

Table 5.12.24 (1/3) ANNUAL DISBURSEMENT SCHEDULE OF UPPER INDRAGIRI RIVER IMPROVEMENT PROJECT (FINANCIAL)
(1996 - 1999)

Description	Unit: Million Rp.														
	Amount			1996			1997			1998			1999		
	F.C.	L.C.	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
I. Construction Base Cost	434,111	537,803	971,914	0	0	0	0	26,636	17,663	22,863	15,897	0	0	0	0
1. Preparatory Works	27,048	15,937	42,985	0	0	0	0	3,944	2,164	0	0	0	0	0	0
2. Main Civil Works	270,490	159,366	429,856	0	0	0	0	19,722	10,819	19,722	10,819	0	0	0	0
Sub-Total	297,538	175,303	472,841	0	0	0	0	23,666	12,983	19,722	10,819	0	0	0	0
7. Price Contingency (3%F.C. & 8%L.C.)	136,573	362,500	499,073	0	0	0	0	2,970	4,680	3,141	5,078	0	0	0	0
II. Compensation Cost	0	27,353	27,353	0	0	0	0	781	0	0	0	0	0	0	0
1. Compensation	0	9,390	9,390	0	0	0	0	620	0	0	0	0	0	0	0
2. Price Contingency (8%L.C.)	0	17,963	17,963	0	0	0	0	161	0	0	0	0	0	0	0
III. Administration Cost	0	65,282	65,282	0	593	0	2,135	0	1,153	0	498	0	0	0	0
1. Administration	0	24,111	24,111	0	509	0	1,895	0	848	0	339	0	0	0	0
2. Price Contingency (8%L.C.)	0	41,171	41,171	0	85	0	440	0	306	0	159	0	0	0	0
IV. Engineering Cost	41,611	48,277	89,888	2,762	1,666	0	0	977	648	1,006	699	0	0	0	0
1. Detailed Design	17,853	10,517	28,370	2,603	1,428	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	11,902	7,012	18,914	0	0	0	0	868	476	868	476	0	0	0	0
3. Price Contingency (3%F.C. & 8%L.C.)	11,856	30,748	42,604	159	238	0	0	109	172	138	223	0	0	0	0
V. Physical Contingency (10% of Items I, II & IV)	47,572	61,343	108,915	276	167	0	78	2,761	1,831	2,387	1,660	0	0	0	0
VI. Total (Items I, II, III, IV & V)	523,294	740,058	1,263,352	3,038	2,425	0	2,994	30,374	21,295	26,256	18,754	0	0	0	0
VII. Value Added Tax (10% of Item VI)	0	126,335	126,335	0	546	0	299	0	5,167	0	4,501	0	0	0	0
VIII. Grand Total	523,294	866,393	1,389,687	3,038	2,972	0	3,294	30,374	26,462	26,256	23,255	0	0	0	0

Notes: *1. Price Level in July 1994

*2. Conversion Rate - 1,00 US\$ = 2,175 Rp.; 1 Yen = 21,90 Rp.

*3. Figures may not add up to totals due to rounding

Table 5.12.24 (2/3) ANNUAL DISBURSEMENT SCHEDULE OF UPPER INDRAGIRI RIVER IMPROVEMENT PROJECT (FINANCIAL)
(2000 - 2007)

Description	2000		2001		2002		2003		2004		2005		2006		2007	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
I. Construction Base Cost	0	0	0	0	74,998	55,627	64,374	50,064	0	0	0	0	46,325	41,488	39,763	37,339
1. Preparatory Works	0	0	0	0	9,867	5,009	0	0	0	0	0	0	5,415	2,746	0	0
2. Main Civil Works	0	0	0	0	49,337	25,045	49,337	25,045	0	0	0	0	27,077	13,730	27,077	13,730
Sub-Total	0	0	0	0	59,204	30,054	49,337	25,045	0	0	0	0	32,492	16,476	27,077	13,730
7. Price Contingency (3%F.C. & 8%L.C.)	0	0	0	0	15,794	25,573	15,037	25,020	0	0	0	0	13,834	25,013	12,686	23,610
II. Compensation Cost	0	0	0	0	5,570	0	0	0	0	0	0	0	4,127	0	0	0
1. Compensation	0	0	0	0	3,250	0	0	0	0	0	0	0	1,770	0	0	0
2. Price Contingency (8%L.C.)	0	0	0	0	2,320	0	0	0	0	0	0	0	2,357	0	0	0
III. Administration Cost	0	1,986	0	7,150	0	3,861	0	1,668	0	1,482	0	5,336	0	2,881	0	1,245
1. Administration	0	1,252	0	4,172	0	2,086	0	834	0	687	0	2,289	0	1,144	0	458
2. Price Contingency (8%L.C.)	0	735	0	2,978	0	1,775	0	834	0	796	0	3,047	0	1,737	0	787
IV. Engineering Cost	7,776	5,246	0	0	2,750	2,040	2,832	2,203	4,803	3,912	0	0	1,699	1,521	1,750	1,643
1. Detailed Design	6,512	3,306	0	0	0	0	0	0	3,574	1,812	0	0	0	0	0	0
2. Construction Supervision	0	0	0	0	2,171	1,102	2,171	1,102	0	0	0	0	1,191	604	1,191	604
3. Price Contingency (3%F.C. & 8%L.C.)	1,264	1,940	0	0	579	938	662	1,101	1,229	2,100	0	0	507	917	558	1,039
V. Physical Contingency (10% of Items I, II & IV)	778	525	0	557	7,775	5,767	6,721	5,227	480	391	0	413	4,802	4,301	4,151	3,898
VI. Total (Items I, II, III, IV & V)	8,554	7,757	0	13,277	85,523	67,294	73,927	59,162	5,284	5,785	0	9,876	52,826	50,191	45,664	44,125
VII. Value Added Tax (10% of Item VI)	0	1,631	0	1,328	0	15,282	0	13,309	0	1,107	0	988	0	10,302	0	8,979
VIII. Grand Total	8,554	9,388	0	14,605	85,523	82,576	73,927	72,470	5,284	6,892	0	10,863	52,826	60,493	45,664	53,103

Notes: *1. Price Level in July 1994

*2. Conversion Rate - 1.00 US\$ = 2.175 Rp.; 1 Yen = 21.90 Rp.

*3. Figures may not add up to totals due to rounding.

Table 5.12.24.(3/3) ANNUAL DISBURSEMENT SCHEDULE OF UPPER INDRAGIRI RIVER IMPROVEMENT PROJECT (FINANCIAL)
(2008 - 2019)

Description	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019				
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.			
I. Construction Base Cost	0	0	0	0	12,148	31,365	10,427	28,227	0	0	0	0	0	51,943	94,324	44,585	84,891	0	0	0	0	0	21,552	42,587	18,499	38,331	
1. Preparatory Works	0	0	0	0	1,262	1,526	0	0	0	0	0	0	0	4,793	3,373	0	0	0	0	0	0	0	1,767	1,119	0	0	
2. Main Civil Works	0	0	0	0	6,309	7,629	6,309	7,629	0	0	0	0	0	23,967	16,864	23,967	16,864	0	0	0	0	0	0	8,835	5,597	8,835	5,597
Sub-Total	0	0	0	0	7,571	9,155	6,309	7,629	0	0	0	0	0	28,760	20,237	23,967	16,864	0	0	0	0	0	10,602	6,716	8,835	5,597	
7. Price Contingency (3%F.C. & 8%L.C.)	0	0	0	0	4,578	22,210	4,118	20,598	0	0	0	0	0	23,183	74,087	20,618	68,027	0	0	0	0	0	10,950	35,871	9,664	32,734	
II. Compensation Cost	0	0	0	0	1,967	0	0	0	0	0	0	0	9,624	0	0	0	0	0	0	0	0	5,284	0	0	0	0	
1. Compensation	0	0	0	0	620	0	0	0	0	0	0	0	2,230	0	0	0	0	0	0	0	0	900	0	0	0	0	
2. Price Contingency (8%L.C.)	0	0	0	0	1,347	0	0	0	0	0	0	0	7,394	0	0	0	0	0	0	0	0	4,384	0	0	0	0	
III. Administration Cost	0	689	0	2,481	0	1,340	0	579	0	2,759	0	9,953	0	5,364	0	2,317	0	1,352	0	4,794	0	2,589	0	1,118	0		
1. Administration	0	235	0	782	0	391	0	156	0	690	0	2,302	0	1,151	0	460	0	245	0	817	0	408	0	163	0		
2. Price Contingency (8%L.C.)	0	454	0	1,699	0	949	0	422	0	2,069	0	7,651	0	4,213	0	1,857	0	1,087	0	3,978	0	2,181	0	955	0		
IV. Engineering Cost	1,260	2,957	0	0	445	1,150	459	1,242	5,386	8,895	0	0	1,905	3,458	1,962	3,735	2,235	4,015	0	0	0	790	1,561	814	1,686		
1. Detailed Design	833	1,007	0	0	0	0	0	0	3,164	2,226	0	0	0	0	0	1,166	739	0	0	0	0	0	0	0	0		
2. Construction Supervision	0	0	0	0	278	336	278	336	0	0	0	0	1,055	742	1,055	742	0	0	0	0	0	369	246	369	246		
3. Price Contingency (3%F.C. & 8%L.C.)	427	1,950	0	0	168	814	181	906	2,222	6,669	0	0	850	2,716	907	2,993	1,069	3,277	0	0	0	402	1,315	425	1,440		
V. Physical Contingency (10% of Items I, II & IV)	126	296	0	197	1,259	3,251	1,089	2,947	539	890	0	962	5,385	9,778	4,655	8,863	223	402	0	528	2,234	4,415	1,931	4,002			
VI. Total (Items I, II, III, IV & V)	1,386	3,942	0	4,644	13,853	37,105	11,974	32,995	5,925	12,544	0	20,519	59,232	112,924	51,201	99,805	2,458	5,749	0	10,607	24,576	51,152	21,244	45,137			
VII. Value Added Tax (10% of Item VI)	0	533	0	464	0	5,056	0	4,497	0	1,847	0	2,052	0	17,216	0	15,101	0	821	0	1,061	0	7,573	0	6,638			
VIII. Grand Total	1,386	4,475	0	5,108	13,853	42,201	11,974	37,492	5,925	14,391	0	22,571	59,232	130,140	51,201	114,906	2,458	6,569	0	11,667	24,576	58,725	21,244	51,775			

Notes : *1 Price Level in July 1994
 *2 Conversion Rate - 1,00 US\$ = 2,175 Rp.; 1 Yen = 21,90 Rp.
 *3 Figures may not add up to totals due to rounding.

Table 5.14.1 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR KAMPAR KANAN WATER SUPPLY PROJECT

No.	Year	Economic Cost					OMR	Benefit			Total	Net Benefit
		Constru- ction	Compen- sation	Admini- stration	Engineerij Service	Physical Contingency		Total Water Supply	Irrigation	Total		
-13	1996			708	2,467	246		3,421			0	-3,421
-12	1997			708	2,056	206		2,970			0	-2,970
-11	1998		455	708	2,056	251		3,470			0	-3,470
-10	1999		2,049	1,063	1,645	369		5,126			0	-5,126
-9	2000	12,138	2,049	1,063	822	1,501		17,573			0	-17,573
-8	2001	28,939		708	1,371	3,031		34,049			0	-34,049
-7	2002	33,601		708	1,371	3,497		39,177			0	-39,177
-6	2003	31,422		708	1,371	3,279		36,780			0	-36,780
-5	2004	17,104		708	549	1,765	497	20,623	5,075	10,057	15,132	-5,491
-4	2005						569	569	5,552	11,512	17,064	16,495
-3	2006		2,458	626	3,609	607	569	7,869	6,029	11,512	17,541	9,672
-2	2007	19,656		626	722	2,037	569	23,610	6,506	11,512	18,018	-5,592
-1	2008	24,570		1,566	1,203	2,577	658	30,574	6,983	13,771	20,754	-9,820
0	2009	9,828		313	481	1,031	769	12,422	7,460	16,594	24,054	11,632
1	2010						813	813	7,937	17,723	25,660	24,847
2	2011						813	813	8,414	17,723	26,137	25,324
3	2012						813	813	8,891	17,723	26,614	25,801
4	2013						813	813	9,368	17,723	27,091	26,278
5	2014						813	813	9,845	17,723	27,568	26,755
6	2015						813	813	10,322	17,723	28,045	27,232
7	2016						813	813	10,799	17,723	28,522	27,709
8	2017						813	813	11,276	17,723	28,999	28,186
9	2018						813	813	11,753	17,723	29,476	28,663
10	2019						813	813	12,230	17,723	29,953	29,140
11	2020						813	813	12,230	17,723	29,953	29,140
12	2021						813	813	12,230	17,723	29,953	29,140
13	2022						813	813	12,230	17,723	29,953	29,140
14	2023						813	813	12,230	17,723	29,953	29,140
15	2024						813	813	12,230	17,723	29,953	29,140
16	2025						813	813	12,230	17,723	29,953	29,140
17	2026						813	813	12,230	17,723	29,953	29,140
18	2027						813	813	12,230	17,723	29,953	29,140
19	2028	21,436		1,072	857	2,230	813	26,408	12,230	17,723	29,953	3,545
20	2029						813	813	12,230	17,723	29,953	29,140
21	2030						813	813	12,230	17,723	29,953	29,140
22	2031						813	813	12,230	17,723	29,953	29,140
23	2032						813	813	12,230	17,723	29,953	29,140
24	2033						813	813	12,230	17,723	29,953	29,140
25	2034						813	813	12,230	17,723	29,953	29,140
26	2035						813	813	12,230	17,723	29,953	29,140
27	2036						813	813	12,230	17,723	29,953	29,140
28	2037						813	813	12,230	17,723	29,953	29,140
29	2038						813	813	12,230	17,723	29,953	29,140
30	2039						813	813	12,230	17,723	29,953	29,140
31	2040						813	813	12,230	17,723	29,953	29,140
32	2041						813	813	12,230	17,723	29,953	29,140
33	2042						813	813	12,230	17,723	29,953	29,140
34	2043						813	813	12,230	17,723	29,953	29,140
35	2044						813	813	12,230	17,723	29,953	29,140
36	2045						813	813	12,230	17,723	29,953	29,140
37	2046						813	813	12,230	17,723	29,953	29,140
38	2047						813	813	12,230	17,723	29,953	29,140
39	2048						813	813	12,230	17,723	29,953	29,140
40	2049						813	813	12,230	17,723	29,953	29,140
41	2050						813	813	12,230	17,723	29,953	29,140
42	2051						813	813	12,230	17,723	29,953	29,140
43	2052						813	813	12,230	17,723	29,953	29,140
44	2053						813	813	12,230	17,723	29,953	29,140
45	2054						813	813	12,230	17,723	29,953	29,140
46	2055						813	813	12,230	17,723	29,953	29,140
47	2056						813	813	12,230	17,723	29,953	29,140
48	2057						813	813	12,230	17,723	29,953	29,140
49	2058						813	813	12,230	17,723	29,953	29,140
50	2059						813	813	12,230	17,723	29,953	29,140
TOTAL		198,694	7,011	11,285	20,580	22,627	44,280				EIRR =	9.82%

(Discount Rate 10%)
 B/C = 0.98
 NPV = -2,300

Table 5.14.2 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR KAMPAR KANAN RIVER IMPROVEMENT PROJECT

Unit: Million Rp.

No.	Year	Economic Cost					Benefit			Total	Net Benefit
		Constru- ction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency	OMR	Total	Bangkinang Area		
-23	1996							0		0	0
-22	1997							0		0	0
-21	1998							0		0	0
-20	1999			1,340	7,395	740	9,475			0	-9,475
-19	2000		1,266	2,233	3,169	444	7,112			0	-7,112
-18	2001		1,266	2,680		127	4,073			0	-4,073
-17	2002	57,448		893	2,113	5,956	66,410			0	-66,410
-16	2003	71,811		893	3,522	7,534	287 84,047	6,517		6,517	-77,530
-15	2004	28,724		893	1,408	3,013	646 34,684	14,766		14,766	-19,919
-14	2005			2,157	11,943	1,194	790 16,084	18,169		18,169	2,085
-13	2006		3,080	3,595	5,119	819	790 13,403	18,832		18,832	5,429
-12	2007	69,662		4,313	2,275	7,193	790 84,233	19,495		19,495	-64,738
-11	2008	92,882		2,876	4,550	9,743	1,138 111,189	20,158	9,091	29,249	-81,940
-10	2009	92,882		1,438	4,550	9,743	1,603 110,216	20,821	21,092	41,913	-68,303
-9	2010						2,067 2,067	21,483		32,988	54,471
-8	2011						2,067 2,067	22,146		33,420	55,566
-7	2012			943	4,404	441	2,067 7,855	22,809		33,852	48,806
-6	2013		1,952	943		195	2,067 5,157	23,472		34,284	57,756
-5	2014	35,822		943	1,468	3,729	2,067 44,029	24,135		34,717	58,851
-4	2015	29,852		943	1,468	3,132	2,246 37,641	27,658		35,149	62,807
-3	2016			1,073	5,108	510	2,395 9,086	30,670		35,581	66,251
-2	2017		677	1,073		68	2,395 4,213	32,588		36,013	68,601
-1	2018	41,595		1,073	1,703	4,330	2,395 51,096	34,506		36,445	70,951
0	2019	34,662		1,073	1,703	3,637	2,603 43,678	36,424		44,748	81,172
1	2020						2,777 2,777	38,342		51,846	90,188
2	2021						2,777 2,777	38,342		51,846	90,188
3	2022						2,777 2,777	38,342		51,846	90,188
4	2023						2,777 2,777	38,342		51,846	90,188
5	2024						2,777 2,777	38,342		51,846	90,188
6	2025						2,777 2,777	38,342		51,846	90,188
7	2026						2,777 2,777	38,342		51,846	90,188
8	2027						2,777 2,777	38,342		51,846	90,188
9	2028						2,777 2,777	38,342		51,846	90,188
10	2029						2,777 2,777	38,342		51,846	90,188
11	2030						2,777 2,777	38,342		51,846	90,188
12	2031						2,777 2,777	38,342		51,846	90,188
13	2032						2,777 2,777	38,342		51,846	90,188
14	2033						2,777 2,777	38,342		51,846	90,188
15	2034						2,777 2,777	38,342		51,846	90,188
16	2035						2,777 2,777	38,342		51,846	90,188
17	2036						2,777 2,777	38,342		51,846	90,188
18	2037						2,777 2,777	38,342		51,846	90,188
19	2038						2,777 2,777	38,342		51,846	90,188
20	2039						2,777 2,777	38,342		51,846	90,188
21	2040						2,777 2,777	38,342		51,846	90,188
22	2041						2,777 2,777	38,342		51,846	90,188
23	2042						2,777 2,777	38,342		51,846	90,188
24	2043						2,777 2,777	38,342		51,846	90,188
25	2044						2,777 2,777	38,342		51,846	90,188
26	2045						2,777 2,777	38,342		51,846	90,188
27	2046						2,777 2,777	38,342		51,846	90,188
28	2047						2,777 2,777	38,342		51,846	90,188
29	2048						2,777 2,777	38,342		51,846	90,188
30	2049						2,777 2,777	38,342		51,846	90,188
31	2050						2,777 2,777	38,342		51,846	90,188
32	2051						2,777 2,777	38,342		51,846	90,188
33	2052						2,777 2,777	38,342		51,846	90,188
34	2053						2,777 2,777	38,342		51,846	90,188
35	2054						2,777 2,777	38,342		51,846	90,188
36	2055						2,777 2,777	38,342		51,846	90,188
37	2056						2,777 2,777	38,342		51,846	90,188
38	2057						2,777 2,777	38,342		51,846	90,188
39	2058						2,777 2,777	38,342		51,846	90,188
40	2059						2,777 2,777	38,342		51,846	90,188
41	2060						2,777 2,777	38,342		51,846	90,188
42	2061						2,777 2,777	38,342		51,846	90,188
43	2062						2,777 2,777	38,342		51,846	90,188
44	2063						2,777 2,777	38,342		51,846	90,188
45	2064						2,777 2,777	38,342		51,846	90,188
46	2065						2,777 2,777	38,342		51,846	90,188
47	2066						2,777 2,777	38,342		51,846	90,188
48	2067						2,777 2,777	38,342		51,846	90,188
49	2068						2,777 2,777	38,342		51,846	90,188
50	2069						2,777 2,777	38,342		51,846	90,188
TOTAL		555,340	8,241	31,375	61,898	62,548	167,265				EIRR = 10.30%

(Discount Rate 10%)
B/C = 1.03
NPV = 7,592

Table 5.14.3 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR KAMPAR AND KAMPAR KIRI RIVER DEVELOPMENT PROJECT

No.	Year	Economic Cost						Benefit						Unit: Million Rp.				
		Constu- ction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency	OMR	Total	Hydropower Generation		Flood Control			Total	Net Benefit			
									(No.1 Dam)	(No.2 Dam)	Kampar Kiri River		Kampar River					
											(No.1 Dam)	(No.2 Dam)				(Improvement)	(Improvement)	
-23	1996							0					0	0				
-22	1997							0					0	0				
-21	1998							0					0	0				
-20	1999							0					0	0				
-19	2000							0					0	0				
-18	2001							0					0	0				
-17	2002							0					0	0				
-16	2003							0					0	0				
-15	2004			3,543	19,588	1,959	25,090						0	0				
-14	2005		5,400	5,905	8,395	1,380	21,080						0	-25,090				
-13	2006	17,627		7,086	1,866	1,949	28,528						0	-21,080				
-12	2007	87,932		2,362	7,462	9,539	107,295						0	-28,528				
-11	2008	148,340		2,362	5,597	15,394	171,693						0	-107,295				
-10	2009	165,618		2,362	3,731	16,935	188,646						0	-171,693				
-9	2010			2,089	11,922	1,192	2,098	17,301	99,293		2,921		102,214	84,913				
-8	2011		2,935	3,481	4,593	753	2,098	13,860	99,293		2,955		102,248	88,388				
-7	2012	25,895		4,177	1,583	2,748	2,098	36,301	99,293		2,988		102,281	65,781				
-6	2013	66,761		1,695	4,404	7,116	2,561	82,537	99,293		3,022		103,927	21,390				
-5	2014	87,473		5,573	29,902	11,737	2,998	137,683	99,293		3,056	1,611	105,915	-31,768				
-4	2015	67,076	3,067	8,058	8,369	7,851	3,334	97,755	99,293		3,090		109,206	11,452				
-3	2016	113,165		8,362	2,216	11,538	3,899	139,180	99,293	37,508	3,124	462	6,909	147,296	8,115			
-2	2017	203,698		2,787	8,866	21,256	4,918	241,525	99,293	37,508	3,158	467	6,994	4,553	151,973			
-1	2018	135,799		2,787	6,650	14,244	5,597	165,077	99,293	37,508	3,192	471	7,079	20,356	167,899	2,822		
0	2019	45,266		2,787	4,433	4,970	5,823	63,279	99,293	37,508	3,225	476	7,164	31,158	178,824	115,545		
1	2020						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
2	2021						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
3	2022						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
4	2023						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
5	2024						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
6	2025						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
7	2026						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
8	2027						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
9	2028						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
10	2029						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
11	2030						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
12	2031						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
13	2032						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
14	2033						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
15	2034						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
16	2035						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
17	2036						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
18	2037						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
19	2038						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
20	2039						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
21	2040						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
22	2041						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
23	2042						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
24	2043						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
25	2044						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
26	2045						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
27	2046						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
28	2047						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
29	2048						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
30	2049						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
31	2050						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
32	2051						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
33	2052						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
34	2053						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
35	2054						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
36	2055						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
37	2056						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
38	2057						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
39	2058						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
40	2059						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
41	2060						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
42	2061						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
43	2062						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
44	2063						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
45	2064						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
46	2065						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
47	2066						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
48	2067						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
49	2068						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
50	2069						5,823	5,823	99,293	37,508	3,259	480	7,250	35,298	183,088	177,265		
TOTAL		1,164,650	11,402	65,416	129,577	130,561	326,585										0	0

