	(*)
3 R. Pinang Kera	Planned	W/O to T-D	4,660	20,748.6	8,597.1	22.74	12,151.5	2.69	2.47	13,080	(*)
Sub-Total			7,955							17,940	
HULU SUNGAI TENGAH											
1 R. Teras	Exist	W/O to T-D	900	1,130.8	512.5	20.80	618.3	2.06	2.21	480	(*)
2 R. Zangkau	Exist	W/O to T-D	900	679.3	1,152.9	4.53	(-79.6)	(0.53)	0.58	1,500	(*)
3 Tg. Jernih	Exist	W/O to T-E	1,194	2,234.7	1,777.7	19.07	1,057.0	0.89	1.90	1,880	(*)
4 Tg. Seremagi Kambet	Exist	W/O to T-E	2,640	8,657.7	2,749.2	29.38	5,888.5	2.23	3.15	4,150	(*)
5 R. Bengkang Extension	Planned	W/O to T-D	600	913.7	973.3	9.51	(59.6)	(0.10)	0.94	1,710	(*)
6 S. Siriang	New	W/O to T-D	2,500	11,357.5	4,357.5	25.10	7,500.5	2.92	2.80	7,140	(*)
7 Binjai	New	W/O to T-D	800	5,654.4	1,500.2	25.07	2,354.2	2.92	2.80	2,240	(*)
Sub-Total			8,934							18,850	
HULU SUNGAI SELATAN											
1 Tg. Longkau	Exist	W/O to T-E	2,005	7,602.1	2,041.3	31.69	5,560.7	2.77	3.72	2,950	(*)
2 Tg. Pagarbutu	Exist	W/O to T-E	500	1,595.4	808.2	22.81	1,187.2	2.37	2.47	790	(*)
3 S. Kajang	Exist	W/O to T-D	1,500	5,981.0	1,389.4	35.50	4,591.6	3.06	4.30	2,380	(*)
4 S. Terai Bahayu	Exist	W/O to T-E	600	2,407.2	829.3	26.00	1,578.0	2.63	2.90	970	(*)
5 S. Tuai	Exist	W/O to T-D	900	1,196.2	496.8	22.35	699.4	2.33	2.41	470	(*)
6 R. Negera	Exist	W/O to T-D	5,200	19,601.2	4,680.8	34.76	14,920.4	2.87	4.19	7,480	(*)
7 S. Bahau	Exist	W/O to T-D	600	506.7	647.6	7.90	(140.8)	(0.23)	0.78	970	(*)
8 R. Aukiang	Planned	W/O to T-D	1,500	6,814.5	2,496.3	24.60	4,318.2	2.88	2.73	4,290	(*)
9 R. Gurus	Planned	W/O to T-D	1,500	6,814.5	2,496.3	24.60	4,318.2	2.88	2.73	4,290	(*)
10 R. Negera Extension	Planned	W/O to T-D	500	2,271.5	780.5	26.42	1,511.0	3.02	2.99	1,430	(*)
11 S. Hadangan	New	W/O to T-D	3,800	18,126.2	3,793.2	27.41	14,533.0	3.77	4.78	11,400	(*)
12 S. Bawang Arai	New	W/O to T-D	1,500	7,155.1	2,285.4	27.42	4,869.7	3.25	3.13	4,500	(*)
13 Teras Langat	New	W/O to T-D	5,000	23,850.3	7,519.2	27.41	16,231.1	3.25	3.13	15,000	(*)
Sub-Total			24,505							56,890	
TAPIN											
1 S. Uda	Exist	W/O to T-D	1,600	3,997.7	1,047.4	32.30	2,950.2	2.95	3.82	1,580	(*)
2 R. Muring	Exist	W/O to T-E	8,000	31,614.7	8,185.1	32.63	23,429.6	2.93	3.86	12,000	(*)
3 S. Garis Hilir	Exist	W/O to T-D	1,000	5,991.1	992.4	33.66	2,998.7	3.00	4.02	1,570	(*)
4 S. Tapin Gadung	Exist	W/O to T-D	1,000	5,984.6	1,186.0	29.22	2,798.6	2.80	3.36	1,560	(*)
5 S. Pinang Baharu	Exist	W/O to T-E	300	1,185.6	418.6	25.50	766.9	2.56	2.83	450	(*)
6 R. Belahri	Exist	W/O to T-E	2,750	10,974.7	3,094.0	30.50	7,880.7	2.87	3.55	4,200	(*)
7 S. Damar	Exist	W/O to T-D	2,250	4,980.8	1,191.9	34.68	3,788.9	3.05	4.18	1,960	(*)
8 S. Selai	Exist	W/O to T-D	400	937.8	415.1	7.70	(77.3)	(0.19)	0.81	650	(*)
9 S. Masim	Exist	W/O to T-D	150	126.8	223.6	4.23	(96.6)	(0.66)	0.56	240	(*)
10 Sbb. Pinu Air	Exist	W/O to T-E	400	390.1	460.2	6.43	(130.1)	(0.33)	0.72	630	(*)
11 R. Baharu	Planned	W/O to T-D	2,000	9,540.1	2,686.8	28.74	6,853.4	3.43	3.55	6,000	(*)
12 R. Muring Extension	Planned	W/O to T-E	2,000	9,560.1	4,235.4	20.97	5,314.7	2.66	2.26	6,000	(*)
13 R. Muring and Extension	New	W/O to T-E	2,000	9,540.1	4,214.3	21.14	5,325.8	2.66	2.26	6,000	(*)
Sub-Total			22,250							42,950	
Total			67,499							142,170	

Note: a: At discount rate of 10 %
 b: Figures in parentheses indicate minus balance.
 W/O: without Project
 T-D: Type D
 T-E: Type E

Table 33 Economic Comparison of Polder Project and Selection of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Economic			EIRR (%)	B-C a/ b/ (Rp.MN)	B-C/ha a/ b/ (Rp.MN/ha)	B/C a/	Paddy Increment (tons)	Prior Scheme B/C>1.00 (*)
			Benefit NPV a/ (Rp.MN)	Cost NPV a/ (Rp.MN)	NPV a/ (Rp.MN)						
TABALONG											
1 Ampukung	Exist	418	369.7	300.4	12.89	69.3	0.17	1.23	710	(*)	
2 Tigaron	Exist	144	136.2	211.7	5.26	(75.5)	(0.53)	0.64	260		
Sub-Total		562							970		
HULU SUNGAI UTARA											
1 Padang Gusti	Exist	468	365.4	1,168.2	-0.58	(802.8)	(1.71)	0.31	700	(*)	
2 Bakar	Exist	2,344	2,070.5	1,533.1	14.37	537.5	0.23	1.35	3,960	(*)	
3 Pakacangan	Exist	1,694	1,527.1	1,641.0	9.12	(113.9)	(0.07)	0.93	2,920	(*)	
4 Kaludan	Exist	2,300	2,204.7	440.3	195.44	1,764.4	0.77	5.51	4,200	(*)	
5 Mirung Bayun c/	Exist	1,737	-	-	-	-	-	-	-	(*)	
6 Simpang Empat	Exist	1,274	994.6	238.1	104.20	756.6	0.59	4.18	1,910	(*)	
7 Alabio	Exist	4,500	33,977.5	6,948.2	41.27	27,029.3	6.01	4.89	38,250	(*)	
8 Lamphong	New	2,800	3,331.5	16,235.0	-2.83	(12,903.5)	(4.61)	0.21	6,300	(*)	
Sub-Total		15,380							58,240		
HULU SUNGAI SELATAN											
1 Kalumpang	New	600	468.4	5,228.2	-7.57	(4,759.7)	(7.93)	0.09	900		
Total		16,542							60,110		

Note: a/ At discount rate of 10 %
b/ Figures in parentheses indicate minus balance.
c/ No merit from improvement of hardware

Table 34 Economic Comparison of Irrigation Project and Ranking of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Economic			EIRR (%)	B-C (Rp.MN)	B-C/ha (Rp.MN/ha)	B/C a/	Paddy Increment (tons)	Ranking	
			Benefit NPV a/ (Rp.MN)	Cost NPV a/ (Rp.MN)	EIRR						EIRR	B-C/ha Rank
TABALONG												
2 Jaro Bawah	Exist	200	1,510.1	214.4	50.75	1,295.8	6.48	7.04	1,700	A	A	1
3 Gumba	Exist	254	625.2	277.7	22.07	347.4	1.37	2.25	1,070	A	C	2
4 Sungai Kafi	New	280	1,024.9	540.7	18.54	484.2	1.73	1.90	1,070	B	C	3
5 Namun	New	64	291.0	141.6	19.74	149.4	2.33	2.06	510	B	B	2
6 Kinarum	New	408	3,080.6	903.5	29.24	2,177.1	5.34	3.41	3,470	A	A	1
7 Milin	New	203	1,532.8	449.6	29.24	1,083.2	5.34	3.41	1,730	A	A	1
8 Barupulut	New	225	1,410.6	434.1	28.39	976.5	4.34	3.25	1,570	A	A	1
9 Bilas	New	643	4,855.0	1,424.1	29.24	3,430.9	5.34	3.41	5,470	A	A	1
10 Banyu Tajun	New	750	5,662.9	1,694.6	28.79	3,968.3	5.29	3.34	6,380	A	A	1
Sub-Total		3,027							22,720			
HULU SUNGAI UTARA												
1 Paran	Exist	188	462.7	208.4	21.80	254.3	1.35	2.22	750	A	C	2
2 Tunoakan	Exist	233	384.0	279.5	14.10	104.4	0.45	1.37	620	C	E	4
3 Suapin	Exist	116	192.0	154.6	12.69	37.4	0.32	1.24	310	D	E	5
5 Balangan	New	2,172	16,399.8	9,009.4	17.60	7,390.4	3.40	1.82	18,460	C	A	2
6 Pitap	New	3,734	29,109.0	16,110.6	17.73	12,998.4	3.48	1.81	35,470	C	A	2
Sub-Total		6,443							55,610			
HULU SUNGAI TENGAH												
1 Talang	Exist	165	406.1	240.4	16.97	165.7	1.00	1.69	660	C	D	4
2 Tapuk	Exist	185	457.8	206.7	21.74	251.1	1.35	2.21	740	A	C	2
3 Tariyang	Exist	166	406.1	212.7	19.01	193.4	1.17	1.91	660	B	C	3
4 Baruh Hawang	Exist	160	393.8	139.4	27.07	254.4	1.59	2.83	640	A	C	2
7 Mangumang	Exist	515	1,267.5	466.4	26.14	801.1	1.56	2.72	2,060	A	C	2
9 Batang Alai	New	6,223	48,512.4	27,112.6	17.58	21,399.8	3.44	1.79	59,120	C	A	2
10 Barabei	New	2,278	17,758.5	9,828.9	17.73	7,929.6	3.48	1.81	21,640	C	A	2
Sub-Total		9,693							85,520			
HULU SUNGAI SELATAN												
2 Tayub	Exist	178	289.2	192.1	15.48	97.1	0.55	1.51	470	C	D	4
5 Pamujan	Exist	214	347.0	294.9	11.99	52.1	0.24	1.18	560	E	E	5
9 Kayu Habang	New	347	2,260.9	768.7	26.19	1,492.2	4.50	2.94	2,720	A	A	1
10 Amardit	New	6,432	45,711.23	28,733.42	15.82	16,977.8	2.64	1.59	55,390	C	A	2
Sub-Total		7,171							59,140			
TAPIN												
2 Pampain	Exist	392	636.2	422.7	15.48	213.5	0.54	1.50	1,030	C	D	4
4 Tanakan	Exist	99	163.7	130.6	12.82	33.1	0.33	1.25	270	D	E	5
5 Pulan Pnang	Exist	270	457.8	218.1	21.40	239.7	0.89	2.10	740	A	D	3
8 Tapin	New	5,328	36,780.0	24,175.5	15.19	12,604.6	2.37	1.52	43,450	C	B	3
9 Labuhan	New	300	1,612.0	665.0	22.55	947.0	3.16	2.42	1,770	A	A	1
Sub-Total		6,389							47,260			
Total		32,723							270,250			

Note: a/ At discount rate of 10 %

Table 35 Economic Comparison of Drainage Project and Ranking of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Level of Improvement	Area (ha)	Economic			Economic			Ranking			
				Benefit NPV a/ (Rp.MN)	Cost NPV a/ (Rp.MN)	EIRR (%)	B-C (Rp.MN)	B-C/ba a/ (Rp.MN/ha)	B/C a/ a/	Increment (tons)	ERR	B-C/ba	Rank
TABALONG													
2 S.Rampang	Exist	W/O to T-E	600	2,255.8	595.9	32.10	1,660.0	2.77	3.79	890	A	A	1
3 S.Palai	Exist	W/O to T-D	475	1,772.6	513.6	29.86	1,260.0	2.65	3.45	700	A	A	1
4 S.Pumpang	Exist	W/O to T-D	150	560.0	213.9	23.93	346.1	2.31	2.62	220	A	B	2
5 S.Electro	Exist	W/O to T-D	103	373.3	124.5	26.70	248.9	2.49	3.00	150	A	B	2
6 S.Nanti	Exist	W/O to T-D	200	1,035.6	251.6	33.65	784.0	3.92	4.12	290	A	A	1
7 Tarunih	New	W/O to T-E	150	546.7	403.5	15.32	143.2	0.95	1.35	200	D	D	4
8 Bangkiling	New	W/O to T-E	400	1,457.9	1,007.8	14.40	450.1	1.13	1.45	520	C	C	3
9 Pulau Kuu	New	W/O to T-E	280	1,020.4	995.3	10.27	25.1	0.09	1.03	370	E	E	5
Sub-Total			2,555							3,340			
HULU SUNGAI UTARA													
1 S.Pinang Hibang	Exist	W/O to T-D	1,995	7,540.9	1,973.7	32.34	5,567.2	2.79	3.82	2,910	A	A	1
2 R.Ran Mandi	Exist	W/O to T-D	1,360	2,651.4	1,439.1	18.59	1,212.3	0.89	1.84	1,980	B	D	3
3 R.Puang Kara	Planned	W/O to T-D	4,600	20,748.6	8,397.1	22.74	12,351.5	2.69	2.47	13,050	A	A	1
Sub-Total			7,955							17,940			
HULU SUNGAI TENGAH													
1 R.Taras	Exist	W/O to T-D	300	1,130.8	512.5	20.80	618.3	2.06	2.21	430	A	B	2
3 Tg.Jeranth	Exist	W/O to T-E	1,194	2,234.7	1,177.7	19.07	1,057.0	0.89	1.90	1,880	B	D	3
4 Tg.Semang Kambat	Exist	W/O to T-E	2,640	8,447.2	2,749.2	29.38	5,698.5	2.23	3.15	4,150	A	B	2
5 S.Sirung	New	W/O to T-D	2,500	11,357.5	4,057.0	25.10	7,300.5	2.92	2.80	7,140	A	A	1
7 Binjai	New	W/O to T-D	300	3,634.4	1,300.2	25.07	2,334.2	2.92	2.80	2,240	A	A	1
Sub-Total			7,434							15,840			
HULU SUNGAI SELATAN													
1 Tg.Langka	Exist	W/O to T-E	2,005	7,602.1	2,041.3	31.69	5,560.7	2.77	3.72	2,950	A	A	1
2 Tg.Panganbau	Exist	W/O to T-E	500	1,995.4	808.2	22.81	1,187.2	2.37	2.47	790	A	B	2
3 S.Kajang	Exist	W/O to T-D	1,500	5,981.0	1,389.4	35.50	4,591.6	3.06	4.30	2,350	A	A	1
4 S.Tirta Bahalayn	Exist	W/O to T-E	600	2,407.2	829.3	26.00	1,578.0	2.63	2.96	970	A	A	1
5 S.Taniran	Exist	W/O to T-D	300	1,196.2	496.8	22.35	699.4	2.33	2.41	470	A	B	2
6 R.Negara	Exist	W/O to T-D	5,200	19,601.2	4,680.8	34.76	14,920.4	2.87	4.19	7,480	A	A	1
8 R.Ankajang	Planned	W/O to T-D	1,500	6,814.5	2,496.3	24.60	4,318.2	2.88	2.73	4,290	A	A	1
9 R.Garis	Planned	W/O to T-D	1,500	6,814.5	2,496.3	24.60	4,318.2	2.88	2.73	4,290	A	A	1
10 R.Negara Extension	Planned	W/O to T-D	500	2,271.5	760.5	26.42	1,511.0	3.02	2.99	1,430	A	A	1
11 S.Hadangan	New	W/O to T-D	3,800	18,126.2	3,795.2	27.41	14,333.0	3.77	4.78	11,430	A	A	1
12 S.Batang Alai	New	W/O to T-D	1,500	7,155.1	2,285.4	27.42	4,869.7	3.25	3.13	4,500	A	A	1
13 Tujau Langk	New	W/O to T-D	5,000	23,850.3	7,619.2	27.41	16,231.1	3.25	3.13	15,000	A	A	1
Sub-Total			23,905							55,920			
TAPIN													
1 S.Udul	Exist	W/O to T-D	1,000	3,997.7	1,047.4	32.30	2,950.2	2.95	3.82	1,580	A	A	1
2 R.Muning	Exist	W/O to T-E	8,000	31,614.7	8,183.1	32.63	25,429.6	2.93	3.86	12,000	A	A	1
3 S.Garis Kalat	Exist	W/O to T-D	1,000	3,991.1	992.4	33.66	2,998.7	3.00	4.02	1,570	A	A	1
4 S.Tapin Gading	Exist	W/O to T-D	1,000	3,984.6	1,186.0	29.22	2,798.6	2.80	3.36	1,560	A	A	1
5 S.Pinang Baharis	Exist	W/O to T-E	300	1,185.6	418.6	25.50	766.9	2.56	2.83	450	A	A	1
6 R.Belan	Exist	W/O to T-E	2,750	10,974.7	3,094.0	30.50	7,880.7	2.87	3.55	4,320	A	A	1
7 S.Damar	Exist	W/O to T-E	1,250	4,980.8	1,191.9	34.68	3,788.9	3.03	4.18	1,930	A	A	1
11 R.Rehau	Planned	W/O to T-D	2,000	9,540.1	2,686.3	28.74	6,853.4	3.43	3.55	6,000	A	A	1
12 R.Muning Extension	Planned	W/O to T-E	2,000	9,540.1	4,225.4	20.97	5,314.7	2.66	2.26	6,000	A	A	1
13 R.Muning 2nd Extension	New	W/O to T-E	2,000	9,540.1	4,214.3	21.14	5,325.8	2.66	2.26	6,000	A	A	1
Sub-Total			21,500							41,430			
Total			62,949							132,470			

T-D: Type D
T-E: Type E

Note: a: At discount rate of 10%
W/O: without Project

Table 36 Economic Comparison of Polder Project and Ranking of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Area (ha)	Economic				Ranking					
			Economic Benefit NPV a/ (Rp.MN)	Economic Cost NPV a/ (Rp.MN)	EIRR (%)	B-C (Rp.MN) a/	B-C/ha (Rp.MN/ha) a/	B/C a/	Paddy Increment (tons)	EIRR B-C/ha	Rank	
TABALONG												
1 Ampukung	Exist	418	369.7	300.4	12.89	69.3	0.17	1.23	710	D	E	5
HULU SUNGAI UTARA												
2 Bakar	Exist	2,344	2,070.5	1,533.1	14.37	537.5	0.23	1.35	3,960	C	E	4
4 Kaludan	Exist	2,300	2,204.7	440.3	195.44	1,764.4	0.77	5.51	4,200	A	D	3
6 Simpang Empat	Exist	1,274	994.6	238.1	104.20	756.6	0.59	4.18	1,910	A	D	3
7 Alabio	Exist	4,500	33,977.5	6,948.2	41.27	27,029.3	6.01	4.89	38,250	A	A	1
Sub-Total		10,418							48,320			
Total		10,836							49,030			

Note: a/; At discount rate of 10 %

Table 37 Economic Comparison of Fishery Project and Ranking of Prior Schemes

Kabupaten/ Name of Scheme	Type of Scheme	Level of Development	Project Area (ha)	Economic		EIRR (%)	B-C (Rp.MN)	B-C/ra a/	B/C a/	Shrimp Increment ('000 ton)	Ranking	
				Benefit a/ (Rp.MN)	Cost a/ (Rp.MN)						EIRR	B-C/ra Rank
HULU SUNGAI UTARA												
1 Alabio	New	W/O to W/P short-term W/P short-term to medium-term	100 1,000	1,068.6 24,679.7	388.9 6,568.5	31.30 39.82	679.6 18,111.1	6.80 18.11	2.75 3.76	0.04 1.16	A A	1 1
TAPIN												
2 Margasari	New	W/O to W/P long-term	2,000	84,926.1	32,401.4	38.50	52,524.7	26.26	2.62	4.80	A	1

