

Table VIII.3.8 (1/2) DOMESTIC WATER SUPPLY LEVEL IN STUDY AREA AT THE END OF PELITA V (1988/89 - 1993/94)

Water Supply Company	Operation Year	Population		Capacity		Operation Hour (Hours)	Quantity		Loss (%)	Nos. of Connection (Unit)	Unit Consumption (Uc/day)	Ave. Price in 1993 (Rp./m ³)
		Planned Population (Person)	Service Population (Person)	Service Ratio (%)	Installed Capacity (Us)		Production (m ³ /year)	Sold (m ³ /year)				
1. PDAM Kab. Indragiri												
Hulu												
1 Rengat	1978	34,435	15,631	45	40.0	24	851,280	844,320	43.6	2,233	62	450
2 Talak Kuantan	1981	12,080	2,604	22	10.0	9	114,768	113,604	54.0	372	57	450
3 Air Molek	1981	14,128	4,158	29	20.0	11	281,472	275,424	52.0	594	46	450
4 PMT. Reba + PK Hernan	1993	12,704	1,050	8	12.5	3	19,710	7,665	55.0	150	23	450
5 Peranap	1993	5,049	560	11	2.5	6	19,710	4,088	54.9	80	43	450
6 Lubuk Jambi	1993	4,002	560	14	2.5	6	19,710	4,088	54.9	80	43	450
7 Baserah	1981	1,954	1,106	57	2.5	8	32,838	29,538	42.2	158	38	450
8 Cereni	1981	2,540	2,107	83	5.0	10	65,676	59,076	42.2	301	49	450
9 Batu Benai	1991	785	175	22	2.5	6	114,768	113,604	54.0	25	142	450
10 Rijal	1993	2,234	525	24	1.0	6	7,884	3,833	54.9	75	19	450
Total		89,911	28,476	32	98.5	61.0	1,527,816	1,455,240	49.5	4,068	54	
2. PDAM Kab. Indragiri Hilir												
1 Tembahan	1983	103,238	16,170	16	40.0	24	595,044	588,936	47.8	2,310	56	805
2 Sungai Guntung	1993	26,864	2,359	9	5.0	12	78,840	17,221	55.0	337	41	805
3 Sungai Salak	1993	15,188	700	5	2.5	6	19,710	5,110	54.9	100	35	805
4 Ijal	1983	6,188	700	11	2.5	6	19,710	4,088	54.9	100	35	805
Total		151,478	19,929	13	50.0	30.0	713,304	615,355	55.3	2,847	36	
3. PDAM Kab. Kampar												
1 Bankinang	1983	19,843	6,069	31	20.0	16	420,480	320,760	52.9	867	89	300
2 Pasir Pengaraian	1990	10,293	924	9	2.5	8	26,280	24,180	16.4	132	65	300
3 Ujung Batu	1990	13,343	1,435	11	5.0	12	78,840	66,960	42.5	205	87	300
4 Sorek Satu	1993	3,940	350	9	1.0	6	7,884	2,555	67.9	50	20	300
5 Air Tiris	1983	5,404	1,435	27	5.0	12	78,840	60,096	70.5	205	44	300
6 Lipat Kain	1983	4,638	1,435	31	5.0	12	61,296	60,096	70.5	205	44	300
7 Teratak Buluh	1993	4,349	560	13	10.0	4	26,280	4,088	54.9	80	58	300
8 Tandun	1993	3,326	350	11	2.5	6	19,710	2,555	67.9	50	50	300
9 Langgam	1993	3,343	350	10	1.0	6	7,884	2,555	67.9	50	20	300
10 Dalu - Dalu	1993	11,026	350	3	1.0	6	7,884	2,555	67.9	50	20	300
11 Kuok	1983	14,011	1,708	12	5.0	12	78,840	61,080	58.7	244	52	300
12 Sungai Pagar	1988	3,326	350	11	2.5	6	19,710	2,555	67.9	50	50	300
13 Kampar	1983	3,782	350	9	2.5	6	19,710	2,555	67.9	50	50	300
Total		100,624	15,666	16	63.0	58.0	853,638	635,590	67.6	2,238	54	
4. PDAM Kodya, Pekanbaru												
Total	1976	385,000	116,376	30	280.0	24	6,937,920	6,006,310	45.9	12,006	77	722

Source: Proyek Peningkatan Sarana Air Bersih (PSAB), Propinsi Riau
Perusahaan Daerah Air Minum (PDAM), Kotamadya Pekanbaru

Table VIII.3.8 (2/2) DOMESTIC WATER SUPPLY LEVEL IN STUDY AREA AT THE END OF PELITA V (1988/89 - 1993/94)

Water Supply Company	Operation Year	Population			Capacity		Operation Hour (Hours)	Quantity			Loss (%)	Nos. of Connection (Unit)	Unit Consumption (l/c/day)	Ave. Price in 1993 (Rp./m ³)
		Planned Population (Person)	Service Population (Person)	Service Ratio (%)	Installed Capacity (l/s)	Production (l/s)		Production (m ³ /year)	Distribution (m ³ /year)	Sold (m ³ /year)				
1 PDAM Kab. Solok	1980	80,305	35,124	43.7	77.5	65.0	24	2,232,613	1,246,554	1,246,554	44.17	3,782	110	160
2 PDAM Kab. Sw/Sijunjung	1982	(274,489)	13,323	(4.9)	50.0	50.0	24	556,465	474,204	345,074	27.23	2,000	56	125
3 PDAM Kab. Tanah Datar	1981	(360,779)	27,616	(7.7)	100.0	100.0	24	1,542,050	1,233,158	1,233,158	20.03	5,499	93	150
4 PDAM Kab. Agam	1982	73,301	35,790	48.8	96.0	55.0	24	1,579,724	1,578,159	777,009	49.20	5,612	121	-
5 PDAM Kab. Limapuluh Kota	1980	(307,611)	12,062	(3.9)	60.0	47.5	24	413,025	368,729	330,420	15.00	1,693	51	125
6 PDAM Kodya Solok	1982	42,580	27,002	63.4	120.0	120.0	24	1,657,321	791,400	791,400	52.25	4,643	50	125
7 PDAM Kodya Sawahlunto	1980	15,923	13,298	83.5	85.0	40.0	24	786,714	678,858	375,071	44.75	1,973	115	125
8 PDAM Kodya Padangpanjang	1979	28,723	25,627	89.2	65.0	85.0	24	1,638,595	1,523,339	1,049,115	31.13	3,361	183	150
9 PDAM Kodya Bukittingi	1975	70,247	48,021	68.4	160.0	60.0	24	4,586,047	3,095,453	3,095,453	32.65	7,880	125	165
10 PDAM Kodya Payakumbuh	1980	82,624	38,585	46.7	80.0	82.5	24	2,102,670	1,417,889	1,417,889	32.56	4,476	112	150
Total		393,703	276,448	56.8	893.5	705.0	24	17,095,224	12,407,743	10,661,143	62.36	40,919	102	142

Sourc Proyek Peningkatan Sarana Air Bersih (PSAB), Propinsi Sumatera Barat
 Pemsahaan Daerah Air Minum (PDAM), Propinsi Sumatera Barat

Note Figures in parentheses are populations of regencies of which planned populations are not known.

Table VIII.3.9 (1/3) HISTORICAL WATER SOLD BY WATER SUPPLY COMPANY

(1) Riau Province

Unit : m³/year

Water Supply Company	1989	1990	1991	1992	1993	1994	Growth Rate (%)
1. PDAM Kodya. Pekanbaru							
1) Household	2,330,000	2,206,626	2,256,480	2,273,086	2,100,800	1,828,715	-3.8
2) Government Office	-	449,806	388,810	442,590	400,752	332,344	-5.6
3) Corporation	942,000	602,386	632,115	699,671	759,369	647,040	-3.0
4) Social and Hospital	359,000	177,552	200,561	154,736	166,889	194,445	-9.5
5) Others	94,170	-	-	-	-	-	-
Total	3,725,170	3,436,370	3,477,966	3,570,083	3,427,810	3,002,544	-3.0
2. PDAM Kab. Kampar							
1) Household	10,718	29,134	50,696	83,525	105,884	187,339	70.5
2) Government Office	-	-	-	-	-	-	-
3) Corporation	-	-	-	4,880	5,431	9,648	40.6
4) Social and Hospital	-	-	-	893	1,355	3,499	97.9
5) Others	-	-	-	1,486	1,670	4,731	78.4
Total	10,718	29,134	50,696	90,784	114,340	205,217	74.3
3. PDAM Kab. Indragiri Hulu							
1) Household	184,391	279,000	280,000	300,023	289,466	-	10.2
2) Government Office	4,320	3,960	3,600	-	-	-	-8.7
3) Corporation	54,720	48,300	50,400	41,114	46,766	-	-4.6
4) Social and Hospital	2,400	3,600	7,000	-	-	-	70.8
5) Others	4,440	8,700	8,200	1,649	458	-	-46.2
Total	250,271	343,560	349,200	342,786	336,690	0	6.1
4. PDAM Kab. Indragiri Hilir							
1) Household	199,269	220,297	262,154	300,045	289,350	320,244	10.0
2) Government Office	-	-	-	-	-	-	-
3) Corporation	29,368	31,784	39,849	42,069	46,812	47,816	11.0
4) Social and Hospital	-	-	-	-	-	613	-
5) Others	444	456	690	955	516	944	13.6
Total	229,081	252,537	302,693	343,069	336,678	369,617	10.1

Source : Persahaan Daerah Air Minum (PDAM), Propinsi Riau

Table VIII.3.9 (2/3) HISTORICAL WATER SOLD BY WATER SUPPLY COMPANY

(2) West Sumatra Province (1/2)

Unit : m³/year

Water Supply Company	1989	1990	1991	1992	1993	1994	Growth Rate (%)
1. PDAM Kab. Solok							
1) Household	404,538	474,888	502,011	539,044	627,029	744,832	12.0
2) Government Office	-	-	-	-	-	-	-
3) Corporation	5,314	4,789	5,688	5,181	4,583	14,814	15.0
4) Social and Hospital	8,502	9,830	12,844	15,064	14,209	27,534	22.6
5) Others	6,443	11,970	15,141	10,526	17,532	5,065	-1.2
Total	424,797	501,477	535,684	569,815	663,353	792,245	12.2
2. PDAM Kab. Sawahlunto /Sijunjung							
1) Household	384,198	418,482	420,023	446,583	446,211	399,587	1.3
2) Government Office	-	-	-	-	-	-	-
3) Corporation	3,157	3,439	3,452	3,670	3,677	3,284	1.3
4) Social and Hospital	6,766	7,397	7,397	7,865	7,859	7,038	1.3
5) Others	15,994	17,422	17,485	18,591	18,576	16,635	1.3
Total	410,115	446,740	448,357	476,709	476,323	426,544	1.3
3. PDAM Kab. Tanah Datar							
1) Household	466,513	845,084	657,882	861,953	955,072	1,020,986	13.9
2) Government Office	-	-	28,956	42,149	42,220	46,452	15.3
3) Corporation	30,956	52,680	41,698	54,244	57,625	57,939	11.0
4) Social and Hospital	58,978	39,730	20,568	60,023	78,321	99,427	17.7
5) Others	-	4,704	7,224	8,142	9,630	8,365	15.5
Total	556,447	942,198	756,328	1,026,511	1,142,868	1,233,169	14.9
4. PDAM Kab. Agam							
1) Household	303,326	407,855	438,213	596,606	636,467	703,906	18.2
2) Government Office	-	-	-	-	-	-	-
3) Corporation	3,780	2,688	5,952	6,003	6,587	13,436	29.5
4) Social and Hospital	14,484	17,356	22,044	25,618	28,417	42,611	22.2
5) Others	3,604	4,554	5,606	6,622	7,536	16,955	34.0
Total	325,194	432,453	471,815	634,849	679,007	776,908	18.7
5. PDAM Kab. Limapuluh Kota							
1) Household	-	-	67,729	148,816	204,965	284,418	58.8
2) Government Office	-	-	-	-	-	-	-
3) Corporation	-	-	-	-	-	-	-
4) Social and Hospital	-	-	1,476	5,531	8,368	22,395	135.7
5) Others	-	-	1,148	2,664	10,292	23,607	183.5
Total	0	0	70,353	157,011	223,625	330,420	64.8
6. PDAM Kodya Solok							
1) Household	796,772	745,825	859,881	936,779	942,978	1,001,580	5.7
2) Government Office	60,912	57,017	65,808	71,694	72,270	76,730	5.7
3) Corporation	62,876	58,855	68,876	75,037	75,639	81,792	6.3
4) Social and Hospital	61,893	57,936	66,869	72,850	73,435	78,444	5.8
5) Others	-	-	-	-	2,325	5,091	-
Total	982,453	919,633	1,061,434	1,156,360	1,166,647	1,243,637	5.8

Source : Perusahaan Daerah Air Minum (PDAM), Propinsi Sumatera Barat

Table VIII.3.9 (3/3) HISTORICAL WATER SOLD BY WATER SUPPLY COMPANY

(3) West Sumatra Province (2/2)

Unit : m³/year

Water Supply Company	1989	1990	1991	1992	1993	1994	Growth Rate (%)
7. PDAM Kodya Sawahlunto							
1) Household	120,450	110,958	132,015	134,215	130,884	144,221	4.1
2) Government Office	6,058	4,587	6,124	6,977	11,120	18,682	27.2
3) Corporation	4,058	2,834	4,178	3,452	1,662	2,735	-10.2
4) Social and Hospital	2,567	3,001	3,574	4,653	4,779	10,932	29.0
5) Others	-	-	-	-	-	-	-
Total	133,133	121,380	145,891	149,297	148,445	176,570	6.0
8. PDAM Kodya Padang Panjang							
1) Household	632,846	572,369	626,146	740,628	763,215	789,070	6.3
2) Government Office	-	-	-	-	-	-	-
3) Corporation	80,906	74,465	74,590	79,535	78,071	84,154	1.2
4) Social and Hospital	20,449	455,926	97,548	141,960	147,651	167,154	23.9
5) Others	-	-	-	-	-	-	-
Total	734,201	1,102,760	798,284	962,123	988,937	1,040,378	4.7
9. PDAM Kodya Bukittinggi							
1) Household	1,320,929	1,381,564	1,449,639	1,668,140	1,826,167	1,967,089	8.9
2) Government Office	144,636	191,978	133,582	158,549	172,232	168,364	1.7
3) Corporation	233,461	271,291	257,020	265,335	286,881	332,178	5.8
4) Social and Hospital	177,451	208,610	327,613	209,530	299,877	339,864	11.8
5) Others	586,169	487,173	552,280	617,790	706,952	681,091	5.8
Total	2,462,646	2,540,616	2,720,134	2,919,344	3,292,109	3,488,586	7.7
10. PDAM Kodya Payakumbuh							
1) Household	967,821	1,014,181	1,054,527	1,145,650	1,182,009	1,196,588	4.7
2) Government Office	-	-	-	-	-	-	-
3) Corporation	76,967	67,020	67,578	78,820	79,981	116,670	8.2
4) Social and Hospital	52,583	65,288	57,002	63,160	71,121	106,724	11.8
5) Others	2098	1,994	1,260	10,242	22,457	11,387	66.4
Total	1,099,469	1,148,483	1,180,367	1,297,872	1,355,568	1,431,369	5.6

Source : Perusahaan Daerah Air Minum (PDAM), Propinsi Sumatera Barat

Table VIII.3.10 GUIDELINES FOR WATER SUPPLY PLANNING

Use Item	Description	Population Category (person)						
		>1,000,000	500,000-1,000,000	100,000-500,000	20,000-100,000	10,000-20,000	3,000-10,000 *1	3,000> *2
Domestic	1. Unit Consumption, House Connection (l/sec/day)	190	170	150	130	100	90	-
	2. Public Hydrant Consumption (l/person/day)	30	30	30	30	30	30	30
	3. Unit Consumption, Non-Domestic Use (l/person/day)	60	40	30	20	10	10	-
	4. Loss (l/person/day), Ratio (%)	20-25 50	20-25 45	20-25 40	20-25 30	10-20 24	10	-
	5. Factor for Daily Max.	20-30	20-30	20-30	20-30	20	20	20
	6. Factor for Hourly Max.	1.1	1.1	1.1	1.1	1.1	1.1	1
	7. Person per House Connection (l/person/day)	1.5	1.5	1.5	1.5	1.5	1.4	1
	8. Person per Hydrant Unit (l/person/day)	5	5	5	5	6	10	-
	9. Water Pressure (m)	300	300	300	300	100-200	100	100
	10. Operation Hour	10	10	10	10	10	10	10
	11. Reservoir Volume for Hourly Peak Demand (%)	24	24	24	24	24	24	24
	12. House Connection : Hydrant (Max.)	20	20	20	20	20	Depend on **	24
Non Domestic		80 : 20	80 : 20	80 : 20	70 : 20	70 : 20	80 : 20	100 ***

Source : Cipta Karya Pusat, 1993

** Capacity of System

*1 Piping System : IKK Completed
 *2 Simple Piping System

1. Consumption of Tourism Area : 0.1 - 0.3 l/s/ha

2. Consumption of Industrial Area : 0.2 - 0.8 l/s/ha

*** 100% served for Public Hydrant

2.50 l/s : 20 m³

5.00 l/s : 40 m³

10.00 l/s : 80 m³

Table VIII.3.11 (U/2) PROJECTED DOMESTIC WATER SUPPLY IN STUDY AREA AT THE END OF REPELITA VI (1994/95 - 1998/99)

Water Supply Company	Operation Year	Population		Service Ratio (%)	Capacity		Operation Hour (Hours)	Production (m ³ /yr)	Quantity		Loss (%)	Nos. of Connection (Unit)	Unit Consumption (l/c/day)
		Planned Population (Person)	Service Population (Person)		Installed Capacity (l/s)	Production (l/s)			Distribution (m ³ /yr)	Sold (m ³ /yr)			
1. PDAM Kab. Indragiri													
Hulu	1978	43,740	34,992	80	54	54	24	1,702,944	1,277,208	1,213,348	25	4,999	100
1 Rengat	1981	13,014	10,411	80	16	16	24	506,678	380,009	361,008	25	1,487	100
2 Taluk Kuantan	1981	16,458	13,166	80	20	20	24	640,765	480,574	456,545	25	1,881	100
3 Air Molek	1993	13,619	10,895	80	13	13	24	530,233	397,675	377,791	25	1,556	100
4 PMT. Reba + PK Heran	1993	5,740	4,592	80	7	7	24	223,477	167,608	159,228	25	656	100
5 Peranap	1993	4,354	3,483	80	5	5	24	169,516	127,137	120,780	25	498	100
6 Lubuk Jambi	1993	2,132	1,706	80	8	8	24	83,006	62,254	59,142	25	400	100
7 Basarab	1981	2,469	1,975	80	8	8	24	96,126	72,095	68,490	25	564	100
8 Cereni	1991	1,301	1,041	80	3	3	24	50,652	37,989	36,090	25	149	100
9 Batu Benai	1991	2,540	2,032	80	3	3	24	98,891	74,168	70,460	25	290	100
10 Rial	1993	105,367	84,294	80	137	137	24	4,102,289	3,076,716	2,922,881	25	12,480	100
2. PDAM Kab. Indragiri													
Hilir	1983	175,535	140,428	80	217	217	24	6,834,163	5,125,622	4,869,341	25	20,061	100
1 Tambahan	1993	28,235	22,588	80	35	35	24	1,099,283	824,462	783,239	25	3,227	100
2 Sungai Gunung	1993	27,983	22,386	80	35	35	24	1,089,471	817,104	776,248	25	3,198	100
3 Sungai Salak	1993	7,755	6,204	80	10	10	24	301,928	226,446	215,124	25	886	100
4 Igal	1993	239,508	191,606	80	297	297	24	9,324,845	6,993,634	6,643,952	29	27,372	100
3. PDAM Kab. Kampar													
1 Bankinang	1983	23,340	18,672	80	29	29	24	908,704	681,528	647,452	25	2,667	100
2 Pasir Pengaraian	1990	13,388	10,710	80	29	29	24	521,239	390,930	371,383	25	1,530	100
3 Ujung Batu	1990	25,132	20,106	80	31	31	24	978,473	733,854	697,162	25	2,872	100
4 Sorek Satu	1993	6,913	5,530	80	9	9	24	289,146	201,860	191,767	25	790	100
5 Air Tiris	1983	5,110	4,088	80	6	6	24	198,949	149,212	141,751	25	584	100
6 Lipat Kain	1983	5,223	4,178	80	6	6	24	203,349	152,512	144,886	25	584	100
7 Teratak Buiuh	1993	4,662	3,730	80	10	10	24	181,507	136,130	129,324	25	533	100
8 Tandun	1993	4,556	3,645	80	6	6	24	177,380	133,035	126,383	25	521	100
9 Langgam	1993	4,453	3,562	80	5	5	24	173,370	130,028	123,526	25	509	100
10 Dalu - Dalu	1993	19,175	15,340	80	24	24	24	746,547	559,910	531,915	25	2,191	100
11 Kuok	1983	15,622	12,498	80	19	19	24	608,217	456,162	433,354	25	1,785	100
12 Sungai Pagar	1988	4,556	3,645	80	6	6	24	177,380	133,035	126,383	25	521	100
13 Kampar	1983	4,556	3,645	80	6	6	24	177,380	133,035	126,383	25	521	100
Total		136,686	109,349	80	186	186	24	5,321,642	3,991,231	3,791,670	25	15,608	100
4. PDAM Kodya. Pekanbaru													
Total	1976	429,400	300,600	70	589	589	24	15,248,000	12,198,000	12,198,000	20	29,850	108

Source : Proyek Peningkatan Sarana Air Bersih (PSAB), Propinsi Riau
Perusahaan Daerah Air Minum (PDAM), Kotamadya Pekanbaru

Table VIII.3.11 (2/2) PROJECTED DOMESTIC WATER SUPPLY IN STUDY AREA AT THE END OF REPELITA VI (1994/95 - 1998/99)

(2) West Sumatra Province

Water Supply Company	Operation Year	Population		Service Ratio (%)		Capacity		Operation Hour (Hours)	Quantity			Loss (%)	Nos. of Connection (Unit)	Unit Consumption (l/c/day)
		Planned Population (Person)	Service Population (Person)	Service Ratio (%)	Installed Capacity (l/s)	Production (l/s)	Production (m ³ /year)		Distribution (m ³ /year)	Sold (m ³ /year)				
1 PDAM Kab. Solok	1980	95,815	62,688	65.4	122.5	110.0	24	2,163,389	1,622,542	1,622,542	25	5,293	130	
2 PDAM Kab. Swi/Sijunjung	1982	(301,917)	37,823	(12.5)	80.0	80.0	24	1,537,210	1,229,768	1,229,768	20	5,500	90	
3 PDAM Kab. Tanah Datar	1981	(396,829)	62,615	(15.8)	140.0	140.0	24	3,968,600	3,174,880	3,174,880	20	10,499	120	
4 PDAM Kab. Agam	1982	96,211	55,284	57.5	122.5	122.5	24	3,784,320	2,649,024	2,649,024	30	9,091	130	
5 PDAM Kab. Limapuluh Kota	1980	(337,991)	29,582	(8.8)	80.0	62.5	24	1,188,716	950,973	950,973	20	4,193	90	
6 PDAM Kodya Solok	1982	46,451	37,502	80.7	150.0	160.0	24	2,733,791	1,913,654	1,913,654	30	9,643	90	
7 PDAM Kodya Sawahlunto	1980	15,923	14,298	89.8	100.0	60.0	24	1,493,300	1,045,310	1,045,310	30	3,473	130	
8 PDAM Kodya Padangpanjang	1979	31,923	31,923	100.0	80.0	80.0	24	1,724,058	1,293,044	1,293,044	25	4,561	120	
9 PDAM Kodya Bukittinggi	1975	71,805	63,087	87.9	200.0	200.0	24	4,357,080	3,267,810	3,267,810	25	9,880	140	
10 PDAM Kodya Payakumbu	1980	101,703	60,285	59.3	150.0	145.0	24	3,101,110	2,325,833	2,325,833	25	7,578	130	
Total		459,831	455,087	70.7	1,225.0	1,160.0	24	26,051,574	19,472,836	19,472,836	25	69,711	117	

Source Proyek Peningkatan Sarana Air Bersih (PSAB), Propinsi Sumatera Barat
Perusahaan Daerah Air Minum (PDAM), Propinsi Sumatera Barat

Note : Figures in parentheses are populations of which planned populations are not known.