EIRR = 12.46%
 (Discount Rate 10%)
 B/C = 1.23
 NPV = 71,146

Table 5.14.5 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR UPPER INDRAGIRI RIVER IMPROVEMENT PROJECT

		Unit: Million Rp.											
No.	Year	Economic Cost					Benefit					Total	Net Benefit
		Construction	Compensation	Administration	Engineering Service	Physical Contingency	OMR	Total	Payakumbuh Area	Solok Area	Sijunjung Area		
-23	1996			509	4,031	403		4,943				0	-4,943
-22	1997		602	1,695		60		2,357				0	-2,357
-21	1998	32,937		848	1,344	3,428		38,557				0	-38,557
-20	1999	27,448		339	1,344	2,879	165	32,175		3,008		3,008	-29,166
-19	2000			1,252	9,818	982	302	12,354		5,119		5,119	-7,235
-18	2001		3,133	4,172		313	302	7,920		5,573		5,573	-2,347
-17	2002	80,263		2,086	3,273	8,354	302	94,278		6,027		6,027	-88,251
-16	2003	66,886		834	3,273	7,016	703	78,712	8,821	6,481		15,302	-63,411
-15	2004			687	5,386	538	1,038	7,649	16,186	6,934		23,120	15,472
-14	2005		1,701	2,289		170	1,038	5,198	16,356	7,388		23,745	18,547
-13	2006	44,033		1,144	1,795	4,583	1,038	52,593	16,527	7,842		24,369	-28,224
-12	2007	36,695		458	1,795	3,849	1,258	44,055	16,698	8,296	1,513	26,506	-17,549
-11	2008			235	1,840	184	1,441	3,700	16,868	8,750	2,780	28,398	24,697
-10	2009		602	782		60	1,441	2,885	17,039	9,203	3,017	29,260	26,374
-9	2010	14,938		391	614	1,555	1,441	18,939	17,209	9,657	3,231	30,098	11,159
-8	2011	12,448		156	614	1,306	1,516	16,040	17,380	14,535	3,424	35,339	19,299
-7	2012			690	5,390	539	1,578	8,197	17,551	18,666	3,597	39,814	31,617
-6	2013		2,215	2,302		222	1,578	6,317	17,721	20,639	3,753	42,114	35,797
-5	2014	43,951		1,151	1,797	4,575	1,578	53,052	17,892	22,613	3,894	44,398	-8,654
-4	2015	36,626		460	1,797	3,842	1,798	44,523	29,630	24,586	4,020	58,236	13,713
-3	2016			245	1,905	191	1,981	4,322	39,480	26,559	4,134	70,173	65,851
-2	2017		894	817		89	1,981	3,781	40,499	28,533	4,236	73,268	69,487
-1	2018	15,547		408	635	1,619	1,981	20,190	41,518	30,506	4,328	76,352	56,162
0	2019	12,956		163	635	1,359	2,059	17,172	42,537	32,480	8,701	83,717	66,546
1	2020						2,124	2,124	43,556	34,453	12,420	90,429	88,305
2	2021						2,124	2,124	43,556	34,453	12,420	90,429	88,305
3	2022						2,124	2,124	43,556	34,453	12,420	90,429	88,305
4	2023						2,124	2,124	43,556	34,453	12,420	90,429	88,305
5	2024						2,124	2,124	43,556	34,453	12,420	90,429	88,305
6	2025						2,124	2,124	43,556	34,453	12,420	90,429	88,305
7	2026						2,124	2,124	43,556	34,453	12,420	90,429	88,305
8	2027						2,124	2,124	43,556	34,453	12,420	90,429	88,305
9	2028						2,124	2,124	43,556	34,453	12,420	90,429	88,305
10	2029						2,124	2,124	43,556	34,453	12,420	90,429	88,305
11	2030						2,124	2,124	43,556	34,453	12,420	90,429	88,305
12	2031						2,124	2,124	43,556	34,453	12,420	90,429	88,305
13	2032						2,124	2,124	43,556	34,453	12,420	90,429	88,305
14	2033						2,124	2,124	43,556	34,453	12,420	90,429	88,305
15	2034						2,124	2,124	43,556	34,453	12,420	90,429	88,305
16	2035						2,124	2,124	43,556	34,453	12,420	90,429	88,305
17	2036						2,124	2,124	43,556	34,453	12,420	90,429	88,305
18	2037						2,124	2,124	43,556	34,453	12,420	90,429	88,305
19	2038						2,124	2,124	43,556	34,453	12,420	90,429	88,305
20	2039						2,124	2,124	43,556	34,453	12,420	90,429	88,305
21	2040						2,124	2,124	43,556	34,453	12,420	90,429	88,305
22	2041						2,124	2,124	43,556	34,453	12,420	90,429	88,305
23	2042						2,124	2,124	43,556	34,453	12,420	90,429	88,305
24	2043						2,124	2,124	43,556	34,453	12,420	90,429	88,305
25	2044						2,124	2,124	43,556	34,453	12,420	90,429	88,305
26	2045						2,124	2,124	43,556	34,453	12,420	90,429	88,305
27	2046						2,124	2,124	43,556	34,453	12,420	90,429	88,305
28	2047						2,124	2,124	43,556	34,453	12,420	90,429	88,305
29	2048						2,124	2,124	43,556	34,453	12,420	90,429	88,305
30	2049						2,124	2,124	43,556	34,453	12,420	90,429	88,305
31	2050						2,124	2,124	43,556	34,453	12,420	90,429	88,305
32	2051						2,124	2,124	43,556	34,453	12,420	90,429	88,305
33	2052						2,124	2,124	43,556	34,453	12,420	90,429	88,305
34	2053						2,124	2,124	43,556	34,453	12,420	90,429	88,305
35	2054						2,124	2,124	43,556	34,453	12,420	90,429	88,305
36	2055						2,124	2,124	43,556	34,453	12,420	90,429	88,305
37	2056						2,124	2,124	43,556	34,453	12,420	90,429	88,305
38	2057						2,124	2,124	43,556	34,453	12,420	90,429	88,305
39	2058						2,124	2,124	43,556	34,453	12,420	90,429	88,305
40	2059						2,124	2,124	43,556	34,453	12,420	90,429	88,305
41	2060						2,124	2,124	43,556	34,453	12,420	90,429	88,305
42	2061						2,124	2,124	43,556	34,453	12,420	90,429	88,305
43	2062						2,124	2,124	43,556	34,453	12,420	90,429	88,305
44	2063						2,124	2,124	43,556	34,453	12,420	90,429	88,305
45	2064						2,124	2,124	43,556	34,453	12,420	90,429	88,305
46	2065						2,124	2,124	43,556	34,453	12,420	90,429	88,305
47	2066						2,124	2,124	43,556	34,453	12,420	90,429	88,305
48	2067						2,124	2,124	43,556	34,453	12,420	90,429	88,305
49	2068						2,124	2,124	43,556	34,453	12,420	90,429	88,305
50	2069						2,124	2,124	43,556	34,453	12,420	90,429	88,305
Total		424,728	9,147	24,113	47,286	48,116	132,701					EIRR =	10.55%

(Discount Rate 10%)
B/C = 1.07
NPV = 15,851

Table 5.14.6 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR ALL OVERALL DEVELOPMENT PROJECTS

Unit: Million Rp.

No.	Year	Economic Cost						Total	Benefit	Net Benefit
		Construc- tion	Compen- sation	Admini- stration	Engineerij Service	Physical Contingency	OMR			
-23	1996	0	0	3,051	17,959	1,795	0	22,805	0	-22,805
-22	1997	0	870	4,667	11,816	1,269	0	18,622	0	-18,622
-21	1998	42,196	12,065	6,042	7,652	6,191	0	74,146	0	-74,146
-20	1999	39,022	3,125	5,250	13,298	5,545	165	66,405	3,008	-63,397
-19	2000	60,854	5,466	8,404	16,902	8,322	302	100,250	5,119	-95,131
-18	2001	130,909	5,475	10,599	6,057	14,244	650	167,934	9,608	-158,326
-17	2002	315,793	0	6,052	13,266	32,907	1,067	369,085	10,113	-358,972
-16	2003	250,977	0	4,800	12,075	26,306	2,313	296,471	25,956	-270,515
-15	2004	84,078	0	8,196	28,754	11,283	3,649	135,960	57,172	-78,788
-14	2005	0	7,101	12,674	47,928	5,503	4,511	77,717	203,040	125,323
-13	2006	61,660	10,012	22,728	18,007	8,967	4,511	125,885	205,365	79,480
-12	2007	364,049	0	15,714	23,390	38,742	5,481	447,376	209,202	-238,174
-11	2008	453,422	9,986	11,336	22,387	48,580	7,040	552,751	238,339	-314,412
-10	2009	343,380	602	8,205	12,441	35,642	7,991	408,261	273,474	-134,787
-9	2010	45,540	0	5,511	37,549	8,308	10,750	107,658	398,445	290,787
-8	2011	58,350	7,085	12,798	7,454	7,289	11,054	104,030	410,256	306,226
-7	2012	218,902	0	12,928	19,226	23,814	12,082	286,952	421,370	134,418
-6	2013	246,816	4,167	7,971	13,241	26,422	13,445	312,062	443,213	131,151
-5	2014	248,449	0	10,698	37,152	28,560	14,289	339,148	458,972	119,824
-4	2015	133,554	3,067	10,641	25,684	16,230	16,224	205,400	496,158	290,758
-3	2016	113,165	1,730	14,400	9,229	12,412	17,122	168,058	551,200	383,142
-2	2017	280,283	1,571	8,217	11,676	29,352	18,141	349,240	562,894	213,654
-1	2018	288,672	0	5,448	13,672	30,235	18,820	356,847	599,953	243,106
0	2019	131,177	0	5,203	8,645	13,982	19,332	178,339	651,479	473,140
1	2020						20,833	20,833	684,219	663,386
2	2021						20,834	20,834	684,219	663,385
3	2022						20,834	20,834	684,219	663,385
4	2023						20,834	20,834	684,219	663,385
5	2024						20,834	20,834	684,219	663,385
6	2025						20,834	20,834	684,219	663,385
7	2026						20,834	20,834	684,219	663,385
8	2027						20,834	20,834	684,219	663,385
9	2028	21,436		1,072	857	2,230	20,834	46,429	684,219	637,790
10	2029						20,834	20,834	684,219	663,385
11	2030						20,834	20,834	684,219	663,385
12	2031						20,834	20,834	684,219	663,385
13	2032						20,834	20,834	684,219	663,385
14	2033						20,834	20,834	684,219	663,385
15	2034						20,834	20,834	684,219	663,385
16	2035						20,834	20,834	684,219	663,385
17	2036						20,834	20,834	684,219	663,385
18	2037						20,834	20,834	684,219	663,385
19	2038						20,834	20,834	684,219	663,385
20	2039						20,834	20,834	684,219	663,385
21	2040						20,834	20,834	684,219	663,385
22	2041						20,834	20,834	684,219	663,385
23	2042						20,834	20,834	684,219	663,385
24	2043						20,834	20,834	684,219	663,385
25	2044						20,834	20,834	684,219	663,385
26	2045						20,834	20,834	684,219	663,385
27	2046						20,834	20,834	684,219	663,385
28	2047						20,834	20,834	684,219	663,385
29	2048						20,834	20,834	684,219	663,385
30	2049						20,834	20,834	684,219	663,385
31	2050						20,834	20,834	684,219	663,385
32	2051						20,834	20,834	684,219	663,385
33	2052						20,834	20,834	684,219	663,385
34	2053						20,834	20,834	684,219	663,385
35	2054						20,834	20,834	684,219	663,385
36	2055						20,834	20,834	684,219	663,385
37	2056						20,834	20,834	684,219	663,385
38	2057						20,834	20,834	684,219	663,385
39	2058						20,834	20,834	684,219	663,385
40	2059						20,834	20,834	684,219	663,385
41	2060						20,834	20,834	684,219	663,385
42	2061						20,834	20,834	684,219	663,385
43	2062						20,834	20,834	684,219	663,385
44	2063						20,834	20,834	684,219	663,385
45	2064						20,834	20,834	684,219	663,385
46	2065						20,834	20,834	684,219	663,385
47	2066						20,834	20,834	684,219	663,385
48	2067						20,834	20,834	684,219	663,385
49	2068						20,834	20,834	684,219	663,385
50	2069						20,834	20,834	684,219	663,385
TOTAL		3,932,684	72,322	222,605	436,317	444,130	1,230,621		EIRR =	11.90%

(Discount Rate 10%)
 B/C = 1.20
 NPV = 315,451

Table 7.2.1 SEMIMONTHLY DIVERSION WATER REQUIREMENT FOR RANTAUBERANGIN IRRIGATION DEVELOPMENT PROJECT (INITIAL PHASE)

Rantauberangin Irrigation Development Project - Case-7 (Starting Date of Land Preparation 1st Crop : Apr. 1 ; 2nd Crop : Oct.16)

Irrigation Area	Month Period	Jan.		Feb.		Mar.		Apr.		May		June	
		1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (l/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86
	1) Water Req. for 4,429 ha (m ³ /sec/ha)	3.59	1.02	1.02	1.11	0.00	0.00	2.79	6.82	2.21	2.39	1.77	3.81
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49	0.00	0.00	0.00	0.80
	Total Water Requirement (m ³ /sec)	3.59	1.02	1.02	1.11	0.00	0.00	2.79	11.31	2.21	2.39	1.77	4.61
(B) Right Bank Area	Unit Water Requirement (l/sec/ha)	0.81	0.23	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86
	1) Water Req. for 277 ha (m ³ /sec/ha)	0.22	0.06	0.06	0.07	0.00	0.00	0.17	0.43	0.14	0.15	0.11	0.24
	2) Additional Supply for Existing Schemes	0.30	0.00	0.00	0.00	0.00	0.00	0.00	4.05	0.00	0.00	0.00	0.98
	Total Water Requirement (m ³ /sec)	0.52	0.06	0.06	0.07	0.00	0.00	0.17	4.49	0.14	0.15	0.11	1.22

Irrigation Area	Month Period	July		Aug.		Sep.		Oct.		Nov.		Dec.	
		1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (l/sec/ha)	1.08	0.80	0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23
	1) Water Req. for 4,429 ha (m ³ /sec/ha)	4.78	3.54	1.11	0.00	0.00	0.00	0.00	6.16	2.21	4.16	1.02	1.02
	2) Additional Supply for Existing Schemes	1.42	2.13	0.00	0.00	0.00	0.00	0.00	5.03	0.00	0.00	0.00	0.00
	Total Water Requirement (m ³ /sec)	6.20	5.67	1.11	0.00	0.00	0.00	0.00	11.19	2.21	4.16	1.02	1.02
(B) Right Bank Area	Unit Water Requirement (l/sec/ha)	1.08	0.80	0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23
	1) Water Req. for 277 ha (m ³ /sec/ha)	0.30	0.22	0.07	0.00	0.00	0.00	0.00	0.39	0.14	0.26	0.06	0.06
	2) Additional Supply for Existing Schemes	1.54	1.99	0.00	0.00	0.00	0.00	0.00	4.41	0.00	0.00	0.00	0.00
	Total Water Requirement (m ³ /sec)	1.84	2.21	0.07	0.00	0.00	0.00	0.00	4.80	0.14	0.26	0.06	0.06

Table 7.2.2 COMPARISON OF WEIR GATE FOR KUOK INTAKE WEIR

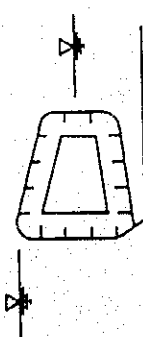

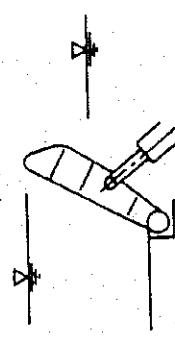
Item	Roller Gate	Rubber gate	Tilting Gate
General View			
Mechanical & Structural Character	Gate body is lifted vertically by Hoisting Device. Structure and mechanical system is so simple that reliability is high	Gate body is inflated by air or water. Gate body is made of synthetic rubber which is fragile against sharp edged matters. Mechanical system is simple.	Gate body is lifted by Hydraulic Hoist. Deck Slab must have a drop for the storing space.
Flood Control Ability	As gate body can be lifted up to the safety position during flood, control ability is better than other types.	There is possibility of incomplete open by sediment or boulder stone.	(The same as left)
Maintenance	Inspection of gate and parts exchange is difficult. Painting should be done in every seven years. Working Life: 50 years	Inspection of gate and parts exchange is difficult. Painting is unnecessary. Working Life: 25 years	Inspection of gate and parts exchange is difficult. Painting should be done in every seven years. Working Life: 50 years
Manufacture	Domestic manufacture in Indonesia is possible.	Gate body should be imported from abroad	Though domestic manufacture in Indonesia is possible, high grade manufacture technique is required.
Civil Structure	Because of the tall pier for gate operation, foundation is large scale	As the gate weight is small, civil structure can be simple.	As the weight of the structure is smaller than other steel gate, foundation can be small scale.
Construction Cost	Approx. 47.0 billion Rp.	Approx. 37.1 billion Rp.	Approx. 48.7 billion Rp.
Evaluation	Moderate	Adequate	Inadequate

Table 7.2.3 HYDRAULIC PARAMETERS OF PROPOSED MAIN IRRIGATION CANALS OF RANTAUBERANGIN IRRIGATION DEVELOPMENT PROJECT (INITIAL PHASE)

Area	Kampar Kanan River	
	Left Bank	Right Bank
Design Discharge (m ³ /s)	11.31	4.8
Velocity (m/s)	1.016	0.791
Flow Sectional Area (m ²)	11.2	6.2
Wet Perimeter (m)	10.7	7.8
Slope	1/3,000	1/3,000
Water Depth (m)	1.47	1.14
Bed Width (m)	5.40	3.70
Height of Lining (m)	1.97	1.39
Stricker roughness coefficient	54.0	50.7

**Table 7.2.4 (1/2) FINANCIAL COST OF KAMPAR KANAN WATER SUPPLY PROJECT
- KUOK INTAKE WEIR / RANTAU BERANGIN IRRIGATION SYSTEM CONSTRUCTION WORKS (INITIAL PHASE) -**

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
I. Construction Base Cost					89,152	47,913	137,065
1. Preparatory Works (10% of Item 2)					8,105	4,356	12,460
2. Irrigation Facilities					81,047	43,557	124,605
a. Head Works					32,105	16,368	48,474
- Excavation	13,400	cu m	8,000	2,000	107	27	134
- Backfill	3,300	cu m	7,200	1,800	24	6	30
- Embankment	12,300	cu m	9,600	2,400	118	30	148
- Weir					17,960	10,283	28,243
Concrete	7,750	cu m	285,000	285,000	2,209	2,209	4,418
Apron	7,000	sq m	80,000	120,000	560	840	1,400
Riverbed Protection	5,600	sq m	0	120,000	0	672	672
Gate	481	sq m	31,500,000	13,500,000	15,152	6,494	21,645
Revetment	1,460	sq m	27,000	47,000	39	69	108
- Foundation Works	1	l.s.	0	0	1,796	1,028	2,824
- Temporary Coffier	1	l.s.	0	0	460	482	942
- Intake					6,245	2,930	9,176
Concrete	1,920	cu m	210,000	210,000	403	403	806
Gate	137	sq m	38,500,000	16,500,000	5,275	2,261	7,535
Foundation Works	1	l.s.	0	0	568	266	834
- Flushing Gate					2,136	999	3,135
Concrete	630	cu m	210,000	210,000	132	132	265
Gate	47	sq m	38,500,000	16,500,000	1,810	776	2,585
Foundation Works	1	l.s.	0	0	194	91	285
- Steel Stop Log	41	ton	910,000	390,000	37	16	53
- Control Bridge	1,895	sq m	1,700,000	300,000	3,222	569	3,790
- Control House	0	sq m	120,000	480,000	0	0	0
b. Head Reach & Main Canal					27,408	20,800	48,207
- Left Bank (L=44 km)					16,122	11,870	27,992
Excavation	924,000	cu m	4,800	1,200	4,435	1,109	5,544
Embankment	396,000	cu m	3,600	900	1,426	356	1,782
Concrete Lining	36,100	cu m	137,700	137,700	4,971	4,971	9,942
Footing	44,000	cu m	48,000	82,000	2,112	3,608	5,720
Expansion Joint	82,000	m	36,800	1,200	3,018	98	3,116
Weep Hole	1,200	unit	800	17,600	1	21	22
Gravel Metaling	26,400	cu m	0	60,200	0	1,589	1,589
Regulation Ponds	1	l.s.	0	0	160	118	277
- Right Bank (L=40 km)					11,286	8,929	20,215
Excavation	407,000	cu m	4,800	1,200	1,954	488	2,442
Embankment	210,000	cu m	3,600	900	756	189	945
Concrete Lining	24,000	cu m	137,700	137,700	3,305	3,305	6,610
Footing	44,000	cu m	48,000	82,000	1,920	3,280	5,200
Expansion Joint	88,000	m	36,800	1,200	3,238	106	3,344
Weep Hole	1,600	unit	800	17,600	1	28	29
Gravel Metaling	24,000	cu m	0	60,200	0	1,445	1,445
Regulation Ponds	1	l.s.	0	0	112	88	200
c. Left Bank Irrigation System					16,049	4,762	20,810
- Existing/Rainfed	553	ha	546,000	162,000	302	90	392
- Existing/Undeveloped	2,781	ha	2,184,000	648,000	6,074	1,802	7,876
- New/Undeveloped	4,429	ha	2,184,000	648,000	9,673	2,870	12,543
d. Right Bank Irrigation System					5,486	1,628	7,113
- Existing/Rainfed	375	ha	546,000	162,000	205	61	266
- Existing/Undeveloped	2,141	ha	2,184,000	648,000	4,676	1,387	6,063
- New/Undeveloped	277	ha	2,184,000	648,000	605	179	784

Table 7.2.4 (2/2) FINANCIAL COST OF KAMPAR KANAN WATER SUPPLY PROJECT
- KUOK INTAKE WEIR/RANTAUBERANGIN IRRIGATION SYSTEM CONSTRUCTION WORKS (INITIAL PHASE) -

Work Item	Quantity Unit	Unit Cost		Amount		
		F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
II. Compensation Cost				0	4,620	4,620
1. Land Acquisition				0	660	660
a. Left Bank (L=44 km)				0	390	390
- Right of Way	130.0 ha	0	3,000,000	0	390	390
b. Right Bank (L=40 km)				0	270	270
- Right of Way	90.0 ha	0	3,000,000	0	270	270
2. Compensation				0	3,960	3,960
a. Left Bank (L=44 km)				0	2,120	2,120
- Permanent House	150 unit	0	12,000,000	0	1,800	1,800
- Semi-Permanent	80 unit	0	4,000,000	0	320	320
b. Right Bank (L=40 km)				0	1,840	1,840
- Permanent House	130 unit	0	12,000,000	0	1,560	1,560
- Semi-Permanent	70 unit	0	4,000,000	0	280	280
III. Administration Cost (5% of Items I & II, allotted to L.C. only)				0	7,084	7,084
IV. Engineering Cost (10% of Item I)				8,915	4,791	13,707
V. Physical Contingency (10% of Items I, II & IV)				9,807	5,732	15,539
VI. Total (Items I to V)				107,874	70,141	178,015
VII. Value Added Tax (10% of Item VI)				0	17,802	17,802
VIII. Grand Total				107,874	87,942	195,817

Note : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp. ; 1 Yen = 21.90 Rp.