Note: a/ Net present values at discount rate of 10%

Table 38 Economic Comparison of Alternative Development Plans of Irrigation Schemes and Ranking

Alternative/ Name of Scheme	Case No.	Area (ha)	Economic		EIRR (%)	B-C a/ b/ (Rp.MN)	B-C/ha a/ b/ (Rp.MN/ha)	B/C a/	Paddy Increment (tons)	Ranking	
			Economic Benefit NPV a/ (Rp.MN)	Economic Cost NPV a/ (Rp.MN)						EIRR B-C/ha	Rank Rank
HULU SUNGAI UTARA											
6 Piap											
	Case 1	3,734	29,109.0	16,110.6	17.73	12,998.4	3.48	1.81	35,470	C	A 2
	Case 2	4,519	33,002.3	19,410.4	16.80	13,591.9	3.01	1.70	40,970	C	A 2
	Case 3	4,444	34,107.2	20,946.0	16.16	13,161.1	2.96	1.63	41,610	C	A 2
	Case 6	5,309	38,349.1	25,933.6	14.80	12,415.4	2.34	1.48	47,730	C	A 2
HULU SUNGAI TENGAH											
9 Batang Alai											
	Case 1	6,223	48,512.4	27,112.6	17.58	21,399.8	3.44	1.79	59,120	C	A 2
	Case 2	6,823	53,189.8	29,768.5	17.58	23,421.3	3.43	1.79	64,820	C	A 2
	Case 3	7,442	55,137.2	32,815.6	16.62	22,321.6	3.00	1.68	67,440	C	A 2
	Case 4	7,441	56,047.8	35,934.2	15.55	20,113.6	2.70	1.56	69,070	C	A 2
	Case 6	8,780	62,374.5	38,116.4	16.28	24,258.1	2.76	1.64	77,720	C	A 2
10 Barabai											
	Case 1	2,278	17,758.5	9,828.9	17.73	7,929.6	3.48	1.81	21,640	C	A 2
	Case 2	3,078	23,995.1	15,598.9	15.37	8,396.1	2.73	1.54	29,240	C	A 2
HULU SUNGAI SELATAN											
10 Armandit											
	Case 1	6,432	45,711.2	28,733.4	15.82	16,977.8	2.64	1.59	55,390	C	A 2
	Case 3	7,042	47,865.4	31,089.8	15.35	16,775.7	2.38	1.54	57,820	C	A 2
	Case 4	7,577	48,463.2	33,157.1	14.64	15,306.1	2.02	1.46	58,900	C	A 2
	Case 5	11,399	57,395.5	57,139.6	10.05	255.9	0.02	1.00	70,410	E	E 5
	Case 6	7,577	47,928.3	33,535.1	14.34	14,393.2	1.90	1.43	58,300	C	C 3
	Case 7	7,577	57,776.2	53,181.6	10.93	4,594.6	0.61	1.09	70,910	E	D 5
TAPIN											
8 Tapin											
	Case 1	5,328	36,780.0	24,175.5	15.19	12,604.6	2.37	1.52	43,450	C	B 3
	Case 2	5,728	38,192.6	25,692.9	14.85	12,499.7	2.18	1.49	45,650	C	B 3
	Case 3	5,818	35,150.5	26,040.2	14.78	9,110.3	1.57	1.48	45,410	C	C 3
	Case 4	6,510	40,007.9	28,713.9	13.99	11,294.0	1.73	1.39	47,390	D	C 4
	Case 5	9,039	40,674.1	62,573.0	5.76	(21,898.9)	(2.42)	0.65	49,800	E	E 5
	Case 6	6,910	41,420.5	30,828.3	13.52	10,592.2	1.53	1.34	48,990	D	C 4
	Case 7	6,510	52,575.7	69,085.5	7.23	(16,519.8)	(2.54)	0.76	64,210	E	E 5

Note: a/ At discount rate of 10%
b/ Figures in parentheses indicate minus balance.

Table 39 Economic Comparison of Combination Development of Drainage and Irrigation Schemes and Ranking

Kabupaten/ Name of Scheme	Area (ha)	Economic			Economic			B/C	B-C a/ b/ (Rp.MN/ha)	B/C/ha a/ b/ (Rp.MN/ha)	Paddy Increment (tons)	Ranking	
		Benefit NPV a/ (Rp.MN)	Cost NPV a/ (Rp.MN)	EIRR (%)	EIRR (%)	EIRR	B-C/ha					Rank	
HULU SUNGAI UTARA													
2 R.Eatu Mandi													
- Drainage Scheme	1,360	2,651.4	1,439.1	18.59	1,212.3	0.89	1.84	1,980	B	D	3		
- Irrigation Scheme	785	3,592.7	3,256.2	11.09	336.4	0.43	1.10	4,320	E	E	5		
Total	2,145	6,244.0	4,695.3	13.43	1,548.8	0.72	1.33	6,300	D	D	4		
HULU SUNGAI TENGAH													
3 Tg.Jaranih													
- Drainage Scheme	1,194	2,234.7	1,177.7	19.07	1,057.0	0.89	1.90	1,890	B	D	3		
- Irrigation Scheme	800	7,322.6	3,657.2	19.30	3,665.4	4.58	2.00	8,800	B	A	2		
Total	1,994	9,557.4	4,835.0	19.25	4,722.4	2.37	1.98	10,690	B	B	2		
4 Tg.Semangi Kambat													
- Drainage Scheme	2,640	8,647.7	2,749.2	29.38	5,898.5	2.23	3.15	4,180	A	B	2		
- Irrigation Scheme	600	5,492.0	3,285.1	16.31	2,206.9	3.68	1.67	6,600	C	A	2		
Total	3,240	14,139.7	6,034.3	22.24	8,105.4	2.50	2.34	10,780	A	B	2		
TAPIN													
10 5bh Pintu Air													
- Drainage Scheme	400	330.1	460.2	6.43	(130.1)	(0.33)	0.72	630	-	-	-		
- Irrigation Scheme	400	3,661.3	2,388.0	15.25	1,273.3	3.18	1.53	4,400	C	A	2		
Total	800	3,991.4	2,848.2	14.07	1,143.2	1.43	1.40	5,030	C	C	3		
Grand-total	8,179							32,800					

Note: a/; At discount rate of 10%
b/; Figures in parentheses indicate minus balance.

Table 40 Economic Comparison of Step-wise Development for Drainage Schemes and Ranking

Kabupaten/ Name of Scheme	Type of Scheme	Level of Improvement	Area (ha)	Economic		EIRR (%)	B-C (Rp.MN)	B-C/ha (Rp.MN/ha)	B/C a/	Paddy Increment (tons)	Ranking	
				Benefit NPV a/ (Rp.MN)	Cost NPV a/ (Rp.MN)						EIRR	B-C/ha
HULU SUNGAI UTARA												
3 R.Pinang Kara	Planned	W/O to T-A	4,600	3,558.3	3,491.7	10.23	66.6	0.01	1.02	13,050	E	5
	-do-	T-A to T-D	4,600	17,190.3	5,416.2	28.02	11,774.1	2.56	3.17	0	A	1
	-do-	W/O to T-D	4,600	20,748.6	8,397.1	22.74	12,351.5	2.69	2.47	13,050	A	1
HULU SUNGAI SELATAN												
11 S.Hadangan	New	W/O to T-A	3,800	2,935.1	2,094.4	14.67	840.7	0.22	1.40	10,760	C	4
	-do-	T-A to T-D	3,800	15,191.1	4,117.8	31.45	11,073.4	2.91	3.69	640	A	1
	-do-	W/O to T-D	3,800	18,126.2	3,793.2	27.41	14,333.0	3.77	4.78	11,400	A	1
12 S.Batang Alai	New	W/O to T-A	1,500	1,158.6	827.1	14.66	331.5	0.22	1.40	4,250	C	4
	-do-	T-A to T-D	1,500	5,996.5	1,624.9	31.46	4,371.7	2.91	3.69	250	A	1
	-do-	W/O to T-D	1,500	7,155.1	2,285.4	27.42	4,869.7	3.25	3.13	4,500	A	1
13 Tiriau Langit	New	W/O to T-A	5,000	3,862.0	2,756.2	14.67	1,105.8	0.22	1.40	14,160	C	4
	-do-	T-A to T-D	5,000	19,988.3	5,418.2	31.45	14,570.1	2.91	3.69	840	A	1
	-do-	W/P 2 to T-D	5,000	23,850.3	7,619.2	27.41	16,231.1	3.25	3.13	15,000	A	1
TAPIN												
12 R.Muning Extension	Planned	W/O to T-D	2,000	3,197.9	2,868.8	11.26	329.1	0.16	1.11	6,000	E	5
	-do-	T-D to T-E	2,000	6,342.3	1,608.8	33.69	4,733.5	2.37	3.94	0	A	1
	-do-	W/O to T-E	2,000	9,540.1	4,225.4	20.97	5,314.7	2.66	2.26	6,000	A	1
13 R.Muning 2nd Extension	New	W/O to T-D	2,000	3,197.9	2,827.6	11.43	370.2	0.19	1.13	6,000	E	5
	-do-	T-D to T-E	2,000	6,342.3	1,608.8	33.69	4,733.5	2.37	3.94	0	A	2
	-do-	W/O to T-E	2,000	9,540.1	4,214.3	21.14	5,325.8	2.66	2.26	6,000	A	1

Note: a/; At discount rate of 10 %
W/O: without Project
T-A: Type A
T-D: Type D
T-E: Type E

Table 42 List of Project Components (1/2)

Negara Pilot Project

1. Jaro Bawah irrigation scheme	200 ha	620 M.Rp.	Tabalong
2. Alabio polder scheme	4,500 ha	8,217 M.Rp.	H.S.U.
3. Rawa Taras drainage scheme	300 ha	764 M.Rp.	H.S.T.
4. Rawa Negara drainage scheme	5,200 ha	6,299 M.Rp.	H.S.S.
5. Sungai Tapin Gadung drainage scheme	1,000 ha	1,739 M.Rp.	Tapin
Total	11,200 ha	17,639 M.Rp.	

Negara Irrigation and Drainage Upgrading Project

1. S. Rampang drainage scheme	600 ha	886 M.Rp.	Tabalong
2. S. Paliat drainage scheme	475 ha	737 M.Rp.	Tabalong
3. S. Nanti drainage scheme	200 ha	370 M.Rp.	Tabalong
4. S. Pimping drainage scheme	150 ha	309 M.Rp.	Tabalong
5. S. Bintro drainage scheme	100 ha	175 M.Rp.	Tabalong
6. Gumba irrigation scheme	254 ha	361 M.Rp.	Tabalong
7. Alabio polder experimental aquaculture scheme	100 ha	522 M.Rp.	H.S.U.
8. Paran irrigation scheme	188 ha	358 M.Rp.	H.S.U.
9. S. Pinang Habang drainage scheme	1,995 ha	3,191 M.Rp.	H.S.U.
10. Tapuk irrigation scheme	186 ha	270 M.Rp.	H.S.T.
11. Baruh Hawang irrigation scheme	160 ha	237 M.Rp.	H.S.T.
12. Manginang irrigation scheme	515 ha	586 M.Rp.	H.S.T.
13. Tg. Semangi Kambat drainage scheme	2,640 ha	3,362 M.Rp.	H.S.T.
14. S. Taniran drainage scheme	300 ha	699 M.Rp.	H.S.S.
15. S. Kajang drainage scheme	1,500 ha	1,844 M.Rp.	H.S.S.
16. Tg. Panganbau drainage scheme	500 ha	1,135 M.Rp.	H.S.S.
17. S. Tirta Bahalayung drainage scheme	600 ha	1,248 M.Rp.	H.S.S.
18. Tg. Lungkau drainage scheme	2,005 ha	2,995 M.Rp.	H.S.S.
19. S. Garis Halat drainage scheme	1,000 ha	1,468 M.Rp.	Tapin
20. S. Pinang Babaris drainage scheme	300 ha	591 M.Rp.	Tapin
21. S. Udul drainage scheme	1,000 ha	1,412 M.Rp.	Tapin
22. S. Damar drainage scheme	1,250 ha	1,746 M.Rp.	Tapin
23. R. Belanti drainage scheme	2,750 ha	4,205 M.Rp.	Tapin
24. R. Muning drainage scheme	8,000 ha	11,656 M.Rp.	Tapin
Total	26,768 ha	40,363 M.Rp.	

Upper Negara Agricultural Development Project

1. Mihim irrigation scheme	203 ha	659 M.Rp.	Tabalong
2. Bilas irrigation scheme	643 ha	2,089 M.Rp.	Tabalong
3. Kinarum irrigation scheme	408 ha	1,325 M.Rp.	Tabalong
4. Batupulut irrigation scheme	225 ha	634 M.Rp.	Tabalong
5. Banyu Tajun irrigation scheme	750 ha	2,487 M.Rp.	Tabalong
6. Sungai Kati irrigation scheme	280 ha	790 M.Rp.	Tabalong
7. Bangkiling drainage scheme	400 ha	1,457 M.Rp.	Tabalong
8. Namun irrigation scheme	64 ha	207 M.Rp.	Tabalong
9. Tamunti drainage scheme	150 ha	585 M.Rp.	Tabalong
10. Pulau Kuu drainage scheme	280 ha	1,457 M.Rp.	Tabalong
11. Ampukung polder scheme	418 ha	348 M.Rp.	Tabalong
12. Alabio polder aquaculture scheme	1,000 ha	8,816 M.Rp.	H.S.U.
13. R. Pinang Kara drainage scheme	4,600 ha	11,892 M.Rp.	H.S.U.
14. Pitap irrigation scheme	3,734 ha	23,015 M.Rp.	H.S.U.
15. Balangan irrigation scheme	2,172 ha	13,388 M.Rp.	H.S.U.

Table 42 List of Project Components (2/2)

16.	R. Batu Mandi drainage scheme	1,360 ha	1,846 M.Rp.	H.S.U.
17.	Kaludan polder scheme	2,300 ha	26 M.Rp.	H.S.U.
18.	Simpang Empat polder scheme	1,274 ha	39 M.Rp.	H.S.U.
19.	Tundakan irrigation scheme	233 ha	369 M.Rp.	H.S.U.
20.	Suapin irrigation scheme	116 ha	207 M.Rp.	H.S.U.
21.	Bakar polder scheme	2,344 ha	1,723 M.Rp.	H.S.U.
22.	Binjai drainage scheme	800 ha	1,833 M.Rp.	H.S.T.
23.	S. Sirung drainage scheme	2,500 ha	5,719 M.Rp.	H.S.T.
24.	Barabai irrigation scheme	2,278 ha	14,041 M.Rp.	H.S.T.
25.	Batang Alai irrigation scheme	6,223 ha	38,754 M.Rp.	H.S.T.
26.	Tamiyang irrigation scheme	166 ha	283 M.Rp.	H.S.T.
27.	Tg. Jaranih drainage scheme	1,994 ha	6,623 M.Rp.	H.S.T.
28.	Talang irrigation scheme	165 ha	326 M.Rp.	H.S.T.
	Total	37,080 ha	140,938 M.Rp.	
Lower Negara Agricultural Development Project				
1.	Kayu Habang irrigation scheme	347 ha	1,128 M.Rp.	H.S.S.
2.	R. Ankinang drainage scheme	1,500 ha	3,525 M.Rp.	H.S.S.
3.	R. Garis drainage scheme	1,500 ha	3,525 M.Rp.	H.S.S.
4.	R. Negara Extension drainage scheme	500 ha	1,067 M.Rp.	H.S.S.
5.	S. Hadangan drainage scheme	3,800 ha	8,095 M.Rp.	H.S.S.
6.	S. Batang Alai drainage scheme	1,500 ha	3,195 M.Rp.	H.S.S.
7.	Tinjau Langit drainage scheme	5,000 ha	10,652 M.Rp.	H.S.S.
8.	Amandit irrigation scheme	6,432 ha	41,387 M.Rp.	H.S.S.
9.	Tayub irrigation scheme	178 ha	250 M.Rp.	H.S.S.
10.	Pamujaan irrigation scheme	214 ha	399 M.Rp.	H.S.S.
11.	Labuhan irrigation scheme	300 ha	975 M.Rp.	Tapin
12.	R. Bahanau drainage scheme	2,000 ha	3,991 M.Rp.	Tapin
13.	R. Muning Extension drainage scheme	2,000 ha	6,082 M.Rp.	Tapin
14.	R. Muning 2d Extension drainage scheme	2,000 ha	6,020 M.Rp.	Tapin
15.	Margasari aquaculture scheme	2,000 ha	32,448 M.Rp.	Tapin
16.	Pulau Pinang irrigation scheme	270 ha	267 M.Rp.	Tapin
17.	Tapin irrigation scheme	5,328 ha	34,960 M.Rp.	Tapin
18.	Pampain irrigation scheme	392 ha	549 M.Rp.	Tapin
19.	Tatakan irrigation scheme	99 ha	174 M.Rp.	Tapin
	Total	35,360 ha	158,689 M.Rp.	

Table 43 Estimate of Public Investment for Irrigation, Drainage, Polder and Fishery Projects

	(Unit Rp. million)																		
	Tabalong			H.S.U			H.S.T			H.S.S			Tabin			Total			
	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	To be Assigned	Accumulated	
Case 1																			
Repelita V	1,239	1,239	5,888	5,888	5,825	5,825	6,996	6,996	8,664	8,664	8,664	8,664	8,664	8,664	28,612	28,612	28,612	28,612	
Repelita VI	690	1,929	3,280	9,169	3,245	9,071	3,897	10,893	4,827	13,490	4,827	13,490	4,827	13,490	15,940	44,552	15,940	44,552	
Rep. VII+VIII	3,541	5,470	16,830	25,999	16,650	25,721	19,995	30,888	24,762	38,255	24,762	38,255	24,762	38,255	81,778	126,330	81,778	126,330	
Rep. IX+X	11,723	17,194	55,720	81,719	55,125	80,845	66,198	97,086	81,983	120,236	81,983	120,236	81,983	120,236	270,750	397,080	270,750	397,080	
Total	17,194	17,194	81,719	81,719	80,845	80,845	97,086	97,086	120,236	120,236	120,236	120,236	120,236	120,236	397,080	397,080	397,080	397,080	
Case 2																			
Repelita V	1,239	1,239	5,888	5,888	5,825	5,825	6,996	6,996	8,664	8,664	8,664	8,664	8,664	8,664	28,612	28,612	28,612	28,612	
Repelita VI	614	1,853	2,920	8,809	2,889	8,714	3,469	10,465	4,297	12,960	4,297	12,960	4,297	12,960	14,190	42,802	14,190	42,802	
Rep. VII+VIII	2,347	4,200	11,155	19,964	11,036	19,750	13,253	23,718	16,413	29,373	16,413	29,373	16,413	29,373	54,203	97,005	54,203	97,005	
Rep. IX+X	5,404	9,604	25,684	45,647	25,409	45,159	30,514	54,231	37,789	67,163	37,789	67,163	37,789	67,163	124,800	221,805	124,800	221,805	
Total	9,604	9,604	45,647	45,647	45,159	45,159	54,231	54,231	67,163	67,163	67,163	67,163	67,163	67,163	221,805	221,805	221,805	221,805	
Case 3																			
Repelita V	1,239	1,239	5,888	5,888	5,825	5,825	6,996	6,996	8,664	8,664	8,664	8,664	8,664	8,664	28,612	28,612	28,612	28,612	
Repelita VI	565	1,804	2,685	8,574	2,657	8,482	3,190	10,186	3,951	12,615	3,951	12,615	3,951	12,615	13,049	41,661	13,049	41,661	
Rep. VII+VIII	1,746	3,550	8,300	16,874	8,211	16,693	9,861	20,047	12,212	24,827	12,212	24,827	12,212	24,827	40,330	81,991	40,330	81,991	
Rep. IX+X	3,079	6,629	14,632	31,506	14,476	31,169	17,384	37,431	21,529	46,356	21,529	46,356	21,529	46,356	71,099	153,090	71,099	153,090	
Total	6,629	6,629	31,506	31,506	31,169	31,169	37,431	37,431	46,356	46,356	46,356	46,356	46,356	46,356	153,090	153,090	153,090	153,090	
Case 4																			
Repelita V	1,239	1,239	5,888	5,888	5,825	5,825	6,996	6,996	8,664	8,664	8,664	8,664	8,664	8,664	28,612	28,612	28,612	28,612	
Repelita VI	502	1,741	2,386	8,274	2,360	8,186	2,834	9,830	3,510	12,174	3,510	12,174	3,510	12,174	11,593	40,205	11,593	40,205	
Rep. VII+VIII	1,152	2,893	5,477	13,751	5,418	13,604	6,507	16,337	8,058	20,232	8,058	20,232	8,058	20,232	26,612	66,817	26,612	66,817	
Rep. IX+X	1,383	4,276	6,572	20,323	6,502	20,106	7,808	24,145	9,670	29,902	9,670	29,902	9,670	29,902	31,936	98,753	31,936	98,753	
Total	4,276	4,276	20,323	20,323	20,106	20,106	24,145	24,145	29,902	29,902	29,902	29,902	29,902	29,902	98,753	98,753	98,753	98,753	