Table VIII.3.12 (1/3) FUTURE WATER DEMAND BY WATER SUPPLY COMPANY

(1) Riau Province

Water Supply Company	Unit	1994	1999	2004	2009	2014	2019
1. PDAM Kab. Indragiri Hulu							
1) Population in Service Area	1,000 persons	89.9	106.5	125.9	147.3	169.4	193.5
2) Service Population	1,000 persons	28.5	85.2	107.0	132.6	161.0	193.5
3) Service Ratio	%	32.0	80.0	85.0	90.0	95.0	100.0
4) Operation Hour	Hours	3-24	24	24	24	24	24
5) Loss	%	50	25	25	20	20	20
6) Unit Consumption	l/capita/day	54	100	110	120	130	150
7) Water Demand	m ³ /sec	0.05	0.13	0.18	0.23	0.30	0.42
(Production Level)	10 ⁶ m ³ /year	1.1	4.1	5.7	7.3	9.5	13.2
2. PDAM Kab. Indragiri Hilir							
1) Population in Service Area	1,000 persons	151.5	165.8	179.5	193.3	206.8	220.4
2) Service Population	1,000 persons	19.9	132.6	152.6	173.9	196.4	220.4
3) Service Ratio	%	13.0	80.0	85.0	90.0	95.0	100.0
4) Operation Hour	Hours	6 - 24	24	24	24	24	24
5) Loss	%	55	25	25	20	20	20
6) Unit Consumption	l/capita/day	36	100	110	120	130	150
7) Water Demand	m ³ /sec	0.02	0.20	0.26	0.30	0.37	0.48
(Production Level)	10 ⁶ m ³ /year	0.6	6.5	8.2	9.5	11.7	15.1
3. PDAM Kab. Kampar							
1) Population in Service Area	1,000 persons	100.6	115.0	130.9	148.2	166.0	184.4
2) Service Population	1,000 persons	15.7	109.3	111.3	133.4	157.7	184.4
3) Service Ratio	%	16.0	80.0	85.0	90.0	95.0	100.0
4) Operation Hour	Hours	4 - 16	24	24	24	24	24
5) Loss	%	56	25	25	20	20	20
6) Unit Consumption	l/capita/day	54	100	110	120	130	150
7) Water Demand	m ³ /sec	0.03	0.17	0.19	0.23	0.30	0.40
(Production Level)	10 ⁶ m ³ /year	0.7	5.3	6.0	7.3	9.4	12.6
4. PDAM Kodya Pekanbaru							
1) Population in Service Area	1,000 persons	385.0	509.2	673.4	890.6	1,150.2	1,468.0
2) Service Population	1,000 persons	116.4	356.4	538.7	801.5	1,092.7	1,468.0
3) Service Ratio	%	30.0	70.0	80.0	90.0	95.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	46	20	20	20	20	20
6) Unit Consumption	l/capita/day	77	110	120	130	150	170
7) Water Demand	m ³ /sec	0.22	0.57	0.94	1.51	2.37	3.61
(Production Level)	10 ⁶ m ³ /year	6.0	17.9	29.5	47.5	74.8	113.9

Table VIII.3.12 (2/3) FUTURE WATER DEMAND BY WATER SUPPLY COMPANY

(2) West Sumatra Province (1/2)

Water Supply Company	Unit	1994	1999	2004	2009	2014	2019
1. PDAM Kab. Solok							
1) Population in Service Area	1,000 persons	80.3	95.8	103.3	117.9	145.5	173.1
2) Service Population	1,000 persons	35.1	62.7	90.3	117.9	145.5	173.1
3) Service Ratio	%	43.7	65.4	87.5	100.0	100.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	44	25	25	25	20	20
6) Unit Consumption	l/capita/sec	110	130	140	150	150	150
7) Water Demand	m ³ /sec	0.07	0.13	0.20	0.27	0.32	0.38
(Production Level)	10 ⁶ m ³ /year	2.5	4.0	6.2	8.6	10.0	11.8
2. PDAM Kab. Sawahlunto/Sijunjung							
1) Population in Service Area	1,000 persons	(339.9)	(391.3)	(447.1)	(512.0)	(584.6)	(666.8)
2) Service Population	1,000 persons	13.3	37.8	62.3	86.8	111.3	135.8
3) Service Ratio	%	3.9	9.7	13.9	17.0	19.0	20.4
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	27	20	20	20	20	20
6) Unit Consumption	l/capita/sec	56	90	100	110	120	130
7) Water Demand	m ³ /sec	0.02	0.05	0.09	0.14	0.19	0.26
(Production Level)	10 ⁶ m ³ /year	0.4	1.6	2.8	4.4	6.1	8.1
3. PDAM Kab. Tanah Datar							
1) Population in Service Area	1,000 persons	(356.8)	(367.3)	(376.1)	(389.1)	(400.1)	(411.4)
2) Service Population	1,000 persons	27.6	62.6	97.6	132.6	167.6	202.6
3) Service Ratio	%	7.7	17.0	26.0	34.1	41.9	49.2
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	20	20	20	20	20	20
6) Unit Consumption	l/capita/day	93	120	130	140	150	150
7) Water Demand	m ³ /sec	0.05	0.11	0.18	0.27	0.36	0.44
(Production Level)	10 ⁶ m ³ /year	1.2	3.4	5.8	8.5	11.5	13.9
4. PDAM Kab. Agam							
1) Population in Service Area	1,000 persons	73.3	96.2	98.3	101.7	121.6	137.2
2) Service Population	1,000 persons	35.8	55.3	74.8	98.2	121.6	137.2
3) Service Ratio	%	48.8	57.5	76.1	96.5	100.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	49	30	30	25	25	20
6) Unit Consumption	l/capita/day	121	130	130	140	140	150
7) Water Demand	m ³ /sec	0.05	0.12	0.16	0.21	0.26	0.30
(Production Level)	10 ⁶ m ³ /year	3.1	3.7	5.1	6.7	8.3	9.4
5. PDAM Kab. Limapuluh Kota							
1) Population in Service Area	1,000 persons	(312.5)	(327.0)	(339.8)	(360.5)	(378.5)	(397.4)
2) Service Population	1,000 persons	12.1	29.6	47.1	64.6	82.1	99.6
3) Service Ratio	%	3.9	9.1	13.9	17.9	21.7	25.1
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	15	20	20	20	20	20
6) Unit Consumption	l/capita/day	51	90	100	110	120	130
7) Water Demand	m ³ /sec	0.01	0.04	0.07	0.10	0.14	0.19
(Production Level)	10 ⁶ m ³ /year	0.3	1.2	2.1	3.2	4.5	5.9

Table VIII.3.12 (3/3) FUTURE WATER DEMAND BY WATER SUPPLY COMPANY

(3) West Sumatra Province (2/2)

Water Supply Company	Unit	1994	1999	2004	2009	2014	2019
6. PDAM Kodya Solok							
1) Population in Service Area	1,000 persons	42.6	46.5	53.0	62.6	71.9	80.9
2) Service Population	1,000 persons	27.0	37.5	48.0	58.5	69.0	79.5
3) Service Ratio	%	63.4	80.6	90.6	93.4	96.0	98.3
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	52	30	30	25	25	20
6) Unit Consumption	l/capita/day	50	90	100	110	120	130
7) Water Demand	m ³ /sec	0.05	0.06	0.08	0.10	0.13	0.15
(Production Level)	10 ⁶ m ³ /year	1.0	1.8	2.5	3.1	4.0	4.7
7. PDAM Kodya Sawahlunto							
1) Population in Service Area	1,000 persons	15.9	15.9	17.8	18.6	19.3	19.8
2) Service Population	1,000 persons	13.3	14.3	15.3	16.3	17.3	18.3
3) Service Ratio	%	83.6	89.9	85.8	87.6	89.8	92.4
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	45	30	30	25	25	20
6) Unit Consumption	l/capita/day	115	130	140	150	150	150
7) Water Demand	m ³ /sec	0.02	0.03	0.04	0.04	0.04	0.04
(Production Level)	10 ⁶ m ³ /year	1.0	1.0	1.1	1.2	1.3	1.3
8. PDAM Kodya Padang Panjang							
1) Population in Service Area	1,000 persons	28.7	31.9	38.2	44.5	50.8	60.3
2) Service Population	1,000 persons	25.6	31.9	38.2	44.5	50.8	60.3
3) Service Ratio	%	89.2	100.0	100.0	100.0	100.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	31	25	25	20	20	20
6) Unit Consumption	l/capita/day	183	120	130	140	150	150
7) Water Demand	m ³ /sec	0.05	0.06	0.08	0.09	0.11	0.13
(Production Level)	10 ⁶ m ³ /year	2.5	1.9	2.4	2.8	3.5	4.1
9. PDAM Kodya Bukittinggi							
1) Population in Service Area	1,000 persons	70.2	71.8	78.5	93.3	108.4	123.5
2) Service Population	1,000 persons	48.0	63.1	78.2	93.3	108.4	123.5
3) Service Ratio	%	68.4	87.9	99.6	100.0	100.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	33	25	25	20	20	20
6) Unit Consumption	l/capita/day	125	140	150	150	150	150
7) Water Demand	m ³ /sec	0.10	0.14	0.18	0.20	0.24	0.27
(Production Level)	10 ⁶ m ³ /year	3.3	4.3	5.7	6.4	7.4	8.5
10. PDAM Kodya Payakumbuh							
1) Population in Service Area	1,000 persons	82.6	101.7	111.2	124.1	134.9	147.1
2) Service Population	1,000 persons	38.6	60.3	82.0	103.7	125.4	147.1
3) Service Ratio	%	46.7	59.3	73.7	83.6	93.0	100.0
4) Operation Hour	Hours	24	24	24	24	24	24
5) Loss	%	33	25	25	20	20	20
6) Unit Consumption	l/capita/day	112	130	140	150	150	150
7) Water Demand	m ³ /sec	0.07	0.12	0.18	0.23	0.27	0.32
(Production Level)	10 ⁶ m ³ /year	2.3	3.8	5.6	7.1	8.6	10.1

Table VIII.3.13 (1/3) FUTURE DOMESTIC WATER DEMAND OF AREAS NOT SERVED BY WATER SUPPLY COMPANIES

(1) Kampar River Basin

Population Unit : 1,000 persons

Regency Related	Category	1994	1999	2004	2009	2014	2019
1) Kab. Pasaman (5%)	Basin Area Population	25.5	28.2	30.8	34.1	37.2	39.9
	PDAM Service Population	0.0	0.0	0.0	0.0	0.0	0.0
	Non PDAM Population	25.5	28.2	30.8	34.1	37.2	39.9
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.01 0.3	0.01 0.3	0.01 0.4	0.01 0.4	0.02 0.5	0.02 0.6
2) Kab. Limapuluh Kota (22%)	Basin Area Population	68.7	71.9	74.7	79.3	83.3	87.4
	PDAM Service Population	7.9	12.2	16.5	21.6	26.8	30.2
	Non PDAM Population	60.9	59.8	58.3	57.7	56.5	57.2
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.02 0.7	0.02 0.7	0.02 0.7	0.02 0.7	0.03 0.8	0.03 0.8
3) Kab. Indragiri Hulu (15%)	Basin Area Population	65.4	77.5	91.6	107.2	123.3	139.3
	PDAM Service Population	4.3	12.8	16.1	19.9	24.1	29.0
	Non PDAM Population	61.1	64.7	75.6	87.3	99.2	110.3
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.02 0.7	0.02 0.7	0.03 1.0	0.04 1.1	0.05 1.4	0.05 1.6
4) Kab. Kampar (55%)	Basin Area Population	362.4	418.8	476.5	539.4	604.1	671.2
	PDAM Service Population	8.6	60.1	61.2	73.4	86.7	101.4
	Non PDAM Population	353.8	358.7	415.3	466.0	517.4	569.8
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.12 3.9	0.12 3.9	0.17 5.3	0.19 6.0	0.24 7.6	0.26 8.3
5) Kodya Pekanbaru (100%)	Kodamadya Population	496.8	649.3	858.8	1,135.7	1,466.8	1,872.1
	PDAM Service Population	116.4	356.4	538.7	801.5	1,092.7	1,468.0
	Non PDAM Population	380.4	292.9	320.0	334.2	374.1	404.1
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.13 4.2	0.10 3.2	0.13 4.1	0.14 4.3	0.17 5.5	0.19 5.9
Kampar River Basin	Basin Area Population	1,018.9	1,245.8	1,532.3	1,895.7	2,314.7	2,810.0
	PDAM Service Population	137.2	441.5	632.4	916.4	1,230.3	1,628.6
	Non PDAM Population	881.8	804.3	899.9	979.3	1,084.4	1,181.4
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.31 9.7	0.28 8.8	0.36 11.5	0.40 12.5	0.50 15.8	0.55 17.2

Note : Percentages in parentheses indicate the population shares given in Table VIII.1.1.

Table VIII.3.13 (2/3) FUTURE DOMESTIC WATER DEMAND OF AREAS NOT SERVED BY WATER SUPPLY COMPANIES

(2) Indragiri River Basin (1/2)

Population Unit : 1,000 persons

Regency Related	Category	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (78%)	Basin Area Population	243.7	255.0	265.0	281.2	295.2	310.0
	PDAM Service Population	9.4	23.1	36.7	50.4	64.0	77.7
	Non PDAM Population	234.3	232.0	228.3	230.8	231.2	232.3
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.08 2.6	0.08 2.5	0.09 2.9	0.09 2.9	0.11 3.4	0.11 3.4
2) Kab. Agam (45%)	Basin Area Population	190.8	195.9	200.2	207.1	213.0	219.0
	PDAM Service Population	14.3	22.1	29.9	39.3	48.6	54.9
	Non PDAM Population	176.5	173.7	170.3	167.8	164.3	164.1
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.06 1.9	0.06 1.9	0.07 2.2	0.07 2.1	0.08 2.4	0.08 2.4
3) Kab. Tanah Datar (100%)	Basin Area Population	356.8	367.3	376.1	389.1	400.1	411.4
	PDAM Service Population	27.6	62.6	97.6	132.6	167.6	202.6
	Non PDAM Population	329.2	304.7	278.5	256.5	232.5	208.8
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.11 3.6	0.11 3.3	0.11 3.6	0.10 3.3	0.11 3.4	0.10 3.0
4) Kab. Solok (49%)	Basin Area Population	223.3	244.1	263.4	281.8	297.9	315.0
	PDAM Service Population	17.2	30.7	44.2	57.8	71.3	84.8
	Non PDAM Population	206.1	213.3	219.1	224.0	226.6	230.2
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.07 2.3	0.07 2.3	0.09 2.8	0.09 2.9	0.10 3.3	0.11 3.4
5) Kab. Sawahlunto/ Sijunjung (54%)	Basin Area Population	183.6	211.3	241.4	276.5	315.7	360.1
	PDAM Service Population	7.2	20.4	33.6	46.9	60.1	73.3
	Non PDAM Population	176.4	190.9	207.8	229.6	255.6	286.7
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.06 1.9	0.07 2.1	0.08 2.7	0.09 2.9	0.12 3.7	0.13 4.2
6) Kodya Payakumbuh (100%)	Basin Area Population	101.5	112.8	123.4	137.7	149.7	161.5
	PDAM Service Population	38.6	60.3	82.0	103.7	125.4	147.1
	Non PDAM Population	62.9	52.5	41.4	34.0	24.3	14.4
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.02 0.7	0.02 0.6	0.02 0.5	0.01 0.4	0.01 0.4	0.01 0.2
7) Kodya Bukittinggi (100%)	Basin Area Population	93.8	104.3	114.1	127.3	139.3	151.4
	PDAM Service Population	48.0	63.1	78.2	93.3	108.4	123.5
	Non PDAM Population	45.8	41.2	35.9	34.0	30.9	27.9
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.02 0.5	0.01 0.5	0.01 0.5	0.01 0.4	0.01 0.5	0.01 0.4

Table VIII.3.13 (3/3) FUTURE DOMESTIC WATER DEMAND OF AREAS NOT SERVED BY WATER SUPPLY COMPANIES

(3) Indragiri River Basin (2/2)

Population Unit : 1,000 persons

Regency Related	Category	1994	1999	2004	2009	2014	2019
8) Kodya Padang Panjang (100%)	Basin Area Population	42.1	45.5	48.5	52.8	56.6	60.3
	PDAM Service Population	25.6	31.9	38.2	44.5	50.8	60.3
	Non PDAM Population	16.5	13.6	10.3	8.3	5.8	0.0
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.01 0.2	0.00 0.1	0.00 0.1	0.00 0.1	0.00 0.1	0.00 0.0
9) Kodya Solok (100%)	Basin Area Population	47.9	55.9	63.6	75.2	86.4	97.0
	PDAM Service Population	27.0	37.5	48.0	58.5	69.0	79.5
	Non PDAM Population	20.9	18.4	15.6	16.7	17.4	17.5
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.01 0.2	0.01 0.2	0.01 0.2	0.01 0.2	0.01 0.3	0.01 0.3
10) Kodya Sawahlunto (100%)	Basin Area Population	16.4	17.2	17.8	18.6	19.3	19.8
	PDAM Service Population	13.3	14.3	15.3	16.3	17.3	18.3
	Non PDAM Population	3.1	2.9	2.5	2.3	2.0	1.5
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.00 0.0	0.00 0.0	0.00 0.0	0.00 0.0	0.00 0.0	0.00 0.0
11) Kab. Indragiri Hulu (80%)	Basin Area Population	348.9	413.4	488.6	571.8	657.8	751.2
	PDAM Service Population	22.8	68.2	85.6	106.1	128.8	154.8
	Non PDAM Population	326.1	345.2	403.0	465.7	529.0	596.4
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.11 3.6	0.12 3.8	0.16 5.1	0.19 5.9	0.24 7.7	0.28 8.7
12) Kab. Indragiri Hilir (69%)	Basin Area Population	362.4	399.8	432.8	466.0	498.5	531.2
	PDAM Service Population	13.7	91.5	105.3	120.0	135.5	152.0
	Non PDAM Population	348.6	308.3	327.5	345.9	363.0	379.1
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.12 3.8	0.11 3.4	0.13 4.2	0.14 4.4	0.17 5.3	0.18 5.5
Indragiri River Basin	Basin Area Population	2,211.1	2,422.4	2,635.0	2,884.9	3,129.4	3,387.8
	PDAM Service Population	264.8	525.7	694.7	869.3	1,046.9	1,228.8
	Non PDAM Population	1,946.4	1,896.6	1,940.3	2,015.6	2,082.5	2,159.0
	Unit Consumption (l/capita/day)	30.0	30.0	35.0	35.0	40.0	40.0
	Water Demand (m ³ /sec) (10 ⁶ m ³ /year)	0.68 21.3	0.66 20.8	0.79 24.8	0.82 25.7	0.96 30.4	1.00 31.5

Note : Percentages in parentheses indicate the population shares given in Table VIII.1.1.

Table VIII.3.14 (1/2) FUTURE DOMESTIC WATER DEMAND BY RIVER BASIN

(1) Kampar River Basin

Regency Related	Category	1994	1999	2004	2009	2014	2019
1) Kab. Pasaman (5%)	PDAM Service Area (m ³ /sec)	0.00	0.00	0.00	0.00	0.00	0.00
	Non PDAM Area (m ³ /sec)	0.01	0.01	0.01	0.01	0.02	0.02
	Total (m ³ /sec)	0.01	0.01	0.01	0.01	0.02	0.02
	(10 ⁶ m ³ /year)	0.28	0.31	0.39	0.44	0.54	0.58
2) Kab. Limapuluh Kota (22%)	PDAM Service Area (m ³ /sec)	0.01	0.03	0.04	0.05	0.06	0.07
	Non PDAM Area (m ³ /sec)	0.02	0.02	0.02	0.02	0.03	0.03
	Total (m ³ /sec)	0.03	0.05	0.06	0.07	0.08	0.09
	(10 ⁶ m ³ /year)	1.01	1.48	1.86	2.21	2.65	2.90
3) Kab. Indragiri Hulu (15%)	PDAM Service Area (m ³ /sec)	0.01	0.02	0.03	0.03	0.05	0.06
	Non PDAM Area (m ³ /sec)	0.02	0.02	0.03	0.04	0.05	0.05
	Total (m ³ /sec)	0.03	0.04	0.06	0.07	0.09	0.11
	(10 ⁶ m ³ /year)	0.91	1.33	1.82	2.20	2.88	3.60
4) Kab. Kampar (55%)	PDAM Service Area (m ³ /sec)	0.01	0.11	0.14	0.17	0.20	0.26
	Non PDAM Area (m ³ /sec)	0.12	0.12	0.17	0.19	0.24	0.26
	Total (m ³ /sec)	0.13	0.24	0.31	0.35	0.44	0.53
	(10 ⁶ m ³ /year)	4.20	7.48	9.80	11.19	13.96	16.61
5) Kodya Pekanbaru (100%)	PDAM Service Area (m ³ /sec)	0.22	0.57	0.94	1.51	2.37	3.61
	Non PDAM Area (m ³ /sec)	0.13	0.10	0.13	0.14	0.17	0.19
	Total (m ³ /sec)	0.35	0.67	1.06	1.64	2.54	3.80
	(10 ⁶ m ³ /year)	11.10	21.10	33.58	51.81	80.24	119.76
Kampar River Basin	PDAM Service Area (m ³ /sec)	0.25	0.73	1.14	1.75	2.68	4.00
	Non PDAM Area (m ³ /sec)	0.31	0.28	0.36	0.40	0.50	0.55
	Total (m ³ /sec)	0.55	1.00	1.50	2.15	3.18	4.55
	(10 ⁶ m ³ /year)	17.50	31.69	47.46	67.85	100.28	143.46

Note : Percentages in parentheses indicate the population share given in Table VIII.1.1.