*3 Costs do not include Price Contingency

*4 Figures may not add up to totals due to rounding

**Table 7.2.5 ANNUAL DISBURSEMENT SCHEDULE OF KAMPAR KANAN WATER SUPPLY PROJECT (FINANCIAL)
(KUOK INTAKE WEIR/RANTAUBERANGIN IRRIGATION - INITIAL)**

Description	Amount												Unit: Million Rp.						
	1996		1997		1998		1999		2000		2001			2002		2003		2004	
	F.C.	L.C.	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
I. Construction Base Cost	113,323	89,838	203,161	0	0	0	0	0	0	10,589	7,352	25,859	19,138	30,801	24,187	29,630	24,486	16,444	14,675
1. Preparatory Works	8,105	4,356	12,461	0	0	0	0	0	0	4,053	2,178	4,053	2,178	0	0	0	0	0	0
2. Head Works	32,105	16,368	48,473	0	0	0	0	0	0	4,816	2,455	9,632	4,910	9,632	4,910	8,026	4,092	0	0
3. Head Reach & Main canal	27,408	20,800	48,208	0	0	0	0	0	0	0	0	4,111	3,120	8,222	6,240	8,222	6,240	6,852	5,200
4. Left bank Irrigation System	16,049	4,762	20,811	0	0	0	0	0	0	0	0	2,407	714	4,815	1,429	4,815	1,429	4,012	1,191
5. Right bank Irrigation System	5,486	1,628	7,114	0	0	0	0	0	0	0	0	823	244	1,646	488	1,646	488	1,372	407
Sub-Total	89,153	47,914	137,067	0	0	0	0	0	0	8,868	4,633	21,025	11,167	24,314	13,067	22,709	12,249	12,236	6,798
7. Price Contingency (3%F.C. & 8%L.C.)	24,170	41,924	66,094	0	0	0	0	0	0	1,721	2,719	4,833	7,971	6,486	11,119	6,921	12,237	4,208	7,878
II. Compensation Cost	0	6,982	6,982	0	0	0	0	0	0	3,055	0	3,299	0	0	0	0	0	0	0
1. Compensation	0	4,620	4,620	0	0	0	0	0	0	2,079	0	2,079	0	0	0	0	0	0	0
2. Price Contingency (8%L.C.)	0	2,362	2,362	0	0	0	0	0	0	976	0	1,220	0	0	0	0	0	0	0
III. Administration Cost	0	11,401	11,401	0	826	0	826	0	964	0	1,561	0	1,686	0	1,214	0	1,311	0	1,416
1. Administration	0	7,084	7,084	0	708	0	708	0	708	0	1,063	0	1,063	0	708	0	708	0	708
2. Price Contingency (8%L.C.)	0	4,317	4,317	0	118	0	118	0	255	0	499	0	624	0	506	0	603	0	708
IV. Engineering Cost	10,416	7,269	17,685	1,702	1,006	1,461	905	1,505	978	1,240	845	639	456	1,096	821	1,129	887	1,163	958
1. Detailed Design	5,349	2,875	8,224	1,605	862	1,337	719	1,337	719	1,070	575	0	0	0	0	0	0	0	0
2. Construction Supervision	3,566	1,916	5,482	0	0	0	0	0	0	0	0	535	287	892	479	892	479	892	479
3. Price Contingency (3%F.C. & 8%L.C.)	1,501	2,478	3,979	98	144	124	187	168	259	170	270	104	169	205	342	238	408	272	479
V. Physical Contingency (10% of Items I, II & IV)	12,374	10,409	22,783	170	101	146	91	151	161	124	90	1,123	1,111	2,696	1,996	3,193	2,507	3,079	2,544
VI. Total (Items I, II, III, IV & V)	136,112	125,900	262,012	1,873	1,933	1,607	1,888	1,656	2,731	1,364	5,851	12,351	13,905	29,651	23,169	35,123	28,892	33,873	29,404
VII. Value Added Tax (10% of Item VI)	0	26,201	26,201	0	381	0	381	0	439	0	721	0	2,626	0	5,282	0	6,402	0	6,328
VIII. Grand Total	136,112	152,101	288,213	1,873	2,313	1,607	2,238	1,656	3,169	1,364	6,572	12,351	16,530	29,651	28,451	35,123	35,294	33,873	35,732

Notes : *1 Price Level in July 1994
 *2 Conversion Rate - 1.00 US\$ = 2,175 Rp. ; 1 Yen = 21.90 Rp.
 *3 Replacement Cost (Rubber Gate) is allocated at 2024 and not included in the Total Amount of the Project Cost
 *4 Figures may not add up to totals due to rounding

Table 7.2.6 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR KAMPAR KANAN WATER SUPPLY PROJECT (PRIORITY PROJECT)

Unit: Million Rp.												
No.	Year	Economic Cost					OMR	Total	Benefit		Total	Net Benefit
		Construction	Compensation	Administration	Engineering Service	Physical Contingency			Public Water	Irrigation Water		
-8	1996			708	2,467	246		3,421			0	-3,421
-7	1997			708	2,056	206		2,970			0	-2,970
-6	1998		455	708	2,056	251		3,470			0	-3,470
-5	1999		2,049	1,063	1,645	369		5,126			0	-5,126
-4	2000	12,138	2,049	1,063	822	1,501		17,573			0	-17,573
-3	2001	28,939		708	1,371	3,031		34,049			0	-34,049
-2	2002	33,601		708	1,371	3,497		39,177			0	-39,177
-1	2003	31,422		708	1,371	3,279		36,780			0	-36,780
0	2004	17,104		708	549	1,765	495	20,621	5,075	10,057	15,132	-5,489
1	2005						569	569	5,552	11,512	17,064	16,495
2	2006						569	569	6,029	11,512	17,541	16,972
3	2007						569	569	6,506	11,512	18,018	17,449
4	2008						569	569	6,983	11,512	18,495	17,926
5	2009						569	569	7,460	11,512	18,972	18,403
6	2010						569	569	7,937	11,512	19,449	18,880
7	2011						569	569	8,414	11,512	19,926	19,357
8	2012						569	569	8,891	11,512	20,403	19,834
9	2013						569	569	9,368	11,512	20,880	20,311
10	2014						569	569	9,845	11,512	21,357	20,788
11	2015						569	569	10,322	11,512	21,834	21,265
12	2016						569	569	10,799	11,512	22,311	21,742
13	2017						569	569	11,276	11,512	22,788	22,219
14	2018						569	569	11,753	11,512	23,265	22,696
15	2019						569	569	12,230	11,512	23,742	23,173
16	2020						569	569	12,230	11,512	23,742	23,173
17	2021						569	569	12,230	11,512	23,742	23,173
18	2022						569	569	12,230	11,512	23,742	23,173
19	2023						569	569	12,230	11,512	23,742	23,173
20	2024						569	569	12,230	11,512	23,742	23,173
21	2025						569	569	12,230	11,512	23,742	23,173
22	2026						569	569	12,230	11,512	23,742	23,173
23	2027						569	569	12,230	11,512	23,742	23,173
24	2028	21,436		1,072	857	2,230	569	26,164	12,230	11,512	23,742	-2,422
25	2029						569	569	12,230	11,512	23,742	23,173
26	2030						569	569	12,230	11,512	23,742	23,173
27	2031						569	569	12,230	11,512	23,742	23,173
28	2032						569	569	12,230	11,512	23,742	23,173
29	2033						569	569	12,230	11,512	23,742	23,173
30	2034						569	569	12,230	11,512	23,742	23,173
31	2035						569	569	12,230	11,512	23,742	23,173
32	2036						569	569	12,230	11,512	23,742	23,173
33	2037						569	569	12,230	11,512	23,742	23,173
34	2038						569	569	12,230	11,512	23,742	23,173
35	2039						569	569	12,230	11,512	23,742	23,173
36	2040						569	569	12,230	11,512	23,742	23,173
37	2041						569	569	12,230	11,512	23,742	23,173
38	2042						569	569	12,230	11,512	23,742	23,173
39	2043						569	569	12,230	11,512	23,742	23,173
40	2044						569	569	12,230	11,512	23,742	23,173
41	2045						569	569	12,230	11,512	23,742	23,173
42	2046						569	569	12,230	11,512	23,742	23,173
43	2047						569	569	12,230	11,512	23,742	23,173
44	2048						569	569	12,230	11,512	23,742	23,173
45	2049						569	569	12,230	11,512	23,742	23,173
46	2050						569	569	12,230	11,512	23,742	23,173
47	2051						569	569	12,230	11,512	23,742	23,173
48	2052						569	569	12,230	11,512	23,742	23,173
49	2053						569	569	12,230	11,512	23,742	23,173
50	2054						569	569	12,230	11,512	23,742	23,173
TOTAL		144,640	4,553	8,154	14,565	16,375	28,945					EIRR = 10.14%

(Discount Rate 10%)
 B/C = 1.02
 NPV = 1,524

Table 7.3.1 FINANCIAL COST OF KAMPAR KANAN RIVER IMPROVEMENT PROJECT
- BANGKINANG AREA RIVER IMPROVEMENT WORKS (INITIAL PHASE) -

Work Item	Quantity	Unit	Unit Cost		Amount						
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)				
I. Construction Base Cost -----					104,888	71,183	176,071				
1. Preparatory Works ----- (10% of Item 2)					9,535	6,471	16,006				
2. Main Civil Works -----					95,353	64,711	160,064				
a. Dredging/Excavation	5,600,000	cu m	5,200	1,300	29,120	7,280	36,400				
b. Earth Dike -----					11,152	10,910	22,062				
- Stripping/Clearing	1,970,000	sq m	0	1,200	0	2,364	2,364				
- Embankment	4,170,000	cu m	2,600	1,000	10,842	4,170	15,012				
- Sodding	1,551,000	sq m	200	1,800	310	2,792	3,102				
- Filter	0	cu m	0	44,000	0	0	0				
- Gravel Metaling	44,000	cu m	0	36,000	0	1,584	1,584				
c. Concrete Dike	0	m	160,000	170,000	0	0	0				
d. Sluice -----					29,207	22,950	52,157				
- Type A	8	unit	355,000,000	279,000,000	2,840	2,232	5,072				
- Type B	5	unit	587,000,000	462,000,000	2,935	2,310	5,245				
- Type C	8	unit	896,000,000	704,000,000	7,168	5,632	12,800				
- Type D	8	unit	1,109,000,000	871,000,000	8,872	6,968	15,840				
- Type E	4	unit	1,848,000,000	1,452,000,000	7,392	5,808	13,200				
- Type F	0	unit	2,128,000,000	1,672,000,000	0	0	0				
- Type G	0	unit	2,520,000,000	1,980,000,000	0	0	0				
- Type H	0	unit	2,968,000,000	2,332,000,000	0	0	0				
e. Revetment -----					3,901	6,762	10,663				
- Low Water Channel	113,000	sq m	27,000	47,000	3,051	5,311	8,362				
- High Water Channel	35,400	sq m	24,000	41,000	850	1,451	2,301				
f. Groin	57	set	33,000,000	32,000,000	1,881	1,824	3,705				
g. Bridge -----					4,200	4,200	8,400				
- Footbridge	0	sq m	200,000	200,000	0	0	0				
- Road Bridge	4,200	sq m	1,000,000	1,000,000	4,200	4,200	8,400				
h. Miscellaneous (20% of a to g)	1	ls.	0	0	15,892	10,785	26,677				
II. Compensation Cost -----					0	2,591	2,591				
1. Land Acquisition					197	ha	0	3,000,000	0	591	591
2. Compensation -----					0	2,000	2,000				
a. Permanent House	100	unit	0	12,000,000	0	1,200	1,200				
b. Semi-Permanent	200	unit	0	4,000,000	0	800	800				
III. Administration Cost ----- (5% of Items I & II, allotted to L.C. only)					0	8,933	8,933				
IV. Engineering Cost ----- (10% of Item I)					10,489	7,118	17,607				
V. Physical Contingency (10% of Items I, II & IV) -----					11,538	8,089	19,627				
VI. Total (Items I to V) -----					126,915	97,914	224,829				
VII. Value Added Tax (10% of Item VI) -----					0	22,483	22,483				
VIII. Grand Total -----					126,915	120,397	247,312				

Note : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp. ; 1 Yen = 21.90 Rp.

*3 Costs do not include Price Contingency

*4 Figures may not add up to totals due to rounding

Table 7.3.2 ANNUAL DISBURSEMENT SCHEDULE OF KAMPAR KANAN RIVER IMPROVEMENT PROJECT (FINANCIAL)
- BANGKINANG AREA RIVER IMPROVEMENT WORKS (INITIAL PHASE) -

Description	Unit: Million Rp.													
	Amount		1999		2000		2001		2002		2003		2004	
	F.C.	L.C.	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	
I. Construction Base Cost	136,152	140,530	276,682	0	0	0	0	0	48,316	47,910	62,207	64,679	25,629	27,941
1. Preparatory Works	9,535	6,471	16,006	0	0	0	0	0	9,535	6,471	0	0	0	0
2. Main Civil Works	95,353	64,711	160,064	0	0	0	0	0	28,606	19,413	47,677	32,356	19,071	12,942
Sub-Total	104,888	71,182	176,070	0	0	0	0	0	38,141	25,884	47,677	32,356	19,071	12,942
7. Price Contingency (3%F.C. & 8%L.C.)	31,264	69,348	100,612	0	0	0	0	0	10,175	22,026	14,531	32,323	6,559	14,999
II. Compensation Cost	0	4,276	4,276	0	0	0	2,056	0	2,220	0	0	0	0	0
1. Compensation	0	2,591	2,591	0	0	0	1,296	0	1,296	0	0	0	0	0
2. Price Contingency (8%L.C.)	0	1,685	1,685	0	0	0	760	0	925	0	0	0	0	0
III. Administration Cost	0	15,473	15,473	0	1,969	0	3,544	0	4,593	0	1,653	0	1,786	0
1. Administration	0	8,933	8,933	0	1,340	0	2,233	0	2,680	0	893	0	893	0
2. Price Contingency (8%L.C.)	0	6,540	6,540	0	629	0	1,311	0	1,913	0	760	0	892	0
IV. Engineering Cost	12,821	12,082	24,903	5,107	4,393	2,254	2,033	0	1,594	1,581	2,737	2,846	1,128	1,229
1. Detailed Design	6,293	4,271	10,564	4,405	2,990	1,888	1,281	0	0	0	0	0	0	0
2. Construction Supervision	4,196	2,847	7,043	0	0	0	0	0	1,259	854	2,098	1,424	839	569
3. Price Contingency (3%F.C. & 8%L.C.)	2,332	4,964	7,296	702	1,403	366	752	0	0	336	727	639	1,422	289
V. Physical Contingency (10% of Items I, II & IV)	14,897	15,689	30,586	511	439	225	409	0	222	4,991	4,949	6,494	6,752	2,917
VI. Total (Items I, II, III, IV & V)	163,870	188,050	351,920	5,618	6,801	2,480	8,042	0	7,035	54,901	56,094	71,439	76,063	29,433
VII. Value Added Tax (10% of Item VI)	0	35,192	35,192	0	1,242	0	1,052	0	704	0	11,099	0	14,750	0
VIII. Grand Total	163,870	223,242	387,112	5,618	8,043	2,480	9,094	0	7,739	54,901	67,193	71,439	90,813	29,433

Notes: *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp.; 1 Yen = 21.90 Rp.

*3 Figures may not add up to totals due to rounding

Table 7.3.3 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR BANGKINANG AREA RIVER IMPROVEMENT WORKS (PRIORITY PROJECT)

Unit: Million R

No.	Year	Economic Cost					Benefit		Net Benefit	
		Constru- ction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency	OMR	Total Bangkinang Area		
-8	1,996						0	0	0	
-7	1,997						0	0	0	
-6	1,998						0	0	0	
-5	1,999			1,340	7,395	740	9,475	0	-9,475	
-4	2,000		1,266	2,233	3,169	444	7,112	0	-7,112	
-3	2,001		1,266	2,680		127	4,073	0	-4,073	
-2	2,002	57,448		893	2,113	5,956	66,410	0	-66,410	
-1	2,003	71,811		893	3,522	7,534	287	84,047	6,517	-77,530
0	2,004	28,724		893	1,408	3,013	646	34,684	14,766	-19,918
1	2,005						790	790	18,169	17,379
2	2,006						790	790	18,832	18,042
3	2,007						790	790	19,495	18,705
4	2,008						790	790	20,158	19,368
5	2,009						790	790	20,820	20,030
6	2,010						790	790	21,483	20,693
7	2,011						790	790	22,146	21,356
8	2,012						790	790	22,809	22,019
9	2,013						790	790	23,471	22,681
10	2,014						790	790	24,134	23,344
11	2,015						790	790	24,797	24,007
12	2,016						790	790	25,460	24,670
13	2,017						790	790	26,122	25,332
14	2,018						790	790	26,785	25,995
15	2,019						790	790	27,448	26,658
16	2,020						790	790	28,111	27,321
17	2,021						790	790	28,111	27,321
18	2,022						790	790	28,111	27,321
19	2,023						790	790	28,111	27,321
20	2,024						790	790	28,111	27,321
21	2,025						790	790	28,111	27,321
22	2,026						790	790	28,111	27,321
23	2,027						790	790	28,111	27,321
24	2,028						790	790	28,111	27,321
25	2,029						790	790	28,111	27,321
26	2,030						790	790	28,111	27,321
27	2,031						790	790	28,111	27,321
28	2,032						790	790	28,111	27,321
29	2,033						790	790	28,111	27,321
30	2,034						790	790	28,111	27,321
31	2,035						790	790	28,111	27,321
32	2,036						790	790	28,111	27,321
33	2,037						790	790	28,111	27,321
34	2,038						790	790	28,111	27,321
35	2,039						790	790	28,111	27,321
36	2,040						790	790	28,111	27,321
37	2,041						790	790	28,111	27,321
38	2,042						790	790	28,111	27,321
39	2,043						790	790	28,111	27,321
40	2,044						790	790	28,111	27,321
41	2,045						790	790	28,111	27,321
42	2,046						790	790	28,111	27,321
43	2,047						790	790	28,111	27,321
44	2,048						790	790	28,111	27,321
45	2,049						790	790	28,111	27,321
46	2,050						790	790	28,111	27,321
47	2,051						790	790	28,111	27,321
48	2,052						790	790	28,111	27,321
49	2,053						790	790	28,111	27,321
50	2,054						790	790	28,111	27,321
TOTA	157,983	2,532	8,932	17,607	17,814	40,433		EIRR =	10.19%	

(Discount Rate 10%)
 B/C = 1.02
 NPV = 2,216

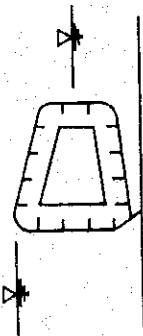
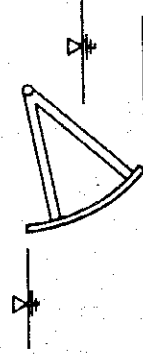
Table 7.4.1 SEMIMONTHLY DIVERSION WATER REQUIREMENT FOR LUBUKJAMBI IRRIGATION DEVELOPMENT PROJECT (INITIAL PHASE)

Lubukjambi Irrigation Development Project - Case-6 (Starting Date of Land Preparation 1st Crop : Mar.16 ; 2nd Crop : Oct.1)

Irrigation Area	Month Period	Jan.		Feb.		Mar.		Apr.		May		June	
		1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (l/sec/ha)	0.23	0.35	0.22	0.00	0.00	0.90	0.76	0.00	0.23	1.50	1.20	1.25
	1) Water Req. for 5,234 ha (m ³ /sec/ha)	1.20	1.83	1.15	0.00	4.71	3.98	0.00	0.00	1.20	7.85	6.28	6.54
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75
	Total Water Requirement (m ³ /sec)	1.20	1.83	1.15	0.00	4.71	3.98	0.00	0.00	1.20	7.85	6.28	7.29
(B) Right Bank Area	Unit Water Requirement (l/sec/ha)	-	-	-	-	-	-	-	-	-	-	-	-
	1) Water Req. for - ha (m ³ /sec/ha)	-	-	-	-	-	-	-	-	-	-	-	-
	2) Additional Supply for Existing Schemes	-	-	-	-	-	-	-	-	-	-	-	-
	Total Water Requirement (m ³ /sec)	-	-	-	-	-	-	-	-	-	-	-	-

Irrigation Area	Month Period	July		Aug.		Sep.		Oct.		Nov.		Dec.	
		1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.
		1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End	1-15	16-End
(A) Left Bank Area	Unit Water Requirement (l/sec/ha)	0.60	0.22	0.00	0.00	0.00	0.00	0.34	0.01	0.81	0.23	0.23	0.78
	1) Water Req. for 5,234 ha (m ³ /sec/ha)	3.14	1.15	0.00	0.00	0.00	0.00	1.78	0.05	4.24	1.20	1.20	4.08
	2) Additional Supply for Existing Schemes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Water Requirement (m ³ /sec)	3.14	1.15	0.00	0.00	0.00	0.00	1.78	0.05	4.24	1.20	1.20	4.08
(B) Right Bank Area	Unit Water Requirement (l/sec/ha)	-	-	-	-	-	-	-	-	-	-	-	-
	1) Water Req. for - ha (m ³ /sec/ha)	-	-	-	-	-	-	-	-	-	-	-	-
	2) Additional Supply for Existing Schemes	-	-	-	-	-	-	-	-	-	-	-	-
	Total Water Requirement (m ³ /sec)	-	-	-	-	-	-	-	-	-	-	-	-

Table 7.4.2 COMPARISON OF WEIR GATE FOR LUBUKJAMBI INTAKE WEIR

Item	Roller Gate	Radial Gate
General View		
Mechanical & Structural Character	Gate body is lifted vertically by Hoisting Device. Structure and mechanical system is so simple that reliability is high	Gate body is lifted by Hoisting Device and turn round Trunnion Axis. Mechanical system is complicated
Flood Control Ability	As gate body can be lifted up to the safety position during flood, control ability is better than other types.	Owing to the limitation of span length the possibility of the flow blocking by drift woods is high.
Maintenance	Inspection of gate and parts exchange is easier than Rubber and Tilting Gate. Painting should be done in every seven years. Working Life: 50 years	(the same as left)
Manufacture	Domestic manufacture in Indonesia is possible.	Though domestic manufacture in Indonesia is possible, high grade manufacture technique is required.
Civil Structure	Because of the tall pier for gate operation, foundation is large scale	As the whole loads concentrate to Trunnion Axis, designing and construction is complicated.
Construction Cost	Approx. 47.4 billion Rp.	Approx. 55.9 billion Rp.
Evaluation	Adequate	Inadequate

**Table 7.4.3 HYDRAULIC PARAMETERS OF PROPOSED MAIN IRRIGATION CANALS
OF LUBUKJAMBI IRRIGATION DEVELOPMENT PROJECT (INITIAL PHASE)**

River	Indragiri River
Bank	Left Bank
Design Discharge (m ³ /s)	7.85
Velocity (m/s)	0.953
Flow Sectional Area (m ²)	8.2
Wet Perimeter (m)	8.8
Slope	1/3,000
Water Depth (m)	1.43
Bed Width (m)	3.60
Height of Lining (m)	1.93
Stricker roughness coefficient	54.4

Table 7.4.4 (1/3) FINANCIAL COST OF KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT
- KUANTAN DAM -