Table 45 Investment Plan for Irrigation, Drainage, Polder and Fishery Projects by Kabupaten in Case 2

Scheme	Tambak			Mata Air/Sungai/Lake			Polder			Main Sungai/Teras			Pemukiran/Scheme			Waduk			Polder/Sungai/Scheme			Polder					
	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)	Scheme	Area (Ha)	Cost (Rp./M\$)	Yield (Tons)
REPETA V	200	620	1,700	P. Aluh	4,500	8,217	38,250	D. R. Teras	300	764	430	D. R. Teras	5,200	6,299	7,480	D. S. Gading	1,000	1,739	1,560	D. S. Gading	1,000	1,739	1,560	D. S. Gading	1,000	1,739	1,560
	0	0	0	I. Tepak	186	270	740	I. Tepak	186	270	740	D. S. Gading	300	659	470	D. S. Gading	1,000	1,468	1,570	D. S. Gading	1,000	1,468	1,570	D. S. Gading	1,000	1,468	1,570
	0	0	0	I. B. Erwang	160	227	580	I. B. Erwang	160	227	580	D. S. T. Manan	0	0	0	D. S. T. Manan	1,000	391	430	D. S. T. Manan	1,000	391	430	D. S. T. Manan	1,000	391	430
	0	0	0	I. Mangarang	515	586	2,060	I. Mangarang	515	586	2,060	D. S. Ulu	0	0	0	D. S. Ulu	1,000	1,412	1,580	D. S. Ulu	1,000	1,412	1,580	D. S. Ulu	1,000	1,412	1,580
	0	0	0	D. T.S. Kambat	2,640	3,362	4,150	D. T.S. Kambat	2,640	3,362	4,150	D. S. Damar	1,230	1,746	1,950	D. S. Damar	1,230	1,746	1,950	D. S. Damar	1,230	1,746	1,950	D. S. Damar	1,230	1,746	1,950
	200	620	1,700	Sub-total	4,500	8,217	38,250	Sub-total	3,801	5,219	8,020	Sub-total	5,500	6,998	7,950	Sub-total	4,530	6,956	7,210	Sub-total	4,530	6,956	7,210	Sub-total	4,530	6,956	7,210
REPETA VI	600	886	890	P. Aluh	100	522	0	D. Blujai	800	1,893	2,240	D. S. Kajang	1,500	1,844	2,350	D. R. Belant	2,750	4,205	4,520	D. R. Belant	2,750	4,205	4,520	D. R. Belant	2,750	4,205	4,520
	0	0	0	I. B. Erwang	100	522	0	I. B. Erwang	100	522	0	D. T. Pangkajene	500	1,155	786	I. Lakuban	500	975	1,770	I. Lakuban	500	975	1,770	I. Lakuban	500	975	1,770
	600	886	890	Sub-total	100	522	0	Sub-total	800	1,893	2,240	Sub-total	2,000	2,979	3,140	Sub-total	3,050	5,180	6,090	Sub-total	3,050	5,180	6,090	Sub-total	3,050	5,180	6,090
	800	1,506	2,594	Accumulate	4,600	8,739	38,250	Accumulate	4,601	7,652	11,260	Accumulate	7,588	9,977	11,890	Accumulate	7,600	12,136	13,200	Accumulate	7,600	12,136	13,200	Accumulate	7,600	12,136	13,200
REPETA VII + VIII	475	737	700	I. Puzan	188	358	750	D. S. Sirang	2,500	5,719	7,140	D. S. Sirang	600	1,248	970	D. R. Maling	8,900	11,655	12,000	D. R. Maling	8,900	11,655	12,000	D. R. Maling	8,900	11,655	12,000
	200	370	290	D. S.P. Habang	0	0	2,910	I. B. Erwang	0	0	0	I. B. Erwang	2,005	2,995	2,950	D. R. Babman	2,000	3,991	6,000	D. R. Babman	2,000	3,991	6,000	D. R. Babman	2,000	3,991	6,000
	150	309	220	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0	I. B. Erwang	347	1,128	2,720	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0
	100	175	150	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	1,500	5,525	4,290	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	254	361	1,020	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	1,500	5,525	4,290	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	203	659	1,710	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	1,500	5,525	4,290	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	1,362	2,611	4,110	Sub-total	2,183	3,549	3,660	Sub-total	2,500	5,719	7,140	Sub-total	5,952	12,421	15,220	Sub-total	10,000	15,667	18,000	Sub-total	10,000	15,667	18,000	Sub-total	10,000	15,667	18,000
	2,182	4,117	6,700	Accumulate	6,783	12,288	41,910	Accumulate	7,101	12,771	17,400	Accumulate	13,432	22,398	26,310	Accumulate	17,600	27,783	31,200	Accumulate	17,600	27,783	31,200	Accumulate	17,600	27,783	31,200
REPETA IX + X	645	2,085	5,470	P. Aluh	1,000	8,816	13,950	I. B. Erwang	2,278	14,041	21,640	D. R. Negeri	500	1,067	1,430	D. R. Negeri	2,000	6,982	6,000	D. R. Negeri	2,000	6,982	6,000	D. R. Negeri	2,000	6,982	6,000
	408	1,325	3,470	D. R. P. Negeri	4,606	11,892	13,950	D. R. P. Negeri	0	0	0	D. R. P. Negeri	3,800	8,095	11,400	D. R. P. Negeri	2,000	6,020	6,000	D. R. P. Negeri	2,000	6,020	6,000	D. R. P. Negeri	2,000	6,020	6,000
	225	654	1,570	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0	I. B. Erwang	1,500	3,185	4,500	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0	I. B. Erwang	0	0	0
	750	2,487	6,390	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	5,800	10,632	15,000	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	280	790	1,070	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	400	1,457	520	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	64	207	310	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	150	585	700	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0	I. Mangarang	0	0	0
	2,920	9,574	18,990	Sub-total	5,690	20,708	54,960	Sub-total	9,579	25,812	39,040	Sub-total	10,800	23,009	32,330	Sub-total	4,000	12,102	12,000	Sub-total	4,000	12,102	12,000	Sub-total	4,000	12,102	12,000
	3,102	11,691	25,990	Accumulate	12,383	52,996	54,960	Accumulate	12,383	52,996	54,960	Accumulate	24,232	45,407	58,540	Accumulate	21,600	39,885	43,200	Accumulate	21,600	39,885	43,200	Accumulate	21,600	39,885	43,200
REPETA XI	280	1,457	370	I. Puzan	9,754	25,015	35,470	I. Puzan	6,223	38,754	59,120	I. Puzan	5,432	41,387	55,590	E. Mangrove	2,000	32,448	0	E. Mangrove	2,000	32,448	0	E. Mangrove	2,000	32,448	0
	418	348	710	I. Mangarang	1,721	13,282	18,460	I. Mangarang	1,464	6,253	660	I. Mangarang	1,78	250	470	I. Mangrove	270	257	740	I. Mangrove	270	257	740	I. Mangrove	270	257	740
	0	0	0	D. R. P. Negeri	1,500	1,946	1,980	D. R. P. Negeri	1,904	6,623	10,690	D. R. P. Negeri	214	399	560	I. Puzan	5,323	34,969	49,450	I. Puzan	5,323	34,969	49,450	I. Puzan	5,323	34,969	49,450
	0	0	0	I. Mangarang	1,500	1,946	1,980	I. Mangarang	1,500	1,946	1,980	I. Mangarang	0	0	0	I. Puzan	392	549	1,020	I. Puzan	392	549	1,020	I. Puzan	392	549	1,020
	0	0	0	I. Mangarang	1,500	1,946	1,980	I. Mangarang	1,500	1,946	1,980	I. Mangarang	0	0	0	I. Puzan	58	174	270	I. Puzan	58	174	270	I. Puzan	58	174	270
	0	0	0	I. Mangarang	1,500	1,946	1,980	I. Mangarang	1,500	1,946	1,980	I. Mangarang	0	0	0	I. Puzan	0	0	0	I. Puzan	0	0	0	I. Puzan	0	0	0
	0	0	0	I. Mangarang	1,500	1,946	1,980	I. Mangarang	1,500	1,946	1,980	I. Mangarang	0	0	0	I. Puzan	0	0	0	I. Puzan	0	0	0	I. Puzan	0	0	0
	698	1,805	1,080	Sub-total	2,346	17,223	35,960	Sub-total	8,548	45,986	71,130	Sub-total	6,824	42,036	58,423	Sub-total	8,089	63,398	45,690	Sub-total	8,089	63,398	45,690	Sub-total	8,089	63,398	45,690
	1,900	15,496	26,770	Accumulate	29,516	72,559	121,870	Accumulate	17,927	72,798	110,170	Accumulate	31,076	87,493	115,036	Accumulate	29,885	106,293	88,690	Accumulate	29,885	106,293	88,690	Accumulate	29,885	106,293	88,690

I: Irrigation scheme D: Drainage scheme P: Polder scheme F: Fishery scheme

Note: For T. g. arwah scheme, combination development is proposed after the new development of the Bangau Arah irrigation scheme.

Table 46 Investment Plan for Irrigation, Drainage, Polder and Fishery Projects by Kabupaten in Case 3

Scheme	Main Stage (tama)			Main Stage (tengah)			Main Stage (akhir)			Total		
	Area (ha)	Const. Cost (Rp. Mn)	Fully Invest. (tama)	Area (ha)	Const. Cost (Rp. Mn)	Fully Invest. (tengah)	Area (ha)	Const. Cost (Rp. Mn)	Fully Invest. (akhir)	Area (ha)	Const. Cost (Rp. Mn)	Fully Invest. (total)
REPETA V	200	620	1,700	0	0	0	0	0	0	0	0	0
I. Jaro Bawab	200	620	1,700	0	0	0	0	0	0	0	0	0
Sub-total	200	620	1,700	0	0	0	0	0	0	0	0	0
REPETA VI	600	886	890	0	0	0	0	0	0	0	0	0
D. S. Rempang	600	886	890	0	0	0	0	0	0	0	0	0
Sub-total	600	886	890	0	0	0	0	0	0	0	0	0
REPETA VII + VIII	600	1,566	2,590	0	0	0	0	0	0	0	0	0
D. S. Paliat	475	737	700	0	0	0	0	0	0	0	0	0
D. S. Nyon	200	370	290	0	0	0	0	0	0	0	0	0
D. S. Dampang	150	308	220	0	0	0	0	0	0	0	0	0
D. S. Darbo	100	175	150	0	0	0	0	0	0	0	0	0
Sub-total	925	1,591	1,360	0	0	0	0	0	0	0	0	0
Accumulate	1,725	3,097	3,060	0	0	0	0	0	0	0	0	0
REPETA IX + X	254	361	1,020	0	0	0	0	0	0	0	0	0
I. Gamba	254	361	1,020	0	0	0	0	0	0	0	0	0
Sub-total	254	361	1,020	0	0	0	0	0	0	0	0	0
REPETA XI	202	659	1,733	0	0	0	0	0	0	0	0	0
I. Mbin	202	659	1,733	0	0	0	0	0	0	0	0	0
Sub-total	202	659	1,733	0	0	0	0	0	0	0	0	0
REPETA XII	488	1,325	3,470	0	0	0	0	0	0	0	0	0
I. Kuaran	488	1,325	3,470	0	0	0	0	0	0	0	0	0
Sub-total	488	1,325	3,470	0	0	0	0	0	0	0	0	0
REPETA XIII	1,508	4,434	11,690	0	0	0	0	0	0	0	0	0
I. Bantak	1,508	4,434	11,690	0	0	0	0	0	0	0	0	0
Sub-total	1,508	4,434	11,690	0	0	0	0	0	0	0	0	0
REPETA XIV	323	7,531	15,640	0	0	0	0	0	0	0	0	0
I. Bantak	323	7,531	15,640	0	0	0	0	0	0	0	0	0
Sub-total	323	7,531	15,640	0	0	0	0	0	0	0	0	0
REPETA XV	225	634	1,570	0	0	0	0	0	0	0	0	0
I. Bantak	225	634	1,570	0	0	0	0	0	0	0	0	0
Sub-total	225	634	1,570	0	0	0	0	0	0	0	0	0
REPETA XVI	230	2,497	6,360	0	0	0	0	0	0	0	0	0
I. Bantak	230	2,497	6,360	0	0	0	0	0	0	0	0	0
Sub-total	230	2,497	6,360	0	0	0	0	0	0	0	0	0
REPETA XVII	408	1,437	3,200	0	0	0	0	0	0	0	0	0
I. Bantak	408	1,437	3,200	0	0	0	0	0	0	0	0	0
Sub-total	408	1,437	3,200	0	0	0	0	0	0	0	0	0
REPETA XVIII	64	287	510	0	0	0	0	0	0	0	0	0
I. Bantak	64	287	510	0	0	0	0	0	0	0	0	0
Sub-total	64	287	510	0	0	0	0	0	0	0	0	0
REPETA XIX	156	385	200	0	0	0	0	0	0	0	0	0
I. Bantak	156	385	200	0	0	0	0	0	0	0	0	0
Sub-total	156	385	200	0	0	0	0	0	0	0	0	0
REPETA XX	418	348	710	0	0	0	0	0	0	0	0	0
I. Bantak	418	348	710	0	0	0	0	0	0	0	0	0
Sub-total	418	348	710	0	0	0	0	0	0	0	0	0
REPETA XXI	2,567	7,965	11,130	0	0	0	0	0	0	0	0	0
I. Bantak	2,567	7,965	11,130	0	0	0	0	0	0	0	0	0
Sub-total	2,567	7,965	11,130	0	0	0	0	0	0	0	0	0
REPETA XXII	5,300	15,466	24,770	0	0	0	0	0	0	0	0	0
I. Bantak	5,300	15,466	24,770	0	0	0	0	0	0	0	0	0
Sub-total	5,300	15,466	24,770	0	0	0	0	0	0	0	0	0

I. Irrigation scheme D. Drainage scheme P. Polder scheme F. Fishery scheme

Note: For Tg. Jaran's scheme, combination development is proposed after the new development of the Bantak Aisi irrigation scheme.

Table 47 Investment Plan for Irrigain, Drainage, Polder and Fishery Projects by Kabupaten in Case 4

Category	KABUPATEN KUPANG				KABUPATEN SOBA				KABUPATEN MALAKA				KABUPATEN BELITANG				KABUPATEN BANGGALING				KABUPATEN BANGGALING				KABUPATEN BANGGALING						
	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)	Fully Inve. (Rp. Mn)	Scheme	Area (Ha)	Const. Cost (Rp. Mn)
REP/ELTA V	I. Jaro Bawak	200	620	1,700	38,250	0	0	0	0	0	0	0	D. R. Teras	300	764	490	7,480	D. S. T. Gading	3,000	1,739	1,560	11,200	17,839	49,420	D. S. T. Gading	3,000	1,739	1,560	11,200	17,839	49,420
													I. Tepak	186	270	743	470	D. S. Gar. Halat	3,000	1,468	1,570	1,480	2,437	2,780	D. S. Gar. Halat	3,000	1,468	1,570	1,480	2,437	2,780
													I. B. Hawang	160	237	640	0	D. S. P. Bahas	3,000	591	456	480	828	1,090	D. S. P. Bahas	3,000	591	456	480	828	1,090
REP/ELTA VI													I. Mangsang	515	486	2,060	0	D. S. U. Uel	3,000	1,472	1,580	1,515	1,988	3,640	D. S. U. Uel	3,000	1,472	1,580	1,515	1,988	3,640
													S. T. S. Kambat	2,640	3,262	4,150	0	D. S. D. D. D. D.	3,000	786	950	3,890	5,108	6,102	D. S. D. D. D. D.	3,000	786	950	3,890	5,108	6,102
													Sub-total	3,801	5,215	8,022	6,998	Sub-total	4,590	5,966	7,110	18,551	26,310	63,930	Sub-total	4,590	5,966	7,110	18,551	26,310	63,930
REP/ELTA VII + VIII													D. R. Teras	800	1,833	2,240	2,350	D. R. Bekant	2,790	4,205	4,323	5,650	8,768	9,800	D. R. Bekant	2,790	4,205	4,323	5,650	8,768	9,800
													Sub-total	800	1,833	2,240	2,350	Sub-total	2,790	4,205	4,323	5,650	8,768	9,800	Sub-total	2,790	4,205	4,323	5,650	8,768	9,800
													Accumulate	4,601	7,052	10,260	8,842	Accumulate	7,300	11,161	11,430	24,201	36,778	42,530	Accumulate	7,300	11,161	11,430	24,201	36,778	42,530
REP/ELTA IX + X													D. S. Sirung	2,500	5,719	7,140	7,900	I. Labuhan	300	975	1,770	3,875	9,388	10,400	I. Labuhan	300	975	1,770	3,875	9,388	10,400
													Sub-total	2,500	5,719	7,140	7,900	Sub-total	300	975	1,770	3,875	9,388	10,400	Sub-total	300	975	1,770	3,875	9,388	10,400
													Accumulate	7,101	12,771	17,400	15,348	Accumulate	7,600	12,136	12,200	35,411	55,156	59,820	Accumulate	7,600	12,136	12,200	35,411	55,156	59,820
REP/ELTA XI + XII													D. R. A. Kuning	1,500	3,525	4,290	4,290	D. R. M. Wang	8,000	11,456	12,000	9,650	15,490	16,510	D. R. M. Wang	8,000	11,456	12,000	9,650	15,490	16,510
													Sub-total	1,500	3,525	4,290	4,290	Sub-total	2,000	3,991	6,200	5,600	7,691	10,440	Sub-total	2,000	3,991	6,200	5,600	7,691	10,440
													Accumulate	500	1,067	1,490	0	Accumulate	0	0	0	752	1,428	2,450	Accumulate	0	0	0	752	1,428	2,450
After Repelita X													D. S. Sirung	2,500	5,719	7,140	7,900	D. R. M. Wang	8,000	11,456	12,000	9,650	15,490	16,510	D. R. M. Wang	8,000	11,456	12,000	9,650	15,490	16,510
													Sub-total	2,500	5,719	7,140	7,900	Sub-total	2,000	3,991	6,200	5,600	7,691	10,440	Sub-total	2,000	3,991	6,200	5,600	7,691	10,440
													Accumulate	7,101	12,771	17,400	15,348	Accumulate	13,952	23,465	27,740	47,618	80,424	126,950	Accumulate	13,952	23,465	27,740	47,618	80,424	126,950
After Repelita XI													I. B. B. B.	2,278	14,041	21,640	8,095	D. R. M. Wang	2,000	6,082	6,000	9,721	29,123	46,510	D. R. M. Wang	2,000	6,082	6,000	9,721	29,123	46,510
													Sub-total	2,278	14,041	21,640	8,095	Sub-total	2,000	6,082	6,000	9,721	29,123	46,510	Sub-total	2,000	6,082	6,000	9,721	29,123	46,510
													Accumulate	7,101	12,771	17,400	15,348	Accumulate	17,600	27,740	31,200	47,618	80,424	126,950	Accumulate	17,600	27,740	31,200	47,618	80,424	126,950

L: Irrigation schemes D: Drainage schemes P: Polder schemes F: Fishery schemes
 Note: For Tigalarah schemes, contribution development is proposed after the new development of the Bangang Aia Irrigation scheme.

Table 48 Environmental Impact Assessment for the Proposed Projects and Countermeasures

Projects/ Countermeasures	Alluvial Plains, Hills and Mountains			Rivers	Water Quality	Founa/ Flora	Prediction
	Swamps	Aliuvial Valleys and Plains					
1. Irrigation	○	○	○	○	○	○	No effects on all the selected environmental fields are expected, because the proposed new schemes are concentrated on the existing rainfed paddy fields.
2. Drainage	-	○	○	○	○	-	Due to the introduction of gravity drainage system, these would be less affected.
3. Polder	○	○	○	○	○	○	No effects on all the selected environmental fields are expected, because of no new development. The candidate new schemes are all excluded from the proposed project due to their lower economic viability.
4. Fishery (Aquaculture)	○	○	○	○	○	+	Positive effects particularly on the fish resources are expected from the development of aquaculture.
5. Intensive Agriculture	○	○	○	○	-	-	Negative effects on water quality and fauna/flora are expected, proper use of chemicals should be introduced.
6. Watershed Management	○	+	+	+	+	+	The proposed countermeasures would mitigate the present soil erosion, sedimentation and flood problems.