Table VIII.3.14 (2/2) FUTURE DOMESTIC WATER DEMAND BY RIVER BASIN

(2) Indragiri River Basin

Regency Related	Category	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (78%)	PDAM Service Area (m ³ /sec)	0.04	0.09	0.13	0.17	0.20	0.23
	Non PDAM Area (m ³ /sec)	0.08	0.08	0.09	0.09	0.11	0.11
	Total (m ³ /sec)	0.12	0.17	0.22	0.26	0.31	0.34
	(10 ⁶ m ³ /year)	3.80	5.46	6.87	8.17	9.84	10.72
2) Kab. Agam (45%)	PDAM Service Area (m ³ /sec)	0.02	0.05	0.07	0.10	0.12	0.13
	Non PDAM Area (m ³ /sec)	0.06	0.06	0.07	0.07	0.08	0.08
	Total (m ³ /sec)	0.08	0.11	0.14	0.16	0.19	0.21
	(10 ⁶ m ³ /year)	2.64	3.59	4.46	5.15	6.13	6.62
3) Kab. Tanah Datar (100%)	PDAM Service Area (m ³ /sec)	0.05	0.11	0.18	0.27	0.36	0.44
	Non PDAM Area (m ³ /sec)	0.11	0.11	0.11	0.10	0.11	0.10
	Total (m ³ /sec)	0.16	0.21	0.30	0.37	0.47	0.54
	(10 ⁶ m ³ /year)	5.18	6.76	9.35	11.75	14.86	16.91
4) Kab. Sotok (49%)	PDAM Service Area (m ³ /sec)	0.03	0.06	0.10	0.13	0.15	0.18
	Non PDAM Area (m ³ /sec)	0.07	0.07	0.09	0.09	0.10	0.11
	Total (m ³ /sec)	0.11	0.14	0.18	0.22	0.26	0.29
	(10 ⁶ m ³ /year)	3.34	4.28	5.81	7.08	8.19	9.17
5) Kab. Sawahlunto/ Stijunjung (54%)	PDAM Service Area (m ³ /sec)	0.01	0.03	0.05	0.07	0.10	0.14
	Non PDAM Area (m ³ /sec)	0.06	0.07	0.08	0.09	0.12	0.13
	Total (m ³ /sec)	0.07	0.09	0.13	0.17	0.22	0.27
	(10 ⁶ m ³ /year)	2.27	2.93	4.19	5.29	7.02	8.54
6) Kodya Payakumbuh (100%)	PDAM Service Area (m ³ /sec)	0.07	0.12	0.18	0.23	0.27	0.32
	Non PDAM Area (m ³ /sec)	0.02	0.02	0.02	0.01	0.01	0.01
	Total (m ³ /sec)	0.09	0.14	0.19	0.24	0.28	0.33
	(10 ⁶ m ³ /year)	2.90	4.39	6.12	7.53	8.94	10.28
7) Kodya Bukittinggi (100%)	PDAM Service Area (m ³ /sec)	0.10	0.14	0.18	0.20	0.24	0.27
	Non PDAM Area (m ³ /sec)	0.02	0.01	0.01	0.01	0.01	0.01
	Total (m ³ /sec)	0.12	0.15	0.20	0.22	0.25	0.28
	(10 ⁶ m ³ /year)	3.75	4.75	6.17	6.82	7.87	8.86
8) Kodya Padang Panjang (100%)	PDAM Service Area (m ³ /sec)	0.05	0.06	0.08	0.09	0.11	0.13
	Non PDAM Area (m ³ /sec)	0.01	0.00	0.00	0.00	0.00	0.00
	Total (m ³ /sec)	0.06	0.06	0.08	0.09	0.11	0.13
	(10 ⁶ m ³ /year)	1.76	2.01	2.55	2.95	3.56	4.12
9) Kodya Solok (100%)	PDAM Service Area (m ³ /sec)	0.01	0.04	0.07	0.10	0.14	0.19
	Non PDAM Area (m ³ /sec)	0.01	0.01	0.01	0.01	0.01	0.01
	Total (m ³ /sec)	0.02	0.04	0.07	0.11	0.15	0.20
	(10 ⁶ m ³ /year)	0.54	1.42	2.35	3.46	4.75	6.16
10) Kodya Sawahlunto (100%)	PDAM Service Area (m ³ /sec)	0.05	0.06	0.08	0.10	0.13	0.15
	Non PDAM Area (m ³ /sec)	0.00	0.00	0.00	0.00	0.00	0.00
	Total (m ³ /sec)	0.05	0.06	0.08	0.10	0.13	0.15
	(10 ⁶ m ³ /year)	1.61	1.79	2.54	3.16	4.06	4.74
11) Kab. Indragiri Hulu (80%)	PDAM Service Area (m ³ /sec)	0.04	0.11	0.15	0.18	0.24	0.34
	Non PDAM Area (m ³ /sec)	0.11	0.12	0.16	0.19	0.24	0.28
	Total (m ³ /sec)	0.15	0.23	0.31	0.37	0.49	0.61
	(10 ⁶ m ³ /year)	4.83	7.10	9.73	11.76	15.36	19.30
12) Kab. Indragiri Hilir (69%)	PDAM Service Area (m ³ /sec)	0.01	0.14	0.18	0.21	0.25	0.33
	Non PDAM Area (m ³ /sec)	0.12	0.11	0.13	0.14	0.17	0.18
	Total (m ³ /sec)	0.13	0.25	0.31	0.35	0.42	0.51
	(10 ⁶ m ³ /year)	4.22	7.83	9.82	10.99	13.34	15.94
Indragiri River Basin	PDAM Service Area (m ³ /sec)	0.49	1.00	1.43	1.85	2.33	2.85
	Non PDAM Area (m ³ /sec)	0.68	0.66	0.79	0.82	0.96	1.00
	Total (m ³ /sec)	1.17	1.66	2.22	2.67	3.30	3.85
	(10 ⁶ m ³ /year)	36.84	52.31	69.94	84.09	103.91	121.36

Note : Percentages in parentheses indicate the population share given in Table VIII.1.1.

Table VIII.3.15 (1/2) HISTORICAL AND FORECASTED PRODUCTIONS OF MAJOR INDUSTRIES BY REGENCY

Year	Kab. Pekanbaru				Kab. Kampar			Kab. Indragiri Hulu				Kab. Indragiri Hilir			
	Mineral Water (m ³)	Crumb Rubber (ton)	Plywood (m ³)	Ice (ton)	Rubber Remillim (ton)	Pulp and Paper (ton)	Crumb Rubber (ton)	Tapioka (ton)	Plywood (m ³)	Fry Oil (ton)	Coconut Oil (ton)	Palm Flour (ton)	Ice (ton)		
1987	63	59,526	26,431	120	6,927	0	7,900	0	0	97,658	85,053	1,987	22,354		
1988	205	55,693	135,299	3,353	6,162	0	7,500	0	0	97,668	85,453	1,968	25,470		
1989	212	49,345	129,507	2,654	6,337	0	6,850	0	0	97,668	83,454	1,970	27,455		
1990	2,100	69,345	508,043	2,915	6,881	0	5,950	0	0	97,833	80,567	1,975	32,215		
1991	1,700	75,841	814,962	6,300	6,134	0	5,550	0	0	97,875	80,564	1,980	39,431		
1992	1,925	76,202	884,298	7,245	5,784	0	5,620	386	386	97,903	85,421	2,005	39,435		
1993	2,100	86,300	977,100	8,800	6,100	0	5,660	390	390	98,000	85,700	2,000	45,100		
1994	2,200	96,400	1,070,000	10,400	6,300	0	5,700	400	400	98,000	86,000	2,000	50,800		
G.R. (%)	-4.3	7.4	31.9	27.2	-2.4	-	-7.5	-	-	0.1	-0.5	0.2	13.1		
1999	2,800	148,400	1,536,100	16,800	6,400	1,100	6,000	440	440	98,200	87,400	2,100	80,300		
2004	3,500	203,300	2,104,600	25,900	6,600	1,700	6,300	490	490	98,400	88,800	2,100	112,700		
2009	4,300	247,400	2,750,700	38,000	6,800	2,500	6,700	540	540	98,600	90,200	2,100	150,800		
2014	5,200	286,800	3,346,600	53,300	7,000	3,300	7,000	600	600	98,700	91,600	2,200	183,500		
2019	6,300	332,400	4,071,600	68,000	7,200	4,100	7,400	660	660	98,900	93,100	2,200	223,200		
U.W.R	2 m ³ /m ³	40 m ³ /ton	2.8 m ³ /m ³	2 m ³ /m ³	40 m ³ /ton	170 m ³ /ton	40 m ³ /ton	60 m ³ /ton	2.8 m ³ /m ³	6 m ³ /ton	6 m ³ /ton	60 m ³ /ton	2 m ³ /ton		

Source : Dinas Perindustrian, Propinsi Riau (Historical data up to 1992)

Note : (1) U.W.R = Unit water requirement per unit production

(2) G.R. = Annual growth rate from 1987 to 1994 in principle.

(3) Productions in 1993 and 1994 are estimated ones.

(4) Growth rates are calculated excluding extremely small figures.

Table VIII.3.15 (2/2) HISTORICAL AND FORCASTED PRODUCTIONS OF MAJOR INDUSTRIES BY REGENCY

(2) West Sumatra Province

Year	Kab. Solok +Kodya Solok	Kab. Sawahlunto/Sijunjung +Kodya Sawahlunto				Kab. Limapuluh Kota +Kodya Payakumbuh
		Sawmill (m ³)	Tapioka (ton)	Textile (ton)	Sawmill (m ³)	
1987	0	8,000	61	44,515	506,137	0
1988	4,917	11,040	52	48,992	558,807	159
1989	22,079	11,040	63	48,992	610,390	159
1990	596	11,365	85	15,409	650,589	826
1991	2,987	13,843	87	22,409	517,229	1,652
1992	574	9,112	102	12,767	884,468	1,500
1993	900	9,800	120	12,500	966,000	1,500
1994	1,240	10,400	140	12,300	1,047,000	1,500
G.R. (%)	-46.7	4.0	13.7	-24.3	7.8	34.8
1999	1,270	14,300	260	11,100	288,000	1,600
2004	1,300	18,700	410	10,000	844,000	1,700
2009	1,340	22,700	610	9,100	1,241,000	1,800
2014	1,370	26,300	820	8,200	1,660,000	1,900
2019	1,400	29,100	990	7,400	2,020,000	2,000
U.W.R	2.8 m ³ /m ³	60 m ³ /ton	150 m ³ /ton	2.8 m ³ /m ³	15.8 m ³ /ton	2 m ³ /m ³

Source : Dinas Perindustrian, Propinsi Sumatera Barat (Historical data up to 1992)

- Note :
- (1) U.W.R = Unit water requirement per unit production
 - (2) G.R. = Annual growth rate from 1987 to 1992 in principle.
 - (3) Productions in 1993 and 1994 are estimated ones.
 - (4) Growth rates are calculated excluding extremely small figures.

Table VIII.3.16 FUTURE WATER DEMAND OF INDUSTRY

(1) Kampar River Basin

Unit : 1,000 m³

Regency Related	Kind	Unit Water Consumption	1994	1999	2004	2009	2014	2019
1) Kab. Kampar	Rubber Remilling	40 m ³ /ton	252.0	256.0	264.0	272.0	280.0	288.0
	Pulp and Paper	170 m ³ /ton	0.0	102.9	159.0	233.8	308.6	383.4
	Total		252.0	358.9	423.0	505.8	588.6	671.4
2) Kodya Pekanbaru	Mineral Water	2 m ³ /m ³	4.4	5.6	7.0	8.6	10.4	12.6
	Crum Rubber	40 m ³ /ton	3,856.0	5,936.0	8,132.0	9,896.0	11,472.0	13,296.0
	Plywood	2.8 m ³ /m ³	2,996.0	4,301.1	5,892.9	7,702.0	9,370.5	11,400.5
	Ice	2 m ³ /m ³	20.8	33.6	51.8	76.0	106.6	136.0
	Total		6,877.2	10,276.3	14,083.7	17,682.6	20,959.5	24,845.1
Kampar River Basin	Water Demand (10 ⁶ m ³ /year)		7.1	10.6	14.5	18.2	21.5	25.5
	Water Demand (m ³ /sec)		0.23	0.34	0.46	0.58	0.68	0.81

(2) Indragiri River Basin

Unit : 1,000 m³

Regency Related	Kind	Unit Water Consumption	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota	Mineral Water	2 m ³ /m ³	3.0	3.2	3.4	3.6	3.8	4.0
	Total		3.0	3.2	3.4	3.6	3.8	4.0
2) Kab. Solok	Sawmill	2.8 m ³ /m ³	3.4	3.6	3.6	3.6	3.9	3.9
	Total		3.4	3.6	3.6	3.6	3.9	3.9
3) Kab. Sawahlunto/ Sijunjung	Tapioka	60 m ³ /ton	624.0	858.0	1,122.0	1,362.0	1,578.0	1,746.0
	Textile	150 m ³ /ton	4,095.0	7,725.0	12,450.0	18,270.0	24,450.0	29,010.0
	Sawmill	2.8 m ³ /m ³	34.4	31.1	28.0	25.5	23.0	20.7
	Coal Mining	15.8 m ³ /ton	16,542.6	4,550.4	13,335.2	19,607.8	26,228.0	31,916.0
	Thermal Plant *	-	0.0	9,460.8	9,460.8	9,460.8	9,460.8	9,460.8
Total		21,296.0	22,625.3	36,396.0	48,726.1	61,739.8	72,153.5	
4) Kab. Indragiri Hulu	Crumb Rubber	40 m ³ /ton	228.0	240.0	252.0	268.0	280.0	296.0
	Tapioka	60 m ³ /ton	336.0	372.0	414.0	420.0	444.0	552.0
	Plywood	2.8 m ³ /m ³	1.1	1.1	1.4	1.4	1.7	2.0
	Total		565.1	613.1	667.4	689.4	725.7	850.0
5) Kab. Indragiri Hilir	Fry Oil	6 m ³ /ton	582.0	589.2	590.4	591.6	592.8	594.0
	Coconut Oil	6 m ³ /ton	516.0	524.4	532.8	541.2	549.6	558.6
	Palm Flour	60 m ³ /ton	120.0	126.0	126.0	126.0	132.0	132.0
	Ice	2 m ³ /m ³	101.6	160.6	225.4	301.6	367.0	446.4
	Total		1,319.6	1,400.2	1,474.6	1,560.4	1,641.4	1,731.0
Indragiri River Basin	Water Demand (10 ⁶ m ³ /year)		23.2	24.6	38.5	51.0	64.1	74.7
	Water Demand (m ³ /sec)		0.74	0.78	1.22	1.62	2.03	2.37

Note : * Ombilin coal-fired thermal plant

Table VIII.3.17 HISTORICAL FISHPOND AREA BY REGENCY

(1) Riau Province

Unit : ha

Year	Kab. Kampar	Kab. Indragiri Hulu	Kab. Indragiri Hilir
1987	147	77	59
1988	215	98	68
1989	215	101	68
1990	240	104	68
1991	280	110	72
1992	289	110	72
1993	327	117	74
1994	369	125	77
G.R. (%)	13.0	6.4	3.4
1999	594	201	124
2004	741	233	144
2009	880	270	167
2014	1,020	312	193
2019	1,154	362	224

Source : Dinas Perikanan, Propinsi Riau (Historical data up to 1992)

Note : G.R. = Average annual growth rate from 1987 to 1992

(2) West Sumatra Province

Unit : ha

Year	Kab. Limapuluh Kota	Kab. Tanah Datar	Kab. Solok	Kab. Sawahlunto/ Sijunjung
1987	1,123	500	357	185
1988	1,127	527	392	197
1989	1,128	530	406	227
1990	1,128	532	373	257
1991	1,168	532	419	386
1992	1,175	624	426	402
1993	1,187	645	438	430
1994	1,199	666	451	460
G.R. (%)	1.0	3.3	2.9	18.8
1999	1,285	714	484	646
2004	1,351	762	534	824
2009	1,420	812	590	1,002
2014	1,492	867	651	1,162
2019	1,568	924	719	1,283

Source : Dinas Perikanan, Propinsi Sumatera Barat (Historical data up to 1992)

Note : G.R. = Average annual growth rate from 1987 to 1992

Table VIII.3.18 FUTURE WATER DEMAND OF INLAND FISHERY

(1) Kampar River Basin

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (60%)	Pond Area (ha)	719	771	810	852	895	941
	Water Demand ($10^6\text{m}^3/\text{year}$)	18.4	19.7	20.7	21.8	22.9	24.0
	(m^3/sec)	0.58	0.62	0.66	0.69	0.73	0.76
2) Kab. Indragiri Hulu (14%)	Pond Area (ha)	17	28	33	38	44	51
	Water Demand ($10^6\text{m}^3/\text{year}$)	0.4	0.7	0.8	1.0	1.1	1.3
	(m^3/sec)	0.01	0.02	0.03	0.03	0.04	0.04
3) Kab. Kampar (71%)	Pond Area (ha)	262	422	526	625	724	819
	Water Demand ($10^6\text{m}^3/\text{year}$)	6.7	10.8	13.4	16.0	18.5	20.9
	(m^3/sec)	0.21	0.34	0.43	0.51	0.59	0.66
Total	Pond Area (ha)	999	1,221	1,369	1,514	1,663	1,811
	Water Demand ($10^6\text{m}^3/\text{year}$)	25.5	31.2	35.0	38.7	42.5	46.3
	(m^3/sec)	0.81	0.99	1.11	1.23	1.35	1.47

(2) Indragiri River Basin

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (40%)	Pond Area (ha)	479	514	540	568	597	627
	Water Demand ($10^6\text{m}^3/\text{year}$)	12.2	13.1	13.8	14.5	15.2	16.0
	(m^3/sec)	0.39	0.42	0.44	0.46	0.48	0.51
2) Kab. Tanah Datar (100%)	Pond Area (ha)	666	714	762	812	867	924
	Water Demand ($10^6\text{m}^3/\text{year}$)	17.0	18.2	19.5	20.8	22.1	23.6
	(m^3/sec)	0.54	0.58	0.62	0.66	0.70	0.75
3) Kab. Solok (23%)	Pond Area (ha)	104	111	123	136	150	165
	Water Demand ($10^6\text{m}^3/\text{year}$)	2.7	2.8	3.1	3.5	3.8	4.2
	(m^3/sec)	0.08	0.09	0.10	0.11	0.12	0.13
4) Kab. Sawahlunto/ Sijunjung (38%)	Pond Area (ha)	175	245	313	381	442	488
	Water Demand ($10^6\text{m}^3/\text{year}$)	4.5	6.3	8.0	9.7	11.3	12.5
	(m^3/sec)	0.14	0.20	0.25	0.31	0.36	0.39
5) Kab. Indragiri Hulu (48%)	Pond Area (ha)	60	96	112	129	150	174
	Water Demand ($10^6\text{m}^3/\text{year}$)	1.5	2.5	2.9	3.3	3.8	4.4
	(m^3/sec)	0.05	0.08	0.09	0.10	0.12	0.14
6) Kab. Indragiri Hilir (10%)	Pond Area (ha)	8	12	14	17	19	22
	Water Demand ($10^6\text{m}^3/\text{year}$)	0.2	0.3	0.4	0.4	0.5	0.6
	(m^3/sec)	0.01	0.01	0.01	0.01	0.02	0.02
Total	Pond Area (ha)	1,491	1,693	1,864	2,043	2,224	2,401
	Water Demand ($10^6\text{m}^3/\text{year}$)	38.1	43.3	47.6	52.2	56.8	61.3
	(m^3/sec)	1.21	1.37	1.51	1.65	1.80	1.94

Note : (1) Unit water consumption is assumed to be 7 mm/day/ha (0.81 l/sec/ha).
 (2) Percentages in parentheses indicate area share given in Table VIII.1.1.