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
1. Construction Base Cost -----					240,708	136,256	376,964
1. Preparatory Works ----- (10% of Items 2 & 3)					8,866	10,692	19,558
2. Road & Bridge -----					7,720	36,720	44,440
a. New road	14,500	m	160,000	240,000	2,320	3,480	5,800
b. Relocation road	24,000	m	100,000	135,000	2,400	3,240	5,640
c. Bridges	400	m	7,500,000	75,000,000	3,000	30,000	33,000
3. Main Civil Works -----					80,939	70,201	151,140
a. Diversion Tunnel -----					19,061	13,060	32,121
- Open Excavation, common	2,300	cu m	4,600	1,200	11	3	13
- Open Excavation, weathered rock	3,100	cu m	6,300	1,700	20	5	25
- Open Excavation, hard rock	2,300	cu m	13,800	3,600	32	8	40
- Fill and backfill	3,200	cu m	7,200	1,800	23	6	29
- Shotcrete for tunnel	19,000	sq m	18,000	12,000	342	228	570
- Rock bolts	2,300	m	24,000	16,000	55	37	92
- Tunnel Excavation	97,500	cu m	90,000	60,000	8,775	5,850	14,625
- Open concrete of inlet & outlet	3,000	cu m	120,000	130,000	360	390	750
- Tunnel concrete	26,800	cu m	240,000	160,000	6,432	4,288	10,720
- Reinforcement bars	250	ton	2,100,000	1,000,000	525	250	775
- Plug concrete	4,000	cu m	85,000	133,000	340	532	872
- Backfill grouting	180	cu m	600,000	400,000	108	72	180
- Curtain grouting	1,700	m	180,000	120,000	306	204	510
- Others (10%)	1	l.s.	0	0	1,733	1,187	2,920
b. Cofferdams -----					1,764	1,673	3,437
- Initial cofferdam embankment	8,600	cu m	9,600	2,400	83	21	103
- Open Excavation, common	2,000	cu m	4,600	1,200	9	2	12
- Open Excavation, weathered rock	3,100	cu m	6,300	1,700	19.53	5.27	24.8
- Mass concrete for main cofferdam	19,900	cu m	75,000	75,000	1,493	1,493	2,985
- Others (10%)	1	l.s.	0	0	160	152	312
c. Main Dam -----					38,726	36,418	75,144
- Open Excavation, common	13,000	cu m	4,600	1,200	60	16	75
- Open Excavation, weathered rock	30,400	cu m	6,300	1,700	192	52	243
- Open Excavation, hard rock	72,700	cu m	13,800	3,600	1,003	262	1,265
- Fill and backfill	10,300	cu m	7,200	1,800	74	19	93
- Shotcrete for slope protection	2,200	sq m	18,000	12,000	40	26	66
- Mass concrete for dam	407,000	cu m	75,000	75,000	30,525	30,525	61,050
- Curtain grouting	13,700	m	180,000	120,000	2,466	1,644	4,110
- Consolidation grouting	4,700	m	180,000	120,000	846	564	1,410
- Others (10%)	1	l.s.	0	0	3,521	3,311	6,831
d. Spillway -----					8,976	8,463	17,439
- Open Excavation, common	13,900	cu m	4,600	1,200	64	17	81
- Open Excavation, weathered rock	32,300	cu m	6,300	1,700	203	55	258
- Open Excavation, hard rock	66,100	cu m	13,800	3,600	912	238	1,150
- Fill and backfill	24,800	cu m	7,200	1,800	179	45	223
- Concrete for piers, walls and slabs	52,100	cu m	81,000	115,000	4,220	5,992	10,212
- Reinforcement bars	1,600	ton	1,400,000	700,000	2,240	1,120	3,360
- Consolidation grouting	1,900	m	180,000	120,000	342	228	570
- Others (10%)	1	l.s.	0	0	816	769	1,585
e. Penstock -----					1,308	980	2,289
- Trench excavation	25,900	cu m	13,800	3,600	357	93	451
- Fill and backfill	19,500	cu m	7,200	1,800	140	35	176
- Concrete for pipe embedment	5,600	cu m	81,000	115,000	454	644	1,098
- Reinforcement bars	170	ton	1,400,000	700,000	238	119	357
- Others (10%)	1	l.s.	0	0	119	89	208

Table 7.4.4 (2/3) FINANCIAL COST OF KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT
- KUANTAN DAM -

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
f. Powerhouse					5,659	5,439	11,098
- Open Excavation, common	14,000	cu m	4,600	1,200	64	17	81
- Open Excavation, weathered rock	20,200	cu m	6,300	1,700	127	34	162
- Open Excavation, hard rock	24,100	cu m	13,800	3,600	333	87	419
- Fill and backfill	6,600	cu m	7,200	1,800	48	12	59
- Shotcrete for slope protection	1,900	sq m	18,000	12,000	34	23	57
- Reinf. concrete for walls and slabs	24,700	cu m	81,000	115,000	2,001	2,841	4,841
- Second stage concrete	7,400	cu m	97,000	138,000	718	1,021	1,739
- Reinforcement bars	1,300	ton	1,400,000	700,000	1,820	910	2,730
- Others (10%)	1	l.s.	0	0	514	494	1,009
g. Tailrace					2,179	1,793	3,972
- Open Excavation, common	29,200	cu m	4,600	1,200	134	35	169
- Open Excavation, weathered rock	38,900	cu m	6,300	1,700	245	66	311
- Open Excavation, hard rock	29,200	cu m	13,800	3,600	403	105	508
- Fill and backfill	2,200	cu m	7,200	1,800	16	4	20
- Anchor bars	240	m	24,000	16,000	6	4	10
- Concrete for walls and slabs	10,300	cu m	81,000	115,000	834	1,185	2,019
- Reinforcement bars	210	ton	1,400,000	700,000	294	147	441
- Wet rubble masonry	1,800	sq m	27,000	47,000	49	85	133
- Others (10%)	1	l.s.	0	0	198	163	361
h. Outdoor Switchyard					289	270	559
- Open Excavation, common	1,100	cu m	4,600	1,200	5	1	6
- Open Excavation, weathered rock	1,100	cu m	6,300	1,700	7	2	9
- Open Excavation, hard rock	600	cu m	13,800	3,600	8	2	10
- Fill and backfill	17,200	cu m	7,200	1,800	124	31	155
- Rein. concrete for switchyard	750	cu m	120,000	130,000	90	98	188
- Gravel bedding	3,400	sq m	0	30,100	0	102	102
- Fence	210	m	90,000	30,000	19	6	25
- Entrance gate	1	l.s.	0	0	10	3	13
- Others (10%)	1	l.s.	0	0	26	25	51
i. Architectural buildings					2,976	2,105	5,081
- Powerhouse	1,300	sq m	2,000,000	1,300,000	2,600	1,690	4,290
- Guard house to damsite	150	sq m	120,000	480,000	18	72	90
- Diesel generator house	150	sq m	1,250,000	850,000	188	128	315
- Gate control house	240	sq m	120,000	480,000	29	115	144
- Others (5%)	1	l.s.	0	0	142	100	242
4. Hydro-Mechanical Works					38,273	4,253	42,526
a. Diversion Tunnel							
Gates (Slide)	260	ton	9,900,000	1,100,000	2,574	286	2,860
b. Spillway Gates (Radial)							
1,300 ton			13,500,000	1,500,000	17,550	1,950	19,500
c. River Outlet Intake Screen							
6 ton			9,900,000	1,100,000	59	7	66
d. River Outlet Gate (Slide)							
18 ton			13,500,000	1,500,000	243	27	270
e. River Outlet Main Valve							
1 l.s.			0	0	2,430	270	2,700
f. River Outlet Steel Pipe							
35 ton			9,900,000	1,100,000	347	39	385
g. Power Intake Screen							
75 ton			9,900,000	1,100,000	743	83	825
h. Power Intake Gate (Roller)							
350 ton			13,500,000	1,500,000	4,725	525	5,250
i. Power Tailrace Gate (Roller)							
110 ton			9,900,000	1,100,000	1,089	121	1,210
j. Power Steel Penstock							
860 ton			9,900,000	1,100,000	8,514	946	9,460
5. Generating Equipment					96,300	10,700	107,000
6. Transmission Line and S/S					8,610	3,690	12,300
Transmission lines	1	l.s.	0	0	2,660	1,140	3,800
Sub-station equipment	1	l.s.	0	0	5,950	2,550	8,500

Table 7.4.4 (3/3) FINANCIAL COST OF KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT
- KUANTAN DAM -

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
II. Compensation Cost					0	24,150	24,150
1. Land Acquisition					0	11,930	11,930
a. Paddy Field					0	4,250	4,250
- Wet Paddy	400	ha	0	10,000,000	0	4,000	4,000
- Dry Paddy	100	ha	0	2,500,000	0	250	250
b. Rubber Plantation	800	ha	0	3,200,000	0	2,560	2,560
c. Residential Land					0	4,620	4,620
- Near District Road	240	ha	0	10,000,000	0	2,400	2,400
- Near Sub-district Road	370	ha	0	6,000,000	0	2,220	2,220
d. Others					0	500	500
- Upland Crops	500	ha	0	1,000,000	0	500	500
2. Compensation					0	12,220	12,220
a. Residence					0	11,000	11,000
- Permanent House	820	units	0	12,000,000	0	9,840	9,840
- Semi-permanent	230	units	0	4,000,000	0	920	920
- Temporary	120	units	0	2,000,000	0	240	240
b. Other Buildings					0	1,220	1,220
- Shops	20	units	0	15,000,000	0	300	300
- Clinic	10	units	0	12,000,000	0	120	120
- Government Building	10	units	0	25,000,000	0	250	250
- School	10	units	0	55,000,000	0	550	550
III. Administration Cost (5% of Items I & II, allotted to L.C. only)					0	20,056	20,056
IV. Engineering Cost (10% of Item I)					24,071	13,626	37,696
V. Physical Contingency (10% of Items I, II & IV)					26,478	17,403	43,881
VI. Total (Items I to V)					291,257	211,490	502,747
VII. Value Added Tax (10% of Item VI)					0	50,275	50,275
VIII. Grand Total					291,257	261,765	553,022

Note : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp. ; 1 Yen = 21.90 Rp.

*3 Costs do not include Price Contingency

*4 Figures may not add up to totals due to rounding

Table 7.4.5 (1/2) FINANCIAL COST OF KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT
- LUBUKJAMBI INTAKE WEIR/IRRIGATION SYSTEM (INITIAL PHASE) -

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
1. Construction Base Cost					83,133	47,273	130,406
1. Preparatory Works (10% of Item 2)					7,558	4,298	11,855
2. Irrigation Facilities					75,575	42,976	118,551
a. Head Works					41,464	20,632	62,096
- Excavation	814,000	cu m	8,000	2,000	6,512	1,628	8,140
- Backfill	18,000	cu m	7,200	1,800	130	32	162
- Embankment	800	cu m	9,600	2,400	8	2	10
- Weir					26,320	15,417	41,737
Concrete	13,200	cu m	285,000	285,000	3,762	3,762	7,524
Apron	10,130	sq m	80,000	120,000	810	1,216	2,026
Riverbed Protection	6,190	sq m	0	120,000	0	743	743
Gate	553	sq m	35,000,000	15,000,000	19,355	8,295	27,650
Foundation Works	1	l.s.	0	0	2,393	1,402	3,794
Temporary Cofferdam	0	l.s.	0	0	0	0	0
- Intake					3,835	1,802	5,636
Concrete	1,200	cu m	210,000	210,000	252	252	504
Gate	84	sq m	38,500,000	16,500,000	3,234	1,386	4,620
Foundation Works	1	l.s.	0	0	349	164	512
- Flushing Gate					2,603	1,224	3,827
Concrete	820	cu m	210,000	210,000	172	172	344
Gate	57	sq m	38,500,000	16,500,000	2,195	941	3,135
Foundation Works	1	l.s.	0	0	237	111	348
- Steel Stop Log	85	ton	910,000	390,000	77	33	111
- Control Bridge	1,142	sq m	1,700,000	300,000	1,941	343	2,284
- Control House	315	sq m	120,000	480,000	38	151	189
b. Head Reach & Main Canal					17,897	17,533	35,431
- Left Bank (L=76 km)					17,897	17,533	35,431
Excavation	1,254,000	cu m	4,800	1,200	6,019	1,505	7,524
Embankment	35,000	cu m	3,600	900	126	32	158
Concrete Lining	60,800	cu m	137,700	137,700	8,372	8,372	16,744
Footing	76,000	cu m	0	60,200	0	4,575	4,575
Expansion Joint	87,000	m	36,800	1,200	3,202	104	3,306
Weep Hole	1,500	unit	800	17,600	1	26	28
Gravel Metaling	45,600	cu m	0	60,200	0	2,745	2,745
Regulation Ponds	1	l.s.	0	0	177	174	351
- Right Bank (L=0 km)					0	0	0
Excavation	0	cu m	4,800	1,200	0	0	0
Embankment	0	cu m	3,600	900	0	0	0
Concrete Lining	0	cu m	137,700	137,700	0	0	0
Footing	0	cu m	0	60,200	0	0	0
Expansion Joint	0	m	36,800	1,200	0	0	0
Weep Hole	0	unit	800	17,600	0	0	0
Gravel Metaling	0	cu m	0	60,200	0	0	0
Regulation Ponds	0	l.s.	0	0	0	0	0
c. Left Bank Irrigation System					16,214	4,811	21,025
- Existing/Rainfed	376	ha	546,000	162,000	205	61	266
- Existing/Undeveloped	2,096	ha	2,184,000	648,000	4,578	1,358	5,936
- New/Undeveloped	5,234	ha	2,184,000	648,000	11,431	3,392	14,823
d. Right Bank Irrigation System	0	ha	0	0	0	0	0

Table 7.4.5 (2/2) FINANCIAL COST OF KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT
- LUBUKJAMBI INTAKE WEIR/IRRIGATION SYSTEM (INITIAL PHASE) -

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
II. Compensation Cost					0	5,185	5,185
1. Land Acquisition					0	805	805
a. Left Bank (L=76 km)					0	780	780
- Right of Way	260.0	ha	0	3,000,000	0	780	780
b. Right Bank (L=0 km)					0	0	0
- Right of Way	0	ha	0	3,000,000	0	0	0
c. Intake Weir					0	25	25
- Residential Area	9.7	ha	0	10,000,000	0	10	10
- Orchard Farms	6.2	ha	0	2,200,000	0	1	1
- Wet Paddy Fields	14.1	ha	0	10,000,000	0	14	14
2. Compensation					0	4,380	4,380
a. Left Bank (L=76 km)					0	3,600	3,600
- Permanent House	250	unit	0	12,000,000	0	3,000	3,000
- Semi-Permanent	150	unit	0	4,000,000	0	600	600
b. Right Bank (L=0 km)					0	0	0
- Permanent House	0	unit	0	12,000,000	0	0	0
- Semi-Permanent	0	unit	0	4,000,000	0	0	0
c. Intake Weir					0	780	780
- Permanent House	60	unit	0	12,000,000	0	720	720
- Semi-Permanent	10	unit	0	4,000,000	0	40	40
- Temporary	10	unit	0	2,000,000	0	20	20
III. Administration Cost (5% of Items I & II, allotted to L.C. only)					0	6,780	6,780
IV. Engineering Cost (10% of Item I)					8,313	4,727	13,041
V. Physical Contingency (10% of Items I, II & IV)					9,145	5,719	14,863
VI. Total (Items I to V)					100,591	69,684	170,275
VII. Value Added Tax (10% of Item VI)					0	17,027	17,027
VIII. Grand Total					100,591	86,712	187,302

Note : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp.; 1 Yen = 21.90 Rp.

*3 Costs do not include Price Contingency

*4 Figures may not add up to totals due to rounding

Table 7.4.6 ANNUAL DISBURSEMENT SCHEDULE OF INDRAGIRI RIVER DEVELOPMENT PROJECT (FINANCIAL)
(KUANTAN DAM AND LUBUKJAMBI INTAKE WEIR/IRRIGATION SYSTEM CONSTRUCTION WORKS)

Unit: Million Rp.

Description	Amount		1996		1997		1998		1999		2000		2001		2002		2003		2004		
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	
	Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		
I. Construction Base Cost	409,522	337,569	747,091																		
1. Preparatory Works	16,424	14,990	31,414																		
2. Main Civil Works	307,417	168,540	475,957																		
Sub-Total	323,841	183,530	507,371																		
7. Price Contingency (3% F.C. & 8% L.C.)	85,681	154,039	239,720																		
II. Compensation Cost	0	41,096	41,096																		
1. Compensation	0	29,335	29,335																		
2. Price Contingency (8% L.C.)	0	11,761	11,761																		
III. Administration Cost	0	43,485	43,485																		
1. Administration	0	26,836	26,836																		
2. Price Contingency (8% L.C.)	0	16,649	16,649																		
IV. Engineering Cost	37,699	27,625	65,324	7,661	4,768	7,891	5,149	2,807	1,929	1,735	1,250	2,341	1,765	4,166	3,288	5,932	4,910	3,426	2,979	1,741	1,585
1. Detailed Design	19,430	11,012	30,442	7,221	4,088	7,221	4,088	2,494	1,418	1,496	851	998	567	0	0	0	0	0	0	0	0
2. Construction Supervision	12,954	7,341	20,295	0	0	0	0	0	0	0	0	963	545	3,387	1,919	4,683	2,653	2,625	1,490	1,295	734
3. Price Contingency (3% F.C. & 3% L.C.)	5,315	9,272	14,587	440	680	670	1,062	313	511	238	399	380	653	779	1,370	1,249	2,257	800	1,489	445	851
V. Physical Contingency (10% of Items I, II & IV)	44,722	40,629	85,351	766	477	789	515	281	3,479	173	315	4,061	4,277	10,644	8,333	13,404	12,333	8,299	7,103	4,306	3,797
VI. Total (Items I, II, III, IV & V)	491,943	490,404	982,347	8,427	7,584	8,680	8,191	3,088	44,643	1,908	7,413	53,459	117,081	97,420	169,448	140,630	91,278	83,502	47,361	47,562	
VII. Value Added Tax (10% of Item VI)	0	98,235	98,235	0	1,601	0	1,687	0	4,773	0	932	0	9,813	0	21,450	0	31,008	0	17,478	0	9,492
VIII. Grand Total	491,943	588,639	1,080,582	8,427	9,185	8,680	9,878	3,088	49,416	1,908	8,346	44,671	63,272	117,081	118,870	169,448	171,637	91,278	100,980	47,361	57,055

Notes: *1 Price Level in July 1994
 *2 Conversion Rate - 1:00 US\$ = 2,175 Rp.; 1 Yen = 21.90 Rp.
 *3 Figures may not add up to totals due to rounding

Table 7.4.7 ALLOCATION OF CONSTRUCTION COST FOR KUANTAN DAM

Particulars	Unit	Purpose			Total
		River	Hydropower	Irrigation	
Required Reservoir Capacity	10 ⁶ m ³	1,341	225	4	1,570
Multipurpose Cost					
Sedimentation Capacity	10 ⁶ m ³		335		
Required Capacity	10 ⁶ m ³		1,235		
Total capacity	10 ⁶ m ³		1,570		
Dam Crest Elevation	EL m		122.0		
Construction Cost	(a) Rp. x10 ⁹		300.5		
Alternate Single Purpose Cost					
Sedimentation Capacity	10 ⁶ m ³	335	-	168	
Required Capacity	10 ⁶ m ³	1,006	-	4	
Total capacity	10 ⁶ m ³	1,341	-	172	
Dam Crest	EL m	119.4	-	93.5	
Construction Cost	(b) Rp. 10 ⁹	286.9	-	204.1	
Justifiable Expenditure	(c) Rp. 10 ⁹	512.9	866.8	77.1	
Lesser value of (b) and (c)	(d) Rp. 10 ⁹	286.9	866.8	77.1	
Exclusive use facilities cost	(e) Rp. 10 ⁹	0.0	202.2	0.0	
(d)-(e)	(f)	286.9	664.6	77.1	
Separable Cost					
Sediment Capacity	10 ⁶ m ³	335	335	335	
Other Purpose Capacity	10 ⁶ m ³	229	1,010	1,231	
Total capacity	10 ⁶ m ³	564	1,345	1,566	
Dam Crest	EL m	107.1	119.5	121.9	
Construction Cost	(g) Rp. 10 ⁹	242.7	286.9	299.4	
Separable Cost [(a)-(g)]	(h) Rp. 10 ⁹	57.8	13.6	1.1	72.6
Remaining Benefit [(f)-(h)]	(i) Rp. 10 ⁹	229.1	651.0	76.0	956
Ratio of Remaining Benefit	(j) %	24.0	68.1	7.9	100.0
Allocated Joint Cost	(k) Rp. 10 ⁹	54.6	155.2	18.1	228 *1
Total Allocated Cost [(h)+(k)]	Rp. 10 ⁹	112.4	168.8	19.2	300.5
Rate of Allocation	%	37.4	56.2	6.4	100.0

Note: *1 (Multipurpose Cost)-(Total of Separable Cost)

Table 7.4.8 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR KUANTAN RIVER MULTIPURPOSE DEVELOPMENT PROJECT (PRIORITY PROJECT)

		Economic Cost					Benefit					Unit: Million Rp.	
No.	Year	Constr- uction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency	OMR	Total	Hydropower Generation	Lubukjambi Irrigation System	Flood Control by Kuantan Dam	Total	Net Benefit
-8	1996			2,006	11,309	1,131		14,446				0	-14,446
-7	1997			2,006	11,309	1,131		14,446				0	-14,446
-6	1998		21,735	4,689	3,912	2,564		32,900				0	-32,900
-5	1999		1,276	2,684	2,347	363		6,670				0	-6,670
-4	2000	49,593	2,552	4,040	3,072	5,521		64,778				0	-64,778
-3	2001	115,545	1,276	3,362	5,306	12,213		137,702				0	-137,702
-2	2002	162,582		2,684	7,336	16,991		189,593				0	-189,593
-1	2003	85,382		2,684	4,115	8,950		101,131				0	-101,131
0	2004	42,776		2,684	2,029	4,481		51,970				0	-51,970
1	2005						2,049	2,049	87,907	8,220	43,696	139,824	137,775
2	2006						2,049	2,049	87,907	8,220	44,206	140,333	138,284
3	2007						2,049	2,049	87,907	8,220	44,715	140,842	138,794
4	2008						2,049	2,049	87,907	8,220	45,225	141,352	139,303
5	2009						2,049	2,049	87,907	8,220	45,734	141,861	139,812
6	2010						2,049	2,049	87,907	8,220	46,243	142,370	140,322
7	2011						2,049	2,049	87,907	8,220	46,753	142,880	140,831
8	2012						2,049	2,049	87,907	8,220	47,262	143,389	141,340
9	2013						2,049	2,049	87,907	8,220	47,771	143,899	141,850
10	2014						2,049	2,049	87,907	8,220	48,281	144,408	142,359
11	2015						2,049	2,049	87,907	8,220	48,790	144,917	142,868
12	2016						2,049	2,049	87,907	8,220	49,299	145,427	143,378
13	2017						2,049	2,049	87,907	8,220	49,809	145,936	143,887
14	2018						2,049	2,049	87,907	8,220	50,318	146,445	144,396
15	2019						2,049	2,049	87,907	8,220	50,827	146,955	144,906
16	2020						2,049	2,049	87,907	8,220	51,337	147,464	145,415
17	2021						2,049	2,049	87,907	8,220	51,337	147,464	145,415
18	2022						2,049	2,049	87,907	8,220	51,337	147,464	145,415
19	2023						2,049	2,049	87,907	8,220	51,337	147,464	145,415
20	2024						2,049	2,049	87,907	8,220	51,337	147,464	145,415
21	2025						2,049	2,049	87,907	8,220	51,337	147,464	145,415
22	2026						2,049	2,049	87,907	8,220	51,337	147,464	145,415
23	2027						2,049	2,049	87,907	8,220	51,337	147,464	145,415
24	2028						2,049	2,049	87,907	8,220	51,337	147,464	145,415
25	2029						2,049	2,049	87,907	8,220	51,337	147,464	145,415
26	2030						2,049	2,049	87,907	8,220	51,337	147,464	145,415
27	2031						2,049	2,049	87,907	8,220	51,337	147,464	145,415
28	2032						2,049	2,049	87,907	8,220	51,337	147,464	145,415
29	2033						2,049	2,049	87,907	8,220	51,337	147,464	145,415
30	2034						2,049	2,049	87,907	8,220	51,337	147,464	145,415
31	2035						2,049	2,049	87,907	8,220	51,337	147,464	145,415
32	2036						2,049	2,049	87,907	8,220	51,337	147,464	145,415
33	2037						2,049	2,049	87,907	8,220	51,337	147,464	145,415
34	2038						2,049	2,049	87,907	8,220	51,337	147,464	145,415
35	2039						2,049	2,049	87,907	8,220	51,337	147,464	145,415
36	2040						2,049	2,049	87,907	8,220	51,337	147,464	145,415
37	2041						2,049	2,049	87,907	8,220	51,337	147,464	145,415
38	2042						2,049	2,049	87,907	8,220	51,337	147,464	145,415
39	2043						2,049	2,049	87,907	8,220	51,337	147,464	145,415
40	2044						2,049	2,049	87,907	8,220	51,337	147,464	145,415
41	2045						2,049	2,049	87,907	8,220	51,337	147,464	145,415
42	2046						2,049	2,049	87,907	8,220	51,337	147,464	145,415
43	2047						2,049	2,049	87,907	8,220	51,337	147,464	145,415
44	2048						2,049	2,049	87,907	8,220	51,337	147,464	145,415
45	2049						2,049	2,049	87,907	8,220	51,337	147,464	145,415
46	2050						2,049	2,049	87,907	8,220	51,337	147,464	145,415
47	2051						2,049	2,049	87,907	8,220	51,337	147,464	145,415
48	2052						2,049	2,049	87,907	8,220	51,337	147,464	145,415
49	2053						2,049	2,049	87,907	8,220	51,337	147,464	145,415
50	2054						2,049	2,049	87,907	8,220	51,337	147,464	145,415
Total		455,878	26,839	26,839	50,735	53,345	102,442					EIRR =	15.27%