Remarks: + : Positive effect ○ : No effect - : Negative effect

Table 49 Development Matrix

	Irrigation	Drainage	Polder	Fishery	Reforest	Paddy	Other Crops	Estate
PRESENT	Poor Achievement	Poor Achievement	Poor Utilization	Over Production	Few Cooperation	Non-active Farming	Restriction to Farming	Suspension of Program
BASIC REQUIREMENTS	Complete Planning	Complete Planning	Complete Planning	Additional Measures	Urgent Execution	Intensive Farming	Intensive Farming	Resumption of Program
TARGET	32,723 ha	63,749 ha	10,836 ha	Aquaculture 3,100 ha	53,470 ha	191,895 ha	78,452 ha	209,075 ha
REQUIRED INVESTMENT	Rp.358 bill. between Repelita V & X							
ACTION TO BE TAKEN	<ol style="list-style-type: none"> 1. F/S for Pilot Project 2. Completion of Pilot project within 2 yrs 3. Establishment of model O&M channel in DPUP for Pilot Project 4. Organization of water user's associations within Pilot Project 5. Through F/Ss for proposed projects 6. Uniform O&M by DPUP 							
Farmers/Fishermen	<ol style="list-style-type: none"> 1. Uniform O&M by water user's associations 2. Active contribution for O&M expenditures 			<ol style="list-style-type: none"> 1. Formulation of systematic extension 2. Construction of fishery centers 3. Promotion of basic research 	<ol style="list-style-type: none"> 1. Provision of job opportunities for shifters 2. Acceleration of coservation 	<ol style="list-style-type: none"> 1. Further improvement on a. Research b. Credit c. Input supply d. Marketing 2. Improvement on a. Extension 	<ol style="list-style-type: none"> 1. Further improvement on a. Research b. Extension c. Input supply d. Marketing 2. Improvement on a. Credit 	<ol style="list-style-type: none"> 1. Further improvement on a. Extension b. Credit c. Input supply d. Marketing 2. Improvement on a. Research

Table 50 List of Schemes not included in Proposed Development Plan

1. Jaro irrigation scheme	625 ha	8 M.Rp.	Tabalong
2. S. Gumpa drainage scheme	1,500 ha	3,112 M.Rp.	Tabalong
3. Tigaron polder scheme	144 ha	283 M.Rp.	Tabalong
4. Lok Batu irrigation scheme	116 ha	355 M.Rp.	H.S.U.
5. Padang Gusti polder scheme	468 ha	1,644 M.Rp.	H.S.U.
6. Pakacangan polder scheme	1,694 ha	2,049 M.Rp.	H.S.U.
7. Murung Bayun polder scheme ^{a/}	1,737 ha	-	H.S.U.
8. Lampihong polder scheme	2,800 ha	23,778 M.Rp.	H.S.U.
9. Intangan irrigation scheme	920 ha	1,244 M.Rp.	H.S.T.
10. Kahakan irrigation scheme	633 ha	746 M.Rp.	H.S.T.
11. Haruyan Dayak irrigation scheme	1,486 ha	1,619 M.Rp.	H.S.T.
12. R. Bangkau drainage scheme	900 ha	1,595 M.Rp.	H.S.T.
13. R. Bangkau Extension drainage scheme	600 ha	1,372 M.Rp.	H.S.T.
14. Telaga Lansat irrigation scheme	1,534 ha	1,861 M.Rp.	H.S.S.
15. Nunungin irrigation scheme	36 ha	257 M.Rp.	H.S.S.
16. Kuangan irrigation scheme	143 ha	339 M.Rp.	H.S.S.
17. Hawatu irrigation scheme	71 ha	391 M.Rp.	H.S.S.
18. Taal irrigation scheme	107 ha	493 M.Rp.	H.S.S.
19. Jarau irrigation scheme	143 ha	97 M.Rp.	H.S.S.
20. S. Balum drainage scheme	600 ha	876 M.Rp.	H.S.S.
21. Kalumpang polder scheme	600 ha	7,733 M.Rp.	H.S.S.
22. Lok Paikat irrigation scheme	392 ha	484 M.Rp.	Tapin
23. Nupadang irrigation scheme	253 ha	283 M.Rp.	Tapin
24. Rampanang irrigation scheme	146 ha	173 M.Rp.	Tapin
25. Binuang irrigation scheme	1,106 ha	1,310 M.Rp.	Tapin
26. S. Selai drainage scheme	400 ha	559 M.Rp.	Tapin
27. S. Masira drainage scheme	150 ha	315 M.Rp.	Tapin
28. 5bh Pintu Air drainage scheme	400 ha	627 M.Rp.	Tapin
Total	19,704 ha	53,603 M.Rp.	

Note: a/; No merit is expected from improvement of hardware.

FIGURES

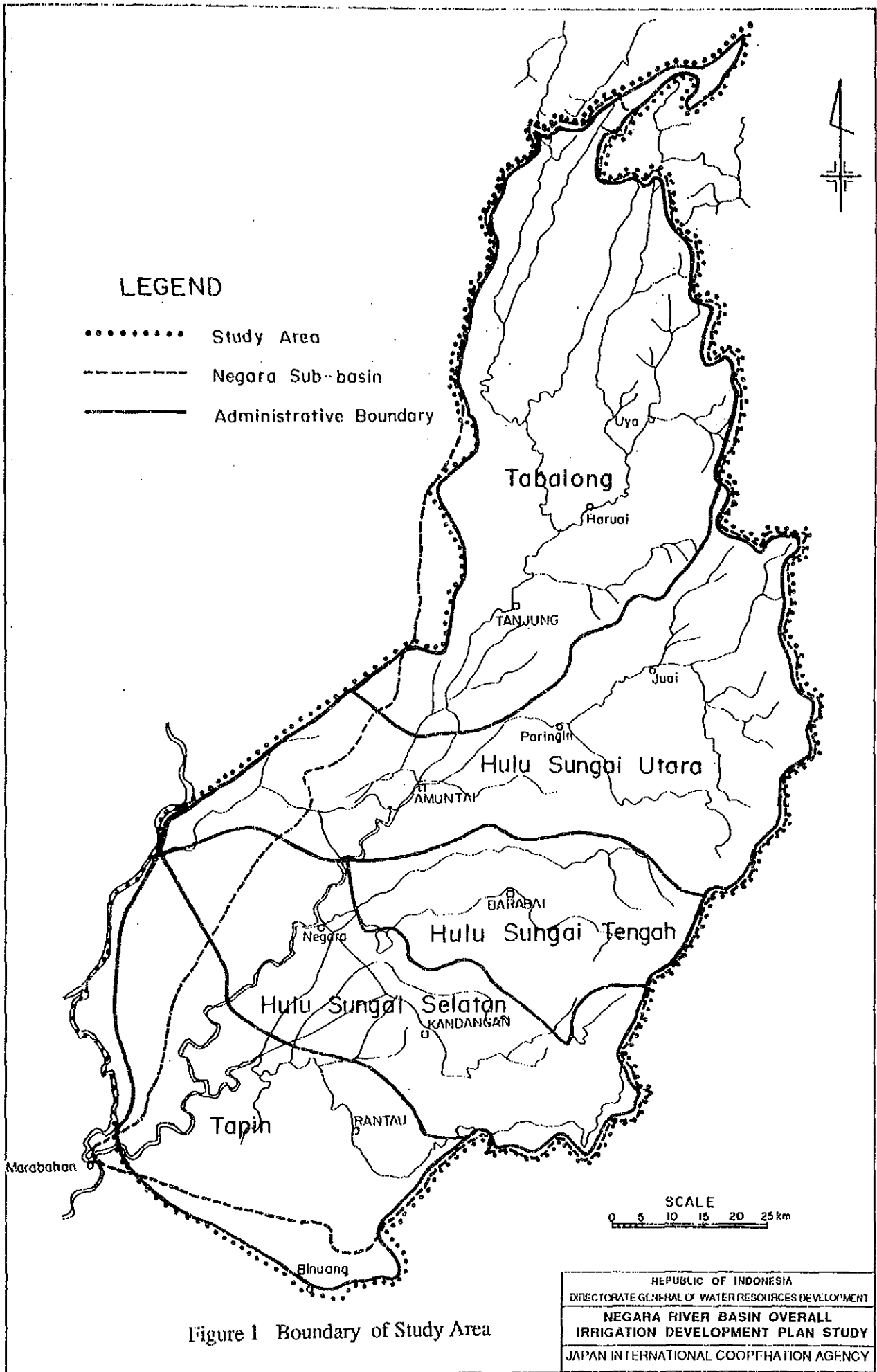
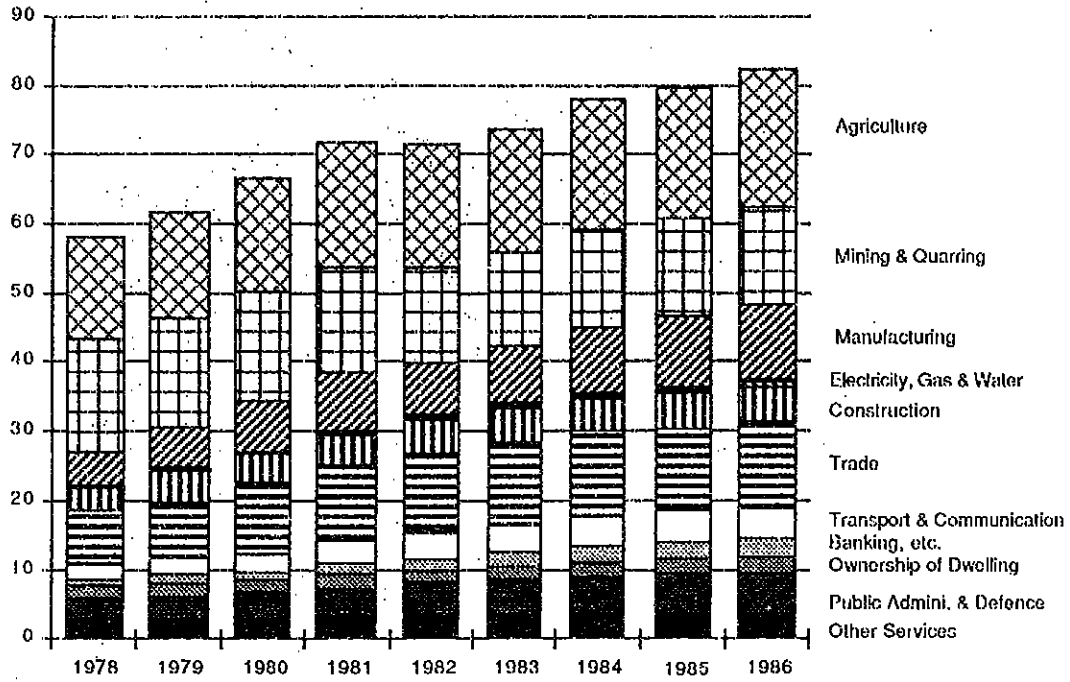


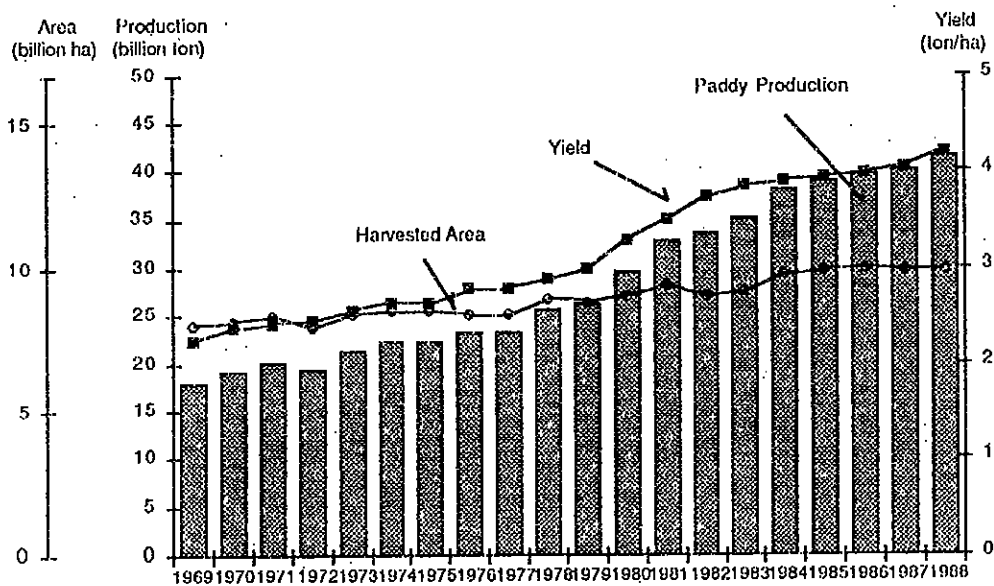
Figure 1 Boundary of Study Area

(Rp. 10¹²)



Source: Central Bureau of Statistics

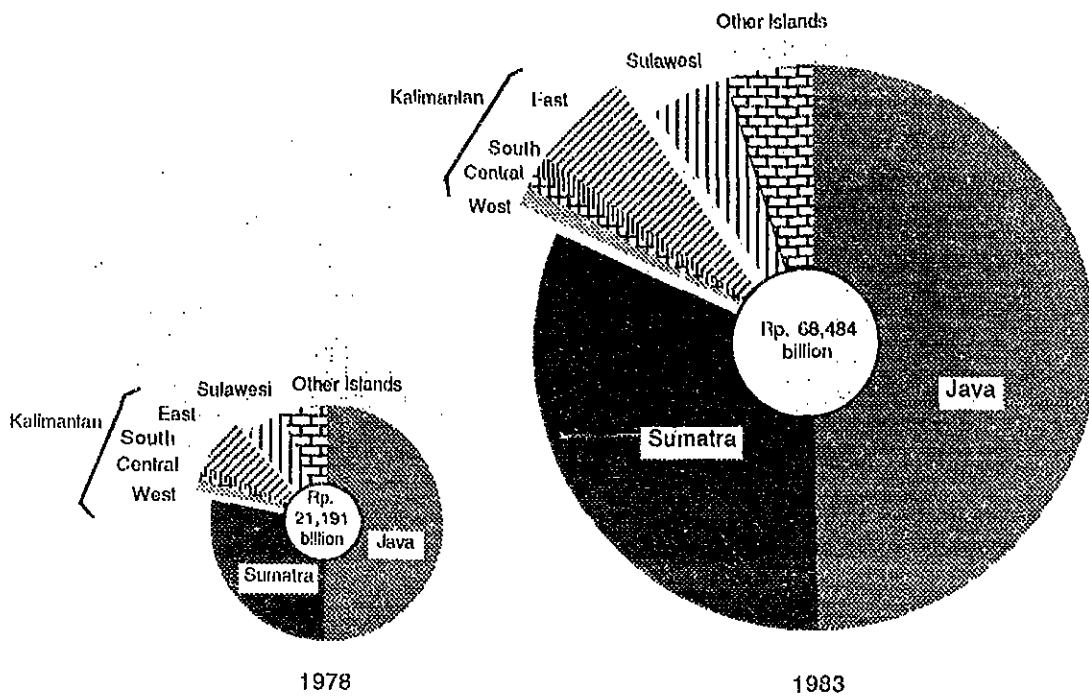
Figure 2 GDP by Industrial Origin at 1983
Constant Price in Indonesia



Source: Central Bureau of Statistics for 1969-1986
Ministry of Agriculture for 1987 & 1988

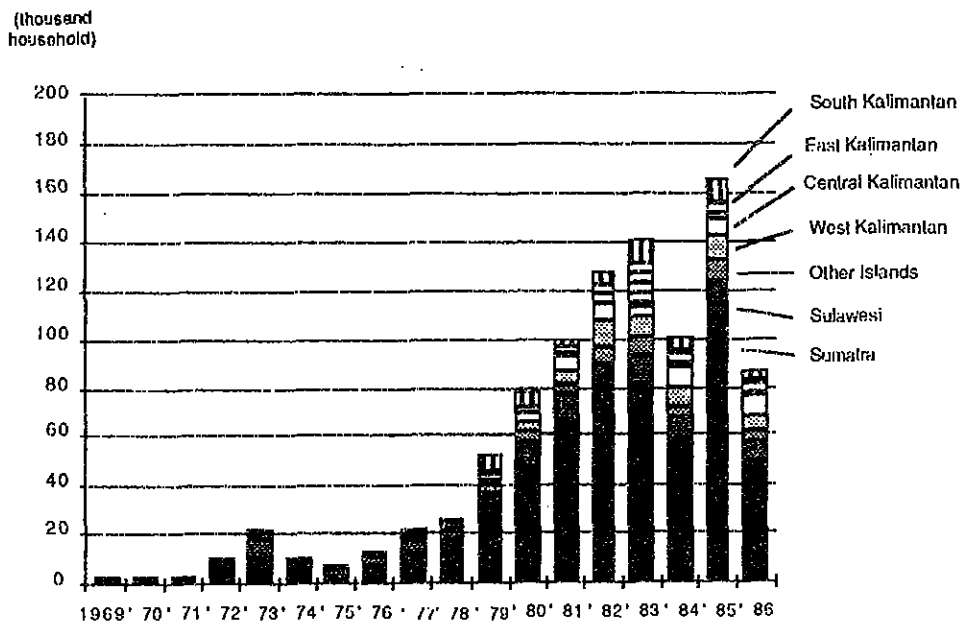
Figure 3 Area Harvested, Production and Yield of Paddy in Indonesia

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Source: Provincial Income in Indonesia 1978-1983, Central Bureau of Statistics

Figure 4 Comparison of GRDP by Region in 1978 and 1983 at Current Market Price



Source: Ministry of Transmigration

Figure 5 Number of Families Moved to the Receiving Area under Transmigration Program

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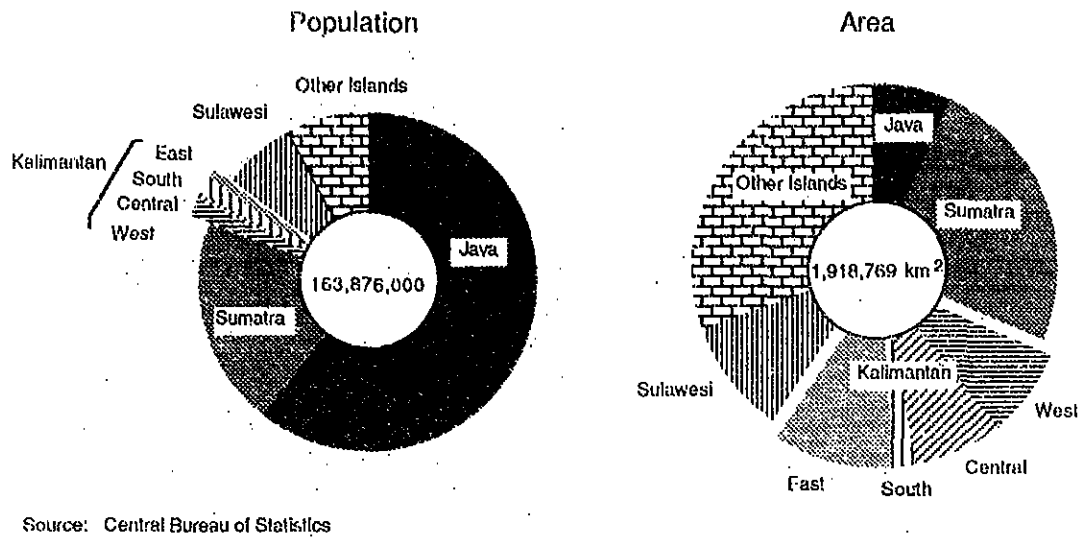