Table VIII.3.19 (1/2) HISTORICAL AND FUTURE LIVESTOCK POPULATIONS BY REGENCY

Regency	Kind	Unit : head												Unit : 1,000 heads	
		1988	1989	1990	1991	1992	1993	Growth Rate (%)	1994	1999	2004	2009	2014	2019	
1) Kab. Kampar	Cow	20,582	26,861	27,248	28,610	30,301	31,833	7.7	35.4	48.7	63.7	79.0	92.9	104.1	
	Buffalo	19,950	20,756	20,098	20,296	20,508	20,923	0.6	20.9	25.6	30.4	35.3	40.1	44.9	
	Pig	-	-	-	-	-	237	-	0.3	0.4	0.4	0.5	0.6	0.7	
	Chicken	805,716	924,933	898,414	867,975	891,467	930,923	1.7	966.6	1,051.6	1,138.5	1,226.5	1,314.8	1,402.5	
	Duck	28,348	29,670	29,854	30,749	31,671	32,635	2.7	33.4	36.4	39.4	42.4	45.5	48.5	
	Goat/Sheep	22,750	24,698	25,679	26,706	27,594	28,607	4.4	31.2	37.8	44.6	51.5	58.0	63.4	
2) Kab. Indragiri Hulu	Cow	36,196	39,946	44,696	45,311	50,721	50,721	7.1	56.4	75.8	97.7	120.0	141.1	158.1	
	Buffalo	12,622	13,200	14,253	15,013	15,110	15,746	4.6	16.7	20.5	24.4	28.2	32.1	36.0	
	Pig	521	622	592	500	517	-	-2.3	0.6	0.8	1.0	1.2	1.4	1.6	
	Chicken	283,806	312,496	336,410	407,598	405,913	402,283	8.1	452.0	563.3	669.0	768.1	843.8	900.1	
	Duck	25,463	27,326	28,170	29,015	28,882	25,330	0.5	27.8	30.2	32.7	35.3	37.8	40.3	
	Goat/Sheep	33,651	37,962	39,567	40,206	41,110	43,697	4.6	47.8	58.2	68.8	79.3	89.3	97.6	
3) Kab. Indragiri Hilir	Cow	2,748	3,275	3,850	4,512	5,233	5,819	16.4	6.7	7.8	9.0	10.2	11.3	12.5	
	Buffalo	583	532	370	269	180	164	-24.7	0.2	0.2	0.2	0.3	0.3	0.3	
	Pig	363	352	364	333	311	343	-2.1	0.3	0.4	0.5	0.6	0.7	0.8	
	Chicken	474,985	483,276	491,685	486,098	507,038	530,897	2.0	530.7	624.2	716.6	810.8	904.0	998.1	
	Duck	154,210	155,200	143,094	131,024	125,608	113,615	-6.2	114.8	135.0	155.0	175.3	195.5	215.8	
	Goat/Sheep	20,429	20,978	21,546	22,073	22,722	23,005	2.5	24.3	27.4	30.5	33.7	36.8	39.9	

Source : Sumatera Barat Dalam Angka, Riau Dalam Angka

Table VIII.3.19 (2/2) HISTORICAL AND FUTURE LIVESTOCK POPULATIONS BY REGENCY

Regency	Kind	Unit : head													Unit : 1,000 heads		
		1988	1989	1990	1991	1992	1993	Growth Rate (%)	1994	1999	2004	2009	2014	2019			
1) Kab. Limapuluh Kota	Cow	26,321	29,944	13,645	30,644	23,965	22,359	-1.9	22.7	26.7	30.6	34.6	38.6	42.6			
	Buffalo	20,335	20,954	15,681	20,766	18,769	18,340	-1.6	18.6	21.9	25.2	28.5	31.7	35.0			
	Pig	-	-	-	-	-	-	-	0	0	0	0	0	0			
	Chicken	1,305,026	1,397,465	794,348	1,045,174	1,385,772	1,468,493	2.4	1,539.8	1,811.2	2,079.4	2,352.7	2,623.1	2,896.1			
	Duck	58,486	57,273	53,913	51,772	52,526	54,264	-1.9	55.0	64.7	74.3	84.1	93.7	103.5			
2) Kab. Agam	Goat/Sheep	17,230	18,092	14,244	14,479	15,897	16,856	-1.4	17.8	20.1	22.4	24.7	27.0	29.2			
	Cow	42,908	39,236	40,059	41,032	41,035	42,113	0.2	45.5	53.5	61.4	69.5	77.4	85.5			
	Buffalo	25,531	25,540	26,424	27,344	27,434	28,339	2.2	28.9	34.0	39.0	44.1	49.2	54.3			
	Pig	-	-	-	-	-	-	-	0	0	0	0	0	0			
	Chicken	768,300	823,600	872,100	948,195	958,055	1,399,810	10.6	1,342.7	1,579.3	1,813.1	2,051.4	2,287.2	2,525.3			
3) Kab. Tanah Daer	Duck	152,400	158,300	164,300	177,482	185,302	95,250	-5.0	127.1	149.5	171.6	194.2	216.5	239.0			
	Goat/Sheep	18,804	19,139	19,300	20,419	20,843	20,897	2.4	22.1	24.9	27.7	30.6	33.5	36.2			
	Cow	27,616	28,116	29,077	30,150	31,087	34,506	4.2	34.7	40.8	46.9	53.0	59.1	65.3			
	Buffalo	16,194	16,436	18,289	19,724	20,098	20,981	5.8	22.6	26.6	30.5	34.5	38.5	42.5			
	Pig	555,708	653,055	670,862	723,759	731,202	770,303	6.0	835.1	982.2	1,127.7	1,275.9	1,422.5	1,570.6			
4) Kab. Solok	Chicken	130,063	83,848	92,401	112,985	106,325	144,887	4.2	157.3	185.0	212.4	240.4	268.0	295.9			
	Duck	19,049	19,243	19,297	22,008	23,269	24,439	5.7	25.8	29.1	32.4	35.8	39.1	42.4			
	Goat/Sheep	42,249	41,088	41,949	42,984	44,121	45,490	1.8	45.6	53.7	61.6	69.7	77.8	85.9			
	Cow	19,482	19,819	20,504	21,218	20,474	21,134	1.6	21.6	25.4	29.1	32.9	36.7	40.5			
	Buffalo	358,718	494,000	609,200	666,845	713,825	775,210	15.5	968.1	1,138.8	1,307.4	1,479.2	1,649.2	1,820.8			
5) Kab. Sawahlunto/Sijunjung	Duck	448,621	441,739	441,779	491,544	517,853	535,718	4.3	553.8	651.4	747.9	846.2	943.4	1,041.6			
	Goat/Sheep	22,479	22,192	22,378	23,675	25,845	26,200	3.7	27.7	31.2	34.8	38.4	42.0	45.4			
	Cow	27,374	29,509	32,752	34,403	32,715	34,087	4.2	36.7	43.1	49.5	56.0	62.5	69.0			
	Buffalo	38,150	38,593	40,427	41,218	39,705	40,774	1.3	41.6	48.9	56.1	63.5	70.8	78.2			
	Pig	579,310	553,183	654,100	725,590	683,500	779,101	6.5	821.3	966.0	1,109.0	1,254.8	1,399.0	1,544.6			
Chicken	32,677	36,550	38,847	40,829	32,758	36,127	0.6	37.0	43.5	50.0	56.5	63.0	69.6				
	Goat/Sheep	58,041	61,921	71,988	76,374	75,872	71,013	4.9	75.0	84.5	94.2	104.0	113.7	123.1			

Source : Sumatera Barat Dalam Angka

Table VIII.3.20 (1/2) FUTURE WATER DEMAND OF LIVESTOCK

(1) Kampar River Basin

Unit : m³/day

Regency Related	Kind	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (60%)	Cow	556	683	811	941	1,069	1,198
	Buffalo	455	559	664	770	875	981
	Pig	0	0	0	0	0	0
	Chicken	594	740	879	1,009	1,109	1,183
	Duck	20	22	24	26	28	30
	Goat/Sheep	57	65	73	81	89	97
	Total	1,682	2,070	2,452	2,827	3,170	3,489
2) Kab. Kampar (71%)	Cow	1,083	1,490	1,948	2,415	2,841	3,183
	Buffalo	596	732	869	1,008	1,146	1,284
	Pig	1	2	2	2	3	3
	Chicken	412	448	485	522	560	597
	Duck	15	16	17	19	20	21
	Goat/Sheep	111	134	158	183	206	225
	Total	2,217	2,822	3,479	4,149	4,775	5,314
3) Kab. Indragiri Hulu (14%)	Cow	338	455	586	720	847	949
	Buffalo	98	120	143	165	188	211
	Pig	1	1	1	1	1	1
	Chicken	38	47	56	65	71	76
	Duck	2	3	3	3	3	3
	Goat/Sheep	33	41	48	56	63	68
	Total	510	666	837	1,009	1,173	1,308
Kampar River Basin	Cow	1,977	2,628	3,345	4,076	4,757	5,330
	Buffalo	1,149	1,411	1,676	1,943	2,209	2,475
	Pig	2	2	3	3	4	4
	Chicken	1,044	1,236	1,420	1,596	1,740	1,856
	Duck	37	41	44	47	51	54
	Goat/Sheep	201	240	279	319	357	391
	Total	4,410	5,557	6,768	7,985	9,118	10,110
	(m ³ /sec)	0.05	0.06	0.08	0.09	0.11	0.12

Note : (1) Unit Water Consumption Rate Applied (l/head/day)

Cow : 40 Pig : 6 Duck : 0.3
Buffalo : 40 Chicken : 0.3 Goat/Sheep : 5

(2) Percentages in parentheses indicates area share given in Table VIII.1.1.

Table VIII.3.20 (2/2) FUTURE WATER DEMAND OF LIVESTOCK

(2) Indragiri River Basin		Unit : m ³ /day					
Regency	Kind	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (40%)	Cow	363	427	490	554	618	682
	Buffalo	298	351	403	456	508	561
	Pig	0	0	0	0	0	0
	Chicken	370	435	499	565	630	695
	Duck	13	16	18	20	22	25
	Goat/Sheep	36	40	45	49	54	58
	Total	1,079	1,268	1,454	1,644	1,832	2,021
2) Kab. Agam (15%)	Cow	273	321	368	417	465	513
	Buffalo	177	208	239	271	302	333
	Pig	0	0	0	0	0	0
	Chicken	134	157	181	204	228	251
	Duck	11	13	15	17	19	20
	Goat/Sheep	17	19	21	23	25	27
	Total	611	718	824	931	1,038	1,145
3) Kab. Tanah Datar (100%)	Cow	1,447	1,702	1,953	2,210	2,464	2,721
	Buffalo	955	1,124	1,290	1,460	1,627	1,797
	Pig	0	0	0	0	0	0
	Chicken	531	625	717	812	905	999
	Duck	94	111	127	144	161	178
	Goat/Sheep	129	145	162	179	196	212
	Total	3,157	3,707	4,250	4,805	5,353	5,906
4) Kab. Solok (23%)	Cow	427	503	577	653	728	804
	Buffalo	201	237	272	308	343	379
	Pig	0	0	0	0	0	0
	Chicken	154	182	208	236	263	290
	Duck	80	94	108	122	136	150
	Goat/Sheep	32	36	40	44	48	52
	Total	895	1,051	1,205	1,362	1,518	1,675
5) Kab. Sawahlunto/ Sijunjung (38%)	Cow	581	683	785	888	990	1,093
	Buffalo	640	753	864	978	1,090	1,203
	Pig	0	0	0	0	0	0
	Chicken	200	235	269	305	340	375
	Duck	8	10	11	13	14	16
	Goat/Sheep	143	161	179	198	216	234
	Total	1,571	1,841	2,109	2,381	2,650	2,921
6) Kab. Indragiri Hulu (48%)	Cow	1,160	1,364	1,566	1,772	1,976	2,182
	Buffalo	335	394	453	512	571	630
	Pig	2	2	2	3	3	4
	Chicken	145	170	196	221	247	272
	Duck	8	9	11	12	14	15
	Goat/Sheep	111	125	139	154	168	182
	Total	1,760	2,065	2,367	2,674	2,979	3,285
7) Kab. Indragiri Hilir (10%)	Cow	30	36	41	46	51	57
	Buffalo	1	1	1	1	1	1
	Pig	0	0	0	0	0	0
	Chicken	32	38	44	50	55	61
	Duck	7	8	9	11	12	13
	Goat/Sheep	12	14	15	17	18	20
	Total	83	97	110	125	139	153
Indragiri River Basin	Cow	4,281	5,035	5,781	6,540	7,292	8,051
	Buffalo	2,608	3,068	3,522	3,985	4,443	4,905
	Pig	2	2	3	3	4	4
	Chicken	1,566	1,842	2,114	2,392	2,667	2,945
	Duck	222	261	299	339	377	417
	Goat/Sheep	479	539	601	664	725	785
	Total	9,156	10,746	12,319	13,922	15,508	17,107
	(m ³ /sec)	0.11	0.12	0.14	0.16	0.18	0.20

Note : (1) Unit Water Consumption Rate Applied (l/head/day)

Cow :	40	Pig :	6	Duck :	0.3
Buffalo :	40	Chicken :	0.3	Goat/Sheep :	5

(2) Percentages in parentheses indicate area share given in Table VIII.1.1.

Table VIII.3.21 (1/2) HISTORICAL AND FORECASTED NUMBERS OF TOURISTS

(1) Riau Province

Unit : 1,000 persons

Fiscal Year	Pekanbaru Kodya. Pekanbaru			Tanjung Pinang Kab. Kepulauan Riau			Batam Kab. Kepulauan Riau		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
1987	(9.0)	4.5	13.5	(1.5)	5.0	6.5	(42.4)	141.5	183.9
1988	(8.9)	4.5	13.4	(1.7)	5.7	7.4	(70.8)	236.1	306.9
1989	(10.4)	5.2	15.6	(4.9)	16.2	21.1	(111.3)	370.8	482.1
1990	(11.2)	5.6	16.8	(14.4)	47.8	62.2	(183.9)	613.1	797.0
1991	(11.6)	5.8	17.4	(23.1)	76.9	100.0	(181.9)	606.3	788.2
1992	(22.1)	11.1	33.2	(21.5)	71.7	93.2	(203.4)	678.1	881.5
1993	(45.3)	22.6	67.9	(21.2)	70.6	91.8	(234.9)	783.1	1,018.0
1994	(52.9)	33.8	86.8	(32.9)	100.0	132.9	(249.2)	991.9	1,241.1
G.R. (%)	(27.4)	27.4	(27.4)	(68.3)	68.0	(68.1)	(31.8)	31.8	(31.8)
1999	114.8	72.8	187.6	66.0	212.4	278.4	343.4	1,560.9	1,904.3
2004	200.9	126.7	327.6	114.8	405.4	520.2	440.9	2,243.6	2,587.0
2009	240.7	150.9	391.6	140.7	671.1	811.8	481.5	2,905.2	3,386.7
2014	286.9	179.1	466.1	189.2	972.4	1,161.6	536.3	3,437.3	3,973.6
2019	323.4	201.3	524.7	225.2	1,243.3	1,468.4	568.8	3,775.8	4,344.7

Year	Dumai Kab. Bengkalis			Others			Riau Province		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
1987	(0.0)	0.0	0.0	(0.6)	0.3	0.9	(53.5)	151.3	204.8
1988	(0.0)	0.0	0.0	(0.3)	0.2	0.5	(81.8)	246.5	328.2
1989	(0.0)	0.0	0.0	(0.2)	0.1	0.3	(126.8)	392.3	519.1
1990	(0.0)	0.0	0.0	(0.2)	0.1	0.3	(209.8)	666.7	876.4
1991	(6.7)	22.2	28.9	(0.0)	0.0	0.0	(223.2)	711.1	934.4
1992	(13.1)	43.7	56.8	(34.1)	17.1	51.2	(294.3)	821.6	1,115.8
1993	(17.2)	57.3	74.5	(69.5)	34.7	104.2	(388.0)	968.3	1,356.4
1994	(32.0)	106.6	138.6	(57.2)	51.6	108.8	(424.2)	1,284.0	1,708.2
G.R. (%)	(60.2)	60.6	(60.5)	(103.8)	103.6	(103.7)	(38.3)	35.8	(36.5)
1999	97.0	317.8	414.9	106.5	97.5	204.0	727.7	2,261.5	2,989.2
2004	147.8	512.7	660.5	173.5	157.2	330.7	1,077.9	3,445.5	4,426.0
2009	171.1	733.5	904.5	206.7	224.9	431.6	1,240.7	4,685.6	5,926.3
2014	203.0	942.0	1,145.1	255.8	288.9	544.7	1,471.3	5,819.8	7,291.1
2019	221.7	1,100.3	1,322.0	287.5	337.4	625.0	1,626.6	6,658.2	8,284.8

Source : Dinas Pariwisata, Propinsi Riau (Historical data up to 1993)

Note : (1) Figures in parentheses are estimated ones.

(2) G.R. = Annual growth rate from 1987 to 1993 in principle

Table VIII.3.21 (2/2) HISTORICAL AND FORECASTED NUMBERS OF TOURISTS

(2) West Sumatra Province

Unit : 1,000 persons

Year	Kodya. Padang			Kodya. Bkittingi		
	Domestic	Foreign	Total	Domestic	Foreign	Total
1989	101.1	14.2	115.3	24.2	13.6	37.8
1990	95.0	14.6	109.6	20.9	11.0	31.9
1991	165.7	37.7	203.4	30.2	24.2	54.4
1992	190.5	43.4	233.9	34.8	27.8	62.6
1993	222.9	50.7	273.6	40.7	32.5	73.2
1994	268.9	62.3	331.2	46.6	37.6	84.2
G.R. (%)	25.6	43.8	28.2	16.8	30.6	22.1
1999	622.5	158.3	780.8	92.1	80.4	172.5
2004	971.2	300.5	1,271.7	143.8	158.9	302.7
2009	1,417.9	469.5	1,887.4	209.9	270.1	480.0
2014	1,938.0	722.4	2,660.4	286.9	415.6	702.5
2019	2,473.5	1,061.4	3,534.9	366.1	610.7	976.8

Year	Others			West Sumatra Province		
	Domestic	Foreign	Total	Domestic	Foreign	Total
1989	249.7	8.9	258.6	375.0	36.8	411.7
1990	304.1	23.1	327.2	420.0	48.7	468.7
1991	279.3	5.9	285.2	475.2	67.8	543.0
1992	321.2	5.0	326.2	546.5	76.2	622.6
1993	375.7	0.6	376.4	639.3	83.9	723.2
1994	413.3	0.7	414.0	728.8	100.6	829.4
G.R. (%)	9.1	-49.9	7.8	14.2	23.3	15.2
1999	658.1	1.5	659.6	1,372.7	240.2	1,612.9
2004	902.2	3.0	905.2	2,017.2	462.4	2,479.6
2009	1,201.4	5.0	1,206.4	2,829.2	744.6	3,573.8
2014	1,560.9	7.7	1,568.6	3,785.8	1,145.7	4,931.5
2019	1,992.1	11.3	2,003.4	4,831.7	1,683.4	6,515.1

Source : Dinas Pariwisata, Propinsi Sumatera Barat (Historical data up to 1993)

Note : (1) Figures in parentheses are estimated ones.

(2) G.R. = Annual growth rate from 1989 to 1993 in principle

Table VIII.3.22 FUTURE NUMBERS OF TOURISTS BY REGENCY

(1) Riau Province

Unit : 1,000 persons

Year	Kodya. Pekanbaru	Kab. Indragiri Hilir	Kab. Indragiri Hulu	Kab. Kampar	Total
1994	83.9	26.9	38.0	60.1	208.8
1999	169.6	51.7	73.0	115.5	409.8
2004	343.9	87.7	123.9	196.1	751.6
2009	454.4	117.9	166.4	263.5	1,002.1
2014	609.8	164.2	231.8	367.0	1,372.8
2019	807.1	212.5	300.0	475.0	1,794.6

(2) West Sumatra Province

Unit : 1,000 persons

Year	Kab.Solok	Kab.Sawahlunto/ Sijunjung	Kab. Tanah Datar	Kab. Agam	Kab. Limapuluh Kota	Kab. Pasaman
1994	95.6	18.9	45.3	46.6	32.7	27.7
1999	152.4	30.1	72.2	74.2	52.1	44.1
2004	209.1	41.3	99.0	101.8	71.5	60.5
2009	278.7	55.0	132.0	135.7	95.3	80.7
2014	362.4	71.5	171.6	176.4	124.0	104.9
2019	462.8	91.3	219.2	225.3	158.3	134.0

Year	Kodya. Solok	Kodya. Sawahlunto	Kodya. Padang Panjang	Kodya. Bukittinggi	Kodya. Payakumbuh	Total
1994	7.6	1.3	8.8	84.2	5.0	373.6
1999	12.0	2.0	14.0	172.5	8.0	633.6
2004	16.5	2.8	19.3	302.6	11.0	935.4
2009	22.0	3.7	25.7	480.0	14.7	1,323.4
2014	28.6	4.8	33.4	702.5	19.1	1,799.1
2019	36.5	6.1	42.6	976.8	24.4	2,377.4

Table VIII.3.23 (1/2) FUTURE WATER DEMAND OF TOURISM

(1) Kampar River Basin

Population Unit : 1,000 persons

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (22%)	Tourist Population	7.2	11.5	15.7	21.0	27.3	34.8
	Water Demand (1,000 m ³ /year)	2.2	3.4	4.7	6.3	8.2	10.4
	(m ³ /day)	5.9	9.4	12.9	17.2	22.4	28.6
2) Kab. Indragiri Hulu (15%)	Tourist Population	5.7	11.0	18.6	25.0	34.8	45.0
	Water Demand (1,000 m ³ /year)	1.7	3.3	5.6	7.5	10.4	13.5
	(m ³ /day)	4.7	9.0	15.3	20.5	28.6	37.0
3) Kab. Kampar (55%)	Tourist Population	33.1	63.5	107.9	144.9	201.9	261.3
	Water Demand (1,000 m ³ /year)	9.9	19.1	32.4	43.5	60.6	78.4
	(m ³ /day)	27.2	52.2	88.6	119.1	165.9	214.7
4) Kodya Pekanbaru (100%)	Tourist Population	83.9	169.6	343.9	454.4	609.8	807.1
	Water Demand (1,000 m ³ /year)	25.2	50.9	103.2	136.3	182.9	242.1
	(m ³ /day)	69.0	139.4	282.7	373.5	501.2	663.4
Kampar River Basin	Tourist Population	129.8	255.5	486.1	645.3	873.7	1,148.2
	Water Demand (1,000 m ³ /year)	39.0	76.7	145.8	193.6	262.1	344.5
	(m ³ /day)	106.7	210.0	399.5	530.3	718.1	943.7
	(m ³ /sec)	0.001	0.002	0.005	0.006	0.008	0.011

- Note : (1) Unit water consumption is assumed to be 10 l/capita/day.
 (2) Average days of touring is assumed to be 30 days/capita/year.
 (3) Percentage in parentheses indicate population share given in Table VIII.1.1.