(Discount Rate 10%)
B/C = 1.74
NPV = 256,670

Table 7.4.9 CASH FLOW OF FINANCIAL COST AND BENEFIT FOR KUANTAN HYDROPOWER DEVELOPMENT PROJECT (PRIORITY PROJECT)

		Unit: Million Rp.							Benefit		
No.	Year	Financial Cost							Total	Net	
		Constru- ction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency	Value Added Tax	OMR		(Revenue)	Benefit
-8	1996			1,474	8,435	844	1,075		11,828	0	-11,828
-7	1997			1,474	8,435	844	1,075		11,828	0	-11,828
-6	1998		13,572	2,947		1,357	1,788		19,664	0	-19,664
-5	1999			1,474		0	147		1,621	0	-1,621
-4	2000	38,010		1,474	1,124	3,913	4,452		48,974	0	-48,974
-3	2001	81,054		1,474	3,374	8,443	9,434		103,779	0	-103,779
-2	2002	108,072		1,474	4,499	11,257	12,530		137,832	0	-137,832
-1	2003	27,018		1,474	1,124	2,814	3,243		35,673	0	-35,673
0	2004	27,018		1,474	1,124	2,814	3,243		35,673	0	-35,673
1	2005							1,406	1,406	99,178	97,772
2	2006							1,406	1,406	99,178	97,772
3	2007							1,406	1,406	99,178	97,772
4	2008							1,406	1,406	99,178	97,772
5	2009							1,406	1,406	99,178	97,772
6	2010							1,406	1,406	99,178	97,772
7	2011							1,406	1,406	99,178	97,772
8	2012							1,406	1,406	99,178	97,772
9	2013							1,406	1,406	99,178	97,772
10	2014							1,406	1,406	99,178	97,772
11	2015							1,406	1,406	99,178	97,772
12	2016							1,406	1,406	99,178	97,772
13	2017							1,406	1,406	99,178	97,772
14	2018							1,406	1,406	99,178	97,772
15	2019							1,406	1,406	99,178	97,772
16	2020							1,406	1,406	99,178	97,772
17	2021							1,406	1,406	99,178	97,772
18	2022							1,406	1,406	99,178	97,772
19	2023							1,406	1,406	99,178	97,772
20	2024							1,406	1,406	99,178	97,772
21	2025							1,406	1,406	99,178	97,772
22	2026							1,406	1,406	99,178	97,772
23	2027							1,406	1,406	99,178	97,772
24	2028							1,406	1,406	99,178	97,772
25	2029							1,406	1,406	99,178	97,772
26	2030							1,406	1,406	99,178	97,772
27	2031							1,406	1,406	99,178	97,772
28	2032							1,406	1,406	99,178	97,772
29	2033							1,406	1,406	99,178	97,772
30	2034							1,406	1,406	99,178	97,772
31	2035							1,406	1,406	99,178	97,772
32	2036							1,406	1,406	99,178	97,772
33	2037							1,406	1,406	99,178	97,772
34	2038							1,406	1,406	99,178	97,772
35	2039							1,406	1,406	99,178	97,772
36	2040							1,406	1,406	99,178	97,772
37	2041							1,406	1,406	99,178	97,772
38	2042							1,406	1,406	99,178	97,772
39	2043							1,406	1,406	99,178	97,772
40	2044							1,406	1,406	99,178	97,772
41	2045							1,406	1,406	99,178	97,772
42	2046							1,406	1,406	99,178	97,772
43	2047							1,406	1,406	99,178	97,772
44	2048							1,406	1,406	99,178	97,772
45	2049							1,406	1,406	99,178	97,772
46	2050							1,406	1,406	99,178	97,772
47	2051							1,406	1,406	99,178	97,772
48	2052							1,406	1,406	99,178	97,772
49	2053							1,406	1,406	99,178	97,772
50	2054							1,406	1,406	99,178	97,772
TOTAL		281,172	13,572	14,739	28,115	32,286	36,988			FIRR =	15.54%

(Discount Rate 8.3%)
 B/C = 2.22
 NPV = 314,097

**Table 7.5.1 (1/2) FINANCIAL COST OF KUANTAN-INDRAGIRI RIVER IMPROVEMENT PROJECT
- RENGAT AREA (INITIAL PHASE) Without Public Road -**

Work Item	Quantity	Unit	Unit Cost		Amount		
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)
I. Construction Base Cost					18,365	10,452	28,817
1. Preparatory Works (10% of Item 2)					1,670	950	2,620
2. Main Civil Works					16,695	9,502	26,197
a. Dredging/Excavation	0	cu m	5,200	1,300	0	0	0
b. Earth Dike					3,542	2,133	5,675
- Stripping/Clearing	271,000	sq m	0	1,200	0	325	325
- Embankment	472,000	cu m	7,400	2,200	3,493	1,038	4,531
- Sodding	245,600	sq m	200	1,800	49	442	491
- Filter	0	cu m	0	44,000	0	0	0
- Gravel Metaling	9,100	cu m	0	36,000	0	328	328
c. Concrete Wall Dike	1,400	m	160,000	170,000	224	238	462
d. Movable Steel Wall (10.0W x 1.2H)	3	unit	108,000,000	12,000,000	324	36	360
e. Control Gate					1,535	1,205	2,740
- 2 spans x 2.5W x 2.0H	5	unit	307,000,000	241,000,000	1,535	1,205	2,740
f. Sluice					3,800	2,900	6,700
- Type A	0	unit	355,000,000	279,000,000	0	0	0
- Type B	0	unit	587,000,000	462,000,000	0	0	0
- Type C	0	unit	896,000,000	704,000,000	0	0	0
- Type D	0	unit	1,109,000,000	871,000,000	0	0	0
- Type E	0	unit	1,848,000,000	1,452,000,000	0	0	0
- Type F	0	unit	2,128,000,000	1,672,000,000	0	0	0
- Type G	0	unit	2,520,000,000	1,980,000,000	0	0	0
- Type H	0	unit	2,968,000,000	2,332,000,000	0	0	0
- 5 spans X 7.0W X 5.2H	1	unit	3,800,000,000	2,900,000,000	3,800	2,900	6,700
g. Drainage Pumping Station					4,070	908	4,978
- Excavation	3,200	cu m	4,200	1,000	13	3	17
- Embankment	3,400	cu m	2,300	600	8	2	10
- Reinforced Concrete	690	cu m	307,000	300,000	212	207	419
- Control House	300	sq m	90,000	370,000	27	111	138
- Foundation Treatment	1	Ls.	0	0	210	185	395
- Mechanical Works	1	Ls.	0	0	3,600	400	4,000
h. Revetment					119	207	326
- Low Water Channel	4,400	sq m	27,000	47,000	119	207	326
- High Water Channel	0	sq m	24,000	41,000	0	0	0
i. Groin	8	set	33,000,000	32,000,000	264	256	520
j. Bridge					35	35	70
- Footbridge	0	sq m	200,000	200,000	0	0	0
- Road Bridge	35	sq m	1,000,000	1,000,000	35	35	70
k. Miscellaneous (20% of a to j)	1	Ls.	0	0	2,783	1,584	4,366
II. Compensation Cost					0	280	280
1. Land Acquisition	40	ha	0	3,000,000	0	120	120
2. Compensation					0	160	160
a. Permanent House	10	unit	0	12,000,000	0	120	120
b. Semi-Permanent	10	unit	0	4,000,000	0	40	40
III. Administration Cost (5% of Items I & II, allotted to L.C. only)					0	1,455	1,455
IV. Engineering Cost (10% of Item I)					1,836	1,045	2,882
V. Physical Contingency (10% of Items I, II & IV)					2,020	1,178	3,198
VI. Total (Items I to V)					22,222	14,410	36,632
VII. Value Added Tax (10% of Item VI)					0	3,663	3,663
VIII. Grand Total					22,222	18,073	40,295

Note : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp. ; 1 Yen = 21.90 Rp.

*3 Costs do not include Price Contingency

*4 Figures may not add up to totals due to rounding

Table 7.5.1 (2/2) FINANCIAL COST OF KUANTAN-INDRAGIRI RIVER IMPROVEMENT PROJECT
- RENGAT AREA (INITIAL PHASE) With Public Road -
(for reference only, not used for economic evaluation)

Work Item	Quantity	Unit	Unit Cost		Amount			
			F.C. (Rp.)	L.C. (Rp.)	F.C. (Mill. Rp.)	L.C. (Mill. Rp.)	Total (Mill. Rp.)	
I. Construction Base Cost						19,659	12,643	32,302
1. Preparatory Works (10% of Item 2)						1,787	1,149	2,937
2. Main Civil Works						17,872	11,494	29,365
a. Dredging/Excavation	0	cu m	5,200	1,300	0	0	0	
b. Earth Dike					3,542	2,133	5,675	
- Stripping/Clearing	271,000	sq m	0	1,200	0	325	325	
- Embankment	472,000	cu m	7,400	2,200	3,493	1,038	4,531	
- Sodding	245,600	sq m	200	1,800	49	442	491	
- Filter	0	cu m	0	44,000	0	0	0	
- Gravel Metaling	9,100	cu m	0	36,000	0	328	328	
c. Concrete Wall Dike	1,400	m	160,000	170,000	224	238	462	
d. Movable Steel Wall (10.0W x 1.2H)	3	unit	108,000,000	12,000,000	324	36	360	
e. Control Gate					1,535	1,205	2,740	
- 2 spans x 2.5W x 2.0H	5	unit	307,000,000	241,000,000	1,535	1,205	2,740	
f. Sluice					2,968	2,332	5,300	
- Type A	0	unit	355,000,000	279,000,000	0	0	0	
- Type B	0	unit	587,000,000	462,000,000	0	0	0	
- Type C	0	unit	896,000,000	704,000,000	0	0	0	
- Type D	0	unit	1,109,000,000	871,000,000	0	0	0	
- Type E	0	unit	1,848,000,000	1,452,000,000	0	0	0	
- Type F	0	unit	2,128,000,000	1,672,000,000	0	0	0	
- Type G	0	unit	2,520,000,000	1,980,000,000	0	0	0	
- Type H	0	unit	2,968,000,000	2,332,000,000	0	0	0	
- 5 spans X 7.0W X 5.2H	1	unit	3,800,000,000	2,900,000,000	2,968	2,332	5,300	
g. Drainage Pumping Station					4,070	908	4,978	
- Excavation	3,200	cu m	4,200	1,000	13	3	17	
- Embankment	3,400	cu m	2,300	600	8	2	10	
- Reinforced Concrete	690	sq m	307,000	300,000	212	207	419	
- Control House	300	cu m	90,000	370,000	27	111	138	
- Foundation Treatment	1	ls.	0	0	210	185	395	
- Mechanical Works	1	ls.	0	0	3,600	400	4,000	
h. Revetment					119	207	326	
- Low Water Channel	4,400	sq m	27,000	47,000	119	207	326	
- High Water Channel	0	sq m	24,000	41,000	0	0	0	
i. Groin	8	set	33,000,000	32,000,000	264	256	520	
j. Bridge					35	35	70	
- Footbridge	0	sq m	200,000	200,000	0	0	0	
- Road Bridge	35	sq m	1,000,000	1,000,000	35	35	70	
k. Public Road					1,812	2,228	4,040	
- Stripping/Clearing	72,000	sq m	0	1,200	0	86	86	
- Embankment	126,000	cu m	7,400	2,200	932	277	1,210	
- Sodding	60,800	sq m	200	1,800	12	109	122	
- Asphalt Pavement	8,300	ton	60,000	90,000	498	747	1,245	
- Base Course	7,700	cu m	48,000	72,000	370	554	924	
- Sub-base Course	10,300	cu m	0	44,000	0	453	453	
l. Miscellaneous (20% of a to k)	1	ls.	0	0	2,979	1,916	4,894	
II. Compensation Cost						0	280	280
1. Land Acquisition							120	120
	40	ha	0	3,000,000	0	120	120	
2. Compensation						0	160	160
a. Permanent House	10	unit	0	12,000,000	0	120	120	
b. Semi-Permanent	10	unit	0	4,000,000	0	40	40	
III. Administration Cost (5% of Items I & II, allotted to L.C. only)						0	1,629	1,629
IV. Engineering Cost (10% of Item I)						1,966	1,264	3,230
V. Physical Contingency (10% of Items I, II & IV)						2,162	1,419	3,581
VI. Total (Items I to V)						23,787	17,235	41,022
VII. Value Added Tax (10% of Item VI)						0	4,102	4,102
VIII. Grand Total						23,787	21,337	45,124

Table 7.52 ANNUAL DISBURSEMENT SCHEDULE OF INDRAGIRI RIVER DEVELOPMENT PROJECT (FINANCIAL)
- RENGAT AREA FLOOD PROTECTION WORKS (INITIAL PHASE) -

Description	Amount												Unit: Million Rp.		
	1996			1997			1998			1999			2000		
	F.C.	L.C.	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
I. Construction Base Cost	21,181	15,167	36,348	0	0	0	0	7,517	5,171	9,677	6,981	3,987	3,016		
1. Preparatory Works	1,670	950	2,620	0	0	0	0	1,670	950	0	0	0	0	0	0
2. Main Civil Works	16,695	9,502	26,197	0	0	0	0	5,009	2,851	8,348	4,751	3,339	1,900		
Sub-Total	18,365	10,452	28,817	0	0	0	0	6,679	3,801	8,348	4,751	3,339	1,900		
7. Price Contingency (3%F.C. & 8%L.C.)	2,816	4,715	7,531	0	0	0	0	838	1,370	1,330	2,230	648	1,115		
II. Compensation Cost	0	353	353	0	0	0	353	0	0	0	0	0	0	0	0
1. Compensation	0	280	280	0	0	0	280	0	0	0	0	0	0	0	0
2. Price Contingency (8%L.C.)	0	73	73	0	0	0	73	0	0	0	0	0	0	0	0
III. Administration Cost	0	1,941	1,941	0	170	0	733	0	594	0	214	0	231		
1. Administration	0	1,455	1,455	0	146	0	582	0	437	0	146	0	146		
2. Price Contingency (8%L.C.)	0	486	486	0	24	0	151	0	157	0	68	0	85		
IV. Engineering Cost	2,018	1,342	3,359	1,169	731	0	0	248	171	426	307	175	133		
1. Detailed Design	1,102	627	1,729	1,102	627	0	0	0	0	0	0	0	0		
2. Construction Supervision	734	418	1,152	0	0	0	0	220	125	367	209	147	84		
3. Price Contingency (3%F.C. & 8%L.C.)	182	297	478	67	104	0	0	28	45	58	98	29	49		
V. Physical Contingency (10% of Items I, II & IV)	2,320	1,686	4,006	117	73	0	35	776	534	1,010	729	416	315		
VI. Total (Items I, II, III, IV & V)	25,518	20,489	46,007	1,286	974	0	1,121	8,541	6,469	11,113	8,230	4,579	3,694		
VII. Value Added Tax (10% of Item VI)	0	4,601	4,601	0	226	0	112	0	1,501	0	1,934	0	827		
VIII. Grand Total	25,518	25,090	50,608	1,286	1,200	0	1,233	8,541	7,970	11,113	10,165	4,579	4,521		

Notes : *1 Price Level in July 1994

*2 Conversion Rate - 1.00 US\$ = 2,175 Rp ; 1 Yen = 21.90 Rp.

*3 Figures may not add up to totals due to rounding

Table 7.5.3 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR RENGAT AREA FLOOD PROTECTION WORKS (PRIORITY PROJECT)

Unit: Million Rp.									
No.	Year	Economic Cost					Total	Benefit	
		Constr- uction	Compen- sation	Admini- stration	Engineering Service	Physical Contingency		OMR	Rengat Area
-4	1996			146	1,729	173	2,048	0	-2,048
-3	1997		268	582	0	27	877	0	-877
-2	1998	9,416		437	345	976	11,174	0	-11,174
-1	1999	11,769		146	576	1,235	13,726	0	-13,726
0	2000	4,707		146	231	494	5,578	0	-5,578
1	2001						129	4,035	3,906
2	2002						129	4,086	3,957
3	2003						129	4,137	4,007
4	2004						129	4,188	4,058
5	2005						129	4,239	4,109
6	2006						129	4,289	4,160
7	2007						129	4,340	4,211
8	2008						129	4,391	4,262
9	2009						129	4,442	4,313
10	2010						129	4,493	4,363
11	2011						129	4,544	4,414
12	2012						129	4,595	4,465
13	2013						129	4,646	4,516
14	2014						129	4,696	4,567
15	2015						129	4,747	4,618
16	2016						129	4,798	4,669
17	2017						129	4,849	4,720
18	2018						129	4,900	4,770
19	2019						129	4,951	4,821
20	2020						129	5,002	4,872
21	2021						129	5,002	4,872
22	2022						129	5,002	4,872
23	2023						129	5,002	4,872
24	2024						129	5,002	4,872
25	2025						129	5,002	4,872
26	2026						129	5,002	4,872
27	2027						129	5,002	4,872
28	2028						129	5,002	4,872
29	2029						129	5,002	4,872
30	2030						129	5,002	4,872
31	2031						129	5,002	4,872
32	2032						129	5,002	4,872
33	2033						129	5,002	4,872
34	2034						129	5,002	4,872
35	2035						129	5,002	4,872
36	2036						129	5,002	4,872
37	2037						129	5,002	4,872
38	2038						129	5,002	4,872
39	2039						129	5,002	4,872
40	2040						129	5,002	4,872
41	2041						129	5,002	4,872
42	2042						129	5,002	4,872
43	2043						129	5,002	4,872
44	2044						129	5,002	4,872
45	2045						129	5,002	4,872
46	2046						129	5,002	4,872
47	2047						129	5,002	4,872
48	2048						129	5,002	4,872
49	2049						129	5,002	4,872
50	2050						129	5,002	4,872
Total		25,892	268	1,457	2,881	2,905	6,473	EIRR =	11.00%

(Discount Rate 10%)
 B/C = 1.11
 NPV = 2,815

Table 7.6.1 CASH FLOW OF ECONOMIC COST AND BENEFIT FOR ALL PRIORITY PROJECTS

		Unit: Million Rp.								
No.	Year	Economic Cost					Total	Benefit	Net Benefit	
		Construc- tion	Compen- sation	Admini- stration	Engineering Service	Physical Contingency				
-8	1996	0	0	2,860	15,505	1,550	0	19,915	0	
-7	1997	0	268	3,296	13,365	1,364	0	18,293	0	
-6	1998	9,416	22,190	5,834	6,313	3,791	0	47,544	0	
-5	1999	11,769	3,325	5,233	11,963	2,707	0	34,997	0	
-4	2000	66,438	5,867	7,482	7,294	7,960	0	95,041	0	
-3	2001	144,484	2,542	6,750	6,677	15,371	129	175,953	4,035	
-2	2002	253,631	0	4,285	10,820	26,444	129	295,309	4,086	
-1	2003	188,615	0	4,285	9,008	19,763	416	222,087	10,654	
0	2004	88,604	0	4,285	3,986	9,259	1,270	107,404	34,052	
1	2005						3,537	3,537	179,296	
2	2006						3,537	3,537	180,995	
3	2007						3,537	3,537	182,695	
4	2008						3,537	3,537	184,396	
5	2009						3,537	3,537	186,095	
6	2010						3,537	3,537	187,795	
7	2011						3,537	3,537	189,496	
8	2012						3,537	3,537	191,196	
9	2013						3,537	3,537	192,896	
10	2014						3,537	3,537	194,595	
11	2015						3,537	3,537	196,295	
12	2016						3,537	3,537	197,996	
13	2017						3,537	3,537	199,695	
14	2018						3,537	3,537	201,395	
15	2019						3,537	3,537	203,096	
16	2020						3,537	3,537	204,319	
17	2021						3,537	3,537	204,319	
18	2022						3,537	3,537	204,319	
19	2023						3,537	3,537	204,319	
20	2024						3,537	3,537	204,319	
21	2025						3,537	3,537	204,319	
22	2026						3,537	3,537	204,319	
23	2027						3,537	3,537	204,319	
24	2028	21,436		1,072	857	2,230	3,537	29,132	204,319	
25	2029						3,537	3,537	204,319	
26	2030						3,537	3,537	204,319	
27	2031						3,537	3,537	204,319	
28	2032						3,537	3,537	204,319	
29	2033						3,537	3,537	204,319	
30	2034						3,537	3,537	204,319	
31	2035						3,537	3,537	204,319	
32	2036						3,537	3,537	204,319	
33	2037						3,537	3,537	204,319	
34	2038						3,537	3,537	204,319	
35	2039						3,537	3,537	204,319	
36	2040						3,537	3,537	204,319	
37	2041						3,537	3,537	204,319	
38	2042						3,537	3,537	204,319	
39	2043						3,537	3,537	204,319	
40	2044						3,537	3,537	204,319	
41	2045						3,537	3,537	204,319	
42	2046						3,537	3,537	204,319	
43	2047						3,537	3,537	204,319	
44	2048						3,537	3,537	204,319	
45	2049						3,537	3,537	204,319	
46	2050						3,537	3,537	204,319	
47	2051						3,537	3,537	204,319	
48	2052						3,537	3,537	204,319	
49	2053						3,537	3,537	204,319	
50	2054						3,537	3,537	204,319	
TOTAL		784,393	34,192	45,382	85,788	90,439	178,811		EIRR =	13.59%

(Discount Rate 10%)
B/C = 1.46
NPV = 263,292

Table 7.7.1 EVALUATION OF SIGNIFICANT IMPACTS IN KAMPAR RIVER BASIN

ACTIVITY COMPONENTS		PRE-CONSTRUCTION		CONSTRUCTION				POST-CONSTRUCTION	
		1	2	3	4	5	6	7	8
ENVIRONMENTAL COMPONENTS									
GEO-	Micro Climate								
PHYSICS-	Air Quality/Noise			-1		-1	-1		
CHEMICAL	Physiography and Geology					-1	-2	-3	
	Water Quality					-1			
	Land Use System					-1			
BIOLOGY	Variety of Land Biota					-2			
	Variety of Water Biota								
SOCIO-	Public Perception/Attitude	-2	-2		-2				
ECONOMY	Employment Opportunity/		-3		+2			+3	+3
CULTURE	Means of Livelihood								
	Land Ownership		-3						
	Local People's Income		+3		+2			+3	+3
	Customs & Traditions				-2				
	Public Health			-2		-2		+3	+3
	Environmental Convenience			-1		-2			
	Public Facilities		-2	-2			-2		+3

NOTES OF ACTIVITY COMPONENTS

1. Survey, Investigation and Land Inventory-taking
2. Compensation
3. Mobilization of Heavy Equipment and Materials
4. Mobilization of Manpower
5. Land Clearing
6. Construction of proposed Facilities
7. Operation/ Maintenance of the intake weir and Irrigation System
8. Operation/ Maintenance of the Dike

NOTES OF CRITERIA:

- +1 = Positive, less significant impact
- +2 = Positive, somewhat significant impact
- +3 = Positive, significant impact
- +4 = Positive, more significant impact
- +5 = Positive, very significant impact
- 1 = Negative, less significant impact
- 2 = Negative, somewhat significant impact
- 3 = Negative, significant impact
- 4 = Negative, more significant impact
- 5 = Negative, very significant impact