Figure 6 Area and Population by Region in 1985

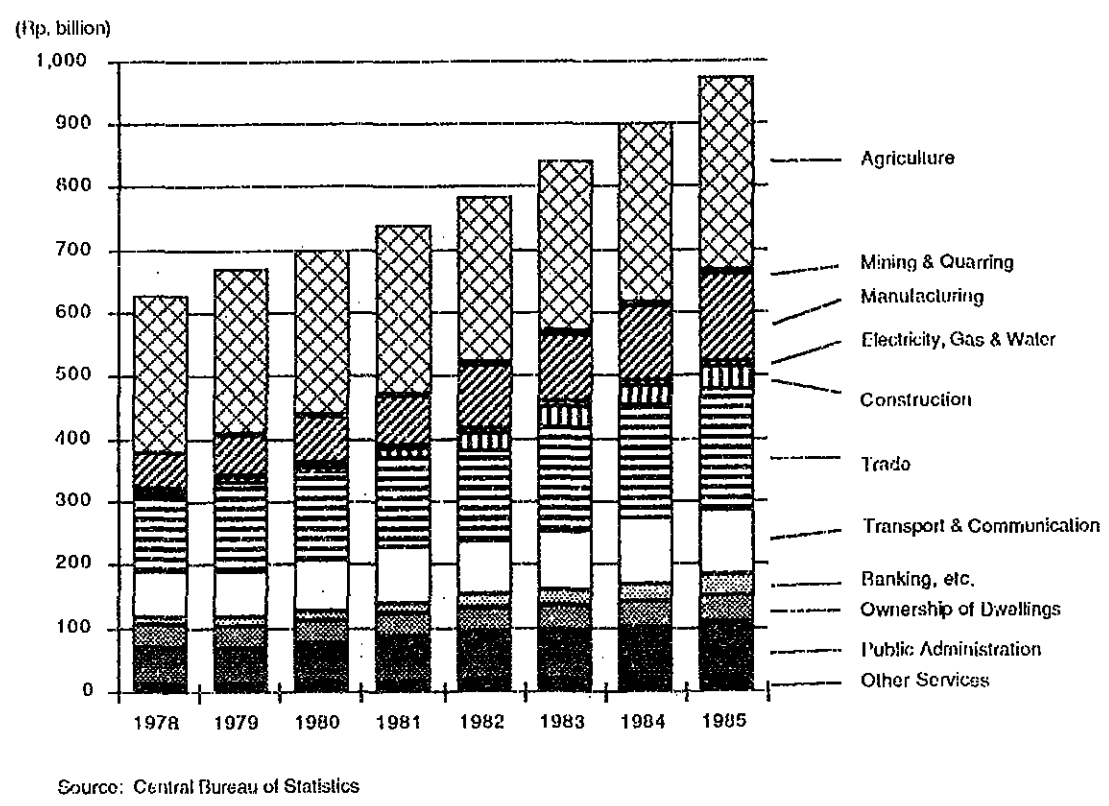


Figure 7 GRDP by Industrial Origin at 1983
Constant Market Price in South Kalimantan

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LEGEND

Physiographic Type	Land System	Map Symbol
Swamps	Gajahut	[Symbol]
	Mendawai	[Symbol]
	Klaru	[Symbol]
	Kahayan	[Symbol]
Alluvial Plains	Tanjung	[Symbol]
	Tanjung	[Symbol]
Alluvial Valleys	Bahunan	[Symbol]
	Kapor	[Symbol]
Plains	Lowangurang	[Symbol]
	Tawah	[Symbol]
	Tawai Baru	[Symbol]
	Sungai Seralat	[Symbol]
Hills	Mapul	[Symbol]
	Mantolat	[Symbol]
	Pakelurat	[Symbol]
	Lohol	[Symbol]
	Berilif	[Symbol]
	Pendrah	[Symbol]
Mountains	Tafas	[Symbol]
	Bukit Pandan	[Symbol]
	Okki	[Symbol]
	Luang	[Symbol]
	[Symbol]	[Symbol]

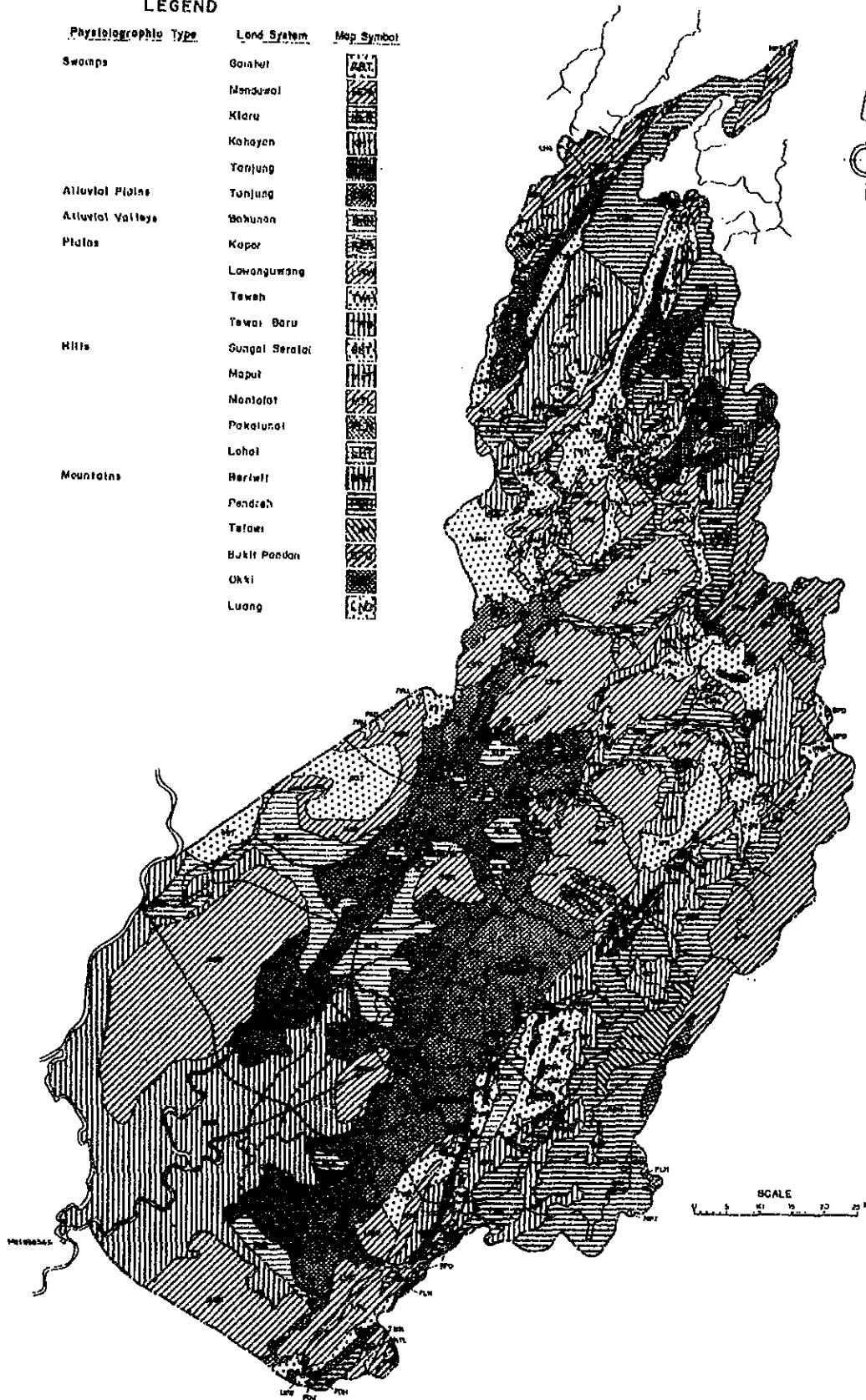


Figure 8 Land System Map

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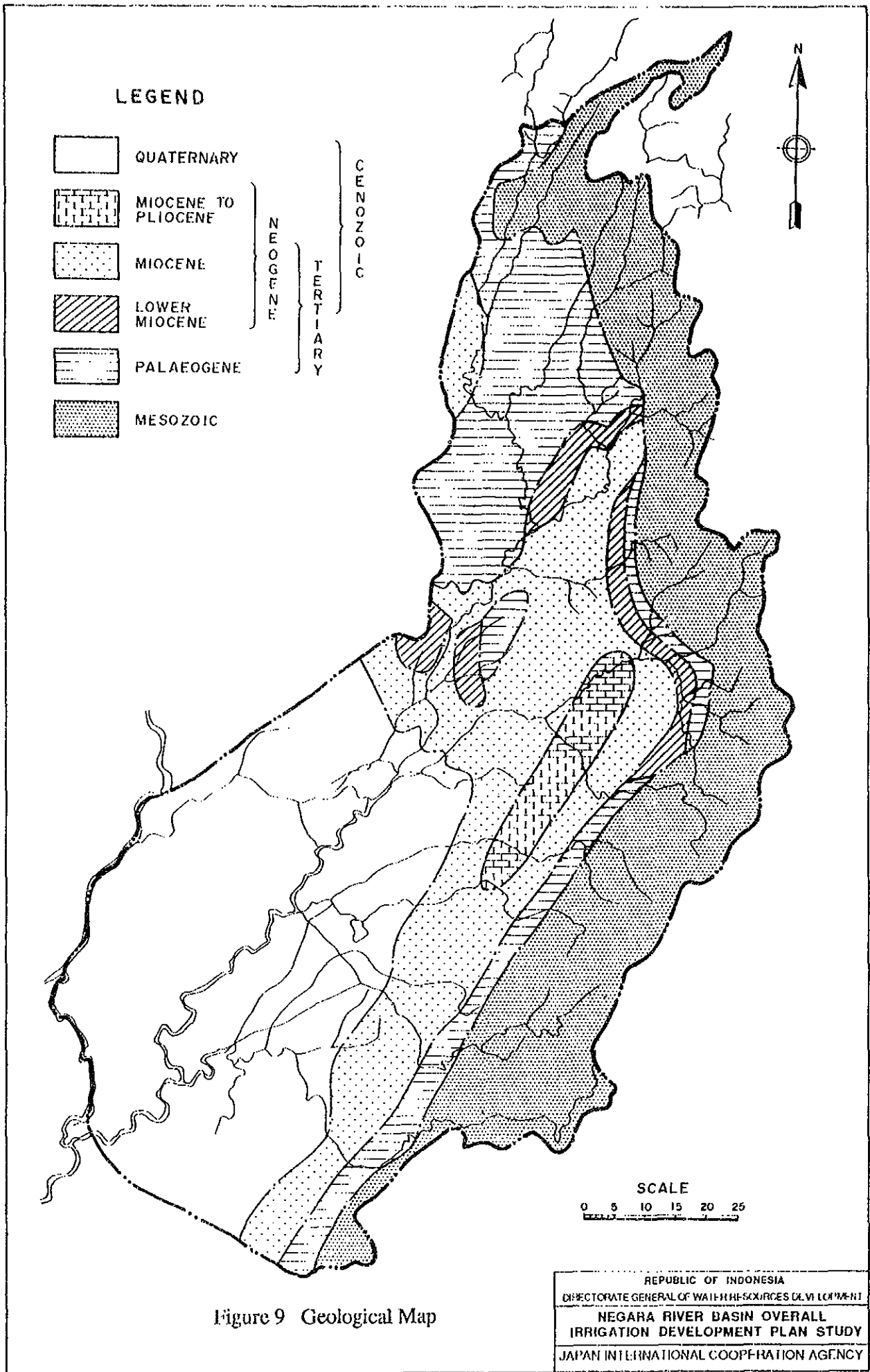


Figure 9 Geological Map

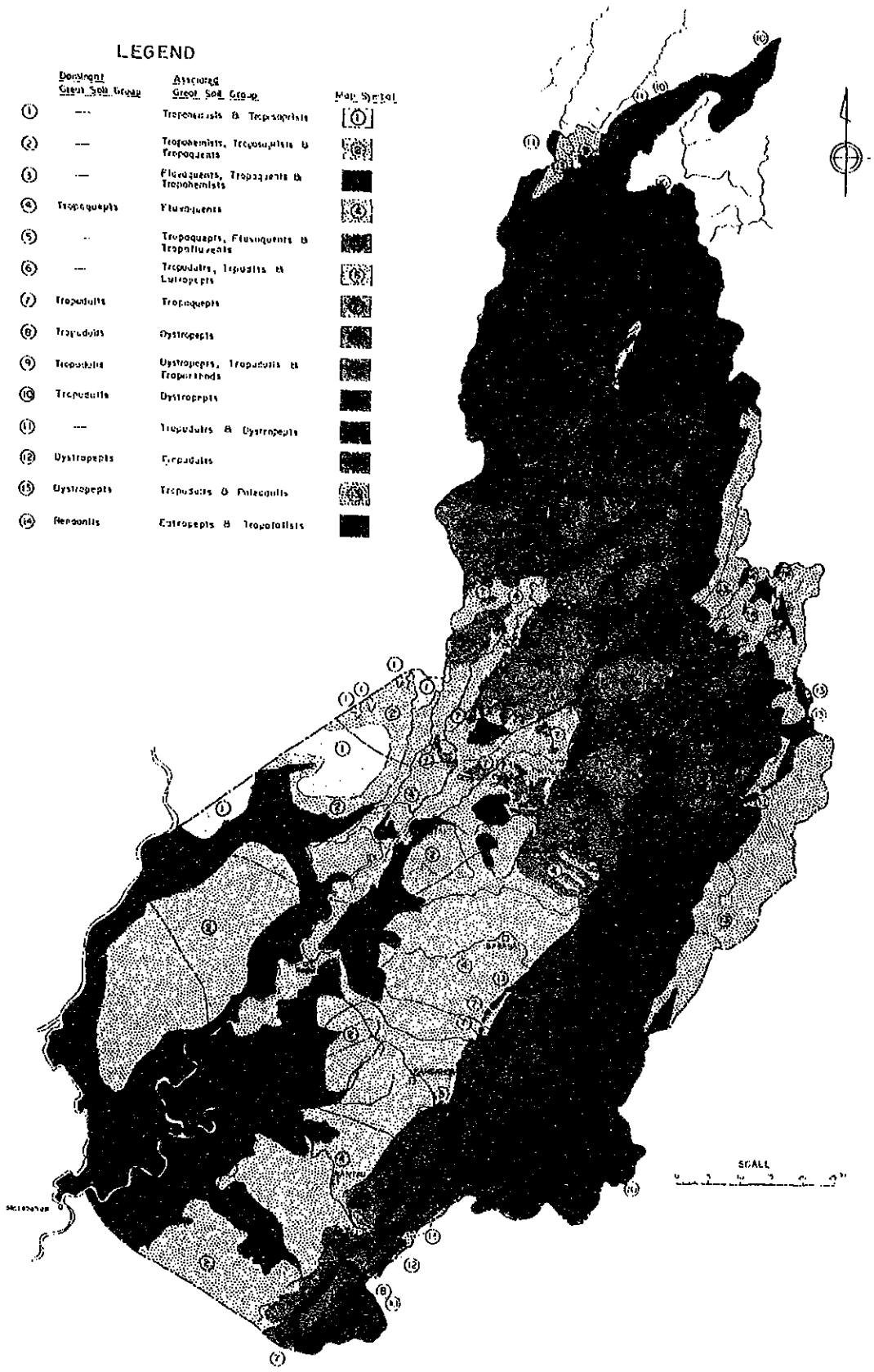
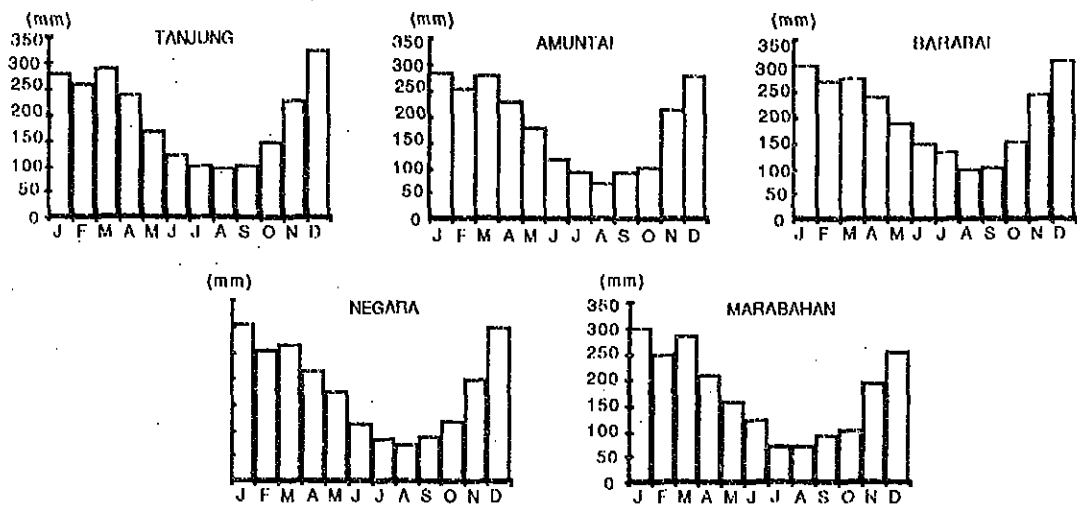
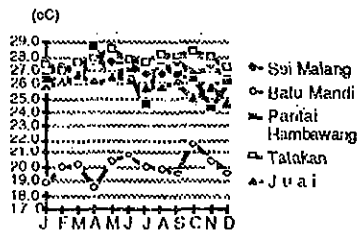


Figure 10 Soil Map

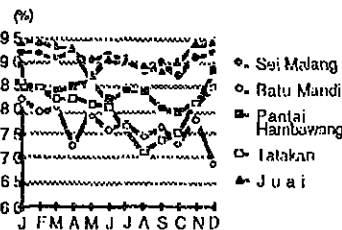
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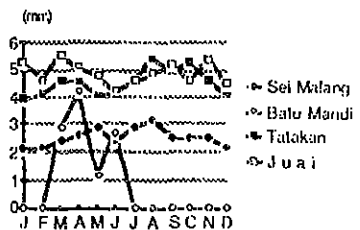
Monthly Temperature



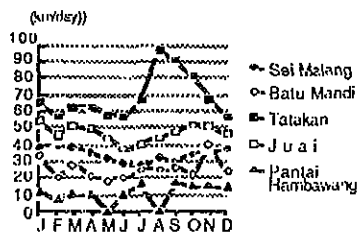
Monthly Relative Humidity



Monthly Evaporation



Monthly Wind Speed



Monthly Sunshine Duration

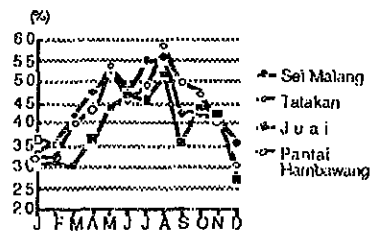


Figure 11 Climatic Condition in the Study Area

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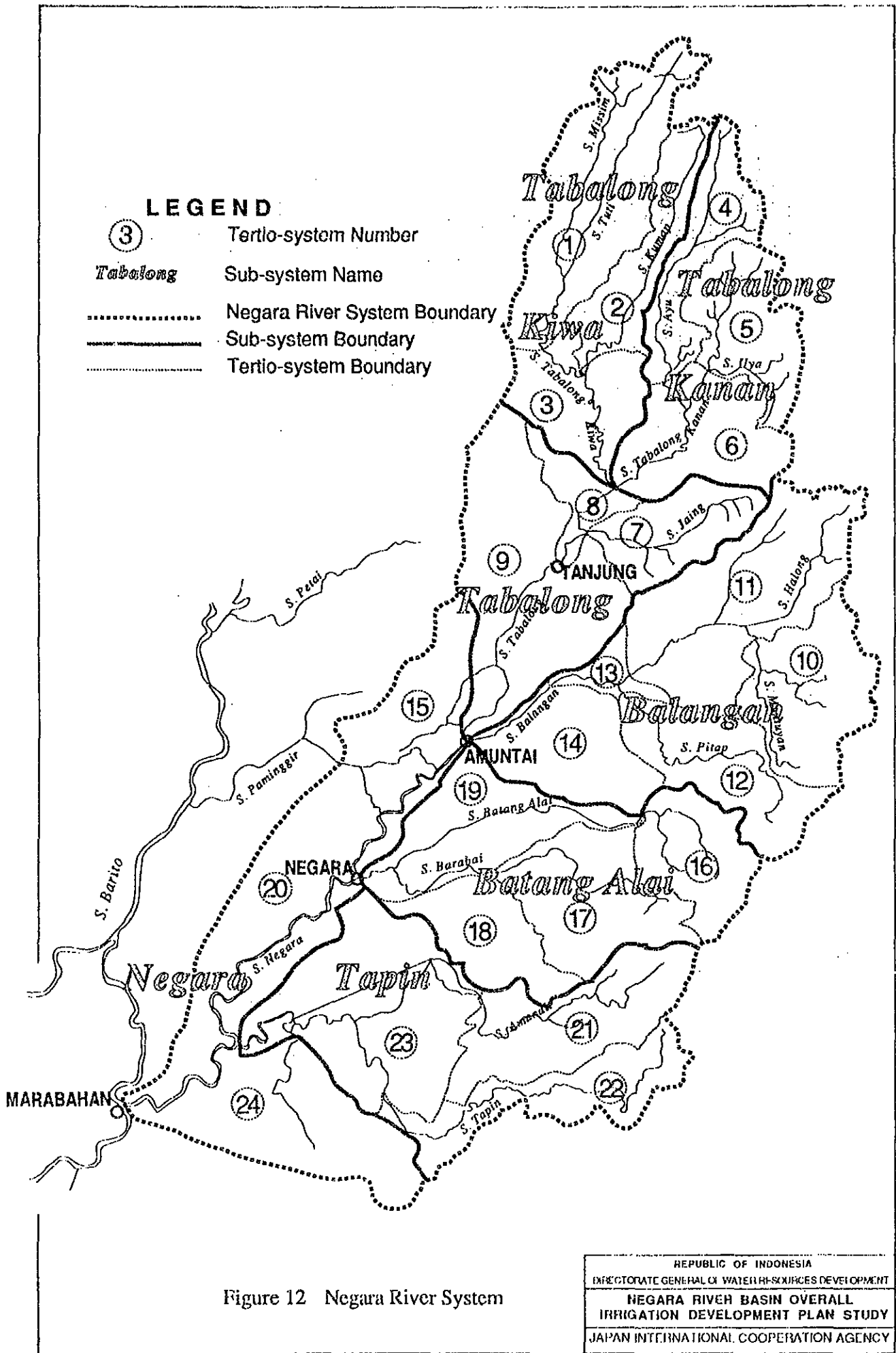