Table VIII.3.23 (2/2) FUTURE WATER DEMAND OF TOURISM

(2) Indragiri River Basin

Population Unit : 1,000 persons

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (78%)	Tourist Population	25.5	40.6	55.8	74.3	96.7	123.5
	Water Demand (1,000 m ³ /year)	7.7	12.2	16.7	22.3	29.0	37.0
	(m ³ /day)	21.0	33.4	45.8	61.1	79.5	101.5
2) Kab. Agam (45%)	Tourist Population	21.0	33.4	45.8	61.1	79.4	101.4
	Water Demand (1,000 m ³ /year)	6.3	10.0	13.7	18.3	23.8	30.4
	(m ³ /day)	17.2	27.4	37.7	50.2	65.2	83.3
3) Kab. Tanah Datar (100%)	Tourist Population	45.3	72.2	99.0	132.0	171.6	219.2
	Water Demand (1,000 m ³ /year)	4.5	7.2	9.9	13.2	17.2	21.9
	(m ³ /day)	12.4	19.8	27.1	36.2	47.0	60.1
4) Kab. Solok (49%)	Tourist Population	46.8	74.7	102.5	136.6	177.6	226.8
	Water Demand (1,000 m ³ /year)	14.1	22.4	30.7	41.0	53.3	68.0
	(m ³ /day)	38.5	61.4	84.2	112.2	146.0	186.4
5) Kab. Sawahlunto/ Sijunjung (54%)	Tourist Population	10.2	16.3	22.3	29.7	38.6	49.3
	Water Demand (1,000 m ³ /year)	3.1	4.9	6.7	8.9	11.6	14.8
	(m ³ /day)	8.4	13.4	18.3	24.4	31.7	40.5
6) Kodya Payakumbuh (100%)	Tourist Population	5.0	8.0	11.0	14.7	19.1	24.4
	Water Demand (1,000 m ³ /year)	1.5	2.4	3.3	4.4	5.7	7.3
	(m ³ /day)	4.1	6.6	9.0	12.1	15.7	20.1
7) Kodya Bukittinggi (100%)	Tourist Population	84.2	172.5	302.6	480.0	702.5	976.8
	Water Demand (1,000 m ³ /year)	25.3	51.8	90.8	144.0	210.8	293.0
	(m ³ /day)	69.2	141.8	248.7	394.5	577.4	802.8
8) Kodya Padang Panjang (100%)	Tourist Population	8.8	14.0	19.3	25.7	33.4	42.6
	Water Demand (1,000 m ³ /year)	2.6	4.2	5.8	7.7	10.0	12.8
	(m ³ /day)	7.2	11.5	15.9	21.1	27.5	35.0
9) Kodya Solok (100%)	Tourist Population	7.6	12.0	16.5	22.0	28.6	36.5
	Water Demand (1,000 m ³ /year)	2.3	3.6	5.0	6.6	8.6	11.0
	(m ³ /day)	6.2	9.9	13.6	18.1	23.5	30.0
10) Kodya Sawahlunto (100%)	Tourist Population	1.3	2.0	2.8	3.7	4.8	6.1
	Water Demand (1,000 m ³ /year)	0.4	0.6	0.8	1.1	1.4	1.8
	(m ³ /day)	1.1	1.6	2.3	3.0	3.9	5.0
11) Kab. Indragiri Hulu (80%)	Tourist Population	30.4	58.4	99.1	133.1	185.4	240.0
	Water Demand (1,000 m ³ /year)	9.1	17.5	29.7	39.9	55.6	72.0
	(m ³ /day)	25.0	48.0	81.5	109.4	152.4	197.3
12) Kab. Indragiri Hilir (69%)	Tourist Population	18.6	35.7	60.5	81.4	113.3	146.6
	Water Demand (1,000 m ³ /year)	5.6	10.7	18.2	24.4	34.0	44.0
	(m ³ /day)	15.3	29.3	49.7	66.9	93.1	120.5
Indragiri River Basin	Tourist Population	304.7	539.7	837.2	1,194.2	1,651.0	2,193.2
	Water Demand (1,000 m ³ /year)	82.3	147.5	231.4	331.9	461.0	614.1
	(m ³ /day)	225.6	404.1	633.8	909.2	1,263.0	1,682.5
	(m ³ /sec)	0.003	0.005	0.007	0.011	0.015	0.019

- Note : (1) Unit water consumption is assumed to be 10 l/capita/day.
(2) Average days of touring is assumed to be 30 days/capita/year.
(3) Percentage in parentheses indicate population share given in Table VIII.1.1.

Table VIII.3.24 (1/2) FUTURE WATER DEMAND OF URBAN AREA FLUSHING

(1) Kampar River Basin

Population Unit : 1,000 persons

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (5%)	Urban Population	1.7	2.9	4.1	5.5	7.1	8.7
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.01 0.3	0.02 0.5	0.02 0.7	0.03 0.9	0.03 1.0
2) Kab. Indragiri Hulu (22%)	Urban Population	5.3	7.9	11.1	15.2	20.0	25.6
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.03 1.0	0.05 1.5	0.06 2.0	0.08 2.6	0.09 2.8
3) Kab. Kampar (15%)	Urban Population	21.3	33.0	47.1	64.1	83.9	106.7
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.13 4.0	0.20 6.2	0.27 8.4	0.35 11.0	0.37 11.7
4) Kodya Pekanbaru (100%)	Urban Population	432.8	578.6	782.4	1,057.5	1,395.1	1,818.0
	Water Demand (m ³ /sec) (10 ⁶ m ³)		2.21 69.7	3.26 102.8	4.41 139.0	5.81 183.3	6.31 199.1
Kampar River Basin	Urban Population	461.1	622.4	844.7	1,142.3	1,506.1	1,959.0
	Water Demand (m ³ /sec) (10 ⁶ m ³)		2.38 75.0	3.52 111.0	4.76 150.1	6.28 197.9	6.80 214.5
Unit Water Requirement (l/capita/day)		330	330	360	360	360	300

Note : Percentages in parentheses indicate population share given in Table VIII.1.1.

Table VIII.3.24 (2/2) FUTURE WATER DEMAND OF URBAN AREA FLUSHING

(2) Indragiri River Basin

Population Unit : 1,000 persons

Regency Related	Item	1994	1999	2004	2009	2014	2019
1) Kab. Limapuluh Kota (78%)	Urban Population	6.1	10.2	14.6	19.7	25.1	32.2
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.04 1.2	0.06 1.9	0.08 2.6	0.10 3.3	0.11 3.5
2) Kab. Agam (45%)	Urban Population	16.5	19.9	23.4	27.3	31.2	35.4
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.08 2.4	0.10 3.1	0.11 3.6	0.13 4.1	0.12 3.9
3) Kab. Tanah Datar (100%)	Urban Population	21.4	27.5	33.8	40.8	48.0	55.5
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.11 3.3	0.14 4.4	0.17 5.4	0.20 6.3	0.19 6.1
4) Kab. Solok (49%)	Urban Population	6.1	10.3	15.0	20.3	26.0	32.1
	Water Demand (m ³ /sec) (10 ⁶ m ³)	0.7	1.2	2.0	2.7	3.4	3.5
5) Kab. Sawahlunto/ Sijunjung (54%)	Urban Population	17.3	23.0	29.9	38.4	48.6	60.9
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.09 2.8	0.12 3.9	0.16 5.0	0.20 6.4	0.21 6.7
6) Kodya Payakumbuh (100%)	Urban Population	57.4	65.5	73.6	84.1	93.7	103.5
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.25 7.9	0.31 9.7	0.35 11.1	0.39 12.3	0.36 11.3
7) Kodya Bukittinggi (100%)	Urban Population	81.7	83.1	84.5	85.9	87.3	88.7
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.32 10.0	0.35 11.1	0.36 11.3	0.36 11.5	0.31 9.7
8) Kodya Padang Panjang (100%)	Urban Population	35.4	39.0	42.3	46.9	51.1	55.3
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.15 4.7	0.18 5.6	0.20 6.2	0.21 6.7	0.19 6.1
9) Kodya Solok (100%)	Urban Population	20.4	24.6	29.0	35.3	41.9	48.5
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.09 3.0	0.12 3.8	0.15 4.6	0.17 5.5	0.17 5.3
10) Kodya Sawahlunto (100%)	Urban Population	15.4	16.3	17.1	18.0	18.8	19.6
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.06 2.0	0.07 2.2	0.08 2.4	0.08 2.5	0.07 2.1
11) Kab. Indragiri Hulu (80%)	Urban Population	27.0	39.9	56.4	76.9	100.9	129.5
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.15 4.8	0.24 7.4	0.32 10.1	0.42 13.3	0.45 14.2
12) Kab. Indragiri Hilir (69%)	Urban Population	17.8	23.1	28.8	35.0	41.8	49.1
	Water Demand (m ³ /sec) (10 ⁶ m ³)		0.09 2.8	0.12 3.8	0.15 4.6	0.17 5.5	0.17 5.4
Indragiri River Basin	Urban Population	322.5	382.4	448.4	528.6	614.4	710.3
	Water Demand (m ³ /sec) (10 ⁶ m ³)		1.46 46.1	1.87 58.9	2.20 69.5	2.56 80.7	2.47 77.8
Unit Water Requirement (l/capita/day)		330	330	360	360	360	300

Note : Percentages in parentheses indicate population shares given in Table VIII.1.1.

Table VIII.3.25 RIVER NAVIGATION

(1) Kampar River

Port	Kind	Unit	1988	1989	1990	1991	1992	Growth Rate (%)
Pangkalan Baru	Ship	No.	58	85	125	184	421	60.6
	Passenger	Person	409	518	715	1,045	1,527	39.6
	Cargo	Ton	143	209	305	445	1,254	66.5
Nilo Kerinci	Ship	No.	235	240	245	256	267	3.3
	Passenger	Person	827	292	1,042	1,313	1,615	32.9
	Cargo	Ton	269	331	407	501	1,579	48.5
Teluk Meranti	Ship	No.	300	283	290	302	310	1.3
	Passenger	Person	532	502	514	522	535	0.5
	Cargo	Ton	1,046	1,162	1,291	1,593	1,927	16.6
Total	Ship	No.	593	608	660	742	998	13.2
	Passenger	Person	1,768	1,312	2,271	2,880	3,677	25.2
	Cargo	Ton	1,458	1,702	2,003	2,539	4,760	31.9

Source : Departemen Perhubungan, Kanwil IV Propinsi Riau

(2) Indragiri River

Port	Kind	Unit	1988	1989	1990	1991	1992	Growth Rate (%)
Tembilahan	Ship	No.	2,845	2,826	2,790	2,754	2,485	-2.9
	Passenger	Person	10,675	16,366	38,462	69,858	66,319	66.6
	Cargo	Ton	1,443	1,796	2,783	3,985	9,957	59.4
Sungai Salak	Ship	No.	409	452	460	441	496	3.7
	Passenger	Person	632	674	1,185	817	922	9.9
	Cargo	Ton	1,796	1,655	1,406	717	853	-20.7
Teluk Kiamgang	Ship	No.	252	255	261	229	203	-5.3
	Passenger	Person	1,668	1,693	1,736	1,692	1,640	-0.3
	Cargo	Ton	229	351	485	640	1,447	53.5
Rengat	Ship	No.	282	269	271	276	280	0.1
	Passenger	Person	1,451	1,369	1,404	1,405	1,426	-0.1
	Cargo	Ton	2,331	2,199	2,210	2,243	2,300	-0.1
Peranap	Ship	No.	187	176	180	185	208	2.7
	Passenger	Person	1,805	1,703	1,746	1,988	2,640	9.6
	Cargo	Ton	523	493	506	725	422	-0.4
Total	Ship	No.	3,975	3,978	3,962	3,885	3,672	-1.8
	Passenger	Person	16,231	21,805	44,533	75,760	72,947	53.0
	Cargo	Ton	6,322	6,494	7,390	8,310	14,979	21.8

Source : Departemen Perhubungan, Kanwil IV Propinsi Riau

Table VIII.3.26 (1/2) MINIMUM MONTHLY MEAN DISCHARGES AT REFERENCE POINTS

(1) Kampar River Basin without Kotapanjang Dam

Unit : m³/sec

Year	KRP-1	KRP-2	KRP-3	KRP-4	KRP-5	KRP-6	KRP-7	KRP-8	KRP-9	KRP-10	KRP-11
1981	50.6	80.1	21.6	8.2	54.3	128.3	238.0	42.5	322.0	20.1	382.8
1982	61.7	93.3	18.6	8.8	56.4	113.9	231.2	35.3	300.8	15.8	345.1
1983	106.4	139.2	23.5	7.0	54.3	120.6	308.6	36.3	379.5	14.1	419.9
1984	82.2	150.9	44.0	7.7	94.3	223.6	400.5	48.9	492.5	23.1	547.8
1985	73.2	94.3	20.8	11.0	64.4	129.6	265.1	46.0	360.9	14.3	409.7
1986	53.9	76.1	20.7	6.6	58.2	117.8	210.3	36.5	281.1	13.8	322.0
1987	104.0	136.3	27.3	7.1	68.4	138.2	313.9	45.5	412.5	14.6	463.9
1988	91.1	140.6	23.0	6.3	54.9	121.1	278.9	37.9	350.7	17.7	398.2
1989	56.5	77.9	18.5	5.4	45.2	104.9	211.0	47.1	301.6	13.5	388.0
1990	48.9	86.7	18.4	5.8	45.0	102.1	207.8	32.3	270.4	12.5	312.3
1991	48.9	73.2	19.1	6.2	45.5	95.5	183.6	25.5	240.1	9.6	275.6
1992	51.4	74.2	24.1	6.4	57.6	110.4	216.8	25.5	265.0	9.1	303.8
Average	69.1	101.9	23.3	7.2	58.2	125.5	255.5	38.3	331.4	14.8	380.8
Max.	106.4	150.9	44.0	11.0	94.3	223.6	400.5	48.9	492.5	23.1	547.8
Min.	48.9	73.2	18.4	5.4	45.0	95.5	183.6	25.5	240.1	9.1	275.6
C.A. (km ²)	3,337	5,231	1,167	552	3,284	7,053	13,635	3,133	20,035	1,462	24,548
Specific Discharge (m ³ /sec/100 km ²)											
Average	2.07	1.95	1.99	1.31	1.77	1.78	1.87	1.22	1.65	1.01	1.55
Max.	3.19	2.89	3.77	2.00	2.87	3.17	2.94	1.56	2.46	1.58	2.23
Min.	1.46	1.40	1.57	0.97	1.37	1.35	1.35	0.81	1.20	0.62	1.12

Average of Min. = 1.20

(2) Kampar River Basin with Kotapanjang Dam

Unit : m³/sec

Year	KRP-1	KRP-2	KRP-3	KRP-4	KRP-5	KRP-6	KRP-7	KRP-8	KRP-9	KRP-10	KRP-11
1981	50.6	80.1	20.9	8.0	52.5	124.2	238.0	42.5	322.0	20.1	382.8
1982	123.3	175.9	18.0	8.8	54.5	110.3	325.3	34.1	392.7	15.3	435.6
1983	140.3	188.2	22.7	6.7	52.5	116.7	322.1	36.3	390.8	13.6	429.8
1984	168.4	227.4	44.0	7.7	94.3	223.6	492.3	48.9	584.3	23.1	639.6
1985	168.4	187.4	20.2	11.0	62.3	125.4	344.5	44.5	437.2	14.3	484.5
1986	89.9	142.4	20.7	6.6	58.2	117.8	303.7	36.5	374.4	13.8	415.3
1987	105.6	144.1	26.4	7.1	68.4	138.2	327.8	45.5	412.7	14.6	494.6
1988	168.4	212.4	23.0	6.3	54.9	121.1	350.7	37.9	422.4	17.7	470.0
1989	56.5	77.9	18.5	5.4	45.2	104.9	256.2	45.6	354.7	13.0	447.6
1990	48.9	89.9	18.4	5.8	45.0	102.1	207.8	32.3	270.4	12.5	312.3
1991	73.8	115.1	19.1	6.2	45.5	95.5	273.4	25.5	323.2	9.6	355.4
1992	137.3	189.9	24.1	6.2	55.7	106.8	319.9	25.5	387.6	9.1	426.4
Average	111.0	152.6	23.0	7.2	57.4	123.9	313.5	37.9	389.4	14.7	441.2
Max.	168.4	227.4	44.0	11.0	94.3	223.6	492.3	48.9	584.3	23.1	639.6
Min.	48.9	77.9	18.0	5.4	45.0	95.5	207.8	25.5	270.4	9.1	312.3
C.A. (km ²)	3,337	5,231	1,167	552	3,284	7,053	13,635	3,133	20,035	1,462	24,548
Specific Discharge (m ³ /sec/100 km ²)											
Average	3.32	2.92	1.97	1.30	1.75	1.76	2.30	1.21	1.94	1.01	1.80
Max.	5.05	4.35	3.77	2.00	2.87	3.17	3.61	1.56	2.92	1.58	2.61
Min.	1.46	1.49	1.54	0.97	1.37	1.35	1.52	0.81	1.35	0.62	1.27

Average of Min. = 1.25

Note : Location of reference point is referred to Fig. VIII.4.2.

Table VIII.3.26 (2/2) MINIMUM MONTHLY MEAN DISCHARGES AT REFERENCE POINTS

(3) Indragiri River Basin without Singkarak Power Station

Unit : m³/sec

Year	IRP-1	IRP-2	IRP-3	IRP-4	IRP-5	IRP-6	IRP-7	IRP-8	IRP-9	IRP-10	IRP-11
1981	15.0	13.5	48.2	4.6	73.0	91.7	20.6	126.8	136.1	17.7	165.6
1982	15.1	13.7	54.8	4.9	83.1	110.5	21.9	152.9	164.3	16.7	197.7
1983	13.5	21.9	64.3	5.0	107.3	162.6	32.5	255.8	270.1	21.1	321.8
1984	13.5	13.2	45.5	3.8	70.1	112.1	46.9	177.6	186.3	22.4	218.3
1985	13.4	15.1	49.6	3.1	70.9	94.6	26.4	136.8	144.4	16.7	169.3
1986	13.5	20.1	51.7	3.7	77.5	95.8	20.7	132.4	140.3	18.2	165.4
1987	15.7	19.4	53.5	4.8	78.9	97.6	20.9	135.9	142.7	16.7	173.6
1988	19.9	18.1	55.6	4.8	79.4	94.7	17.5	129.6	137.6	18.7	165.4
1989	14.8	16.1	58.5	4.0	84.8	101.0	19.1	149.1	157.0	27.7	202.0
1990	17.5	14.6	46.7	3.4	65.1	99.6	17.1	138.3	158.7	31.8	201.8
1991	18.0	14.9	62.3	3.8	83.7	107.6	14.5	145.2	152.4	16.8	182.9
1992	18.5	31.1	91.6	4.3	115.8	133.5	23.2	189.5	199.7	38.9	289.9
Average	15.7	17.6	56.8	4.2	82.5	108.4	23.4	155.8	165.8	22.0	204.5
Max.	19.9	31.1	91.6	5.0	115.8	162.6	46.9	255.8	270.1	38.9	321.8
Min.	13.4	13.2	45.5	3.1	65.1	91.7	14.5	126.8	136.1	16.7	165.4
C.A. (km ²)	1,580	1,076	4,679	436	7,453	9,082	1,803	12,320	13,309	1,791	16,268
Specific Discharge (m ³ /sec/100 km ²)											
Average	0.99	1.64	1.21	0.96	1.11	1.19	1.30	1.26	1.25	1.23	1.26
Max.	1.26	2.89	1.96	1.14	1.55	1.79	2.60	2.08	2.03	2.17	1.98
Min.	0.85	1.23	0.97	0.70	0.87	1.01	0.80	1.03	1.02	0.93	1.02

Note : * including (IRP-2) Singkarak lake basin
 ** excluding (IRP-2) Singkarak lake basin

Average of Min. (*) = 0.95
 Average of Min. (**) = 0.92

(4) Indragiri River Basin with Singkarak Power Station

Unit : m³/sec

Year	IRP-1	IRP-2	IRP-3	IRP-4	IRP-5	IRP-6	IRP-7	IRP-8	IRP-9	IRP-10	IRP-11
1981	15.0	2.0	36.7	4.6	66.3	85.0	20.6	120.1	129.4	17.7	158.9
1982	15.1	2.0	37.9	4.9	71.3	97.3	22.6	142.1	152.1	16.7	184.6
1983	13.5	2.0	42.6	5.2	88.8	151.4	33.5	246.8	261.6	21.1	311.7
1984	13.5	2.0	34.3	3.9	63.4	105.3	46.9	170.8	179.6	22.4	211.6
1985	13.8	2.0	33.3	3.2	58.5	83.0	27.3	126.6	134.5	16.7	160.2
1986	13.5	2.0	33.3	3.9	64.6	82.9	20.7	119.6	127.5	18.2	152.5
1987	16.2	2.0	36.1	4.8	67.2	85.9	20.9	124.1	130.9	16.7	161.8
1988	19.9	2.0	39.5	4.8	68.1	83.5	17.5	118.3	126.3	19.4	154.2
1989	15.2	2.0	33.1	4.0	57.6	73.8	19.1	126.2	138.2	27.7	182.9
1990	17.5	2.0	34.0	3.4	55.9	89.6	17.7	129.6	150.7	32.8	195.2
1991	18.6	2.0	43.1	3.9	66.6	81.9	14.5	114.3	142.2	16.8	172.7
1992	18.5	2.0	43.0	4.3	71.4	89.2	23.2	145.1	155.4	39.6	245.6
Average	15.9	2.0	37.2	4.2	66.6	92.4	23.7	140.3	152.4	22.2	191.0
Max.	19.9	2.0	43.1	5.2	88.8	151.4	46.9	246.8	261.6	39.6	311.7
Min.	13.5	2.0	33.1	3.2	55.9	73.8	14.5	114.3	126.3	16.7	152.5
C.A. (km ²)	1,580	1,076	4,679	436	7,453	9,082	1,803	12,320	13,309	1,791	16,268
Specific Discharge (m ³ /sec/100 km ²)											
Average	1.00	0.19	0.80	0.97	0.89	1.02	1.32	1.14	1.14	1.24	1.17
Max.	1.26	0.19	0.92	1.18	1.19	1.67	2.60	2.00	1.97	2.21	1.92
Min.	0.85	0.19	0.71	0.73	0.75	0.81	0.80	0.93	0.95	0.93	0.94

Note : * including (IRP-2) Singkarak lake basin
 ** excluding (IRP-2) Singkarak lake basin

Average of Min. (*) = 0.78
 Average of Min. (**) = 0.84

Location of reference point is referred to Fig. VIII.4.3.

Table VIII.3.27 SUMMARY OF FUTURE WATER DEMAND~~X~~

(1) Kampar River Basin

Unit : m³/sec

Use Item	1994	1999	2004	2009	2014	2019
1 Irrigation (*)	12.09 (3.26)	22.57 (6.96)	31.68 (9.78)	40.79 (12.60)	49.91 (15.40)	59.01 (18.22)
2 Domestic Use	0.56	1.00	1.50	2.15	3.18	4.55
3 Industry	0.23	0.34	0.46	0.58	0.68	0.81
4 Inland Fishery	0.81	0.99	1.11	1.23	1.35	1.47
5 Livestock	0.05	0.06	0.08	0.09	0.11	0.12
6 Tourism	0.00	0.00	0.01	0.01	0.01	0.01
7 Urban Area Flushing	0.00	2.38	3.52	4.76	6.28	6.80
8 Hydropower Generation	0.00	0.00	0.00	0.00	0.00	0.00
9 River Navigation	(included in river maintenance flow)					
10 River Maintenance Flow	294.58	294.58	294.58	294.58	294.58	294.58
Total	308.32 (13.74)	321.92 (27.34)	332.94 (38.36)	344.19 (49.61)	356.10 (61.52)	367.35 (72.77)

Note : * Irrigation water demand of upper row indicates peak discharge and that of lower row annual average.