Table 7.7.2 EVALUATION OF SIGNIFICANT IMPACTS IN INDRAGIRI RIVER BASIN

ACTIVITY COMPONENTS		PRE-CONSTRUCTION		CONSTRUCTION					POST-CONSTRUCTION		
		1	2	3	4	5	6	7	8	9	10
ENVIRONMENTAL COMPONENTS											
GEO-	Micro Climate								-1		
PHYSICS-	Air Quality/Noise			-1		-2	-2	-1			
CHEMICAL	Physiography and Geology					-1	-2	-2	-3	-3	
	River Flow Pattern							-2	+3		
	Water Quality					-2	-2		+3		
	Land Use System					-2			-3		
BIOLOGY	Variety of Land Biota					-2			-2		
	Variety of Water Biota					-2	-2		+3		
SOCIO-	Public Perception/Attitude	-2	-2		-2						
ECONOMY	Employment Opportunity/		-3		+2				+3	+3	
CULTURE	Means of Livelihood										
	Land Ownership		-3								
	Local People's Income		+2		+2				+3	+3	+3
	Customs & Traditions				-2						
	Public Health			-3		-2	-2	-2	+3	+3	+3
	Environmental Convenience			-2		-2					
	Public Facilities		-2	-2					+3		+3

NOTES OF ACTIVITY COMPONENTS

1. Survey, Investigation and Land Inventory-taking
2. Compensation
3. Mobilization of Heavy Equipment and Materials
4. Mobilization of Manpower
5. Land Clearing
6. Temporary Diversion of River Course
7. Construction of proposed Facilities
8. Dam Operation/Maintenance
9. Operation/ Maintenance of the Dam, intake weir and Irrigation System
10. Operation/ Maintenance of the Dike

NOTES OF CRITERIA:

- +1 = Positive, less significant impact
 +2 = Positive, somewhat significant impact
 +3 = Positive, significant impact
 +4 = Positive, more significant impact
 +5 = Positive, very significant impact
- 1 = Negative, less significant impact
 -2 = Negative, somewhat significant impact
 -3 = Negative, significant impact
 -4 = Negative, more significant impact
 -5 = Negative, very significant impact

Table 7.7.3 (1/2) ENVIRONMENTAL MANAGEMENT LOCATION OF KAMPAR RIVER BASIN

No.	Component	Management Location	Schedule of Management Implementation
I. GEOPHYSICAL CHEMICAL ASPECT			
1.	Air quality and noise	<ul style="list-style-type: none"> — Around the activity location during the construction — Around the quarry and borrow areas 	During the activities of : <ul style="list-style-type: none"> — Mobilization of materials and heavy equipment — Land opening and clearance — Management of quarry and borrow areas — Construction of diversion tunnel
2.	Physiography and geology	<ul style="list-style-type: none"> — Around the activity location during the construction — Location of access road construction 	<ul style="list-style-type: none"> — Management of quarry and borrow areas — Construction of diversion tunnel
3.	River flow pattern	<ul style="list-style-type: none"> — The upstream of Indragiri river 	<ul style="list-style-type: none"> — Construction of diversion tunnel
4.	Water quality	<ul style="list-style-type: none"> — Kampar river in the location of activity 	<ul style="list-style-type: none"> — Construction of access road — Construction of labor camp and its operation — Construction of quarry and borrow areas
II. BIOLOGICAL ASPECT			
1.	Variety of terrestrial biota	<ul style="list-style-type: none"> — Location of activity during the construction — Location of construction of access road — Location of quarry and borrow areas 	<ul style="list-style-type: none"> — Land opening and clearance — Construction of access road — Construction of quarry and borrow areas
2.	Variety of aquatic biota	<ul style="list-style-type: none"> — Location of activity 	<ul style="list-style-type: none"> — Land opening and clearance — Construction of access road

Table 7.7.3 (2/2) ENVIRONMENTAL MANAGEMENT LOCATION OF KAMPAR RIVER BASIN

No.	Component	Management Location	Schedule of Management Implementation
III. SOCIO ECONOMICAL AND CULTURAL ASPECT			
1.	Public Perception	— Location of activity during the pre-construction	— Survey and investigation
2.	Means of livelihood	— Location of activity	— Land acquisition
3.	Land ownership	— Location of activity	— Land acquisition
4.	Customs & traditions and Cultural Value	— Location of activity	— Mobilization of manpower
5.	Public Health	— Location of activities for the irrigation canal	— Mobilization of materials and heavy equipment — Mobilization of manpower — Land opening and clearing — Construction of access road
		— Location of quarry and borrow areas	— Construction of labor camp and its operation — Management of quarry and borrow areas
6.	Environment Convenience	— Location of activities for the irrigation canal	— Mobilization of materials and heavy equipment — Land opening and clearance — Construction of access road — Construction of labor camp and its operation
7.	Public Facilities	— Location of the activity	— Land acquisition — Mobilization of materials and heavy equipment

Table 7.7.4 (1/2) ENVIRONMENTAL MANAGEMENT LOCATION OF INDRAGIRI RIVER BASIN

No.	Component	Management Location	Schedule of Management Implementation
I. GEOPHYSICAL CHEMICAL ASPECT			
1.	Air quality and noise	<ul style="list-style-type: none"> — Around the activity location during the construction — Around the quarry and borrow areas 	During the activities of : <ul style="list-style-type: none"> — Mobilization of materials and heavy equipment — Land opening and clearance — Management of quarry and borrow areas — Construction of diversion tunnel
2.	Physiography and geology	<ul style="list-style-type: none"> — Around the activity location during the construction — Location of access road construction 	<ul style="list-style-type: none"> — Management of quarry and borrow areas — Construction of diversion tunnel — Construction of main dam
3.	River flow pattern	<ul style="list-style-type: none"> — The upstream of Indragiri river 	<ul style="list-style-type: none"> — Construction of diversion tunnel — Construction of coffer dam
4.	Water quality	<ul style="list-style-type: none"> — Indragiri river in the location of activity 	<ul style="list-style-type: none"> — Construction of access road — Construction of labor camp and its operation — Construction of quarry and borrow areas — Operation and maintenance of the dam — Construction of coffer dam
II. BIOLOGICAL ASPECT			
1.	Variety of terrestrial biota	<ul style="list-style-type: none"> — Location of activity during the construction — Location of construction of access road — Location of quarry and borrow — Location of reservoir area 	<ul style="list-style-type: none"> — Land opening and clearance — Construction of access road — Construction of quarry and borrow areas — Operation and maintenance of the dam — Reserving water
2.	Variety of aquatic biota	<ul style="list-style-type: none"> — Location of reservoir area 	<ul style="list-style-type: none"> — Land opening and clearance — Construction of access road

Table 7.7.4 (2/2) ENVIRONMENTAL MANAGEMENT LOCATION OF INDRAGIRI RIVER BASIN

No.	Component	Management Location	Schedule of Management Implementation
III. SOCIO ECONOMICAL AND CULTURAL ASPECT			
1.	Public Perception	— Location of reservoir area during the pre-construction	— Survey and investigation
2.	Means of livelihood	— Location of reservoir area and location of activity	— Land acquisition
3.	Land ownership	— Location of reservoir area and location of activity	— Land acquisition
4.	Customs & traditions and Cultural Value	— Location of activity	— Mobilization of manpower
5.	Public Health	— Location of activities for the dam and dike	— Mobilization of materials and heavy equipment — Mobilization of manpower — Land opening and clearance — Construction of access road
		— Location of quarry and borrow areas	— Construction of labor camp and its operation — Management of quarry and borrow areas — Construction of coffer dam — Construction of main dam — Reserving water
6.	Environment Convenience	— Location of activities for the dam and dike	— Mobilization of materials and heavy equipment — Land opening and clearing — Construction of access road — Construction of labor camp and its operation
7.	Public Facilities	— Reservoir area	— Land acquisition — Mobilization of materials and heavy equipment — Land acquisition
		— Location of activity	

Table 9.2.1 SUMMARY OF DISBURSEMENT SCHEDULE OF PROJECT COST

Unit Rp. 10⁶

Project	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total		
OVERALL DEVELOPMENT PLAN																											
Kampar Kanan Water Supply Project	Currency	1,765	1,471	1,471	10,343	24,109	27,726	25,961	13,832	0	2,385	16,181	20,441	8,176	0	0	0	0	0	0	0	0	0	0	0	155,288	
	F.C.	1,999	1,796	2,355	4,698	10,673	17,282	19,943	18,776	10,621	0	5,496	11,841	15,811	5,980	0	0	0	0	0	0	0	0	0	0	0	127,071
	L.C.	3,764	3,257	3,626	5,675	21,016	41,391	47,669	44,737	24,473	0	8,081	28,022	36,252	14,156	0	0	0	0	0	0	0	0	0	0	0	282,229
Kampar Kanan River Improvement Project	F.C.	0	0	0	4,846	2,077	0	43,340	54,752	21,901	6,276	3,547	55,317	74,808	0	0	2,462	0	23,202	19,472	3,052	0	0	0	0	0	444,754
	L.C.	0	0	0	5,376	5,782	4,515	37,670	47,931	19,522	8,547	10,472	46,016	58,976	57,994	0	0	3,904	3,457	28,035	23,711	4,310	2,026	2,026	30,668	25,927	423,859
	Total	0	0	0	10,422	7,859	4,515	81,010	102,683	41,423	16,823	14,019	101,333	133,784	132,202	0	0	6,366	3,457	51,237	43,183	7,362	2,026	2,026	59,427	50,062	868,613
Kampar and Kampar Kiri River Development Project	F.C.	0	0	0	0	0	0	0	14,501	6,215	12,651	67,506	117,936	160,987	8,241	3,142	20,858	49,872	83,782	66,223	90,327	166,026	111,205	38,631	1,018,103		
	L.C.	0	0	0	0	0	0	0	13,097	17,698	21,229	62,780	91,277	68,115	8,487	10,190	20,543	47,420	76,530	46,813	73,937	122,040	82,769	30,733	793,693		
	Total	0	0	0	0	0	0	0	27,598	23,913	33,880	130,286	209,213	229,102	16,728	13,332	41,401	97,292	160,312	113,036	164,264	288,086	193,974	69,364	1,811,796		
Indragiri River Development Project	F.C.	8,193	7,009	10,156	11,010	38,498	85,281	120,541	66,651	31,935	18,487	3,985	119,724	146,214	58,485	39,690	37,827	144,362	60,072	10,328	0	0	64,639	81,684	32,674	1,328,733	
	L.C.	7,693	7,631	28,004	12,189	37,804	62,297	84,398	49,544	24,337	17,433	19,756	104,833	134,863	50,772	35,112	41,975	133,301	125,776	57,630	7,971	7,388	45,670	54,075	22,409	1,172,921	
	Total	15,886	14,640	38,160	23,199	76,302	147,578	204,939	116,195	56,292	35,940	23,741	224,557	281,077	109,257	74,802	79,802	277,663	257,044	117,722	18,299	3,368	110,329	135,759	55,083	2,501,653	
Upper Indragiri River Improvement Project	F.C.	2,864	0	26,987	22,648	7,164	0	67,512	56,639	3,932	0	37,051	31,095	916	0	8,633	7,245	3,480	0	32,796	27,523	1,283	0	12,090	10,146	360,024	
	L.C.	2,374	2,615	19,916	16,203	6,093	8,322	46,744	38,221	3,341	4,659	25,630	20,956	1,568	1,610	12,777	10,534	3,801	5,290	29,930	24,562	1,291	1,987	10,082	8,265	307,213	
	Total	5,438	2,615	46,903	38,851	13,257	8,322	114,256	94,860	7,273	4,659	62,681	52,051	2,484	1,610	21,410	17,779	7,281	5,290	62,726	52,085	2,574	1,987	22,172	18,411	667,237	
Total	F.C.	12,822	8,480	36,614	39,681	58,082	109,390	259,119	204,023	86,121	32,978	59,819	289,823	360,315	302,456	56,564	48,214	171,162	181,140	199,852	123,346	94,662	230,685	237,738	105,586	3,306,872	
	L.C.	12,266	12,042	50,275	38,568	60,352	92,616	188,755	153,872	70,938	48,351	82,583	246,426	302,495	183,871	56,371	62,699	161,549	181,883	192,165	103,037	86,926	171,743	177,594	87,354	2,824,757	
	Total	25,088	20,522	86,889	78,249	118,434	202,006	447,874	357,895	157,059	81,353	142,402	536,249	662,810	486,327	112,935	110,913	332,711	363,023	392,017	226,603	181,588	402,428	411,332	192,940	6,131,629	

Note: Price Contingency is not included.
Physical Contingency and Value Added Tax are included.

Unit: Rp. 10⁶

Project	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total		
PRIORITY PROJECTS																											
Kampar Kanan Water Supply Project (Initial Phase)	Currency	1,765	1,471	1,471	10,343	24,109	27,726	25,961	13,832	0	2,385	16,181	20,441	8,176	0	0	0	0	0	0	0	0	0	0	0	155,288	
	F.C.	1,999	1,796	2,355	4,698	10,673	17,282	19,943	18,776	10,621	0	5,496	11,841	15,811	5,980	0	0	0	0	0	0	0	0	0	0	0	127,071
	L.C.	3,764	3,257	3,626	5,675	21,016	41,391	47,669	44,737	24,473	0	8,081	28,022	36,252	14,156	0	0	0	0	0	0	0	0	0	0	0	282,229
Bangkang Area River Improvement Works	F.C.	0	0	0	4,846	2,077	0	43,340	54,752	21,901	6,276	3,547	55,317	74,808	0	0	2,462	0	23,202	19,472	3,052	0	0	0	0	0	444,754
	L.C.	0	0	0	5,376	5,782	4,515	37,670	47,931	19,522	8,547	10,472	46,016	58,976	57,994	0	0	3,904	3,457	28,035	23,711	4,310	2,026	2,026	30,668	25,927	423,859
	Total	0	0	0	10,422	7,859	4,515	81,010	102,683	41,423	16,823	14,019	101,333	133,784	132,202	0	0	6,366	3,457	51,237	43,183	7,362	2,026	2,026	59,427	50,062	868,613
Kuntan River Multipurpose Development Project	F.C.	7,943	7,943	2,743	1,846	37,412	95,198	133,764	69,937	35,241	391,847																
	L.C.	7,947	7,947	36,370	5,715	40,798	72,048	96,952	52,945	27,738	348,480																
	Total	15,890	15,890	39,113	7,561	40,798	72,048	96,952	52,945	27,738	348,480																
Rengas Air Flood Protection Works	F.C.	1,212	0	7,589	9,586	3,834	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22,221	
	L.C.	1,040	979	5,989	7,120	2,944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,072	
	Total	2,252	979	13,578	16,706	6,778	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40,293	
Total	F.C.	10,920	9,414	11,803	17,235	53,666	119,307	204,830	150,670	70,994	648,839																
	L.C.	10,986	10,722	44,714	22,909	60,197	93,845	154,565	119,032	57,901	574,697																
	Total	21,906	20,136	56,517	40,164	113,863	213,152	359,395	269,722	128,895	1,223,536																

Table 9.3.1 BUDGET OF FIFTH 5-YEAR DEVELOPMENT PLAN
(PELITA V, 1990-1994)

Unit (except ratio): Rp. 10⁶

Area Sector	Year					Total	Ratio to Whole Indonesia
	1989/90	1990/91	1991/92	1992/93	1993/94		
Indonesia							
Rivers *1	128,800	197,700	197,700	197,700	197,800	919,700	
Irrigation *2	486,800	1,228,400	1,228,500	1,228,600	1,228,200	5,400,500	
Total	615,600	1,426,100	1,426,200	1,426,300	1,426,000	6,320,200	
Riau Province							
Rivers *1	1,934	2,879	4,486	2,620	3,407	15,326	1.7%
Irrigation *2	147	3,680	6,786	6,584	6,855	24,052	0.4%
Total	2,081	6,559	11,272	9,204	10,262	39,378	0.6%
West Sumatra Province							
Rivers *1	8,963	4,315	20,087	47,425	48,080	128,870	14.0%
Irrigation *2	11,545	17,215	30,047	30,249	37,597	126,653	2.3%
Total	20,508	21,530	50,134	77,674	85,677	255,523	4.0%
Riau and West Sumatra Provinces							
Rivers *1	10,897	7,194	24,573	50,045	51,487	144,196	15.7%
Irrigation *2	11,692	20,895	36,833	36,833	44,452	150,705	2.8%
Total	22,589	28,089	61,406	86,878	95,939	294,901	4.7%

Table 9.3.2 ACTUAL EXPENDITURE OF FIFTH 5-YEAR DEVELOPMENT PLAN
(PELITA V, 1990-1994)

Unit (except ratio): Rp. 10⁶

Area Sector	Year					Total	Ratio to Whole Indonesia
	1989/90	1990/91	1991/92	1992/93	1993/94		
Indonesia							
Rivers *1	130,750	244,246	283,262	348,713	443,892	1,450,863	
Irrigation *2	501,022	441,232	715,125	856,344	1,035,718	3,549,441	
Total	631,772	685,478	998,387	1,205,057	1,479,610	5,000,304	
Riau Province							
Rivers *1	194	466	1,063	2,620	3,407	7,750	0.5%
Irrigation *2	197	969	3,317	4,192	6,855	15,530	0.4%
Total	391	1,435	4,380	6,812	10,262	23,280	0.5%
West Sumatra Province							
Rivers *1	458	1,590	14,085	45,225	43,648	105,006	7.2%
Irrigation *2	7,895	10,822	17,093	29,877	38,548	104,235	2.9%
Total	8,353	12,412	31,178	75,102	82,196	209,241	4.2%
Riau and West Sumatra Provinces							
Rivers *1	652	2,056	15,148	47,845	47,055	112,756	7.8%
Irrigation *2	8,092	11,791	20,410	34,069	45,403	119,765	3.4%
Total	8,744	13,847	35,558	81,914	92,458	232,521	4.7%

Table 9.3.3 NATIONAL BUDGET IN LONG-TERM DEVELOPMENT PLAN

Unit: Rp. 10⁹

Area Sector	REPELITA VI	REPELITA VII	REPELITA VIII	REPELITA IX	REPELITA X	Total
	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019	1995-2019
Indonesia						
		*3	*3	*3	*3	
Rivers *1	4,357	5,794	7,532	9,791	12,728	40,201
Irrigation *2	5,342	4,396	4,829	3,249	1,313	19,129
Total	9,699	10,189	12,361	13,040	14,041	59,330

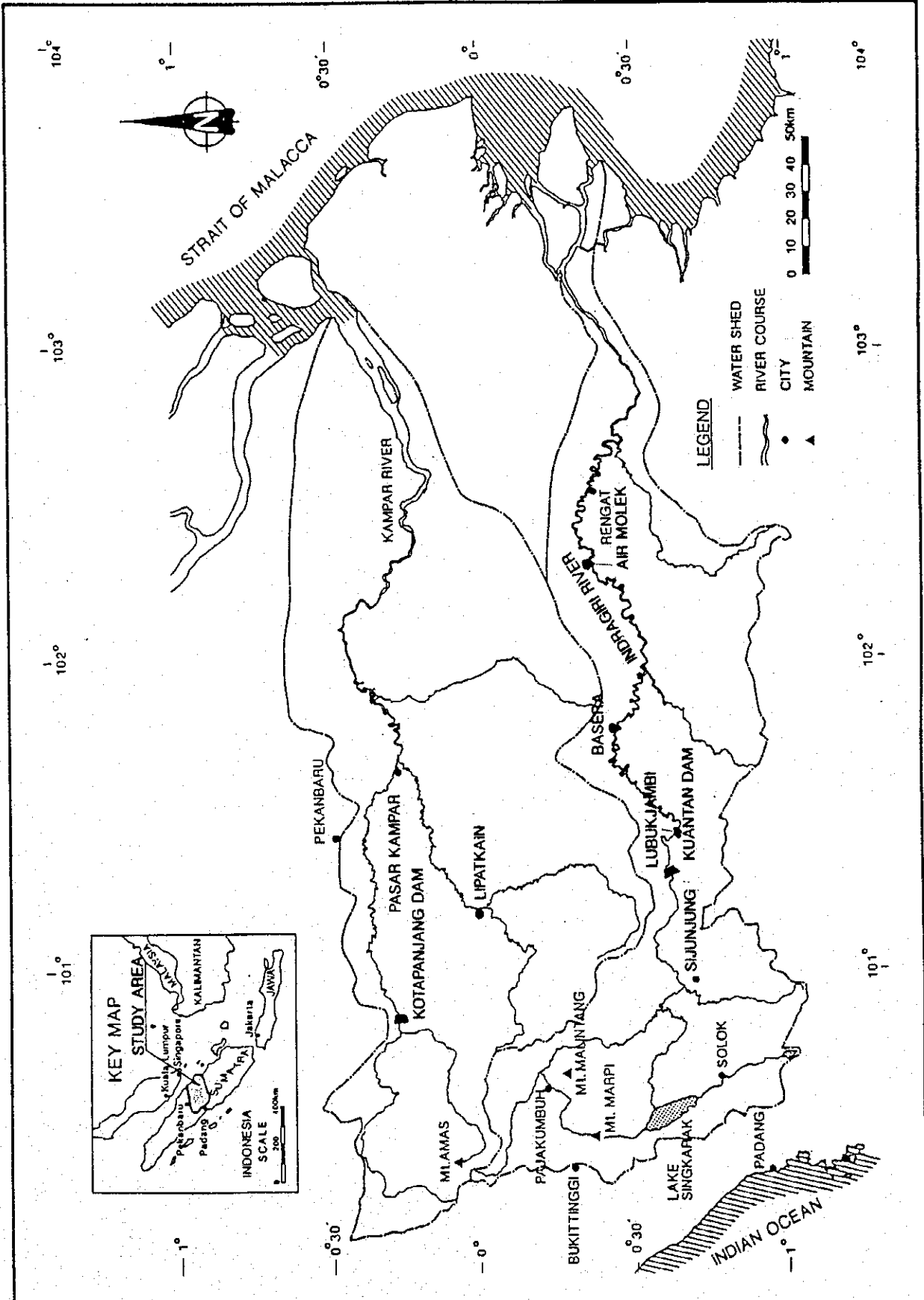
Source: DGWRD, Department of Public Works of Indonesia, Jakarta