Figure 12 Negara River System

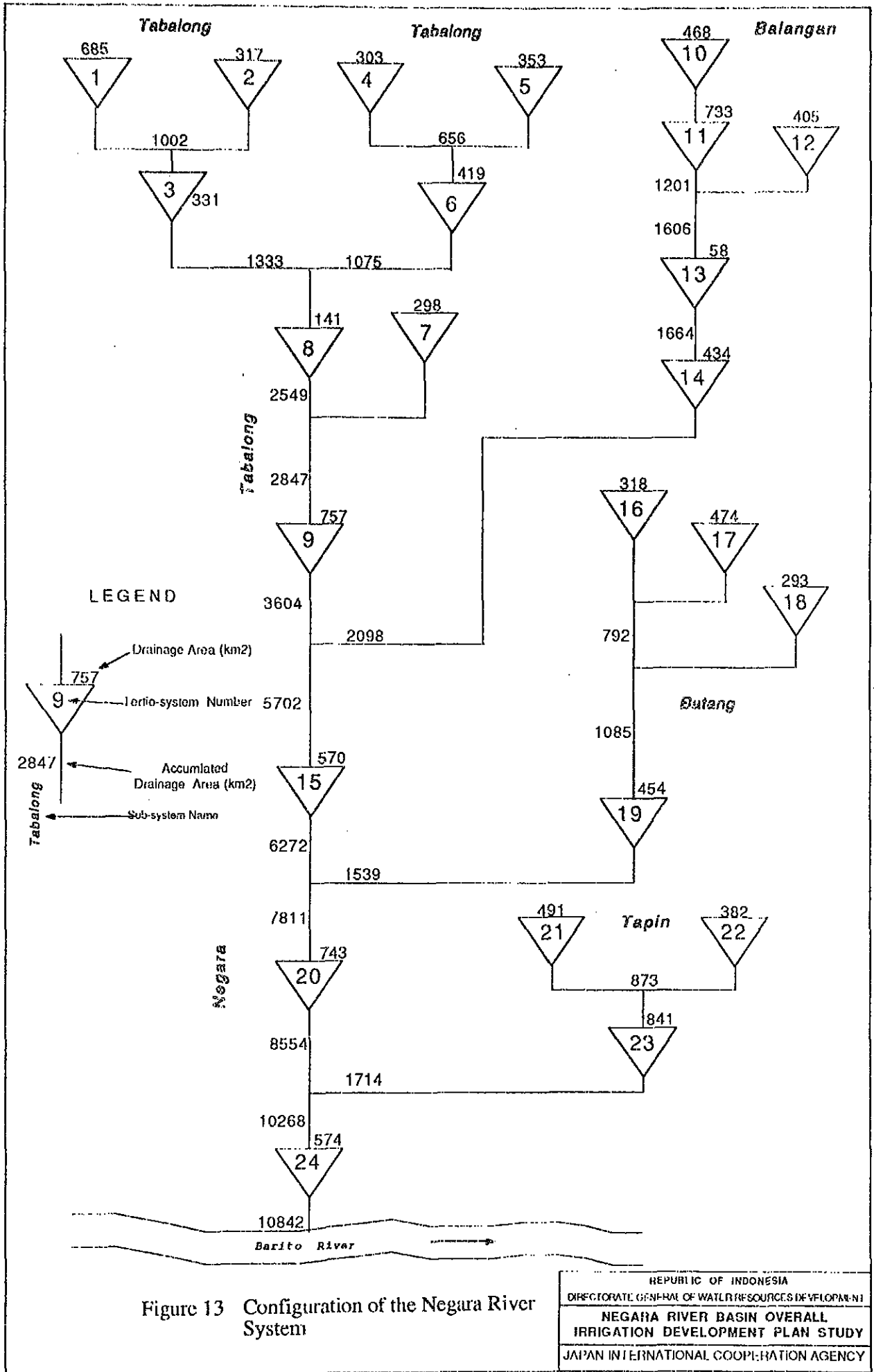


Figure 13 Configuration of the Negara River System

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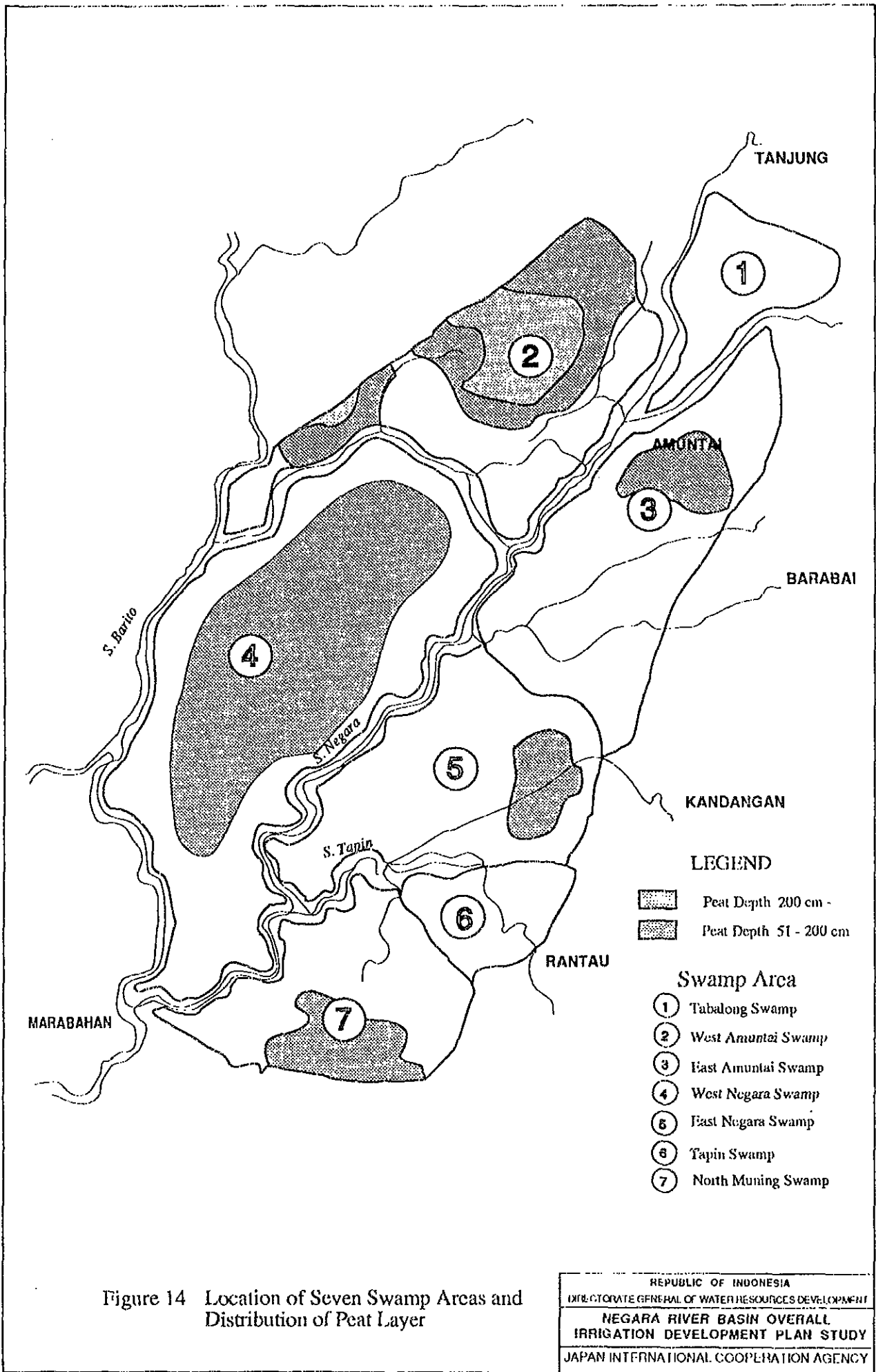


Figure 14 Location of Seven Swamp Areas and Distribution of Peat Layer

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LEGEND

Category	Symbol	Pattern
Forest	[Hr]	Swamp Forest
	[Hq]	Peat Swamp Forest
	[Hh]	Lowland Forest
	[Hk]	Heath Forest
	[Hn]	Riparian Forest
	[Hl]	Submontane Forest
	[Ht]	Forest on Limestone
	[Hu]	Forest on Ultrabasic Hills
	[Hs]	Loggia Primary Forest
	[Hr]	Reforestation of Foresty Area
	Bush & Grassland	[B]
[G]		Alang-alang
[S]		Swamp including Sedges, Pteridites
Cultivate Land	[P]	Paddy
	[E]	Estates
	[C]	Shifting Cultivation
Others	[S]	Settlement
	[W]	Water

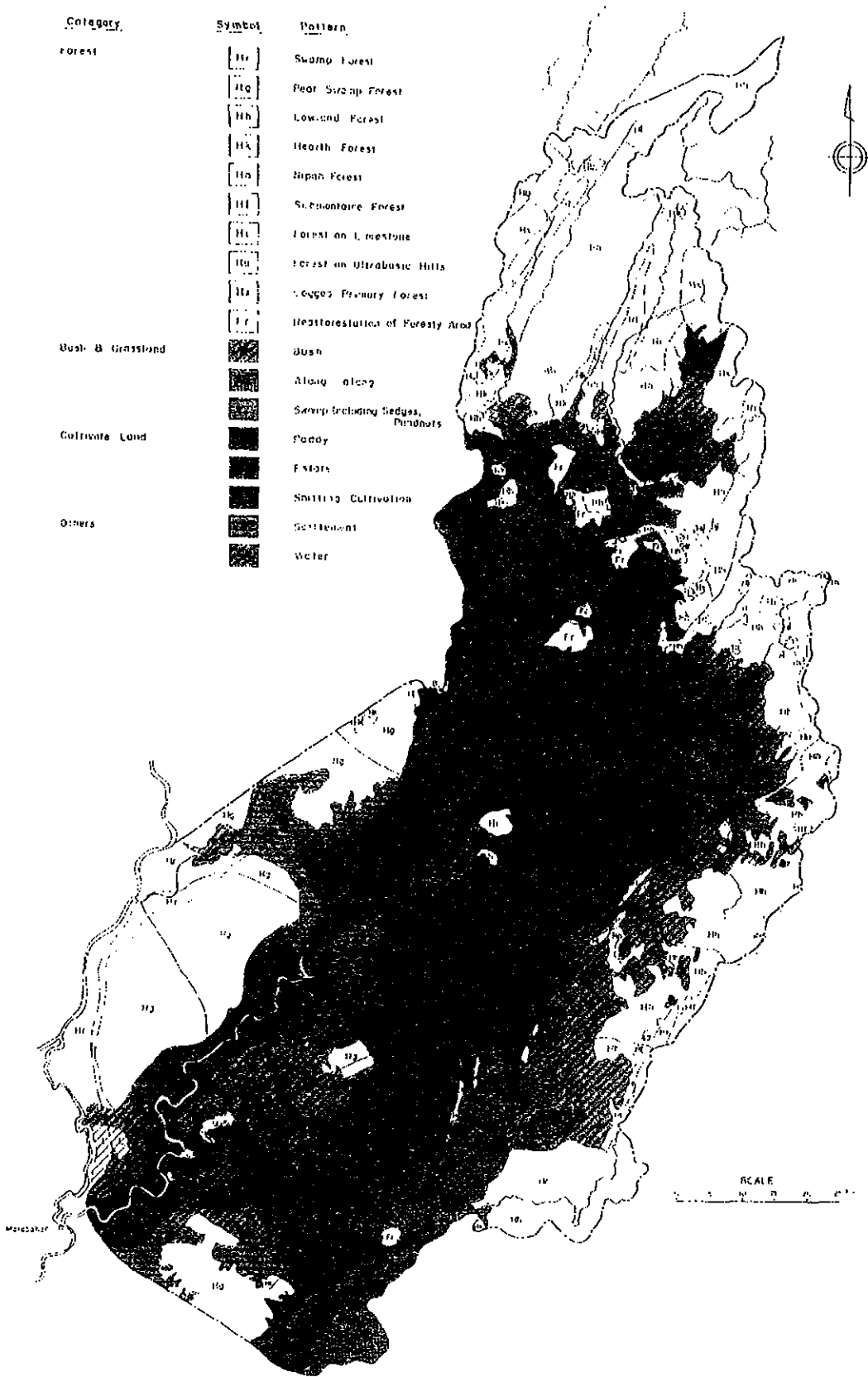


Figure 15 Land Use Map

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Paddy Field Condition	J	F	M	A	M	J	J	A	S	O	N	D
Irrigated			H/V							T/P		
				T/P				H/V				
Drained			H/V								T/P	
				T/P				H/V				
Poldered			H/V								T/P	
				T/P				H/V				
Rainfed			H/V								T/P	
				T/P							H/V	

Remarks : H/V : Harvesting
T/P : Transplanting

Figure 16 Typical Paddy Cropping Calenders

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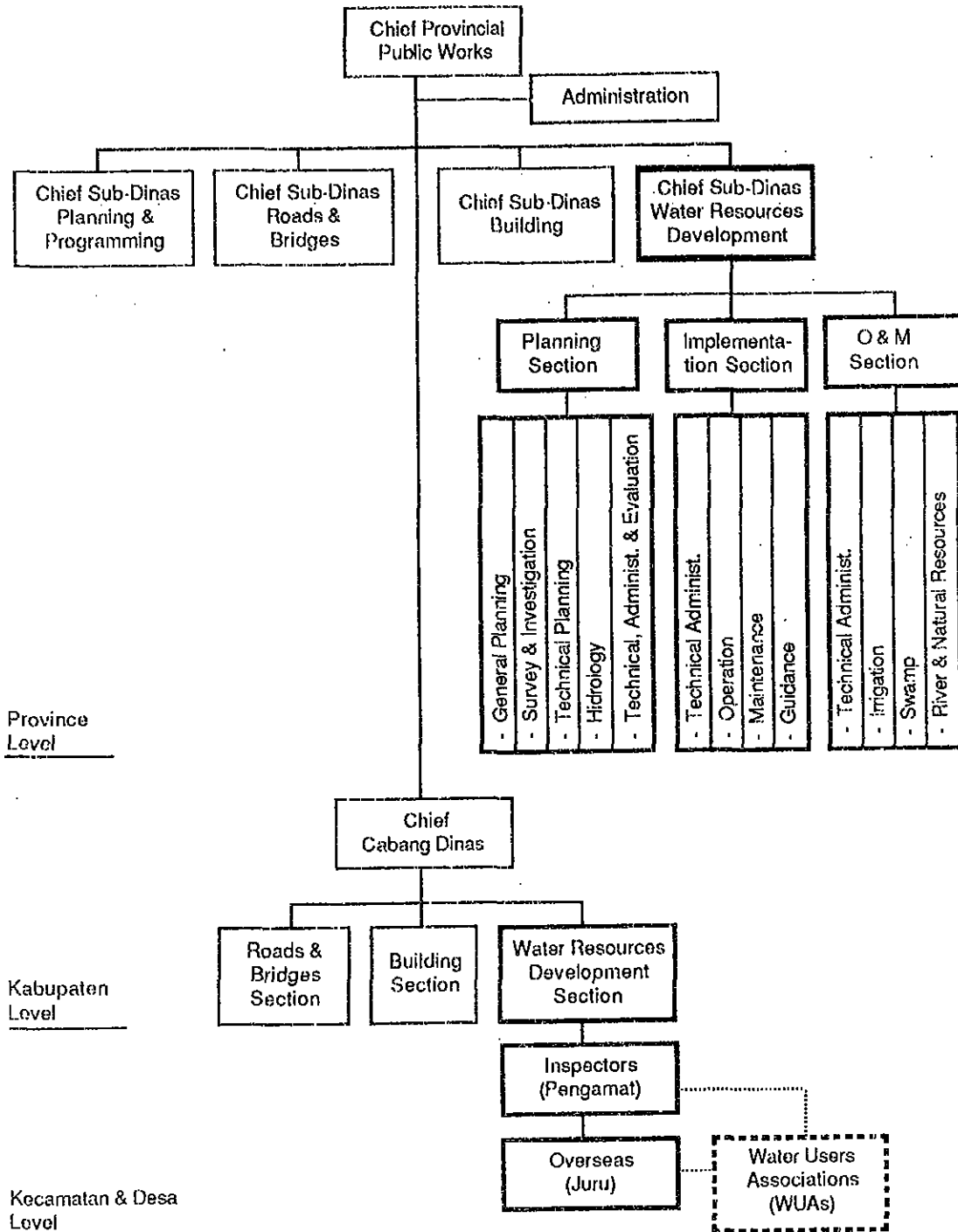
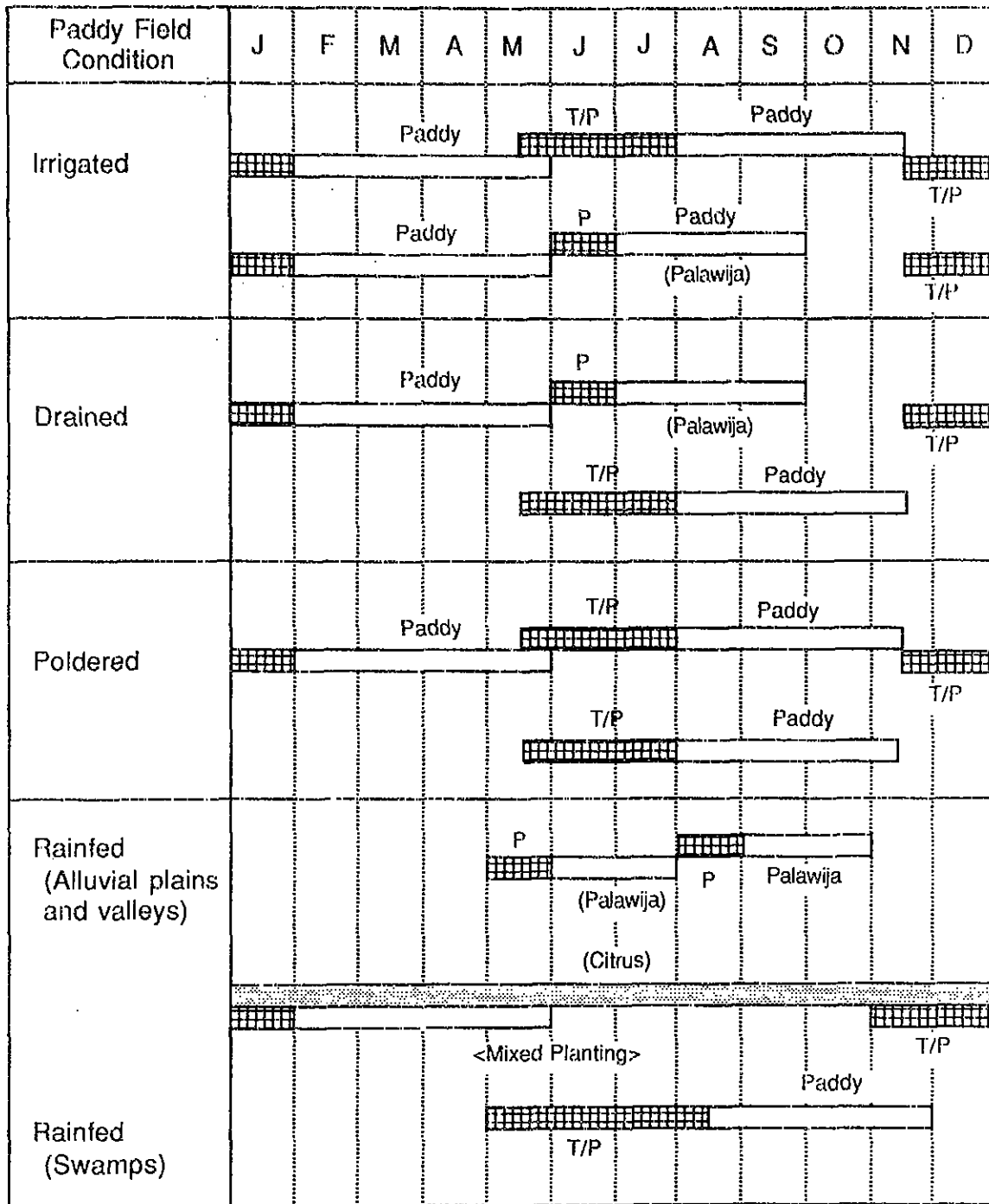