(2) Indragiri River Basin

Unit : m³/sec

Use Item	1994	1999	2004	2009	2014	2019
1 Irrigation	147.70 (38.84)	122.73 (54.80)	131.80 (58.08)	140.87 (61.36)	149.94 (64.63)	159.01 (67.91)
2 Domestic Use	1.17	1.66	2.22	2.67	3.30	3.85
3 Industry	0.74	0.78	1.22	1.62	2.03	2.35
4 Inland Fishery	1.21	1.37	1.51	1.65	1.80	1.94
5 Livestock	0.11	0.12	0.14	0.16	0.18	0.20
6 Tourism	0.00	0.01	0.01	0.01	0.02	0.02
7 Urban Area Flushing	0.00	1.46	1.87	2.20	2.56	2.47
8 Hydropower Generation	0.00	43.70	43.70	43.70	43.70	43.70
9 River Navigation	(included in river maintenance flow)					
10 River Maintenance Flow	146.41	146.41	146.41	146.41	146.41	146.41
Total	297.34 (150.93)	318.24 (171.83)	328.88 (182.47)	339.29 (192.88)	349.94 (203.53)	359.95 (213.54)

Note : * Irrigation water demand of upper row indicates peak discharge and that of lower row annual average.

Table VIII.4.1 AREA AND POPULATION SHARES BY SUB-BASIN

(1) Kampar River Basin

(a) Area Share Unit : %

Regency Related	Sub-basin											Total
	1	2	3	4	5	6	7	8	9	10	11	
1) Kab. Pasaman	7											7
2) Kab. Limapuluh Kota	60			3	7	4						14
3) Kab. Indragiri Hulu			4		2	11	5	11	12	5	11	71
4) Kab. Kampar	3	7										100
5) Kodya. Pekanbaru		100										
Cathment Area (km ²)	3,337	1,894	1,187	552	1,545	3,769	1,351	3,133	3,267	1,462	3,051	24,548

(b) Population Share Unit : %

Regency Related	Sub-basin											Total
	1	2	3	4	5	6	7	8	9	10	11	
1) Kab. Pasaman	5											5
2) Kab. Limapuluh Kota	22			2	4	9						22
3) Kab. Indragiri Hulu			2		1	6	2	5	4	1	4	15
4) Kab. Kampar	3	27										55
5) Kodya. Pekanbaru		100										100

(2) Indragiri River Basin

(a) Area Share Unit : %

Regency Related	Sub-basin											Total
	1	2	3	4	5	6	7	8	9	10	11	
1) Kab. Limapuluh Kota	40											40
2) Kab. Agam	15											15
3) Kab. Tanah Datar		24	76									100
4) Kab. Solok		11	2									23
5) Kab. Sawahlunto/Sijunjung			12	3	10							38
6) Kodya. Payakumbuh	100				23							100
7) Kodya. Bukittinggi	100											100
8) Kodya. Padang Panjang		100										100
9) Kodya. Solok		100										100
10) Kodya. Sawahlunto			100									100
11) Kab. Indragiri Hulu						11	12	9	6	10		48
12) Kab. Indragiri Hilir											10	10
Cathment Area (km ²)	1,580	1,076	2,023	360	2,414	1,629	1,803	1,435	989	1,791	1,168	16,268

(b) Population Share Unit : %

Regency Related	Sub-basin											Total
	1	2	3	4	5	6	7	8	9	10	11	
1) Kab. Limapuluh Kota	78											78
2) Kab. Agam	45											45
3) Kab. Tanah Datar		24	76									100
4) Kab. Solok		37	7									49
5) Kab. Sawahlunto/Sijunjung			21	7	5							54
6) Kodya. Payakumbuh	100				26							100
7) Kodya. Bukittinggi	100											100
8) Kodya. Padang Panjang		100										100
9) Kodya. Solok		100										100
10) Kodya. Sawahlunto		100										100
11) Kab. Indragiri Hulu						26	6	25	17	6		80
12) Kab. Indragiri Hilir											69	69

Table VIII.4.2 IRRIGATION AREAS OF RESPECTIVE SUB-BASINS

(1) Extention of Existing Irrigation Area

Kampar River Basin	Sub-basin No.	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	Total		
		Existing Area (ha)	4,147	0	0	0	206	0	0	0	0	0		0	
	Share (%)	42	55	0	0	0	3	0	0	0	0	0	100		
	Potential Area (ha)	3,780	10,182	0	206	450	12,909						27,527		
	Share (%)	14	37	0	1	2	47	0	0	0	0	0	100		
Indragiri River Basin	Sub-basin No.	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11	Total		
		Existing Area (ha)	17,135	19,151	1,250	15,258	3,533	0	0	0	125	0		84,313	
			Share (%)	33	20	23	1	18	4	0	0	0		0	100
		Potential Area (ha)	17,537	19,996	1,790	21,822	6,720	0	0	0	1,346	196		0	97,705
	Share (%)	29	18	20	2	22	7	0	0	1	0	0	100		

(2) Proposed Irrigation Projects

Kampar River Basin (Rantauberangin)	Sub-basin No.	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	Total		
		Existing Area (ha)	0	0	0	0	0	0	0	0	0	0		0	
	Share (%)	0	0	0	0	0	0	0	0	0	0	0	0		
	Potential Area (ha)	0	10,794	0	0	0	0	0	0	0	0	0	10,794		
	Share (%)	0	100	0	0	0	0	0	0	0	0	0	100		
Indragiri River Basin (Lubukjambi)	Sub-basin No.	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11	Total		
		Existing Area (ha)	0	0	0	0	0	0	0	0	0	0		0	
			Share (%)	0	0	0	0	0	0	0	0	0		0	0
		Potential Area (ha)	0	0	0	0	0	23,777	0	0	0	0		0	23,777
	Share (%)	0	0	0	0	0	100	0	0	0	0	0	100		

Table VIII.4.3 PROJECTION OF IRRIGATION DEVELOPMENT AREA BY SUB-BASIN

(1) Kampar River Basin

Unit : ha

Sub-basin No.	Item	1994	1999	2004	2009	2014	2019
K-1	Irrigation Area Increment	3,204	3,337 133	3,448 111	3,558 110	3,669 111	3,780 111
K-2	Irrigation Area Increment	4,147	5,540 1,393	6,700 1,160	7,861 1,161	9,021 1,160	10,182 1,161
K-2 (Rantau Berangin)	Irrigation Area Increment	0	2,491 2,490	4,567 2,076	6,642 2,076	8,718 2,076	10,794 2,076
K-4	Irrigation Area Increment	0	48 48	87 39	127 40	166 39	206 40
K-5	Irrigation Area Increment	0	104 104	190 86	277 87	363 86	450 87
K-6	Irrigation Area Increment	206	3,137 2,931	5,580 2,443	8,023 2,443	10,466 2,443	12,909 2,443
Total	Irrigation Area Increment	7,557	14,656 7,099	20,573 5,917	26,489 5,916	32,405 5,916	38,321 5,916

Note : Irrigation areas except Rantau Berangin are those by extension of existing irrigation area.

(2) Indragiri River Basin

Unit : ha

Sub-basin No.	Item	1994	1999	2004	2009	2014	2019
I-1	Irrigation Area Increment	27,861	27,962 101	28,046 84	28,130 84	28,214 84	28,298 84
I-2	Irrigation Area Increment	17,135	17,228 93	17,305 77	17,382 77	17,460 78	17,537 78
I-3	Irrigation Area Increment	19,151	19,346 195	19,509 163	19,671 162	19,834 163	19,996 163
I-4	Irrigation Area Increment	1,250	1,375 125	1,478 103	1,582 104	1,686 104	1,790 104
I-5	Irrigation Area Increment	15,258	16,773 1,515	18,035 1,262	19,297 1,262	20,560 1,263	21,822 1,263
I-6	Irrigation Area Increment	3,533	4,268 735	4,881 613	5,494 613	6,107 613	6,720 613
I-6 (Lubuk Jambi)	Irrigation Area Increment	0	5,487 5,485	10,060 4,573	14,632 4,573	19,205 4,573	23,777 4,573
I-9	Irrigation Area Increment	0	311 311	569 258	828 259	1,087 259	1,346 259
I-10	Irrigation Area Increment	125	141 16	155 14	169 14	182 13	196 13
Total	Irrigation Area Increment	84,313	92,890 8,577	100,038 7,148	107,186 7,148	114,334 7,148	121,482 7,148

Note : Irrigation areas except Lubukjambi are those by extension of existing irrigation area.

Table VIII.4.4 (1/2) FUTURE IRRIGATION WATER DEMAND BY SUB-BASIN IN KAMPAR RIVER BASIN
(BASE YEAR :1988)

(1) Year : 1994

Sub-basin No.	Irrigation Area (ha)	Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec		
		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-30	1-15	16-31	
K-1	3,204	0.10	0.00	0.00	4.10	1.67	1.47	0.74	3.75	1.60	0.80	0.74	0.13	0.00	0.00	0.00	0.00	0.00	5.13	1.35	3.78	2.60	0.74	2.98	0.74	0.74
K-2	4,147	0.12	0.00	0.00	5.31	2.16	1.91	0.95	4.85	2.07	1.04	0.95	0.17	0.00	0.00	0.00	0.00	0.00	6.64	1.74	4.89	3.36	0.95	3.86	0.95	0.95
K-2 (*)	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-6	206	0.01	0.00	0.00	0.26	0.11	0.09	0.05	0.24	0.10	0.05	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.33	0.09	0.24	0.17	0.05	0.19	0.05	0.05
Total	7,557	0.23	0.00	0.00	9.67	3.93	3.48	1.74	8.84	3.78	1.89	1.74	0.30	0.00	0.00	0.00	0.00	0.00	12.09	3.17	8.92	6.12	1.74	7.03	1.74	1.74
U.W.R. (l/sec/ha)		0.03	0.00	0.00	1.28	0.52	0.46	0.23	1.17	0.50	0.25	0.23	0.04	0.00	0.00	0.00	0.00	0.00	1.60	0.42	1.18	0.81	0.23	0.93	0.23	0.23

(2) Year : 1999

Sub-basin No.	Irrigation Area (ha)	Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec	
		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31
K-1	3,337	2.70	0.77	0.77	0.83	0.00	0.00	2.10	5.14	1.67	1.80	1.33	2.87	3.60	2.67	0.83	0.00	0.00	0.00	0.00	0.00	4.64	1.67	3.14	0.77
K-2	5,540	4.49	1.27	1.27	1.38	0.00	0.00	3.49	8.53	2.77	2.99	2.22	4.76	5.98	4.43	1.38	0.00	0.00	0.00	0.00	0.00	7.70	2.77	5.21	1.27
K-2 (*)	2,491	2.02	0.57	0.57	0.62	0.00	0.00	1.57	3.84	1.25	1.35	1.00	2.14	2.69	1.99	0.62	0.00	0.00	0.00	0.00	0.00	3.46	1.25	2.34	0.57
K-4	48	0.04	0.01	0.01	0.01	0.00	0.00	0.03	0.07	0.02	0.03	0.02	0.04	0.05	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.07	0.02	0.04	0.01
K-5	104	0.08	0.02	0.02	0.03	0.00	0.00	0.07	0.16	0.05	0.06	0.04	0.09	0.11	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.14	0.05	0.10	0.02
K-6	3,137	2.54	0.72	0.72	0.78	0.00	0.00	1.98	4.83	1.57	1.69	1.25	2.70	3.39	2.51	0.78	0.00	0.00	0.00	0.00	0.00	4.36	1.57	2.95	0.72
Total	14,656	11.87	3.37	3.37	3.66	0.00	0.00	9.23	22.57	7.33	7.91	5.86	12.60	15.83	11.73	3.66	0.00	0.00	0.00	0.00	0.00	20.37	7.33	13.78	3.37
U.W.R. (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	1.08	0.80	0.25	0.00	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23

(3) Year : 2004

Sub-basin No.	Irrigation Area (ha)	Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec	
		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31
K-1	3,448	2.79	0.79	0.79	0.86	0.00	0.00	2.17	5.31	1.72	1.86	1.38	2.97	3.72	2.76	0.86	0.00	0.00	0.00	0.00	4.79	1.72	3.24	0.79	
K-2	6,700	5.43	1.54	1.54	1.68	0.00	0.00	4.22	10.32	3.35	3.62	2.68	5.76	7.24	5.36	1.68	0.00	0.00	0.00	0.00	9.31	3.35	6.30	1.54	
K-2 (*)	4,567	3.70	1.05	1.05	1.14	0.00	0.00	2.88	7.03	2.28	2.47	1.83	3.93	4.93	3.65	1.14	0.00	0.00	0.00	0.00	6.35	2.28	4.29	1.05	
K-4	87	0.07	0.02	0.02	0.02	0.00	0.00	0.05	0.13	0.04	0.05	0.03	0.07	0.09	0.07	0.02	0.00	0.00	0.00	0.00	0.12	0.04	0.08	0.02	
K-5	190	0.15	0.04	0.04	0.05	0.00	0.00	0.12	0.29	0.10	0.10	0.08	0.16	0.21	0.15	0.05	0.00	0.00	0.00	0.00	0.26	0.10	0.18	0.04	
K-6	5,580	4.52	1.28	1.28	1.40	0.00	0.00	3.52	8.59	2.79	3.01	2.23	4.80	6.03	4.46	1.40	0.00	0.00	0.00	0.00	7.76	2.79	5.25	1.28	
Total	20,573	16.66	4.73	4.73	5.14	0.00	0.00	12.96	31.68	10.29	11.11	8.23	17.69	22.22	16.46	5.14	0.00	0.00	0.00	0.00	28.60	10.29	19.34	4.73	
U.W.R. (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	1.08	0.80	0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	

Note : U.W.R. = Unit Water Requirement * Rantauberangin Project

Table VIII.4.4 (2/2) FUTURE IRRIGATION WATER DEMAND BY SUB-BASIN IN KAMPAR RIVER BASIN
(BASE YEAR : 1988)

Sub-basin No.	Irrigation Area (ha)	Unit : m ³ /sec																								
		Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec		
		1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	
K-1	3,558	2.88	0.82	0.89	0.00	0.00	2.24	5.48	1.78	1.92	1.42	3.06	3.84	2.85	0.89	0.00	0.00	0.00	0.00	0.00	4.95	1.78	3.34	3.34	0.82	0.82
K-2	7,861	6.37	1.81	1.97	0.00	0.00	4.95	12.11	3.93	4.24	3.14	6.76	8.49	6.29	1.97	0.00	0.00	0.00	0.00	0.00	10.93	3.93	7.39	1.81	1.81	1.81
K-2 (*)	6,642	5.38	1.53	1.66	0.00	0.00	4.18	10.23	3.32	3.59	2.66	5.71	7.17	5.31	1.66	0.00	0.00	0.00	0.00	0.00	9.23	3.32	6.24	1.53	1.53	1.53
K-4	127	0.10	0.03	0.03	0.00	0.00	0.08	0.20	0.06	0.07	0.05	0.11	0.14	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.18	0.06	0.12	0.03	0.03	0.03
K-5	277	0.22	0.06	0.06	0.00	0.00	0.17	0.43	0.14	0.15	0.11	0.24	0.30	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.38	0.14	0.26	0.06	0.06	0.06
K-6	8,023	6.50	1.85	1.85	0.00	0.00	5.05	12.36	4.01	4.33	3.21	6.90	8.67	6.42	2.01	0.00	0.00	0.00	0.00	0.00	11.15	4.01	7.54	1.85	1.85	1.85
Total	26,489	21.46	6.09	6.62	0.00	0.00	16.69	40.79	13.24	14.30	10.60	22.78	28.61	21.19	6.62	0.00	0.00	0.00	0.00	0.00	36.82	13.24	24.90	6.09	6.09	6.09
U.W.R. (l/sec/ha)		0.81	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86	1.08	0.80	0.25	0.00	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23	0.23

Sub-basin No.	Irrigation Area (ha)	Unit : m ³ /sec																							
		Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec	
		1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31
K-1	3,669	2.97	0.84	0.92	0.00	0.00	2.31	5.65	1.83	1.98	1.47	3.16	3.96	2.94	0.92	0.00	0.00	0.00	0.00	0.00	5.10	1.83	3.45	0.84	0.84
K-2	9,021	7.31	2.07	2.26	0.00	0.00	5.68	13.89	4.51	4.87	3.61	7.76	9.74	7.22	2.26	0.00	0.00	0.00	0.00	0.00	12.54	4.51	8.48	2.07	2.07
K-2 (*)	8,718	7.06	2.01	2.18	0.00	0.00	5.49	13.43	4.36	4.71	3.49	7.50	9.42	6.97	2.18	0.00	0.00	0.00	0.00	0.00	12.12	4.36	8.20	2.01	2.01
K-4	166	0.13	0.04	0.04	0.00	0.00	0.10	0.26	0.08	0.09	0.07	0.14	0.18	0.13	0.04	0.00	0.00	0.00	0.00	0.23	0.08	0.16	0.04	0.04	
K-5	363	0.29	0.08	0.08	0.00	0.00	0.23	0.56	0.18	0.20	0.15	0.31	0.39	0.29	0.09	0.00	0.00	0.00	0.00	0.51	0.18	0.34	0.08	0.08	
K-6	10,466	8.48	2.41	2.41	0.00	0.00	6.59	16.12	5.23	5.65	4.19	9.00	11.30	8.37	2.62	0.00	0.00	0.00	0.00	14.55	5.23	9.84	2.41	2.41	
Total	32,405	26.25	7.45	8.10	0.00	0.00	20.42	49.90	16.20	17.50	12.96	27.87	35.00	25.92	8.10	0.00	0.00	0.00	0.00	45.04	16.20	30.46	7.45	7.45	
U.W.R. (l/sec/ha)		0.81	0.23	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86	1.08	0.80	0.25	0.00	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23	

Sub-basin No.	Irrigation Area (ha)	Unit : m ³ /sec																							
		Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec	
		1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31
K-1	3,780	3.06	0.87	0.87	0.95	0.00	0.00	2.38	5.82	1.89	2.04	1.51	3.25	4.08	3.02	0.95	0.00	0.00	0.00	5.25	1.89	3.55	0.87	0.87	
K-2	10,182	8.25	2.34	2.34	2.55	0.00	0.00	6.41	15.68	5.09	5.50	4.07	8.76	11.00	8.15	2.55	0.00	0.00	0.00	14.15	5.09	9.57	2.34	2.34	
K-2 (*)	10,794	8.74	2.48	2.48	2.70	0.00	0.00	6.80	16.62	5.40	5.83	4.32	9.28	11.66	8.64	2.70	0.00	0.00	0.00	15.00	5.40	10.15	2.48	2.48	
K-4	206	0.17	0.05	0.05	0.05	0.00	0.00	0.13	0.32	0.10	0.11	0.08	0.18	0.22	0.16	0.05	0.00	0.00	0.00	0.29	0.10	0.19	0.05	0.05	
K-5	450	0.36	0.10	0.10	0.11	0.00	0.00	0.28	0.69	0.23	0.24	0.18	0.39	0.49	0.36	0.11	0.00	0.00	0.63	0.23	0.42	0.10	0.10		
K-6	12,909	10.46	2.97	2.97	3.23	0.00	0.00	8.13	19.88	6.45	6.97	5.16	11.10	13.94	10.33	3.23	0.00	0.00	0.00	17.94	6.45	12.13	2.97	2.97	
Total	38,321	31.04	8.81	8.81	9.58	0.00	0.00	24.14	59.01	19.16	20.69	15.33	32.96	41.39	30.66	9.58	0.00	0.00	0.00	53.27	19.16	36.02	8.81	8.81	
U.W.R. (l/sec/ha)		0.81	0.23	0.25	0.25	0.00	0.00	0.63	1.54	0.50	0.54	0.40	0.86	1.08	0.80	0.25	0.00	0.00	0.00	1.39	0.50	0.94	0.23	0.23	

Note : U.W.R. = Unit Water Requirement * Rantauberangin Project

Table VIII.4.6 (1/2) PEAK IRRIGATION WATER DEMAND BY SUB-BASIN AND SIMULATION YEAR

(1) Kampar River Basin

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave.	Max
K-1	4.55	4.26	4.55	4.13	5.32	5.38	3.88	5.13	4.01	4.93	5.25	5.03	4.70	5.38
K-2	5.89	5.52	5.89	5.35	6.88	6.97	5.02	6.64	5.18	6.39	6.80	6.51	6.09	6.97
K-2(*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-6	0.29	0.27	0.29	0.27	0.34	0.35	0.25	0.33	0.26	0.32	0.34	0.32	0.30	0.35
K-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave.	0.89	0.84	0.89	0.81	1.05	1.06	0.76	1.01	0.79	0.97	1.03	0.99	0.92	1.06
Max	5.89	5.52	5.89	5.35	6.88	6.97	5.02	6.64	5.18	6.39	6.80	6.51	6.09	6.97
Total	10.73	10.05	10.73	9.75	12.54	12.70	9.15	12.10	9.45	11.64	12.39	11.86	11.09	12.70

2) Year: 2019

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave.	Max
K-1	7.22	7.22	7.22	6.31	7.22	6.24	6.99	5.82	6.46	5.30	6.09	7.33	6.62	7.33
K-2	19.45	19.45	19.45	17.00	19.45	16.80	18.84	15.68	17.41	14.36	16.39	19.75	17.84	19.75
K-2(*)	20.62	20.62	20.62	18.03	20.62	17.81	19.97	16.62	18.46	15.22	17.38	20.94	18.91	20.94
K-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.39	0.39	0.39	0.00	0.39	0.34	0.38	0.32	0.35	0.29	0.33	0.40	0.33	0.40
K-5	0.86	0.86	0.86	0.75	0.86	0.74	0.83	0.69	0.77	0.63	0.72	0.87	0.79	0.87
K-6	24.66	24.66	24.66	21.56	24.66	21.30	23.88	19.88	22.07	18.20	20.78	25.04	22.61	25.04
K-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave.	6.10	6.10	6.10	5.30	6.10	5.27	5.91	4.92	5.46	4.50	5.14	6.19	5.59	6.19
Max	24.66	24.66	24.66	21.56	24.66	21.30	23.88	19.88	22.07	18.20	20.78	25.04	22.61	25.04
Total	73.20	73.20	73.20	63.65	73.20	63.23	70.89	59.01	65.52	54.00	61.69	74.33	67.09	74.33