Note: *1 includes flood control, water supply and multipurpose dam

*2 includes rehabilitation and village irrigation

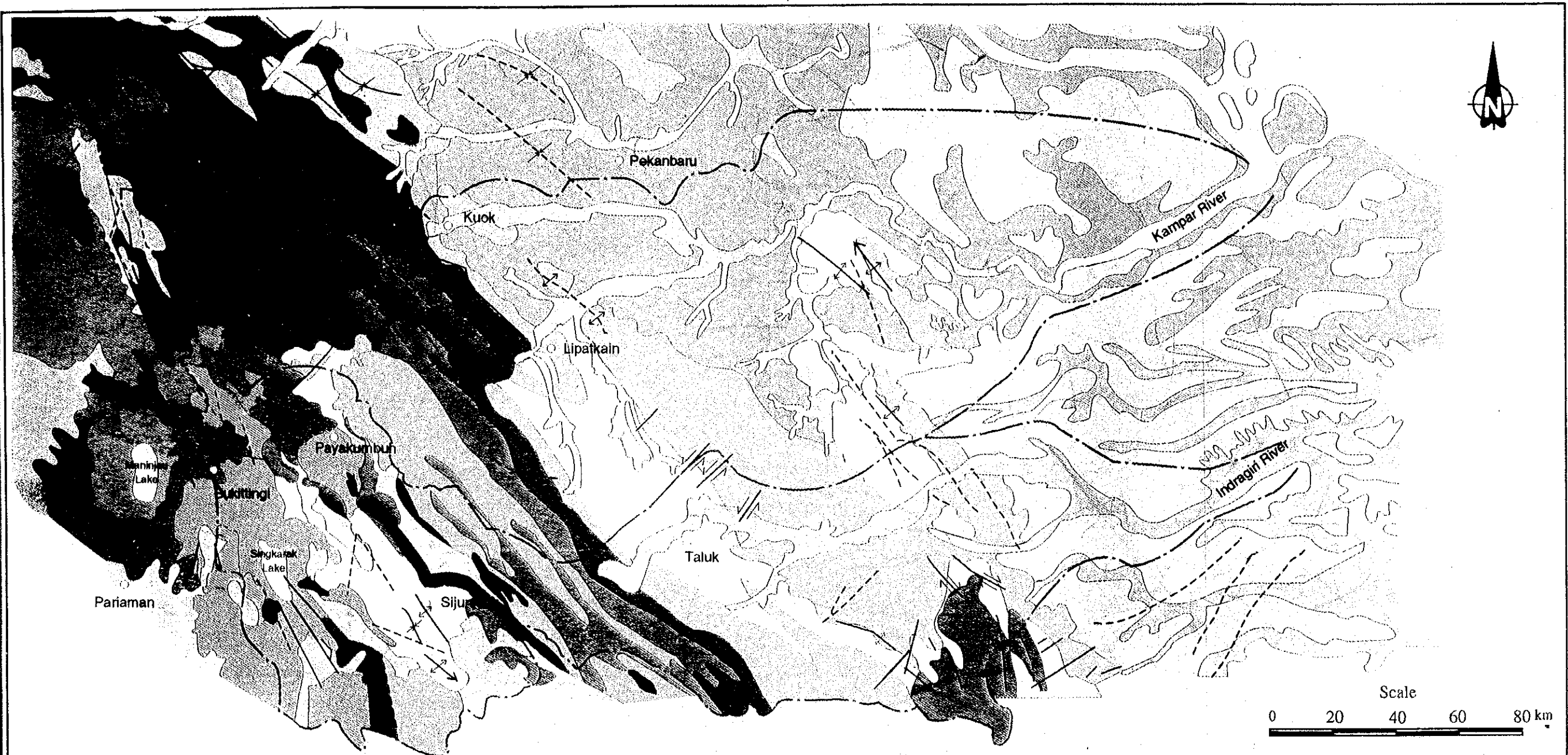
*3 values are of pre memoria

FIGURES



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Fig. 1.3.1 STUDY AREA



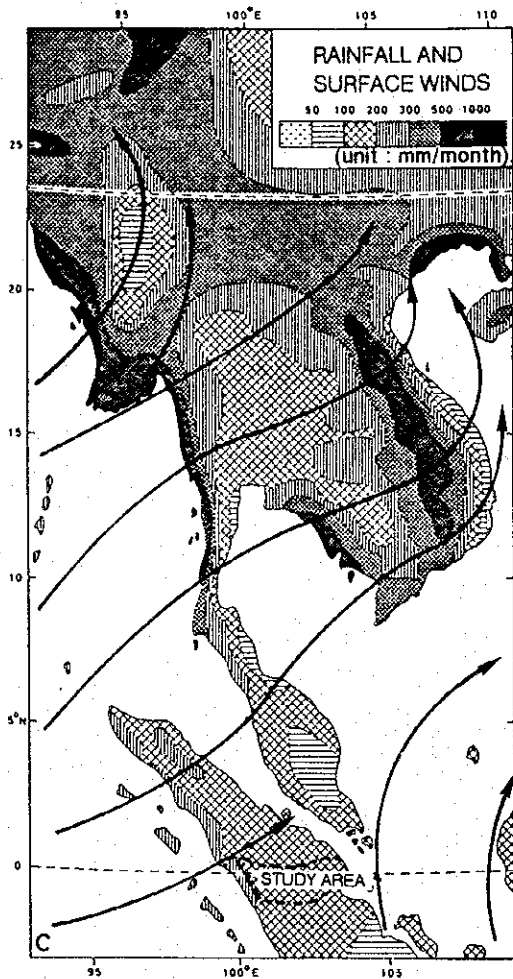
- | | | | | | | | |
|--|---|--|--|--|---|--|---------------------|
| | Younger alluvium (Holocene) | | Mudstone & Sandstone, Palembang and Petani formations (Plio-Miocene) | | Undifferentiated metamorphic rocks (Pre-Tertiary) | | geological boundary |
| | Coastal Plain deposits (Holocene) | | Mudstone, marl & sandstone, Telisa formation (Miocene) | | Shale and limestone, Tuhur formation (Triassic) | | strike-slip fault |
| | Older alluvium (Pleistocene) | | Marl, limestone & sandstone, Ombilin formation Mio-Oligocene | | Shale/mudstone, Kuantan formation (Permo-Carboniferous) | | thrust fault |
| | Volcanic rocks andesite, basalt (Pleistocene) | | Undifferentiated Tertiary sandstone | | Limestone, Kuantan formation (Permo-Carboniferous) | | major fault line |
| | Pumiceous tuff (Quaternary) | | Granite (Late Cretaceous) | | Quartzite/sandstone, Kuantan formation (PermoCarboniferous) | | syncline |
| | Tuffaceous rocks (Plio-Pleistocene) | | Pegmatitic granodiorite (Eocene-Oligocene) | | Undifferentiated Paleozoic rocks | | anticline |
| | | | | | | | basin boundary |

Scale
0 20 40 60 80 km

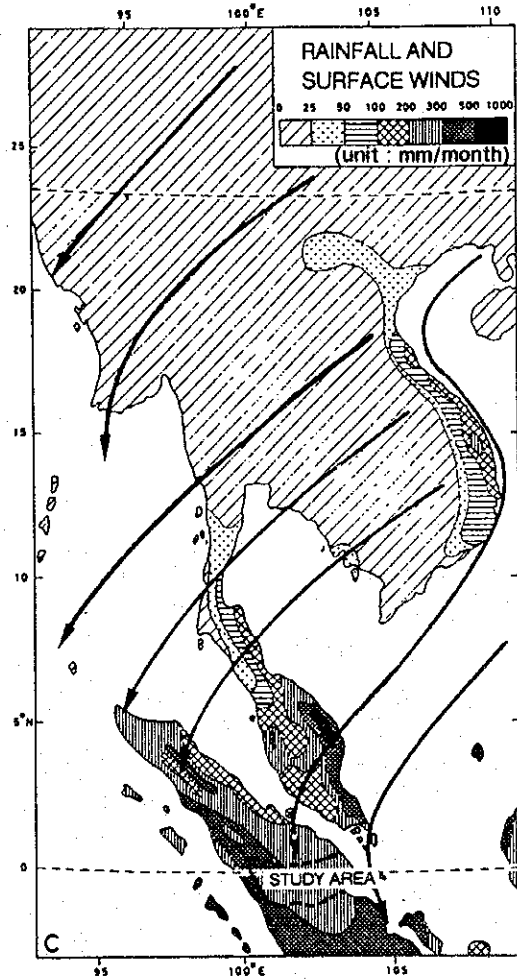
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Fig.2.2.1 GEOLOGICAL MAP OF STUDY AREA

SOUTHWEST MONSOON
(JULY)

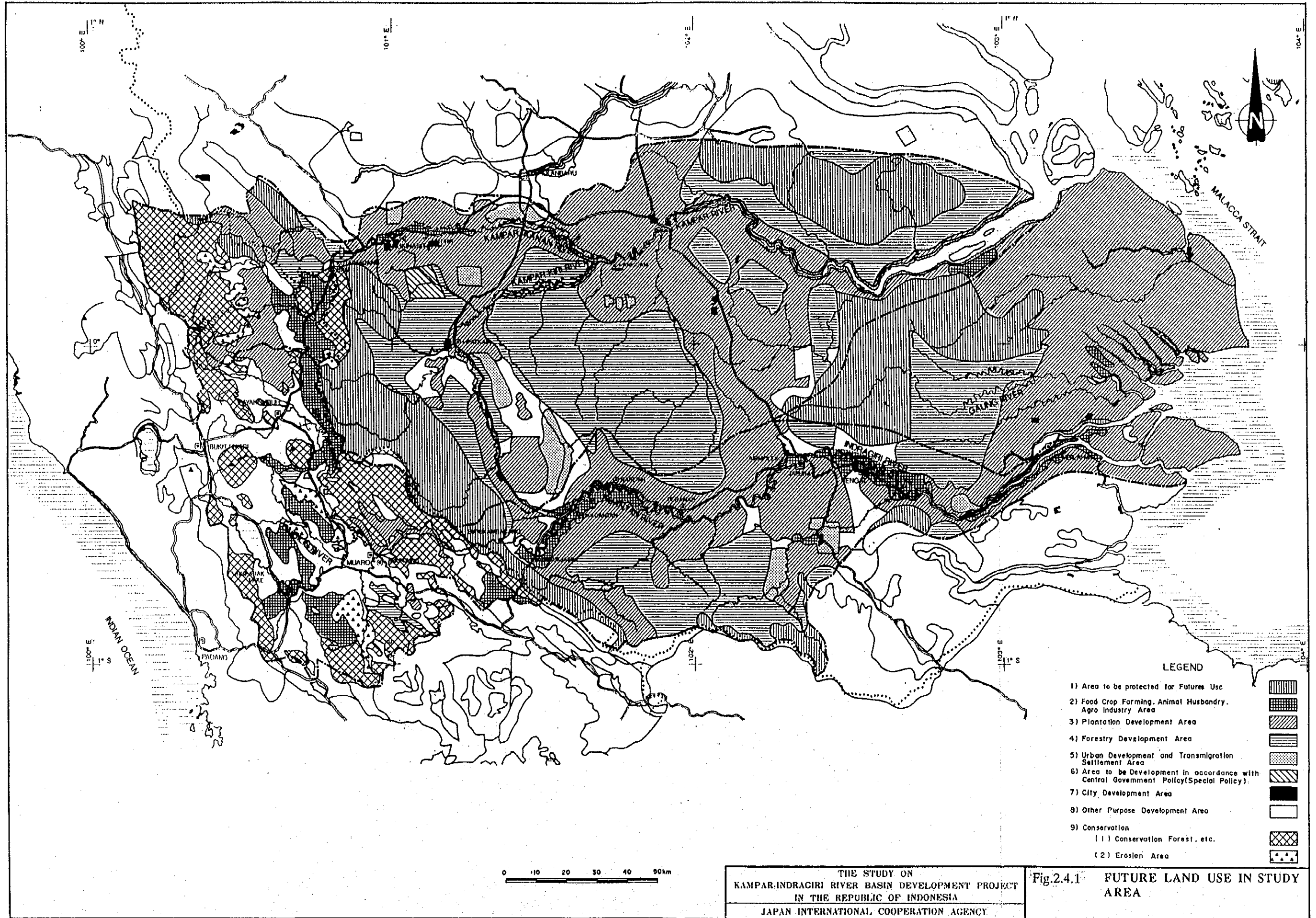


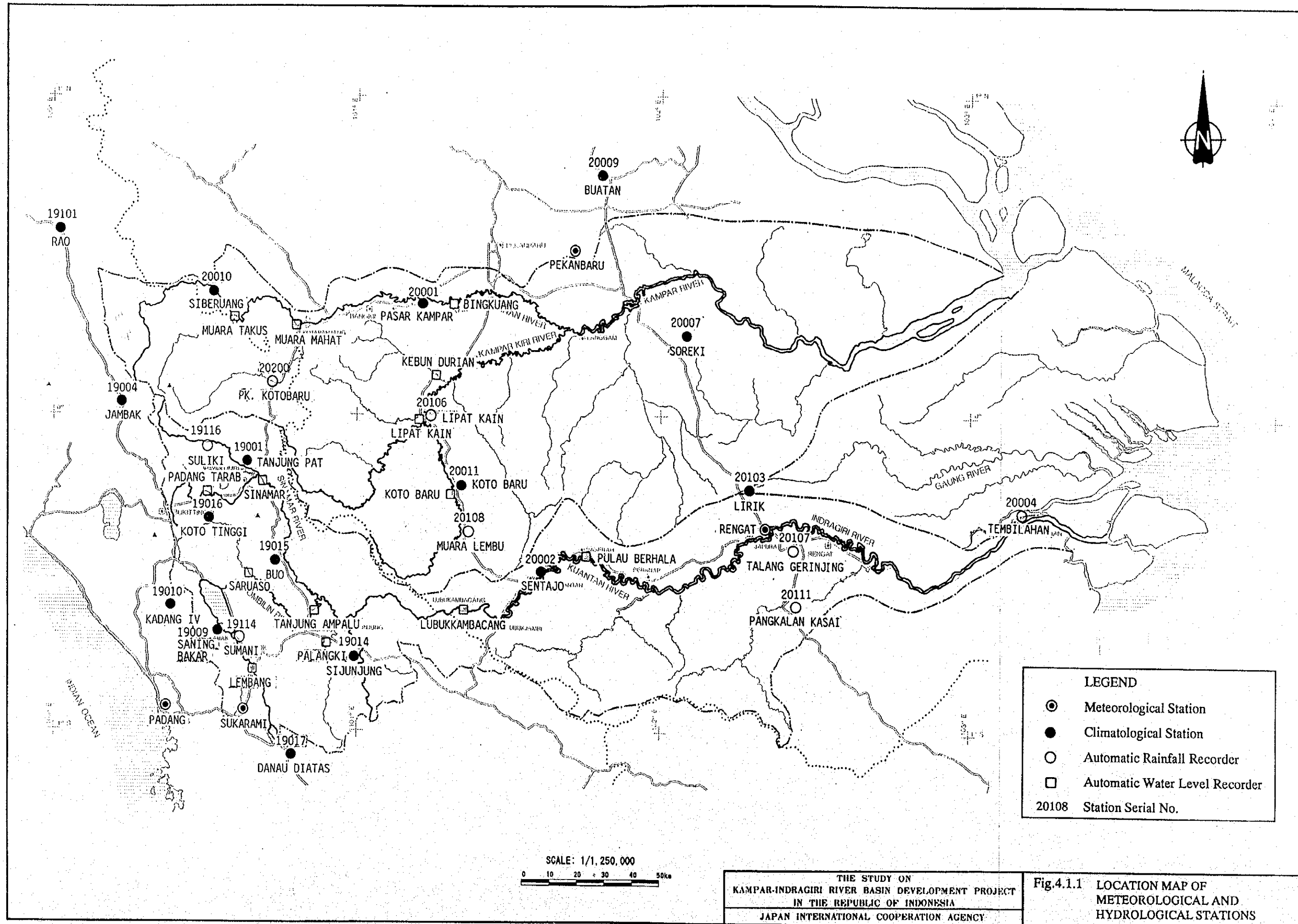
NORTHEAST MONSOON
(JANUARY)

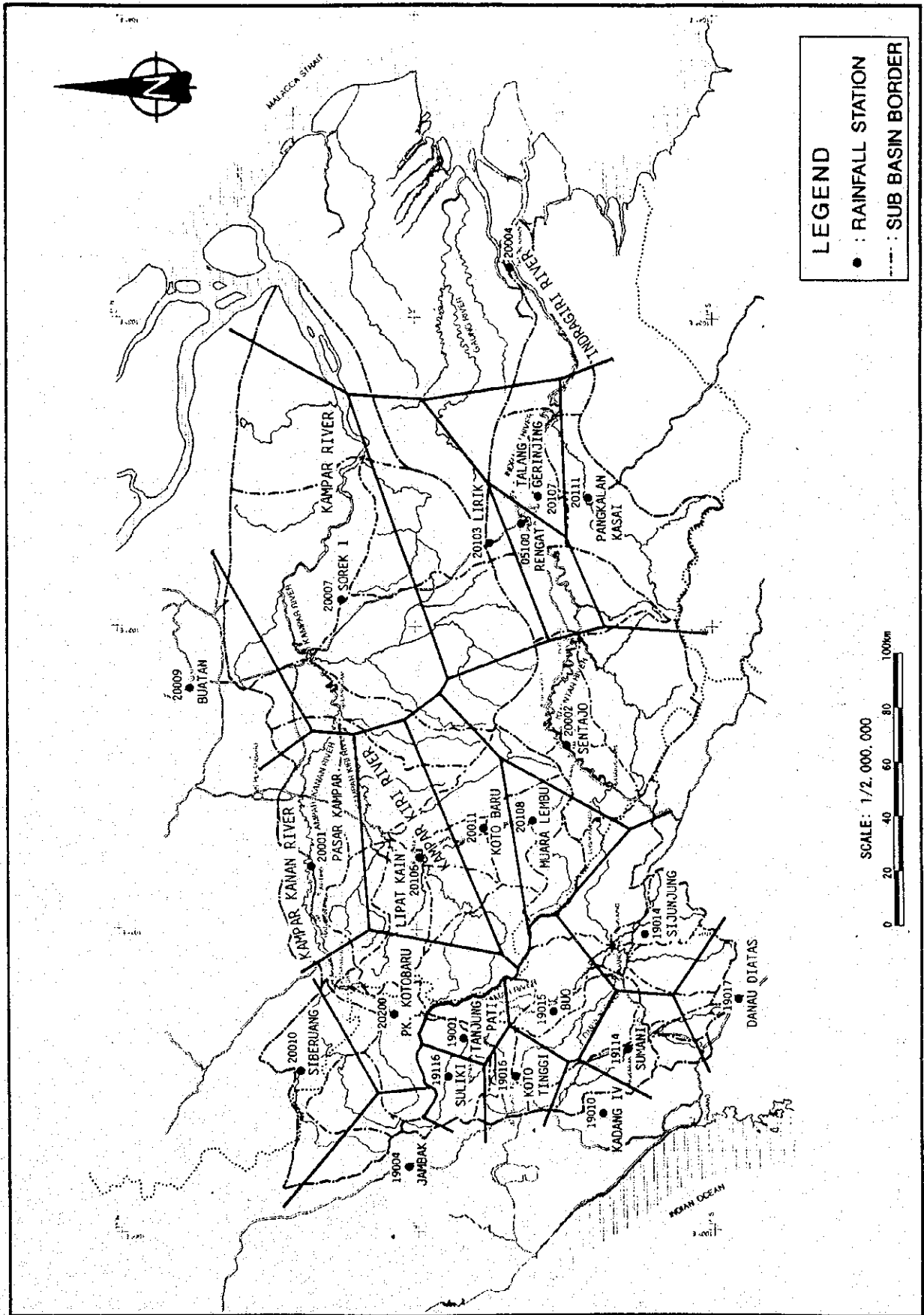


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Fig. 2.3.1 RAINFALL DEPTH AND WIND DIRECTION DURING MONSOONS



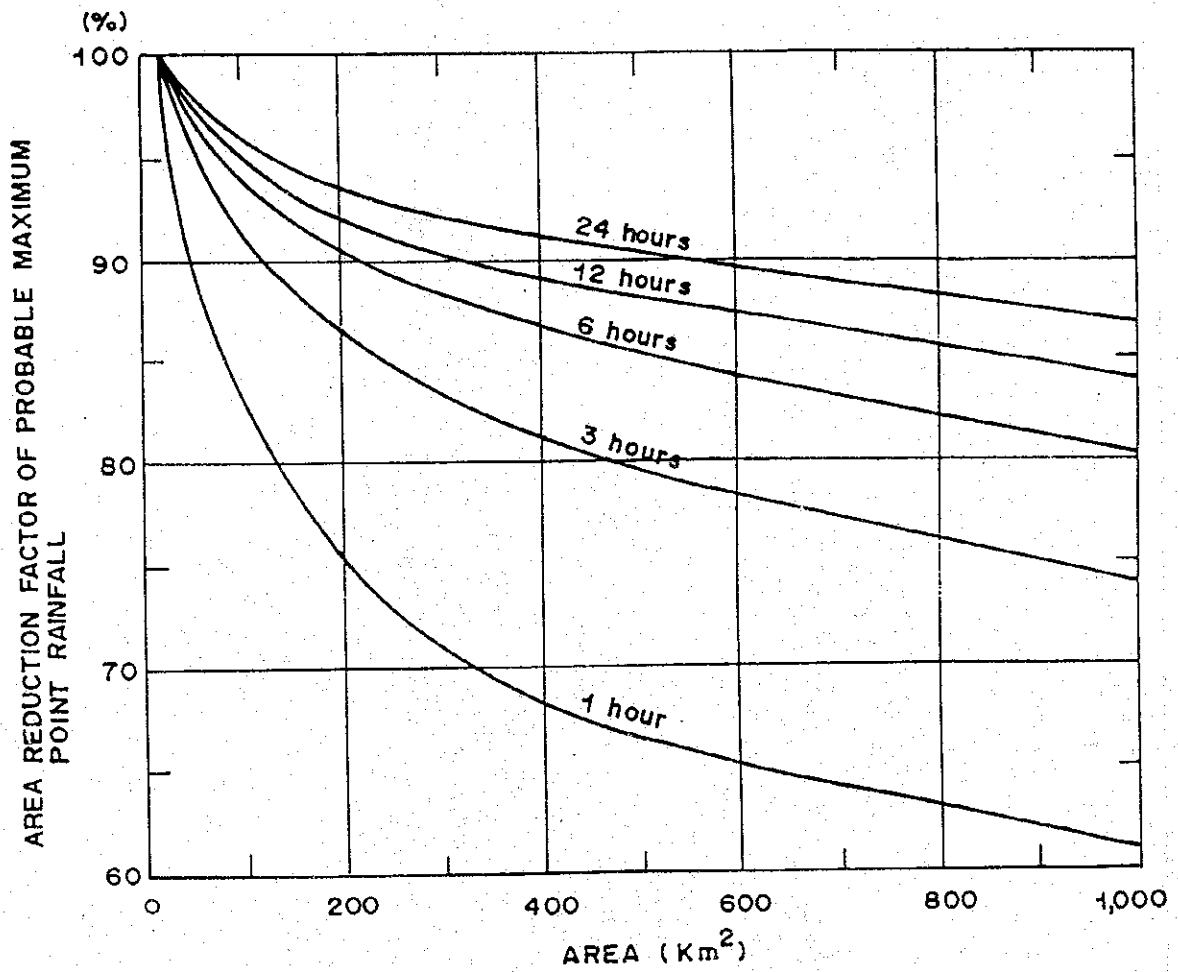




LEGEND
 ● : RAINFALL STATION
 - - - : SUB BASIN BORDER

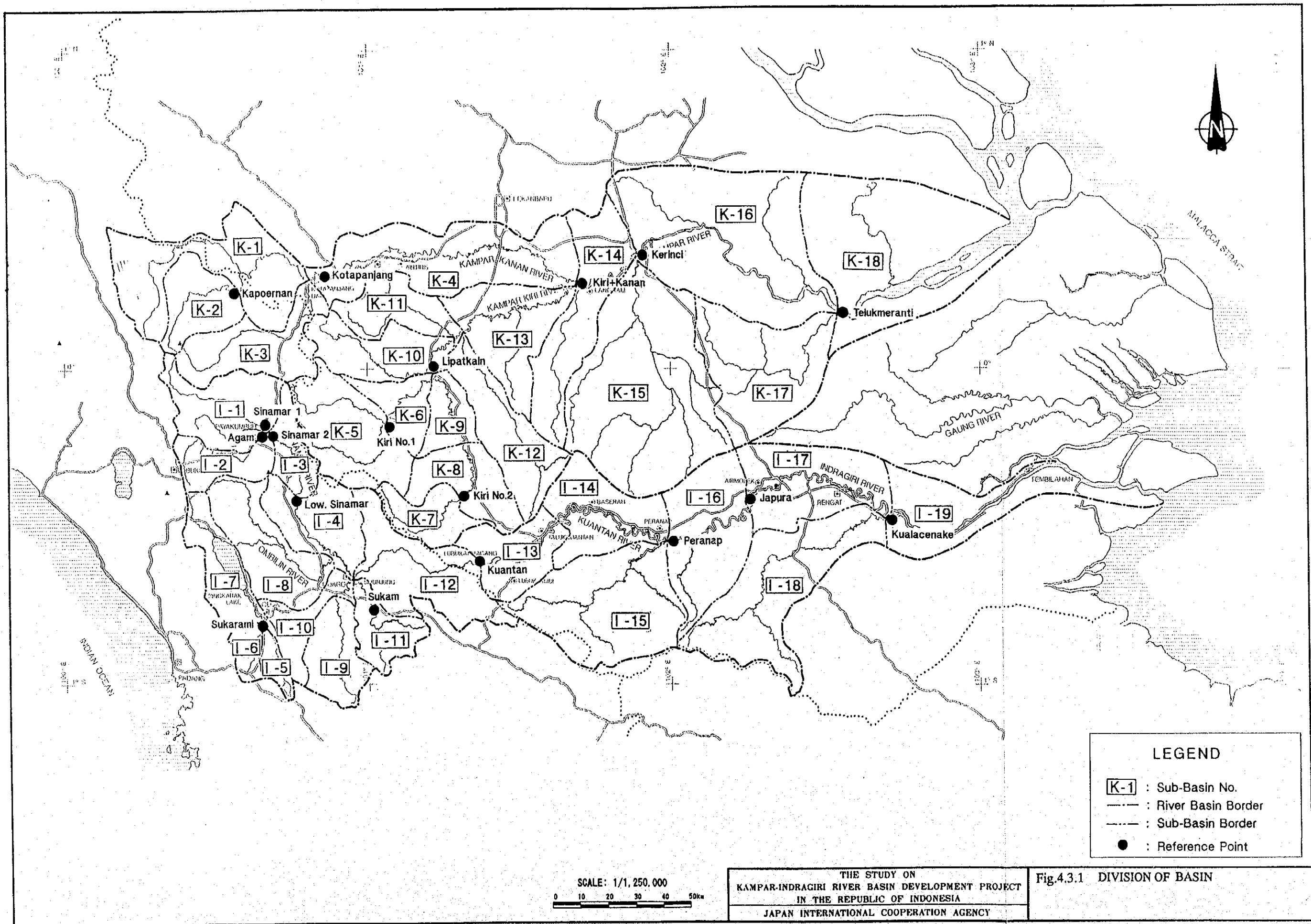
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Fig.4.2.1 THIESSEN POLYGON FOR
 KAMPAR AND INDRAGIRI
 RIVER BASINS