Figure 17 Organization Structure of Sub-Dinas Water Resources Development in South Kalimantan

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Remarks: T/P: Transplanting
P: Planting

Figure 18 Proposed Cropping Calenders

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List of Hydropower Project

No.	Project Name
1	Tablong-1
2	Tablong-2
3	Ayu-1
4	Ayu-2
5	Uwi
6	Halong-1
7	Halong-2
8	Pitap-1
9	Pitap-2
10	Batang Alai
11	Amandit-1
12	Tapin
13	Amandit-2

LEGEND

2 Proposed Damsite

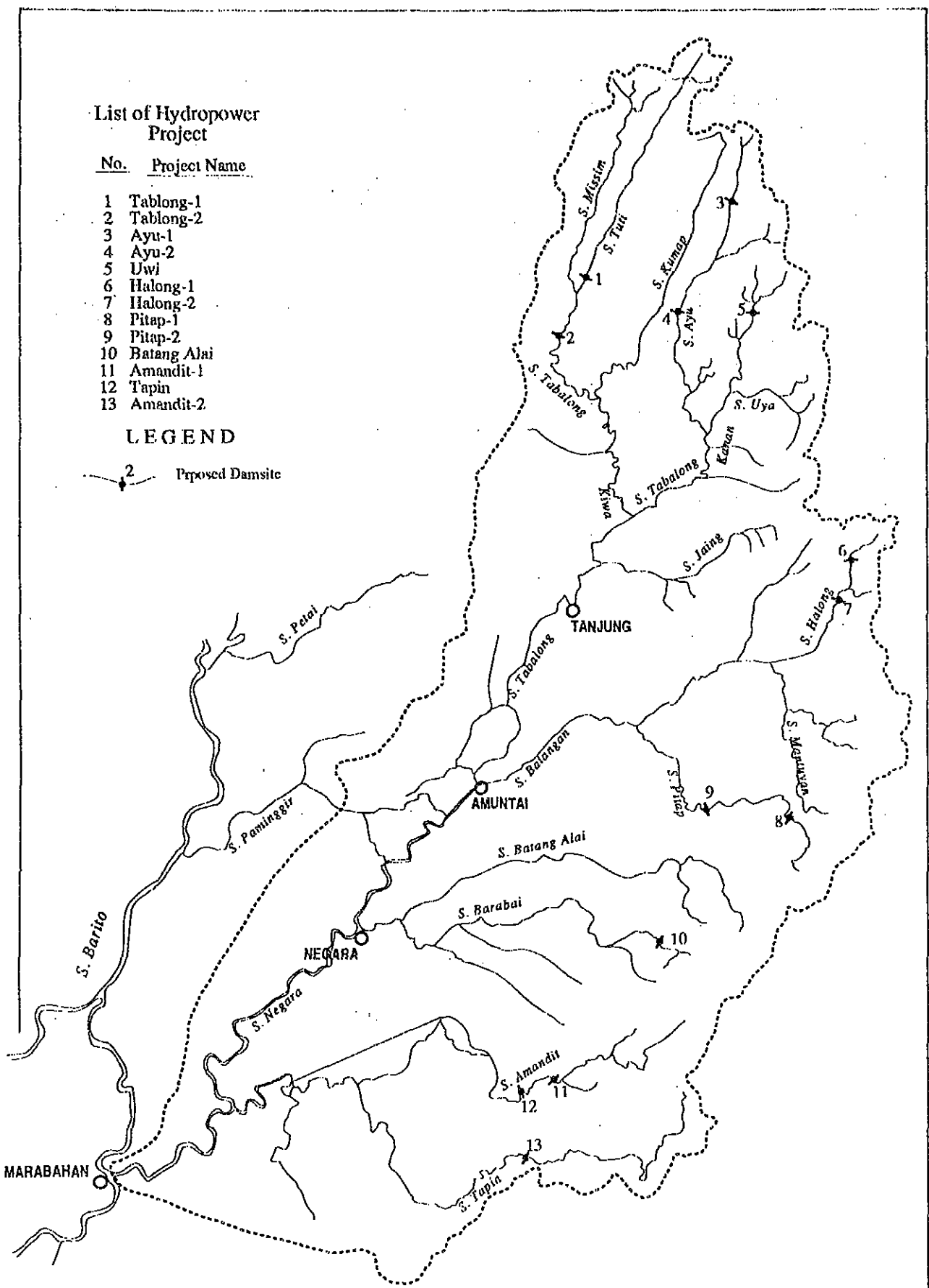


Figure 19 Location of Hydropower Project Sites

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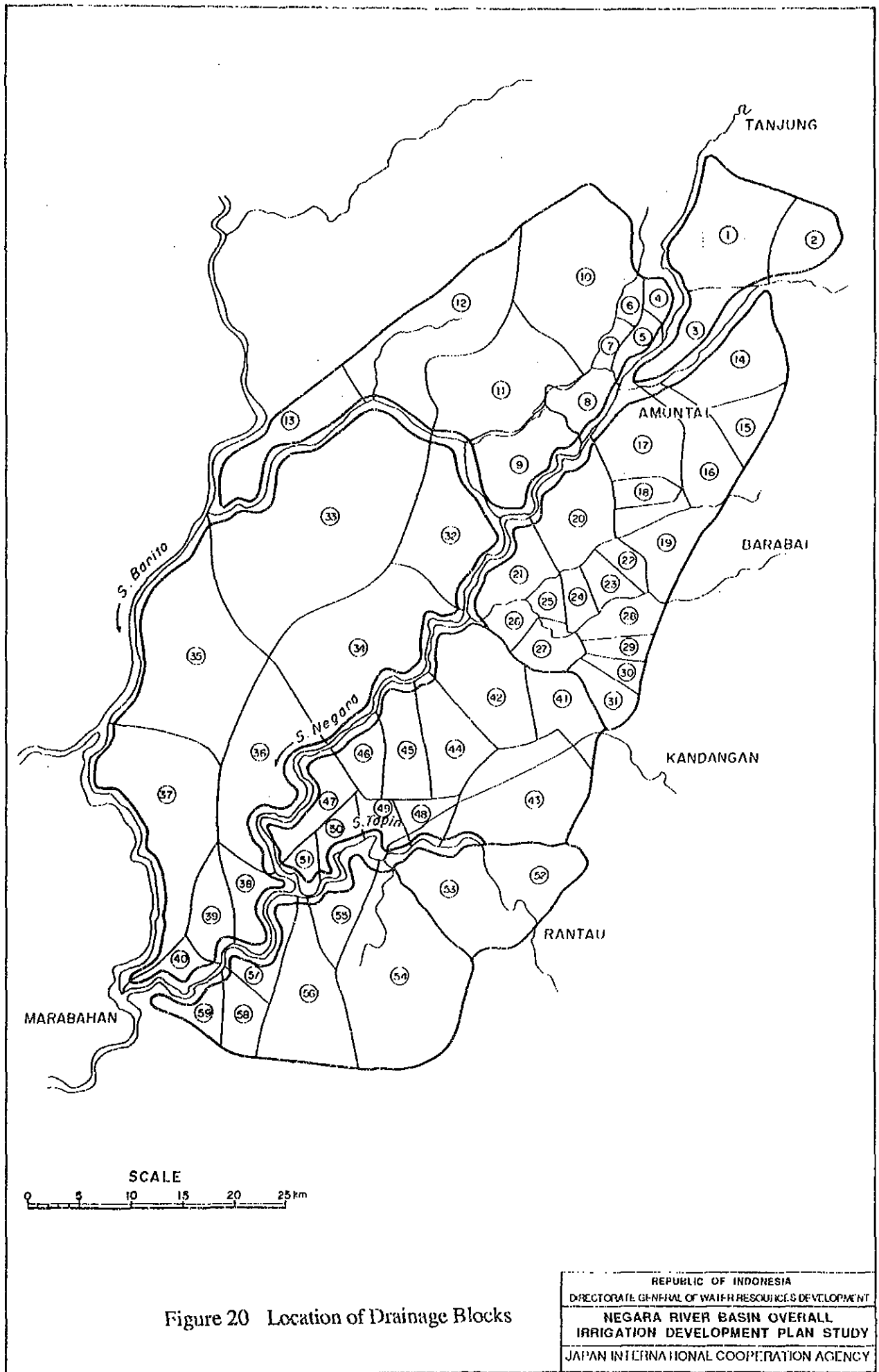
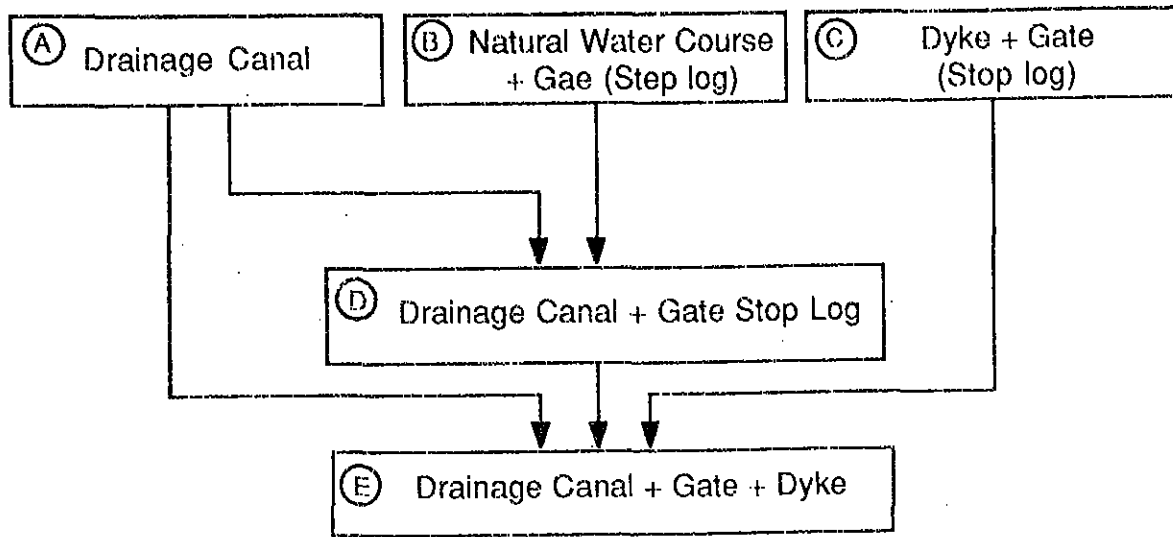


Figure 20 Location of Drainage Blocks

Type of Drainage System



Type of Drainage System

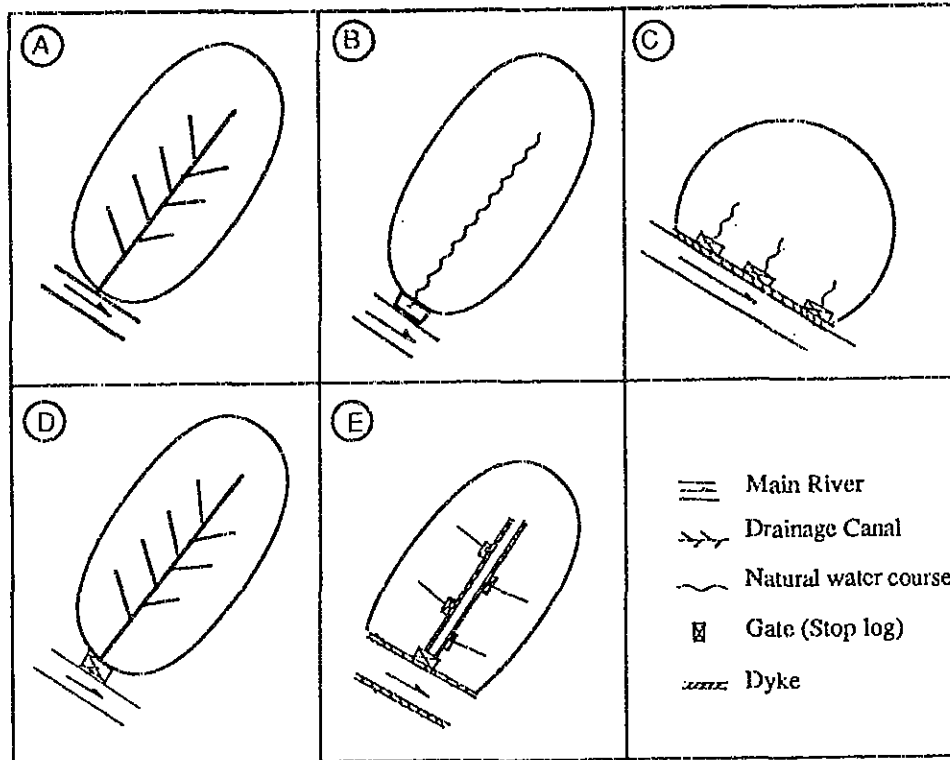


Figure 21 Drainage Improvement Step

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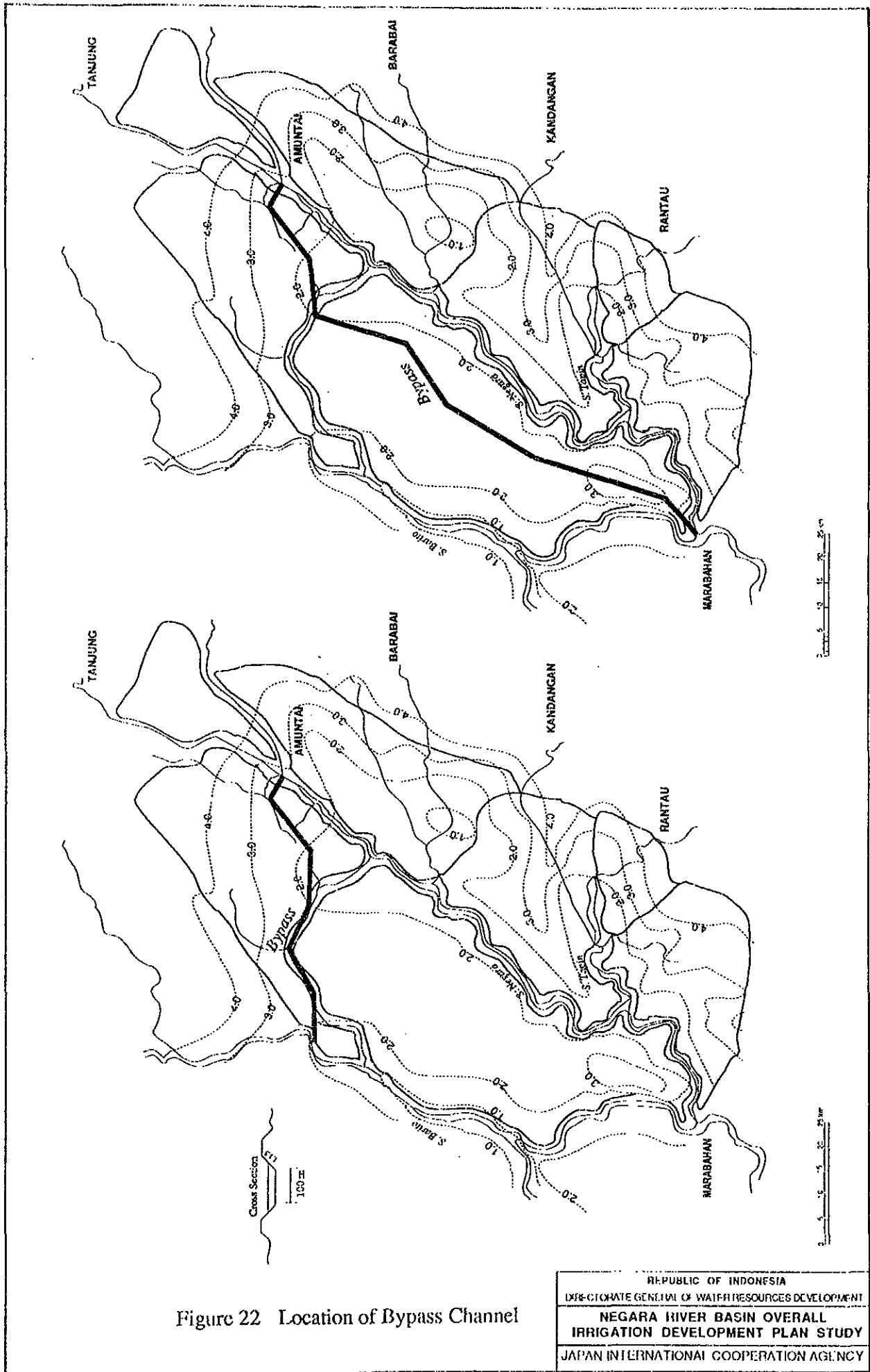


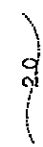
Figure 22 Location of Bypass Channel

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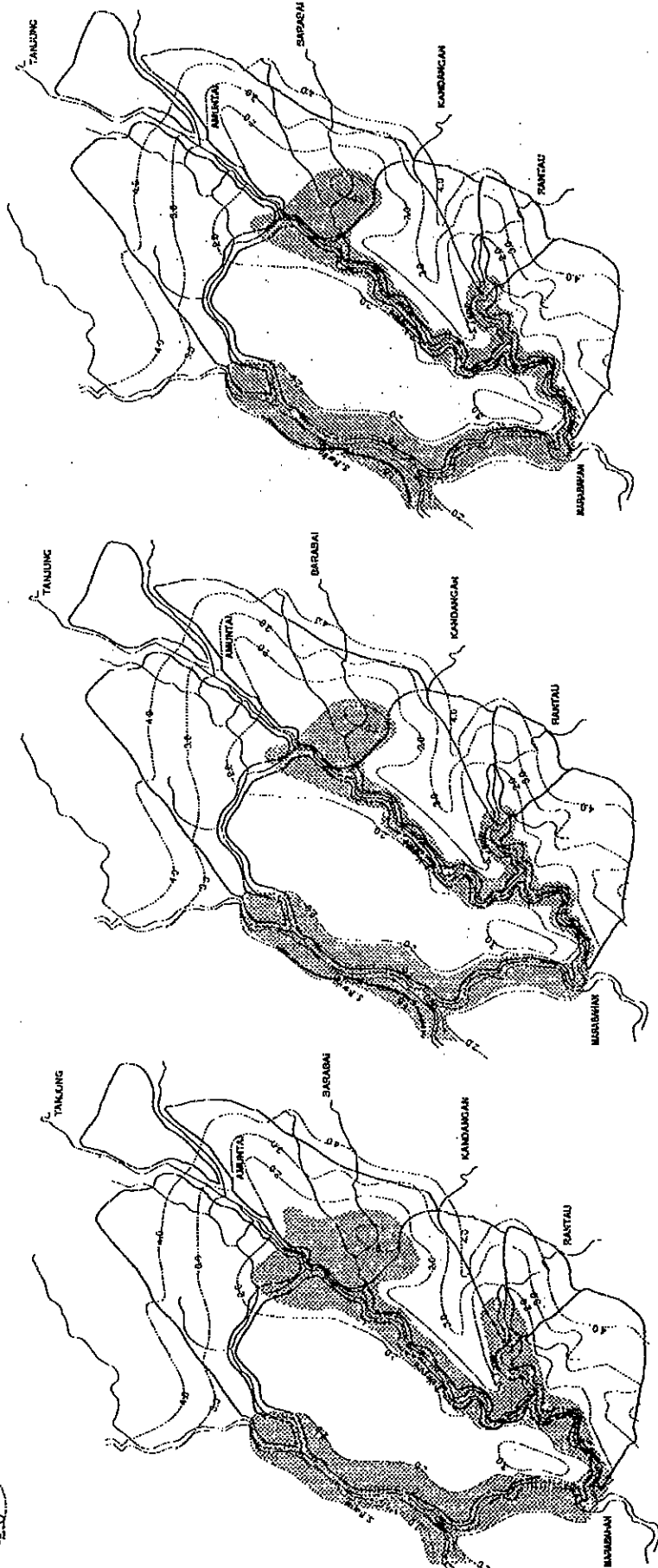
LEGEND