Note : * Rantauberangin Irrigation Project Area

Table VIII.4.6 (2/2) PEAK IRRIGATION WATER DEMAND BY SUB-BASIN AND SIMULATION YEAR

(2) Indragiri River Basin

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave.	Max
1-1	36.22	40.96	37.33	40.40	52.10	48.76	40.96	33.71	37.89	33.43	47.36	32.88	40.17	52.10
1-2	22.28	25.19	22.96	24.85	32.04	29.99	25.19	20.73	23.30	20.56	29.13	20.22	24.70	32.04
1-3	24.90	28.15	25.66	27.77	35.81	33.51	28.15	23.17	26.05	22.98	32.56	22.60	27.61	35.81
1-4	1.63	1.84	1.68	1.81	2.34	2.19	1.84	1.51	1.70	1.50	2.13	1.48	1.80	2.34
1-5	19.84	22.43	20.45	22.12	28.53	26.70	22.43	18.46	20.75	18.31	25.94	18.00	22.00	28.53
1-6	2.69	4.98	4.59	2.79	6.61	6.39	6.75	4.73	3.89	4.73	3.85	5.26	4.77	6.75
1-6 (*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.10	0.18	0.16	0.10	0.23	0.23	0.24	0.17	0.14	0.17	0.14	0.19	0.17	0.24
1-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave.	8.97	10.31	9.40	9.99	13.14	12.31	10.46	8.54	9.48	8.47	11.76	8.39	10.10	13.15
Max	36.22	40.96	37.33	40.40	52.10	48.76	40.96	33.71	37.89	33.43	47.36	32.88	40.17	52.10
Total	107.66	123.73	112.83	119.84	157.66	147.77	125.56	102.48	113.72	101.68	141.11	100.63	121.22	157.81

2) Year : 2019

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave.	Max
1-1	38.77	36.79	38.77	54.05	44.14	38.77	38.77	50.65	45.84	41.32	54.90	44.14	43.91	54.90
1-2	24.03	22.80	24.03	33.50	27.36	24.03	24.03	31.39	28.41	25.60	34.02	27.36	27.21	34.02
1-3	27.39	26.00	27.39	38.19	31.19	27.39	27.39	35.79	32.39	29.19	38.79	31.19	31.02	38.79
1-4	2.45	2.33	2.45	3.42	2.79	2.45	2.45	3.20	2.90	2.61	3.47	2.79	2.78	3.47
1-5	29.90	28.37	29.90	41.68	34.04	29.90	29.90	39.06	35.35	31.86	42.33	34.04	33.86	42.33
1-6	9.34	10.48	9.54	6.59	10.08	10.08	12.10	11.16	9.61	11.16	13.57	10.48	10.35	13.57
1-6 (*)	33.05	37.09	33.76	23.30	35.67	35.67	42.80	39.47	34.00	39.47	48.03	37.09	36.62	48.03
1-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-9	1.87	2.10	1.91	1.32	2.02	2.02	2.42	2.23	1.92	2.23	2.72	2.10	2.07	2.72
1-10	0.27	0.31	0.28	0.19	0.29	0.29	0.35	0.33	0.28	0.33	0.40	0.31	0.30	0.40
1-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave.	13.92	13.86	14.00	16.85	15.63	14.22	15.02	17.77	15.89	15.31	19.85	15.79	15.68	19.85
Max	38.77	37.09	38.77	54.05	44.14	38.77	42.80	50.65	45.84	41.32	54.90	44.14	43.91	54.90
Total	167.07	166.27	168.03	202.24	187.58	170.60	180.21	213.28	190.70	183.77	238.23	189.50	188.12	238.23

Note : * Lubukjambi Irrigation Project Area

Table VIII.4.7 (1/2) ANNUAL IRRIGATION WATER DEMAND BY SUB-BASIN AND SIMULATION YEAR

(1) Kampar River Basin

1) Present Demand in 1994

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave	Max
K-1	1.57	1.45	1.52	1.33	1.62	1.27	1.26	1.38	1.45	1.56	1.30	1.47	1.43	1.62
K-2	2.03	1.87	1.97	1.72	2.10	1.64	1.63	1.79	1.88	2.02	1.68	1.91	1.85	2.10
K-2(*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-6	0.10	0.09	0.10	0.09	0.10	0.08	0.08	0.09	0.09	0.10	0.08	0.09	0.09	0.10
K-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave	0.31	0.28	0.30	0.26	0.32	0.25	0.25	0.27	0.29	0.31	0.26	0.29	0.28	0.32
Max	2.03	1.87	1.97	1.72	2.10	1.64	1.63	1.79	1.88	2.02	1.68	1.91	1.85	2.10
Total	3.70	3.41	3.59	3.14	3.82	2.99	2.97	3.26	3.42	3.68	3.06	3.47	3.38	3.82

2) Future Demand in 2019

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave	Max
K-1	1.94	2.14	2.60	2.26	2.27	2.07	2.17	1.80	2.15	1.87	2.06	2.16	2.12	2.60
K-2	5.22	5.75	7.00	6.08	6.12	5.57	5.85	4.84	5.78	5.04	5.55	5.82	5.72	7.00
K-2(*)	5.54	6.10	7.43	6.45	6.49	5.91	6.21	5.13	6.13	5.34	5.88	6.17	6.07	7.43
K-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.11	0.12	0.14	0.00	0.12	0.11	0.12	0.10	0.12	0.10	0.11	0.12	0.11	0.14
K-5	0.23	0.25	0.31	0.27	0.27	0.25	0.26	0.21	0.26	0.22	0.25	0.26	0.25	0.31
K-6	6.62	7.29	8.88	7.71	7.76	7.07	7.42	6.14	7.33	6.38	7.04	7.38	7.25	8.88
K-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave	1.64	1.80	2.20	1.90	1.92	1.75	1.84	1.52	1.81	1.58	1.74	1.83	1.79	2.20
Max	6.62	7.29	8.88	7.71	7.76	7.07	7.42	6.14	7.33	6.38	7.04	7.38	7.25	8.88
Total	19.66	21.65	26.36	22.77	23.03	20.98	22.03	18.22	21.77	18.95	20.89	21.91	21.52	26.36

Note : * Rantauberangin Irrigation Project Area

Table VIII.4.7 (2/2) ANNUAL IRRIGATION WATER DEMAND BY SUB-BASIN AND SIMULATION YEAR

(2) Indragiri River Basin

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave	Max
1) Present Demand in 1994														
I-1	11.75	11.33	14.08	12.32	13.66	13.14	11.82	11.62	11.46	12.71	13.06	10.97	12.33	14.08
I-2	7.23	6.97	8.66	7.58	8.40	8.08	7.27	7.15	7.05	7.82	8.03	6.75	7.58	8.66
I-3	8.08	7.79	9.68	8.47	9.39	9.03	8.12	7.99	7.88	8.74	8.98	7.54	8.47	9.68
I-4	0.53	0.51	0.63	0.55	0.61	0.59	0.53	0.52	0.51	0.57	0.59	0.49	0.55	0.63
I-5	6.43	6.20	7.71	6.75	7.48	7.20	6.47	6.36	6.27	6.96	7.15	6.01	6.75	7.71
I-6	0.54	0.52	0.84	0.35	0.87	0.77	1.07	0.88	0.83	0.96	0.79	1.03	0.79	1.07
I-6 (*)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-10	0.02	0.02	0.03	0.01	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.04
I-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave	2.88	2.78	3.47	3.00	3.37	3.24	2.94	2.88	2.84	3.15	3.22	2.74	3.04	3.49
Max	11.75	11.33	14.08	12.32	13.66	13.14	11.82	11.62	11.46	12.71	13.06	10.97	12.33	14.08
Total	34.58	33.34	41.63	36.02	40.44	38.84	35.32	34.55	34.03	37.79	38.63	32.83	36.50	41.87

Unit : m³/sec

Year/ Sub-basin	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Ave	Max
2) Future Demand in 2019														
I-1	15.38	13.25	17.84	13.62	18.44	17.32	15.10	18.04	15.21	15.10	13.56	14.36	15.60	18.44
I-2	9.53	8.21	11.06	8.44	11.43	10.73	9.36	11.18	9.43	9.36	8.40	8.90	9.67	11.43
I-3	10.86	9.36	12.61	9.62	13.03	12.24	10.67	12.75	10.75	10.67	9.58	10.15	11.02	13.03
I-4	0.97	0.84	1.13	0.86	1.17	1.10	0.96	1.14	0.96	0.96	0.86	0.91	0.99	1.17
I-5	11.86	10.22	13.76	10.50	14.22	13.36	11.65	13.91	11.73	11.65	10.46	11.07	12.03	14.22
I-6	3.10	2.56	3.01	2.58	3.51	2.76	4.41	5.10	3.27	4.58	3.37	3.75	3.50	5.10
I-6 (*)	10.97	9.05	10.66	9.14	12.40	9.77	15.59	18.04	11.57	16.22	11.92	13.29	12.39	18.04
I-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-9	0.62	0.51	0.60	0.52	0.70	0.55	0.88	1.02	0.66	0.92	0.67	0.75	0.70	1.02
I-10	0.09	0.07	0.09	0.08	0.10	0.08	0.13	0.15	0.10	0.13	0.10	0.11	0.10	0.15
I-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ave	5.28	4.51	5.90	4.61	6.25	5.66	5.73	6.78	5.31	5.80	4.91	5.27	5.50	6.88
Max	15.38	13.25	17.84	13.62	18.44	17.32	15.59	18.04	15.21	16.22	13.56	14.36	15.60	18.44
Total	63.38	54.07	70.76	55.36	75.00	67.91	68.75	81.33	63.68	69.59	58.92	63.29	66.00	82.60

Note : * Lubakjambi Irrigation Project Area

Table VIII.4.8 FUTURE DOMESTIC WATER DEMAND BY SUB-BASIN

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.05	0.07	0.09	0.10	0.13	0.14
K-2	0.42	0.79	1.22	1.82	2.76	4.06
K-3	0.00	0.01	0.01	0.01	0.02	0.02
K-4	0.00	0.01	0.01	0.01	0.01	0.02
K-5	0.01	0.02	0.02	0.03	0.03	0.04
K-6	0.03	0.05	0.07	0.08	0.10	0.13
K-7	0.00	0.01	0.01	0.01	0.02	0.02
K-8	0.01	0.02	0.03	0.03	0.04	0.05
K-9	0.01	0.02	0.02	0.03	0.03	0.04
K-10	0.00	0.00	0.01	0.01	0.01	0.01
K-11	0.01	0.02	0.02	0.03	0.03	0.04
Total	0.55	1.00	1.50	2.15	3.18	4.55

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin No.	1994	1999	2004	2009	2014	2019
I-1	0.42	0.58	0.75	0.88	1.05	1.16
I-2	0.24	0.32	0.45	0.56	0.70	0.82
I-3	0.17	0.22	0.30	0.38	0.48	0.55
I-4	0.01	0.01	0.02	0.02	0.03	0.04
I-5	0.05	0.06	0.08	0.10	0.13	0.16
I-6	0.05	0.07	0.10	0.12	0.16	0.20
I-7	0.01	0.02	0.02	0.03	0.04	0.05
I-8	0.05	0.07	0.10	0.12	0.15	0.19
I-9	0.03	0.05	0.07	0.08	0.10	0.13
I-10	0.01	0.02	0.02	0.03	0.04	0.05
I-11	0.13	0.25	0.31	0.35	0.42	0.51
Total	1.17	1.66	2.22	2.67	3.30	3.85

Table VIII.4.9 FUTURE WATER DEMAND OF INDUSTRY BY SUB-BASIN

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.00	0.00	0.00	0.00	0.00	0.00
K-2	0.22	0.33	0.45	0.56	0.67	0.79
K-3	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0.00	0.00	0.00	0.00	0.00	0.00
K-6	0.01	0.01	0.01	0.02	0.02	0.02
K-7	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.23	0.34	0.46	0.58	0.69	0.81

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
I-1	0.00	0.00	0.00	0.00	0.00	0.00
I-2	0.00	0.00	0.00	0.00	0.00	0.00
I-3	0.26	0.28	0.45	0.60	0.76	0.89
I-4	0.09	0.09	0.15	0.20	0.25	0.30
I-5	0.33	0.35	0.56	0.74	0.94	1.09
I-6	0.01	0.01	0.01	0.01	0.01	0.01
I-7	0.00	0.00	0.00	0.00	0.00	0.00
I-8	0.01	0.01	0.01	0.01	0.01	0.01
I-9	0.00	0.00	0.00	0.00	0.00	0.00
I-10	0.00	0.00	0.00	0.00	0.00	0.00
I-11	0.04	0.04	0.05	0.05	0.05	0.05
Total	0.74	0.78	1.22	1.62	2.03	2.35

**Table VIII.4.10 FUTURE WATER DEMAND OF INLAND FISHERY
BY SUB-BASIN**

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.59	0.64	0.67	0.71	0.75	0.79
K-2	0.02	0.03	0.04	0.05	0.06	0.07
K-3	0.01	0.02	0.02	0.03	0.03	0.04
K-4	0.00	0.00	0.01	0.01	0.01	0.01
K-5	0.01	0.02	0.03	0.03	0.03	0.04
K-6	0.04	0.06	0.07	0.09	0.10	0.11
K-7	0.01	0.02	0.03	0.04	0.04	0.05
K-8	0.03	0.05	0.07	0.08	0.09	0.10
K-9	0.04	0.06	0.07	0.09	0.10	0.11
K-10	0.01	0.02	0.03	0.04	0.04	0.05
K-11	0.03	0.05	0.07	0.08	0.09	0.10
Total	0.81	0.99	1.11	1.23	1.35	1.47

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
I-1	0.39	0.42	0.44	0.46	0.48	0.51
I-2	0.17	0.18	0.20	0.21	0.23	0.24
I-3	0.46	0.51	0.56	0.61	0.66	0.71
I-4	0.01	0.02	0.02	0.02	0.03	0.03
I-5	0.12	0.16	0.20	0.23	0.27	0.30
I-6	0.01	0.02	0.02	0.02	0.03	0.03
I-7	0.01	0.02	0.02	0.03	0.03	0.04
I-8	0.01	0.01	0.02	0.02	0.02	0.03
I-9	0.01	0.01	0.01	0.01	0.02	0.02
I-10	0.01	0.02	0.02	0.02	0.03	0.03
I-11	0.01	0.01	0.01	0.01	0.02	0.02
Total	1.21	1.37	1.51	1.65	1.80	1.94

Table VIII.4.11 FUTURE WATER DEMAND OF LIVESTOCK BY SUB-BASIN

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.02	0.03	0.03	0.03	0.04	0.04
K-2	0.00	0.00	0.00	0.00	0.01	0.01
K-3	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0.00	0.00	0.01	0.01	0.01	0.01
K-6	0.01	0.01	0.01	0.01	0.01	0.01
K-7	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.01	0.01	0.01	0.01	0.01
K-9	0.00	0.01	0.01	0.01	0.01	0.01
K-10	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.01	0.01	0.01	0.01	0.01
Total	0.05	0.06	0.08	0.09	0.11	0.12

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
I-1	0.02	0.02	0.03	0.03	0.03	0.04
I-2	0.01	0.02	0.02	0.02	0.02	0.03
I-3	0.03	0.04	0.05	0.05	0.06	0.06
I-4	0.00	0.00	0.00	0.00	0.00	0.00
I-5	0.02	0.02	0.02	0.02	0.03	0.03
I-6	0.00	0.01	0.01	0.01	0.01	0.01
I-7	0.01	0.01	0.01	0.01	0.01	0.01
I-8	0.00	0.00	0.01	0.01	0.01	0.01
I-9	0.00	0.00	0.00	0.00	0.00	0.00
I-10	0.00	0.00	0.01	0.01	0.01	0.01
I-11	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.11	0.12	0.14	0.16	0.18	0.20

Table VIII.4.12 FUTURE WATER DEMAND OF TOURISM BY SUB-BASIN

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.00	0.00	0.00	0.00	0.00	0.00
K-2	0.00	0.00	0.01	0.01	0.01	0.01
K-3	0.00	0.00	0.00	0.00	0.00	0.00
K-4	0.00	0.00	0.00	0.00	0.00	0.00
K-5	0.00	0.00	0.00	0.00	0.00	0.00
K-6	0.00	0.00	0.00	0.00	0.00	0.00
K-7	0.00	0.00	0.00	0.00	0.00	0.00
K-8	0.00	0.00	0.00	0.00	0.00	0.00
K-9	0.00	0.00	0.00	0.00	0.00	0.00
K-10	0.00	0.00	0.00	0.00	0.00	0.00
K-11	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.01	0.01	0.01	0.01

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
I-1	0.00	0.01	0.01	0.01	0.02	0.02
I-2	0.00	0.00	0.00	0.00	0.00	0.00
I-3	0.00	0.00	0.00	0.00	0.00	0.00
I-4	0.00	0.00	0.00	0.00	0.00	0.00
I-5	0.00	0.00	0.00	0.00	0.00	0.00
I-6	0.00	0.00	0.00	0.00	0.00	0.00
I-7	0.00	0.00	0.00	0.00	0.00	0.00
I-8	0.00	0.00	0.00	0.00	0.00	0.00
I-9	0.00	0.00	0.00	0.00	0.00	0.00
I-10	0.00	0.00	0.00	0.00	0.00	0.00
I-11	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.01	0.01	0.01	0.02	0.02

**Table VIII.4.13 FUTURE WATER DEMAND OF URBAN AREA FLUSHING
BY SUB-BASIN**

(1) Kampar River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
K-1	0.00	0.02	0.03	0.04	0.05	0.05
K-2	0.00	2.27	3.36	4.54	5.98	6.49
K-3	0.00	0.00	0.01	0.01	0.01	0.01
K-4	0.00	0.00	0.01	0.01	0.01	0.01
K-5	0.00	0.01	0.02	0.02	0.03	0.03
K-6	0.00	0.03	0.05	0.07	0.09	0.09
K-7	0.00	0.00	0.01	0.01	0.01	0.01
K-8	0.00	0.01	0.02	0.02	0.03	0.03
K-9	0.00	0.01	0.01	0.02	0.03	0.03
K-10	0.00	0.00	0.00	0.00	0.01	0.01
K-11	0.00	0.01	0.01	0.02	0.03	0.03
Total	0.00	2.38	3.52	4.76	6.28	6.80

(2) Indragiri River Basin

Unit : m³/sec

Sub-basin	1994	1999	2004	2009	2014	2019
I-1	0.00	0.68	0.82	0.90	0.99	0.90
I-2	0.00	0.36	0.45	0.52	0.60	0.56
I-3	0.00	0.12	0.16	0.20	0.25	0.24
I-4	0.00	0.01	0.02	0.02	0.03	0.03
I-5	0.00	0.05	0.07	0.09	0.11	0.11
I-6	0.00	0.05	0.08	0.11	0.14	0.15
I-7	0.00	0.01	0.02	0.03	0.03	0.04
I-8	0.00	0.05	0.08	0.11	0.14	0.15
I-9	0.00	0.03	0.05	0.07	0.09	0.10
I-10	0.00	0.01	0.02	0.02	0.03	0.03
I-11	0.00	0.08	0.11	0.14	0.15	0.16
Total	0.00	1.46	1.87	2.20	2.56	2.47

Table VIII.4.14 ANNUAL WATER DEFICIT BY SUB-BASIN IN 2019

(1) Kampar River Basin

Unit : 10⁶m³

Simulation Year	K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11
1981	0.0	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1982	0.0	50.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	0.0	76.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	0.0	89.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	0.0	65.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1987	0.0	69.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989	0.0	62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990	0.0	32.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	69.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	0.0	54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max.	0.0	89.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min.	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C.A. (km ²)	3,337	1,871	1,187	552	1,545	3,769	1,351	3,133	3,267	1,462	3,051

(2) Indragiri River Basin

Unit : 10⁶m³

Simulation Year	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11
1981	16.9	4.6	0.0	0.0	0.0	16.1	0.0	0.0	0.0	0.0	0.0
1982	31.1	0.4	0.0	0.0	0.0	34.2	0.0	0.0	0.0	0.0	0.0
1983	31.7	1.9	1.1	0.0	0.2	26.5	0.0	0.0	0.0	0.0	0.0
1984	19.6	1.7	1.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
1985	57.2	13.1	13.3	0.0	11.0	52.7	0.0	0.0	0.0	0.0	0.0
1986	38.1	5.6	10.8	0.0	5.5	39.7	0.0	0.0	0.0	0.0	0.0
1987	29.7	1.1	4.9	0.0	0.3	133.8	0.0	0.0	0.0	0.0	0.0
1988	10.1	3.5	4.6	0.0	0.0	272.8	0.0	0.0	0.0	0.0	0.0
1989	33.2	2.7	7.0	0.0	0.9	74.1	0.0	0.0	0.0	0.0	0.0
1990	3.6	4.3	2.3	0.0	2.1	204.7	0.0	0.0	0.0	0.0	0.0
1991	18.6	0.2	2.3	0.0	10.2	162.0	0.0	0.0	0.0	0.0	0.0
1992	20.2	2.4	7.1	0.0	4.6	96.6	0.0	0.0	0.0	0.0	0.0
Average	25.8	3.4	4.6	0.0	3.0	92.8	0.0	0.0	0.0	0.0	0.0
Max.	57.2	13.1	13.3	0.0	11.0	272.8	0.0	0.0	0.0	0.0	0.0
Min.	3.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C.A. (km ²)	1,580	1,076	2,023	360	2,414	1,629	1,803	1,435	939	1,791	1,168