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Fig.4.2.2 AREA REDUCTION FACTOR FOR DESIGN RAINFALL



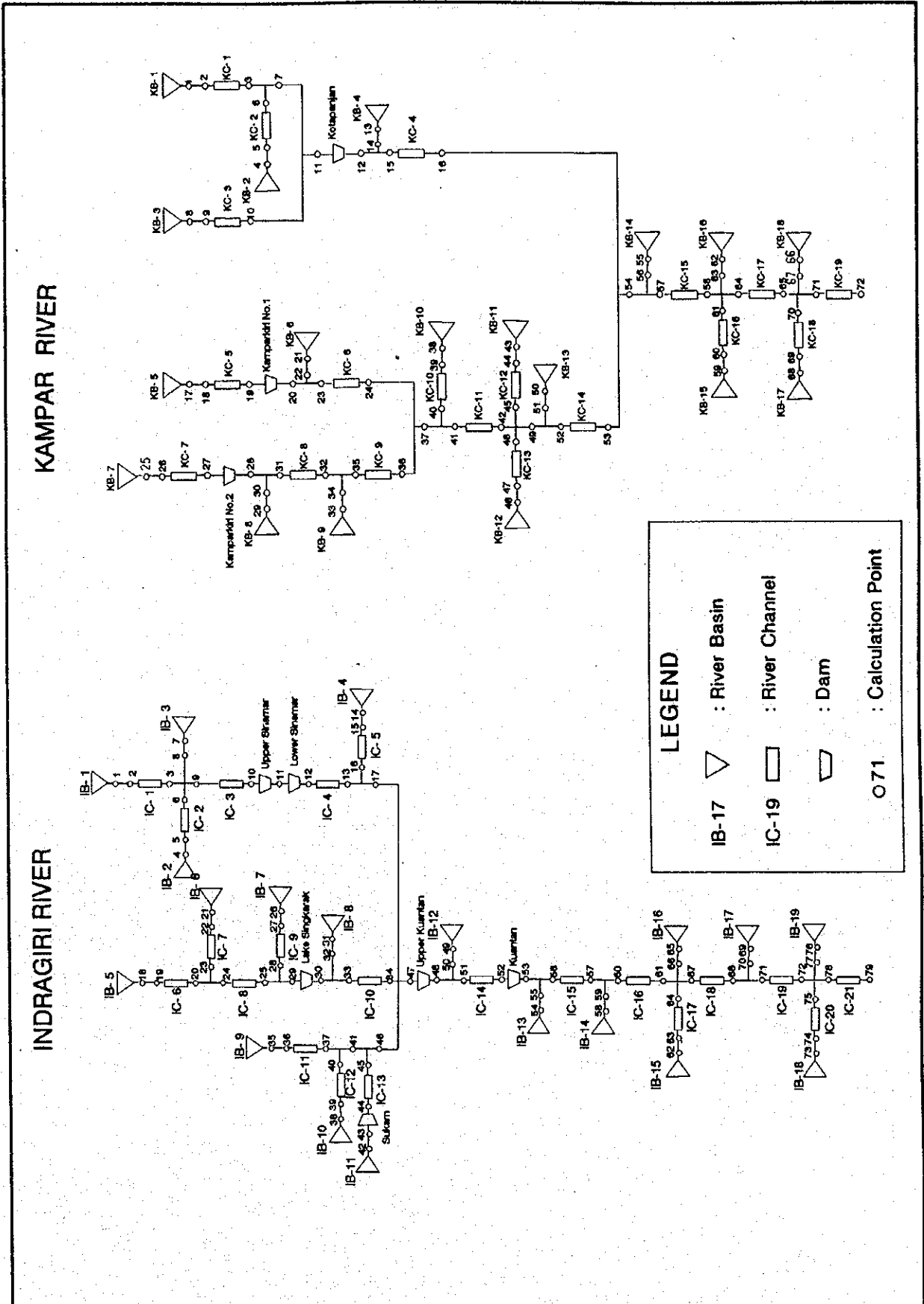
LEGEND

- K-1 : Sub-Basin No.
- : River Basin Border
- - - : Sub-Basin Border
- : Reference Point

SCALE: 1/1,250,000
 0 10 20 30 40 50km

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Fig.4.3.1 DIVISION OF BASIN



KAMPAR RIVER

INDRAGIRI RIVER

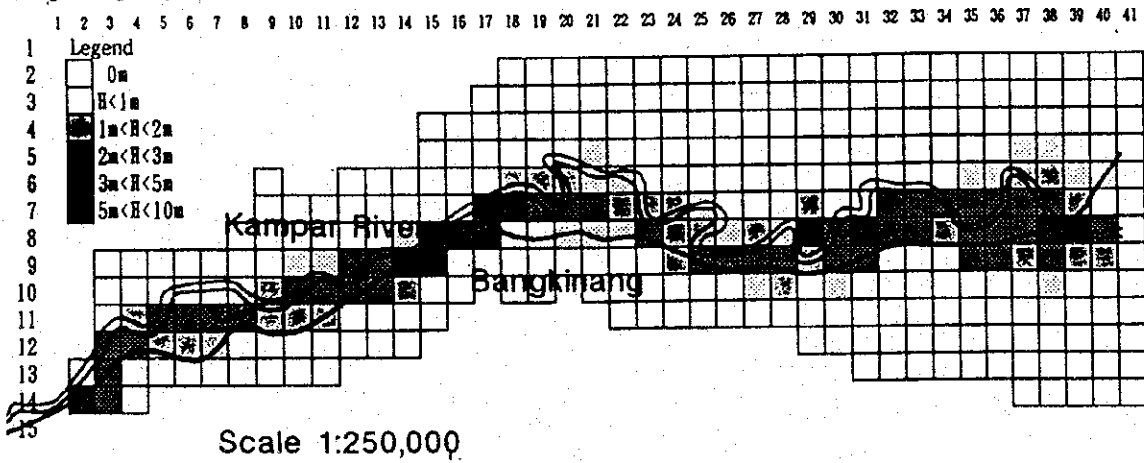
LEGEND

- IB-17 : River Basin
- IC-19 : River Channel
- : Dam
- 71 : Calculation Point

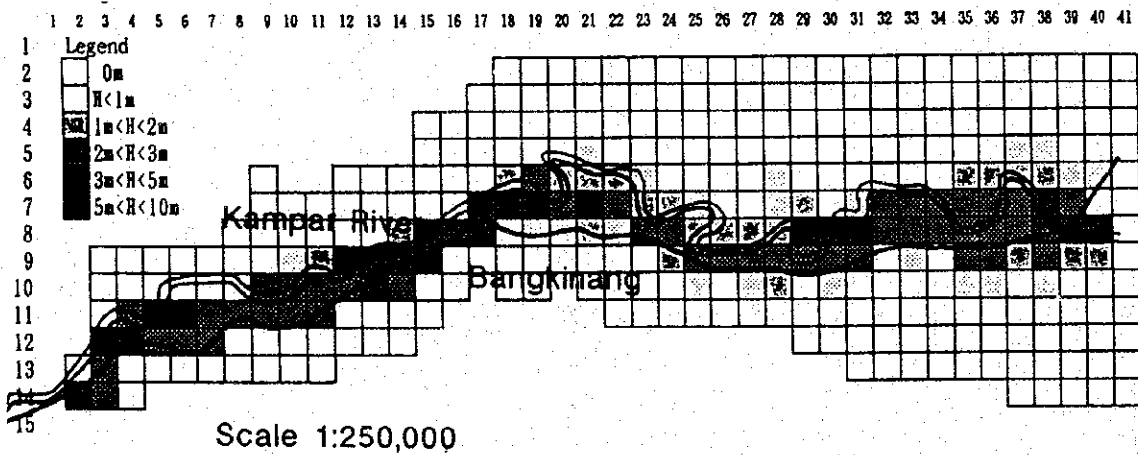
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Fig.4.3.2 MODEL FOR FLOOD RUNOFF SIMULATION

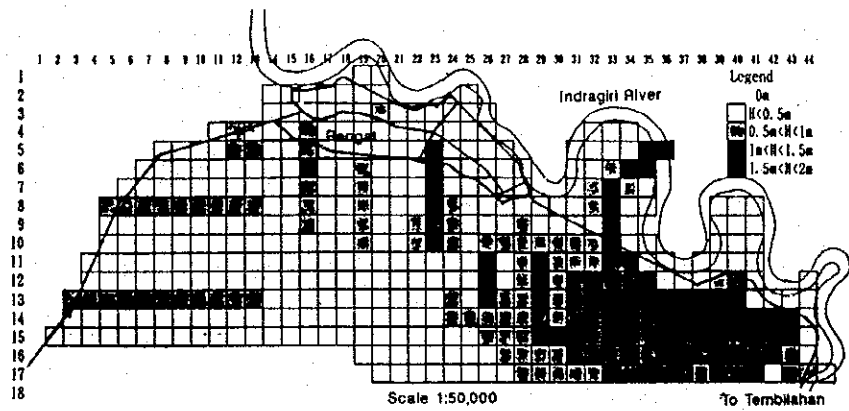
Bangkinang (2-year Return Period)



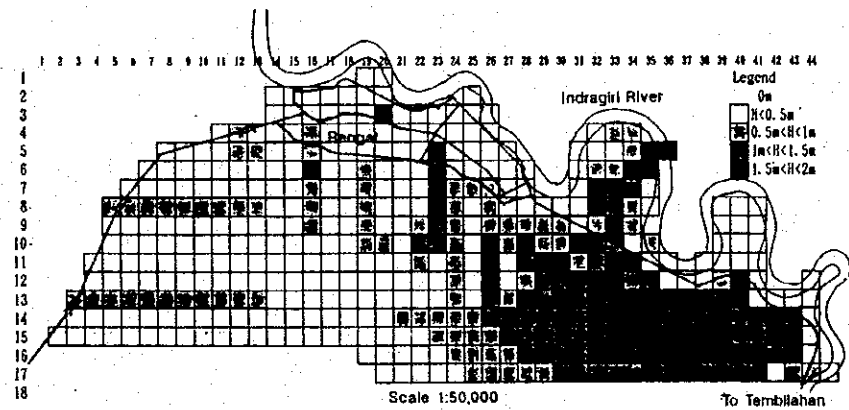
Bangkinang (5-year Return Period)



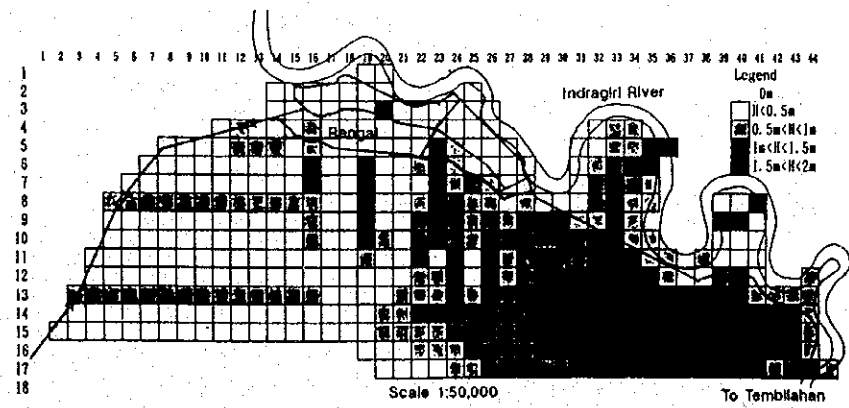
Rengat (2-year Return Period)

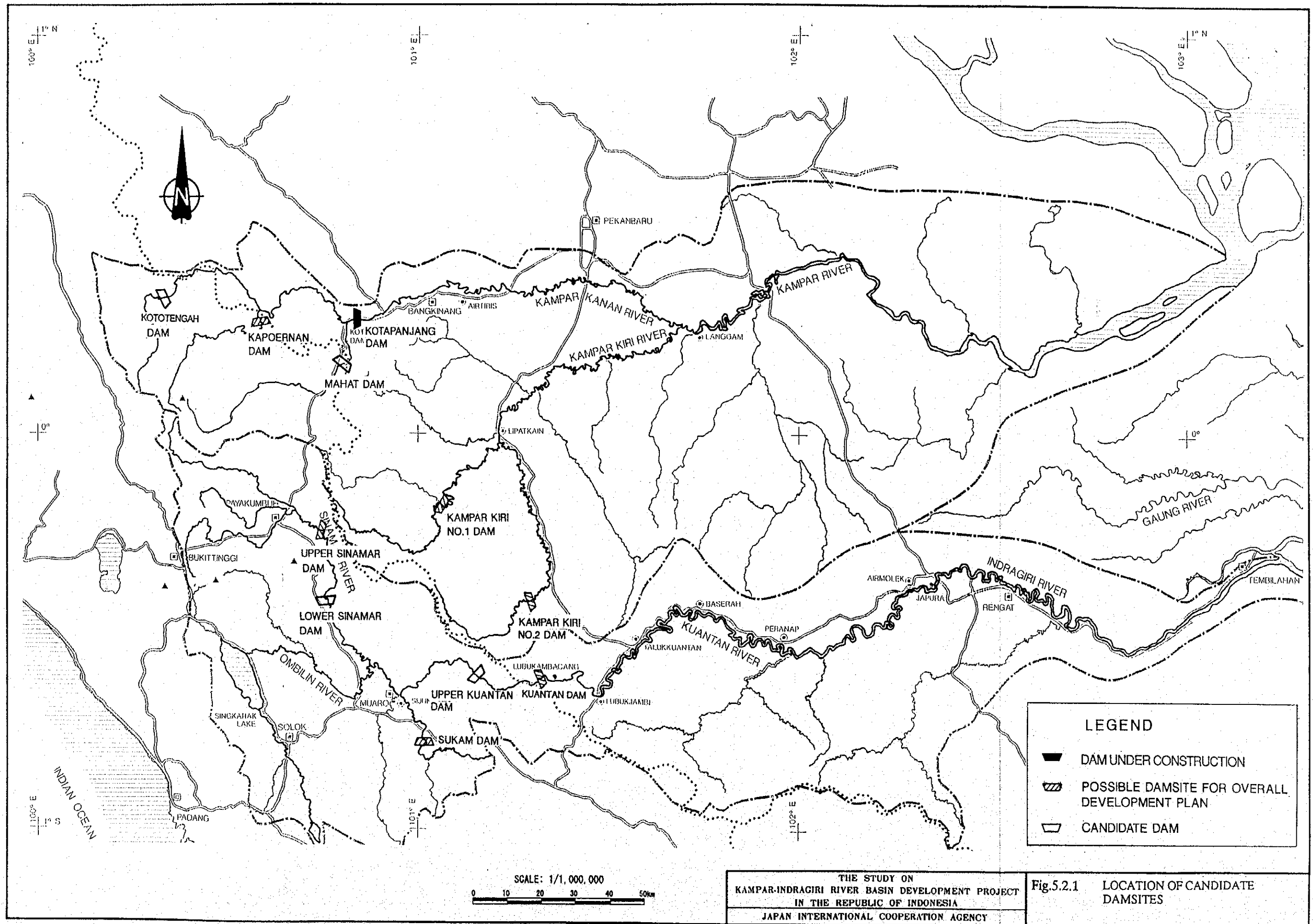


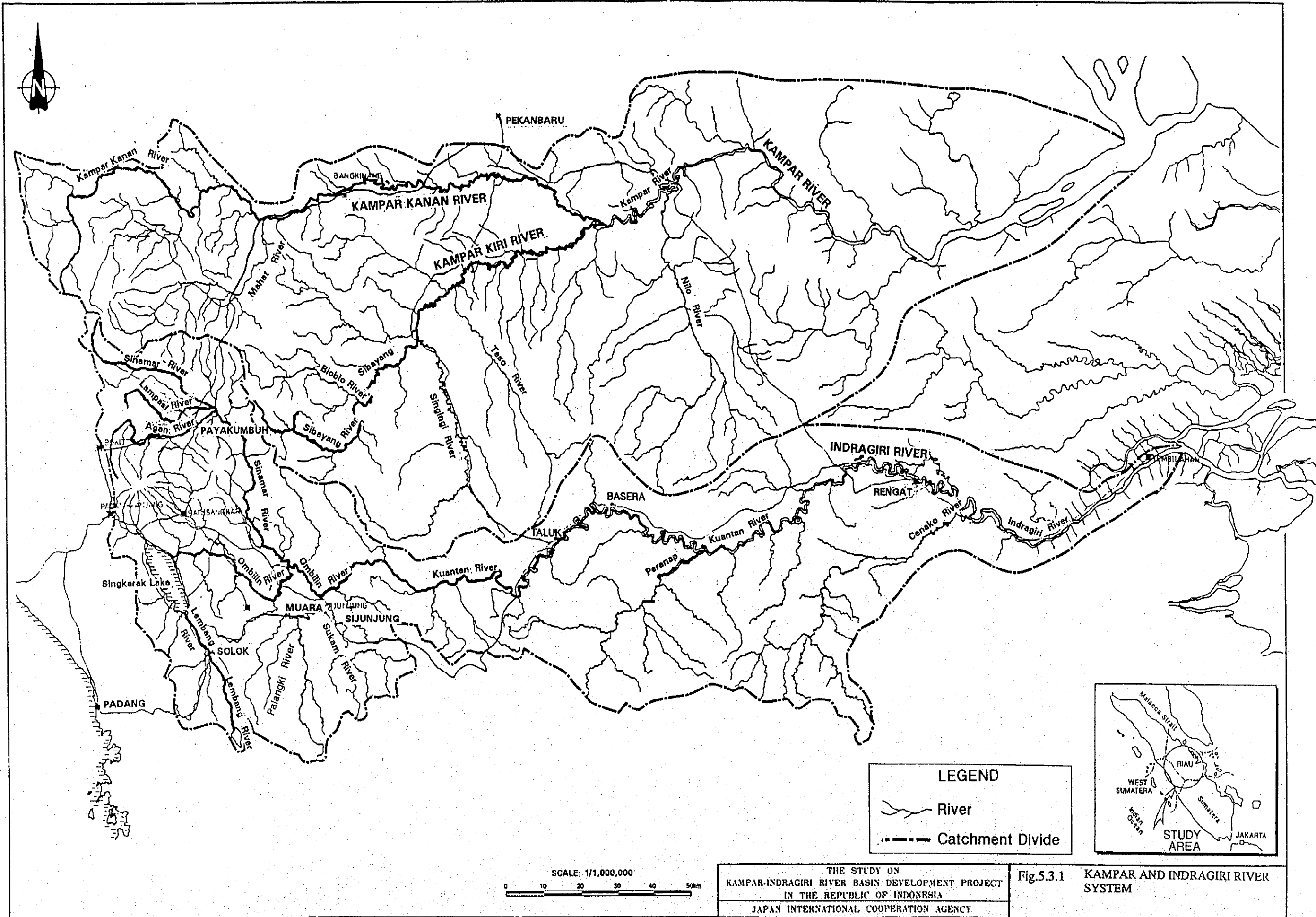
Rengat (5-year Return Period)

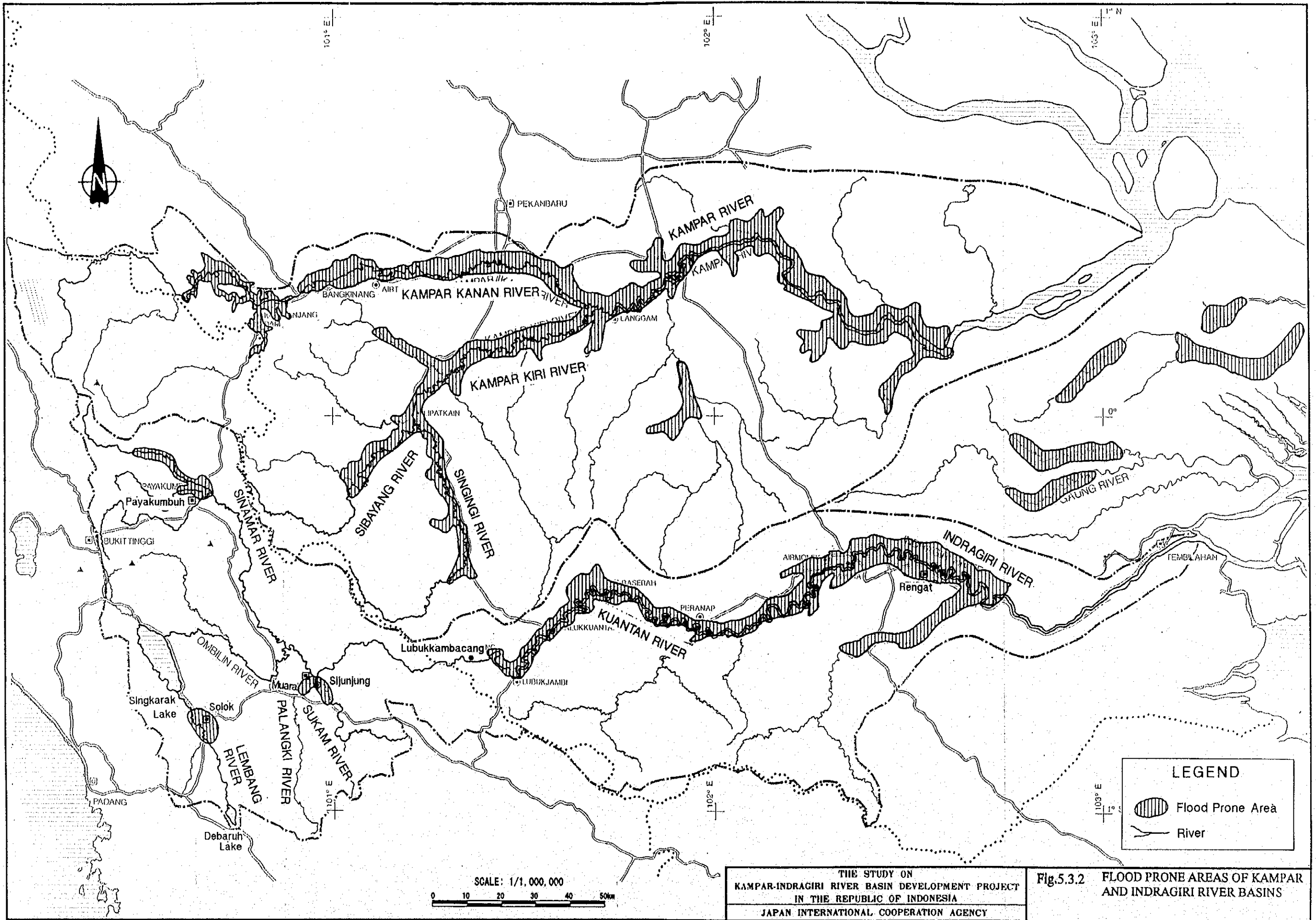


Rengat (10-year Return Period)









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Fig.5.3.2 FLOOD PRONE AREAS OF KAMPAR AND INDRAGIRI RIVER BASINS