Inundation Area



Contour Line
2.0



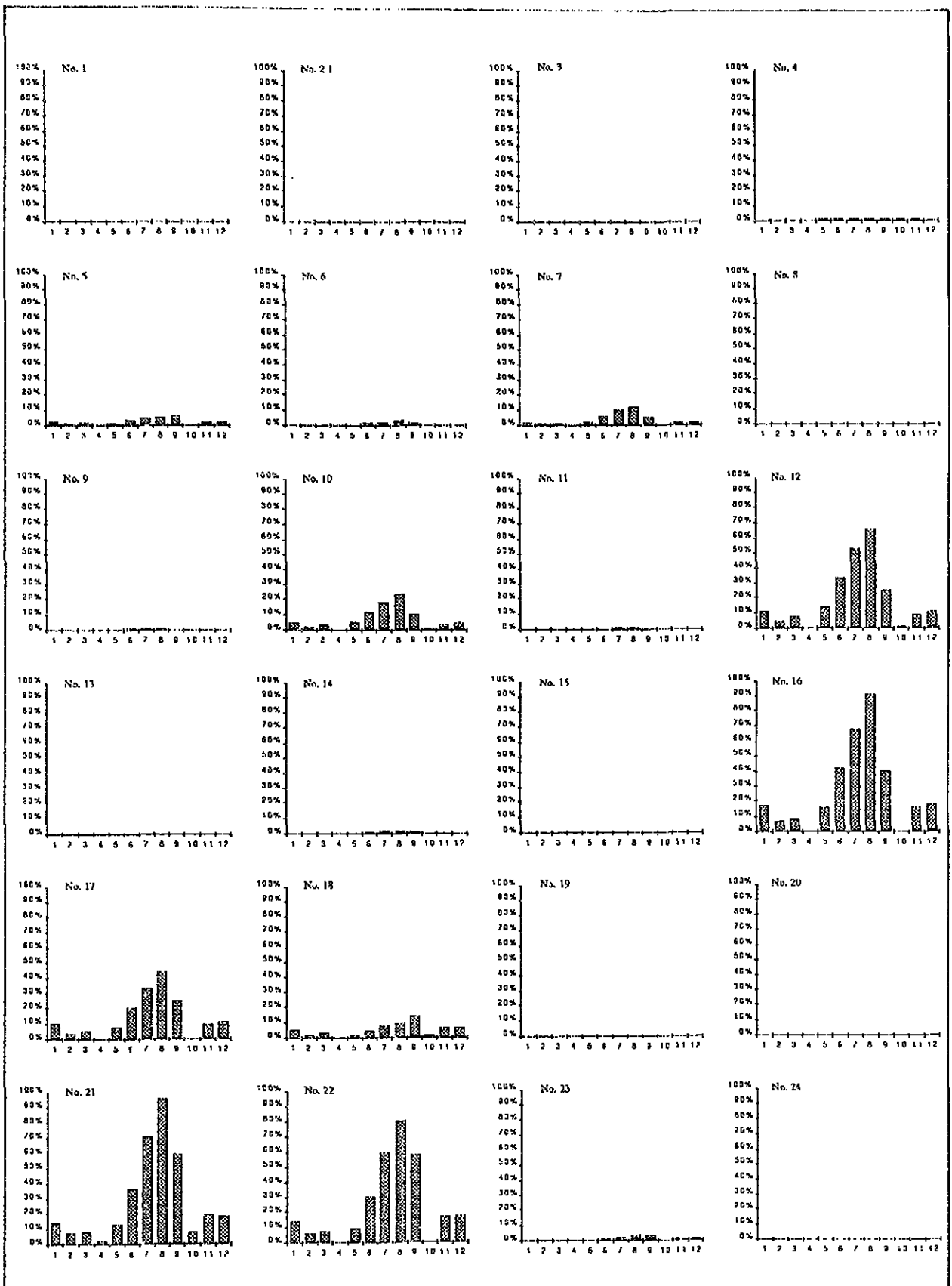
Case 1

Case 2

Case 3

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Figure 23 Estimated Inundation Area under Three Cases



LEGEND

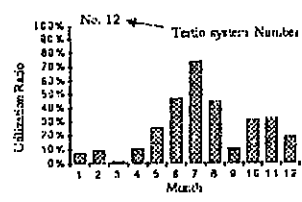


Figure 24 Monthly Water Utilization Ratio by Tertiary-system in 2018

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- | | | | | | |
|--|---|---|---|---|---|
| EXISTING DRAINAGE SCHEME | PLANNED DRAINAGE SCHEME | EXISTING POLDER SCHEME | NEW IRRIGATION SCHEME | EXISTING IRRIGATION SCHEME | PLANNED SCHEME |
| <ul style="list-style-type: none"> 1 S. Gajah 2 S. Ronggo 3 S. Paksi 4 S. P. Pang 5 S. Banteh 6 S. Neri 7 S. P. Neri - 2000 8 R. Batu Mendi 9 R. Jember 10 R. Banteh 11 R. Tures 12 R. Banteh 13 R. Jember 14 R. Tures 15 S. T. Banteh 16 S. T. Banteh 17 S. T. Banteh 18 S. T. Banteh 19 S. T. Banteh 20 S. T. Banteh 21 S. T. Banteh 22 S. T. Banteh 23 S. T. Banteh 24 S. T. Banteh 25 S. T. Banteh 26 S. T. Banteh 27 S. T. Banteh 28 S. T. Banteh 29 S. T. Banteh 30 S. T. Banteh | <ul style="list-style-type: none"> 1 R. P. Neri 2 R. Banteh 3 R. P. Pang 4 R. G. Pang 5 R. Neri 6 R. Banteh 7 R. Neri - 2000 8 R. Batu Mendi 9 R. Jember 10 R. Banteh 11 R. Tures 12 R. Banteh 13 R. Jember 14 R. Tures 15 S. T. Banteh 16 S. T. Banteh 17 S. T. Banteh 18 S. T. Banteh 19 S. T. Banteh 20 S. T. Banteh 21 S. T. Banteh 22 S. T. Banteh 23 S. T. Banteh 24 S. T. Banteh 25 S. T. Banteh 26 S. T. Banteh 27 S. T. Banteh 28 S. T. Banteh 29 S. T. Banteh 30 S. T. Banteh | <ul style="list-style-type: none"> 1 Antabura 2 Tigapuluh 3 Alas 4 P. Neri 5 P. Pang 6 P. Neri 7 P. Pang 8 P. Neri 9 P. Pang 10 P. Neri 11 P. Pang 12 P. Neri 13 P. Pang 14 P. Neri 15 P. Pang 16 P. Neri 17 P. Pang 18 P. Neri 19 P. Pang 20 P. Neri 21 P. Pang 22 P. Neri 23 P. Pang 24 P. Neri 25 P. Pang 26 P. Neri 27 P. Pang 28 P. Neri 29 P. Pang 30 P. Neri | <ul style="list-style-type: none"> 1 Singsing 2 Kuning 3 Kuning 4 Kuning 5 Kuning 6 Kuning 7 Kuning 8 Kuning 9 Kuning 10 Kuning 11 Kuning 12 Kuning 13 Kuning 14 Kuning 15 Kuning 16 Kuning 17 Kuning 18 Kuning 19 Kuning 20 Kuning 21 Kuning 22 Kuning 23 Kuning 24 Kuning 25 Kuning 26 Kuning 27 Kuning 28 Kuning 29 Kuning 30 Kuning | <ul style="list-style-type: none"> 1 Jero Sogor 2 G. Mas 3 P. Neri 4 T. Neri 5 S. Neri 6 L. Neri 7 T. Neri 8 T. Neri 9 T. Neri 10 T. Neri 11 T. Neri 12 T. Neri 13 T. Neri 14 T. Neri 15 T. Neri 16 T. Neri 17 T. Neri 18 T. Neri 19 T. Neri 20 T. Neri 21 T. Neri 22 T. Neri 23 T. Neri 24 T. Neri 25 T. Neri 26 T. Neri 27 T. Neri 28 T. Neri 29 T. Neri 30 T. Neri | <ul style="list-style-type: none"> 1 Jero Sogor 2 G. Mas 3 P. Neri 4 T. Neri 5 S. Neri 6 L. Neri 7 T. Neri 8 T. Neri 9 T. Neri 10 T. Neri 11 T. Neri 12 T. Neri 13 T. Neri 14 T. Neri 15 T. Neri 16 T. Neri 17 T. Neri 18 T. Neri 19 T. Neri 20 T. Neri 21 T. Neri 22 T. Neri 23 T. Neri 24 T. Neri 25 T. Neri 26 T. Neri 27 T. Neri 28 T. Neri 29 T. Neri 30 T. Neri |

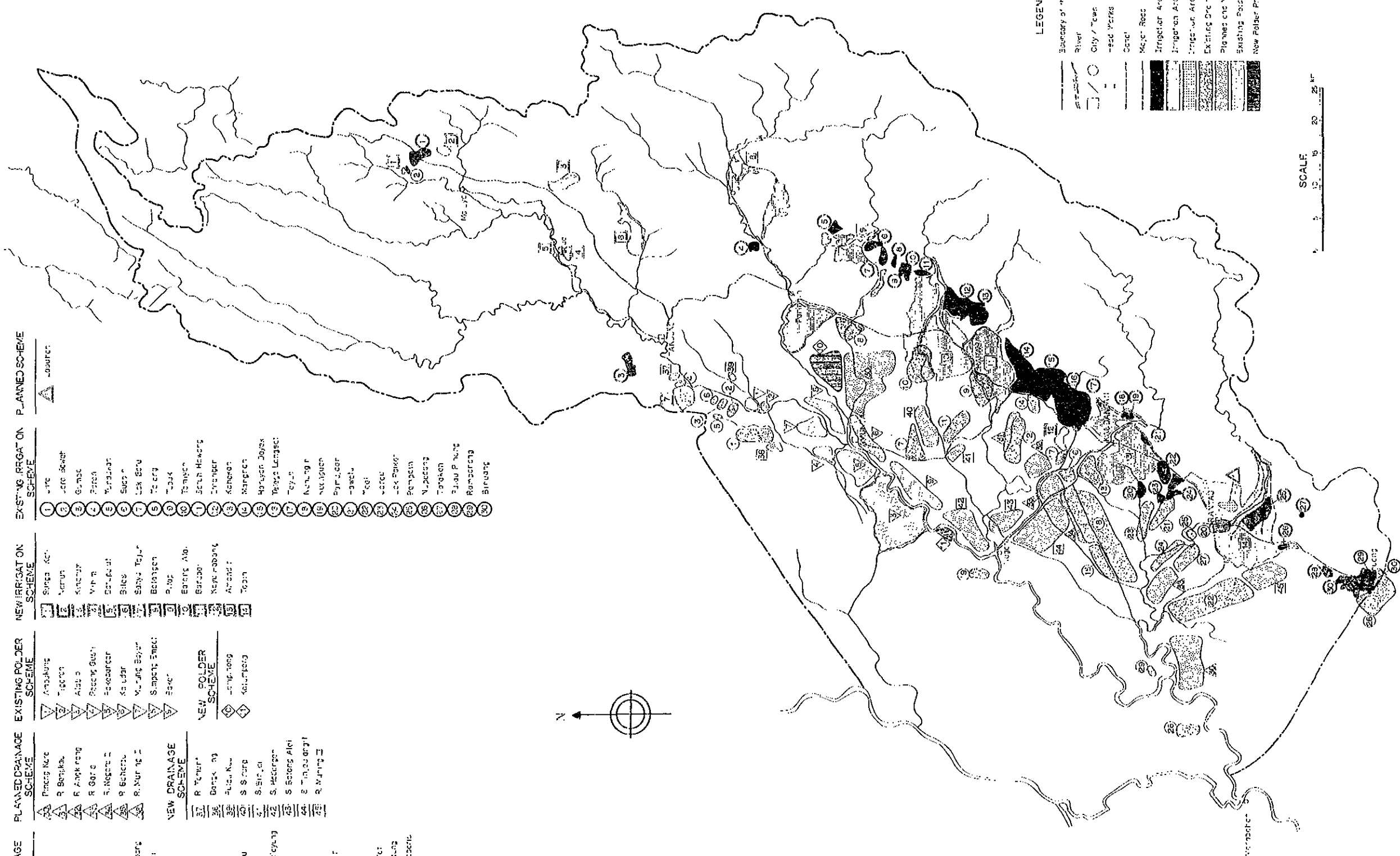


Figure 25 Location of Candidate Schemes

REPUBLIC OF INDONESIA
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 NEGARA RIVER BASIN OVERALL
 IRRIGATION DEVELOPMENT PLAN STUDY
 JAPAN INTERNATIONAL COOPERATION AGENCY

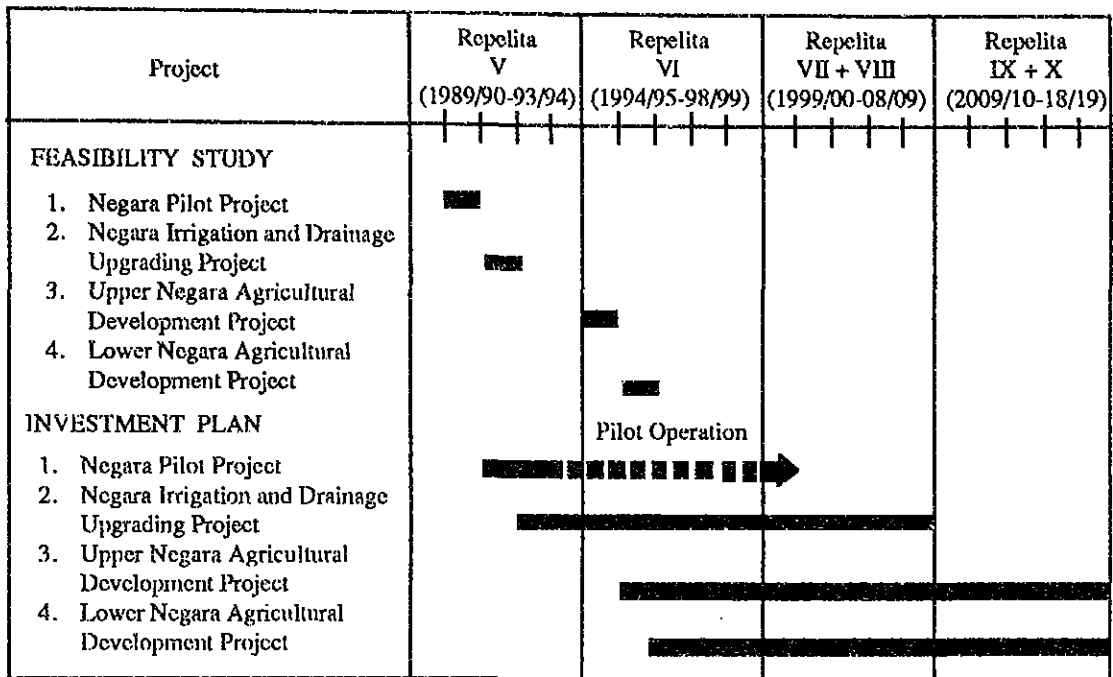


Figure 26 Implementation Program

REPUBLIC OF INDONESIA
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 NEGARA RIVER BASIN OVERALL
 IRRIGATION DEVELOPMENT PLAN STUDY
 JAPAN INTERNATIONAL COOPERATION AGENCY

ATTACHMENT

SCOPE OF WORK
FOR
NEGARA RIVER BASIN OVERALL IRRIGATION DEVELOPMENT PLAN STUDY
IN
THE REPUBLIC OF INDONESIA

AGREED UPON
BETWEEN

DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT

MINISTRY OF PUBLIC WORKS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

JAKARTA, JULY 29, 1987



Ir. RACHARDJO NOTOSAPUTRO
Director of Planning and
Programming, DGWRD,
Ministry of Public Works.



Mr. TAKAYA ENDO
Leader
The Preliminary Study Team
Japan International
Cooperation Agency.

I. INTRODUCTION

In response to the request of the Government of the Republic of Indonesia, the Government of Japan has decided to conduct Negara River Basin Overall Irrigation Development Study (hereinafter referred to as "The Study") in accordance with the relevant laws and regulations in force in Japan.

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

The Directorate General of Water Resources Development, the Ministry of Public Works, Indonesia, (hereinafter referred to as "DGWRD") shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the scope of work with regard to the above-mentioned Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are :

- (1) To formulate a plan on the Negara River Basin Overall Irrigation Development in South Kalimantan, and
- (2) To make technology transfer to the Indonesian counterpart personnel in the course of the Study.

III. SCOPE OF THE STUDY

1. Study Area

The Study covers a planned area of about 11,500 Km² of the whole Negara River Basin and its affected area in South Kalimantan.

2. Contents of the Study

The Study will be composed of three phases as follows;

Phase - I Collection, review and analysis of relevant data and Information on the whole Negara River Basin.

A) Natural conditions

- a. Topography
- b. Meteorology and Hydrology
- c. Geology and Hydrogeology
- d. Pedology
- e. Inundation and Flood
- f. Upper Watershed Management and critical land.

B) Social and economic conditions

- a. Population
- b. Social organization
- c. Regional and national developmnet programmes
- d. Rural economy
- e. Social infrastructure
- f. Water usage facilities
- g. Others such as inland navigation and transmigration

C) Agricultural conditions

- a. Land Use
- b. Land tenure
- c. Irrigation and Drainage
- d. Farming and Cropping
- e. Inland fishery
- f. Agro-economy
- g. Processing, Marketing and Transportation
- h. Agricultural organization.

Phase - II Supplemental Survey and Formulation of a Basic
Development Plan

- A) Supplemental survey in Indonesia based on the results of Phase-I study
- B) Identification and evaluation of the development potentials in the area
- C) Formulation of a basic development plan

Phase - III Formulation of the Overall Irrigation Development Plan

The Overall Irrigation Development Plan in the Negara River Basin will be formulated, taking into consideration the following components;

- a. Irrigation and drainage system
- b. Preliminary design for irrigation and drainage facilities
- c. Operation and maintenance system
- d. Land reclamation
- e. Water demand and supply (including drinking water)
- f. Mini-hydro electric power development sub-projects
- g. General layout of development sub-projects
- h. Prioritization of development sub-projects
- i. Project evaluation
- j. Environmental impact evaluation

IV. STUDY SCHEDULE

The whole study shall be conducted within 17 months as in the attached tentative schedule.

V. R E P O R T S

JICA shall prepare and submit the following reports in English to the Government of Indonesia.

1. Inception Report
Thirty (30) copies at the beginning of Phase-I study in Indonesia.
2. Field Report (I)
Thirty (30) copies at the end of the field survey of Phase-I study
3. Progress Report
Thirty (30) copies at the beginning of the field survey of Phase-II study.
4. Field Report (II)
Thirty (30) copies at the end of the field survey of Phase-II study
5. Interim Report
Thirty (30) copies at the end of Phase-II study.
6. Field Report (III)
Thirty (30) copies at the end of the field survey of Phase-III study.
7. Draft Final Report
Fifty (50) copies at the end of Phase-III study
The Government of Indonesia shall, if any, present comments on the Draft Final Report to JICA within one (1) month after receiving the Draft Final Report.
8. Final Report
Fifty (50) copies within one (1) month after receipt of comments on the draft Final Report.

VI. UNDERTAKING OF THE GOVERNMENT OF INDONESIA

1. To facilitate smooth conduct of the Study, the Government of Indonesia will take necessary measures :
 - (1) To secure the safety of the Japanese study Team,
 - (2) To permit the members of the Japanese Study Team to enter, leave and sojourn in Indonesia for the duration

- of their assignment therein, and exempt them from alien registration requirements and consular fees,
- (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 Indonesia for the conduct of the Study,
 - (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,
 - (5) To provide necessary facilities to the Japanese Study Team for the remittances as well as the utilization of the funds introduced into Indonesia from Japan in connection with the implementation of the Study,
 - (6) To secure permission to take all data and documents related to the Study out of Indonesia to Japan by the Japanese Study Team,
 - (7) To provide medical services as needed. Its expenses will be chargeable on the members of the Japanese Study Team.
2. The Government of Indonesia shall bear claims, if any arises, against the members of the Japanese Study Team arising 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. DGWRD shall, at its own expenses, provide the Japanese Study Team with the following, in cooperation with other agencies concerned, if necessary;
- (1) Available data and information related to the Study,
 - (2) Counterpart personnel,
 - (3) Suitable offices with necessary equipment, in Banjarmasin and the Study area,
 - (4) Credentials or identification cards.

4. DGWRD will assist the Japanese Study Team to arrange accommodations.

VII. UNDERTAKING OF JICA

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

- (1) To dispatch, at its own expense, study teams to Indonesia
- (2) To pursue technology transfer to the Indonesian counterpart personnel in the course of the Study in Indonesia as well as in Japan.
- (3) To provide equipment and materials necessary for the Study.

VIII. OTHERS

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

TENTATIVE SCHEDULE

Phase	Phase I					Phase II					Phase III						
Item Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORK IN INDONESIA	=====					=====					=====						
WORK IN JAPAN	=====					=====					=====		=====				
REPORTS	△ Inc.R	△ F/R(I)		△ P.R.		△ F/R(II)			△ Int.R		△ F/R(III)		△ D.F.R.		△ F.R		

(Remarks) Inc.R.: Inception Report P.R.: Progress Report
 Int.R.: Interim Report D.F.R.: Draft Final Report
 F.R. : Final Report F/R : Field Report
 ⊙ Comments on D.F.R. by Indonesian side

===== : Field Work
 ===== : Home Office Work

JICA