Table VIII.4.15 ANNUAL WATER DEFICIT AT REFERENCE POINTS IN 2019

(1) Kampar River Basin

Unit : 10⁶m³

Simulation Year	KRP-1	KRP-2	KRP-3	KRP-4	KRP-5	KRP-6	KRP-7	KRP-8	KRP-9	KRP-10	KRP-11
1981	0.0	26.3	0.0	0.0	0.0	0.0	26.3	0.0	26.3	0.0	26.3
1982	0.0	50.5	0.0	0.0	0.0	0.0	50.5	0.0	50.5	0.0	50.5
1983	0.0	76.2	0.0	0.0	0.0	0.0	76.2	0.0	76.2	0.0	76.2
1984	0.0	28.9	0.0	0.0	0.0	0.0	28.9	0.0	28.9	0.0	28.9
1985	0.0	89.1	0.0	0.0	0.0	0.0	89.1	0.0	89.1	0.0	89.1
1986	0.0	65.2	0.0	0.0	0.0	0.0	65.2	0.0	65.2	0.0	65.2
1987	0.0	69.9	0.0	0.0	0.0	0.0	69.9	0.0	69.9	0.0	69.9
1988	0.0	16.1	0.0	0.0	0.0	0.0	16.1	0.0	16.1	0.0	16.1
1989	0.0	62.5	0.0	0.0	0.0	0.0	62.5	0.0	62.5	0.0	62.5
1990	0.0	32.8	0.0	0.0	0.0	0.0	32.8	0.0	32.8	0.0	32.8
1991	0.0	69.8	0.0	0.0	0.0	0.0	69.8	0.0	69.8	0.0	69.8
1992	0.0	60.5	0.0	0.0	0.0	0.0	60.5	0.0	60.5	0.0	60.5
Average	0.0	54.0	0.0	0.0	0.0	0.0	54.0	0.0	54.0	0.0	54.0
Max.	0.0	89.1	0.0	0.0	0.0	0.0	89.1	0.0	89.1	0.0	89.1
Min.	0.0	16.1	0.0	0.0	0.0	0.0	16.1	0.0	16.1	0.0	16.1
C.A. (km ²)	3,337	5,231	1,187	552	3,284	7,053	13,635	3,133	20,035	1,462	24,548

(2) Indragiri River Basin

Unit : 10⁶m³

Simulation Year	IRP-1	IRP-2	IRP-3	IRP-4	IRP-5	IRP-6	IRP-7	IRP-8	IRP-9	IRP-10	IRP-11
1981	16.9	4.6	16.9	0.0	16.9	33.0	0.0	33.0	33.0	0.0	33.0
1982	31.1	0.4	31.1	0.0	31.1	65.3	0.0	65.3	65.3	0.0	65.3
1983	31.7	1.9	31.7	0.0	31.8	58.3	0.0	58.3	58.3	0.0	58.3
1984	19.6	1.7	19.6	0.0	20.9	20.9	0.0	20.9	20.9	0.0	20.9
1985	57.2	13.1	57.2	0.0	68.1	120.8	0.0	120.8	120.8	0.0	120.8
1986	38.1	5.6	38.1	0.0	43.6	83.3	0.0	83.3	83.3	0.0	83.3
1987	29.7	1.1	29.7	0.0	30.0	163.8	0.0	163.8	163.8	0.0	163.8
1988	10.1	3.5	10.1	0.0	10.1	282.8	0.0	282.8	282.8	0.0	282.8
1989	33.2	2.7	33.2	0.0	34.1	108.3	0.0	108.3	108.3	0.0	108.3
1990	3.6	4.3	3.6	0.0	5.7	210.5	0.0	210.5	210.5	0.0	210.5
1991	18.6	0.2	18.6	0.0	28.8	190.9	0.0	190.9	190.9	0.0	190.9
1992	20.2	2.4	20.2	0.0	24.8	121.4	0.0	121.4	121.4	0.0	121.4
Average	25.8	3.4	25.8	0.0	28.8	121.6	0.0	121.6	121.6	0.0	121.6
Max.	57.2	13.1	57.2	0.0	68.1	282.8	0.0	282.8	282.8	0.0	282.8
Min.	3.6	0.2	3.6	0.0	5.7	20.9	0.0	20.9	20.9	0.0	20.9
C.A. (km ²)	1,580	1,076	4,679	360	7,453	9,082	1,803	12,320	13,309	1,791	16,268

Note : Water deficit in sub-basin I-2 (Singkarak lake basin) is not included in the deficit at respective reference points except IRP-2.

Table VIII.6.1 MINIMUM MONTHLY MEAN DISCHARGE BY DEVELOPMENT CASE

(1) Kampar River at River Mouth (KRP - 11)

Unit : m³/sec

Year	Case 1	Case 2	Case 3	Case 4	Case 5
1981	382.8	366.1	405.6	373.5	413.0
1982	345.1	444.3	490.1	453.5	499.4
1983	419.9	408.0	448.2	420.9	461.2
1984	547.8	626.2	644.9	638.0	656.7
1985	409.7	460.2	502.9	468.2	510.9
1986	322.0	398.6	442.1	407.7	451.2
1987	463.9	472.4	496.6	480.0	504.2
1988	398.2	435.8	476.6	449.3	490.2
1989	388.0	421.7	466.1	436.2	476.1
1990	312.3	297.3	343.3	311.3	357.3
1991	275.6	340.8	381.5	351.4	392.0
1992	303.8	411.3	451.9	422.9	463.5
Ave.	380.8	423.6	462.5	434.4	473.0
Max.	547.8	626.2	644.9	638.0	656.7
Min.	275.6	297.3	343.3	311.3	357.3

Note: Case 1 = Present condition (1994)
 Case 2 = With Kotapanjang Dam (2019)
 Case 3 = Case 2 + Kampar Kiri No. 1 Dam (2019)
 Case 4 = Case 2 + Kampar Kiri No. 2 Dam (2019)
 Case 5 = Case 2 + Kampar Kiri No. 1 Dam + Kampar Kiri No. 2 Dam (2019)

(2) Indragiri River at River Mouth (IRP - 11)

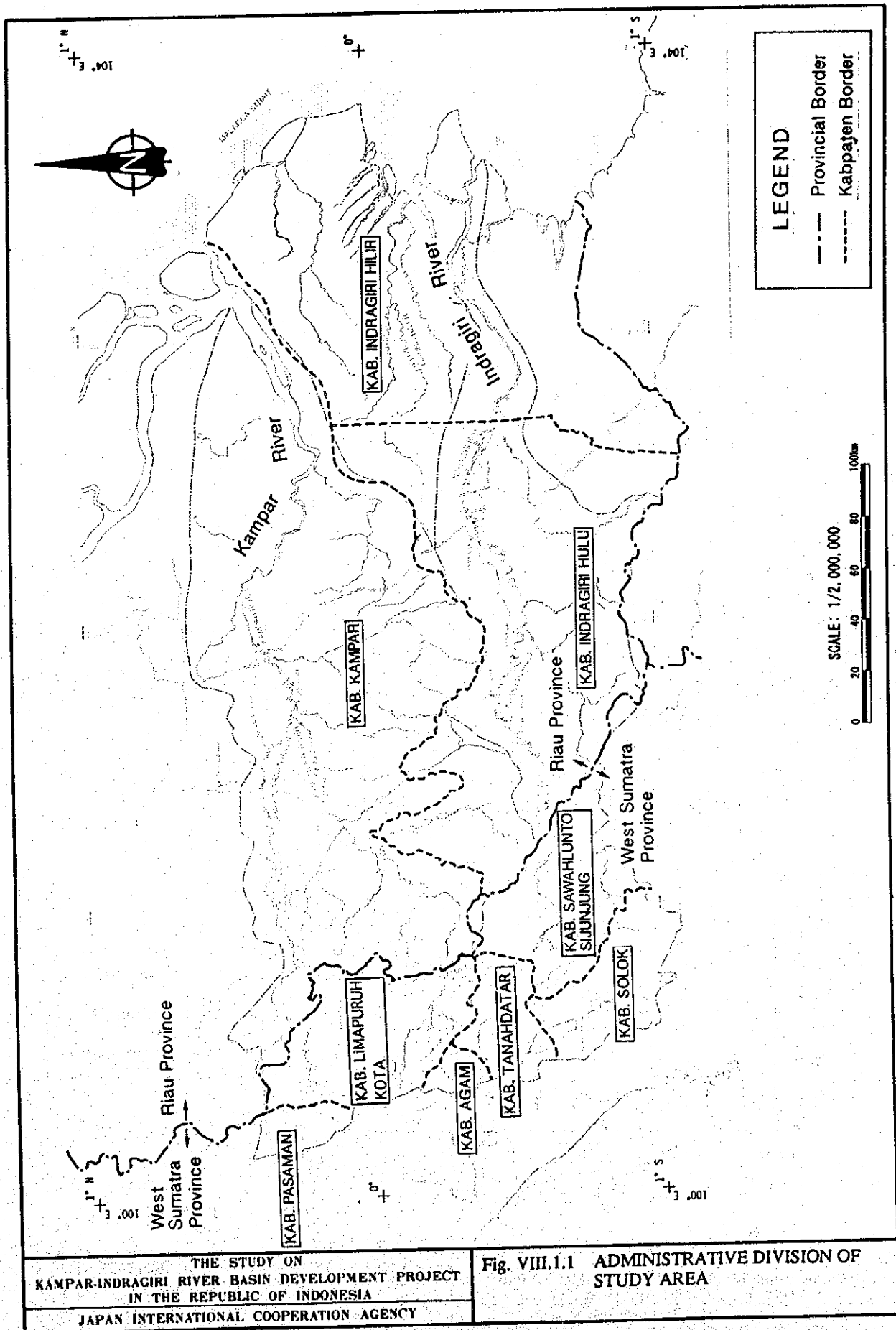
Unit : m³/sec

Year	Case 1	Case 2	Case 3
1981	170.4	154.8	218.3
1982	202.6	141.1	225.3
1983	339.3	255.9	323.4
1984	222.8	207.4	271.9
1985	178.1	86.6	198.7
1986	170.9	148.4	205.5
1987	179.2	118.8	208.2
1988	170.3	111.7	198.7
1989	214.0	129.4	226.1
1990	212.5	132.3	227.7
1991	187.4	128.8	191.7
1992	294.2	226.7	296.2
Ave.	211.8	153.5	232.6
Max.	339.3	255.9	323.4
Min.	170.3	86.6	191.7

Note: Case 1 = Present condition (1994)
 Case 2 = With Singkarak power station (2019)
 Case 3 = Case 2 + Kuantan Dam (2019)

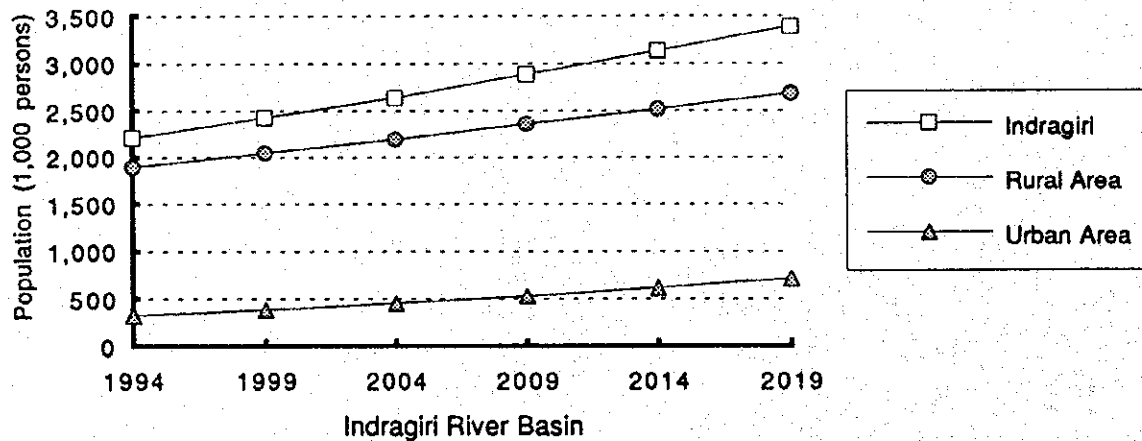
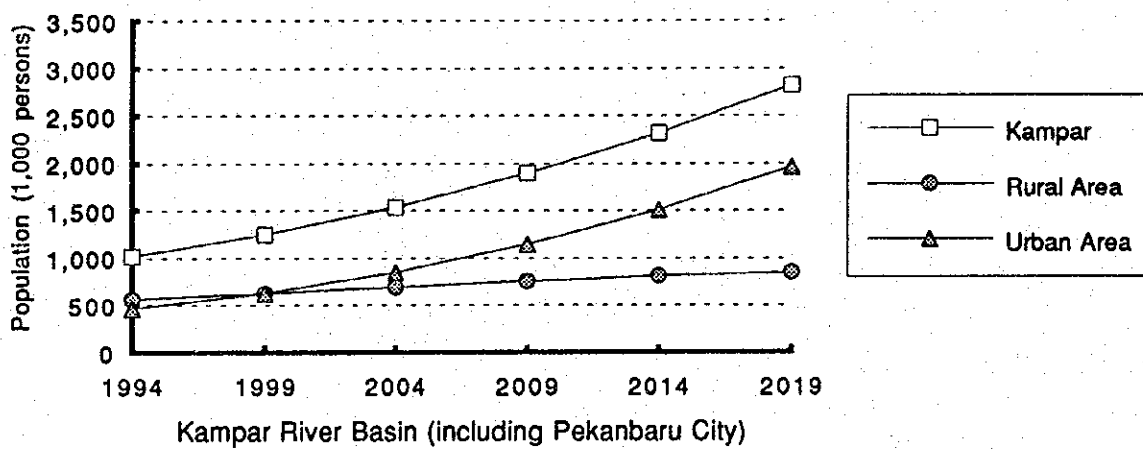
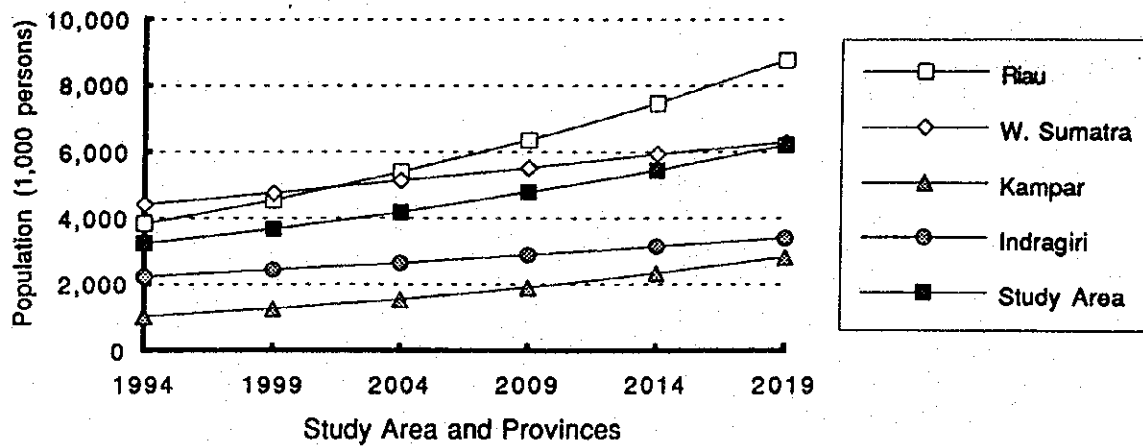
FIGURES

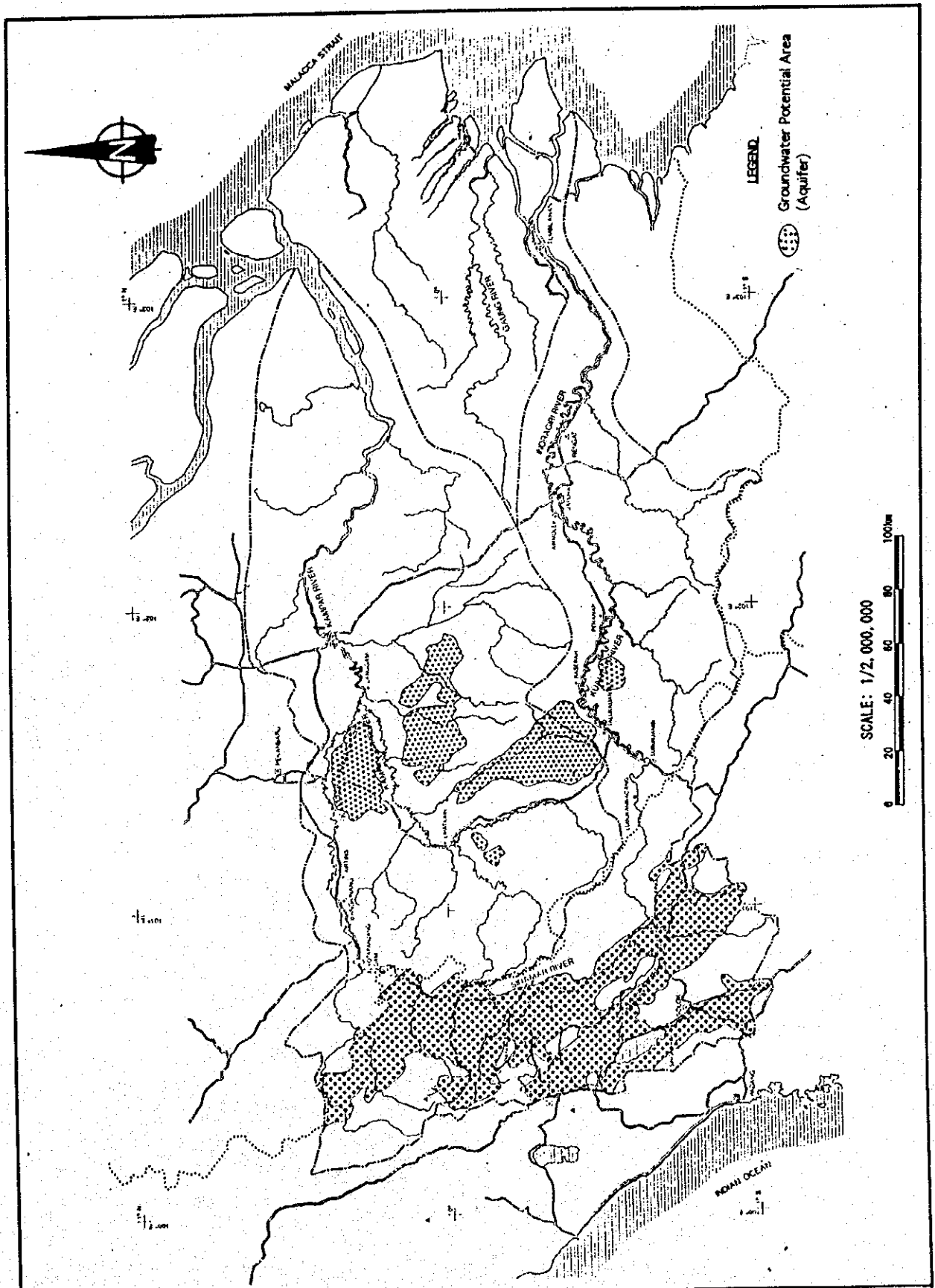
**VIII WATER RESOURCES
DEVELOPMENT
PLAN**



THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

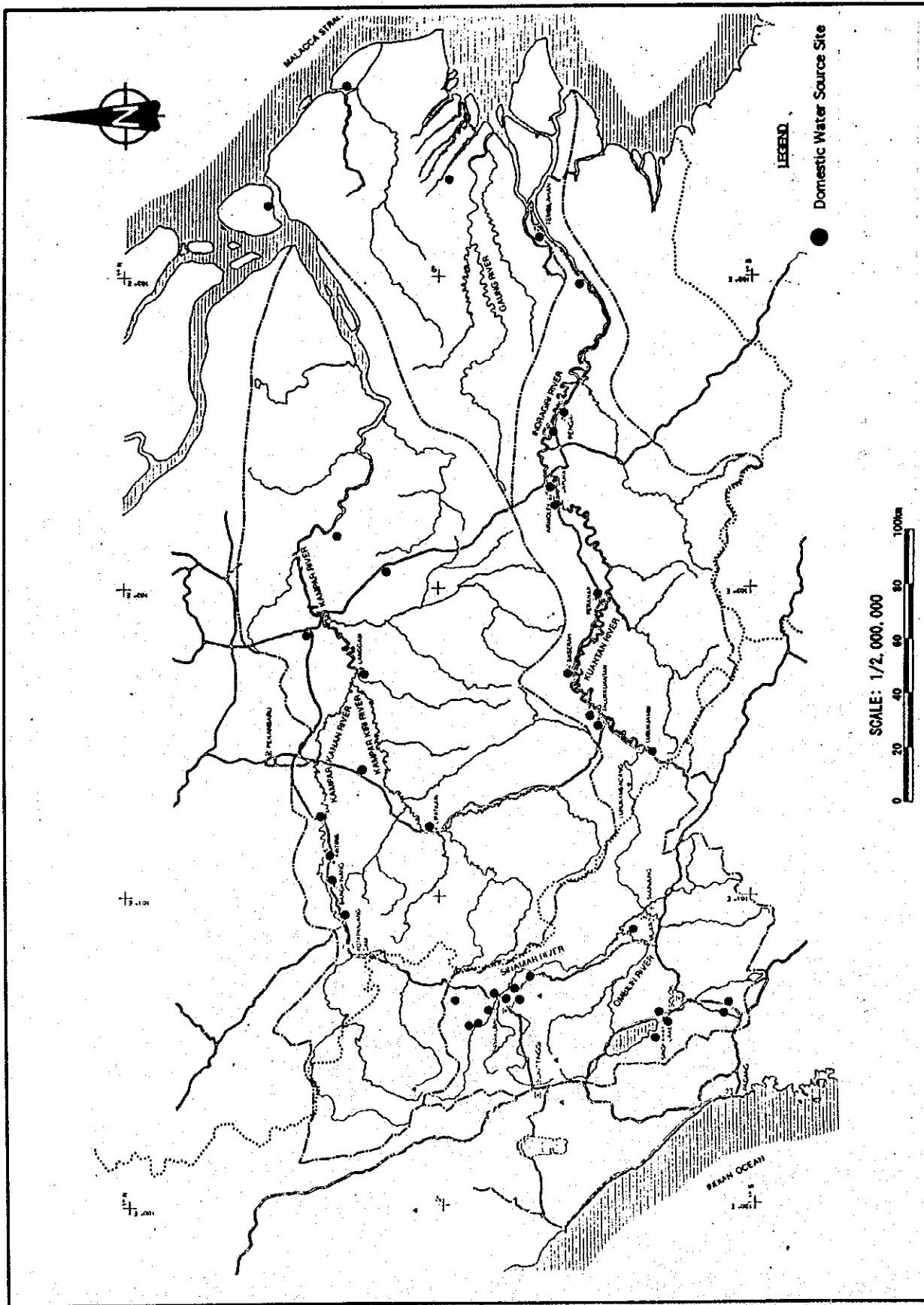
Fig. VIII.1.1 ADMINISTRATIVE DIVISION OF STUDY AREA





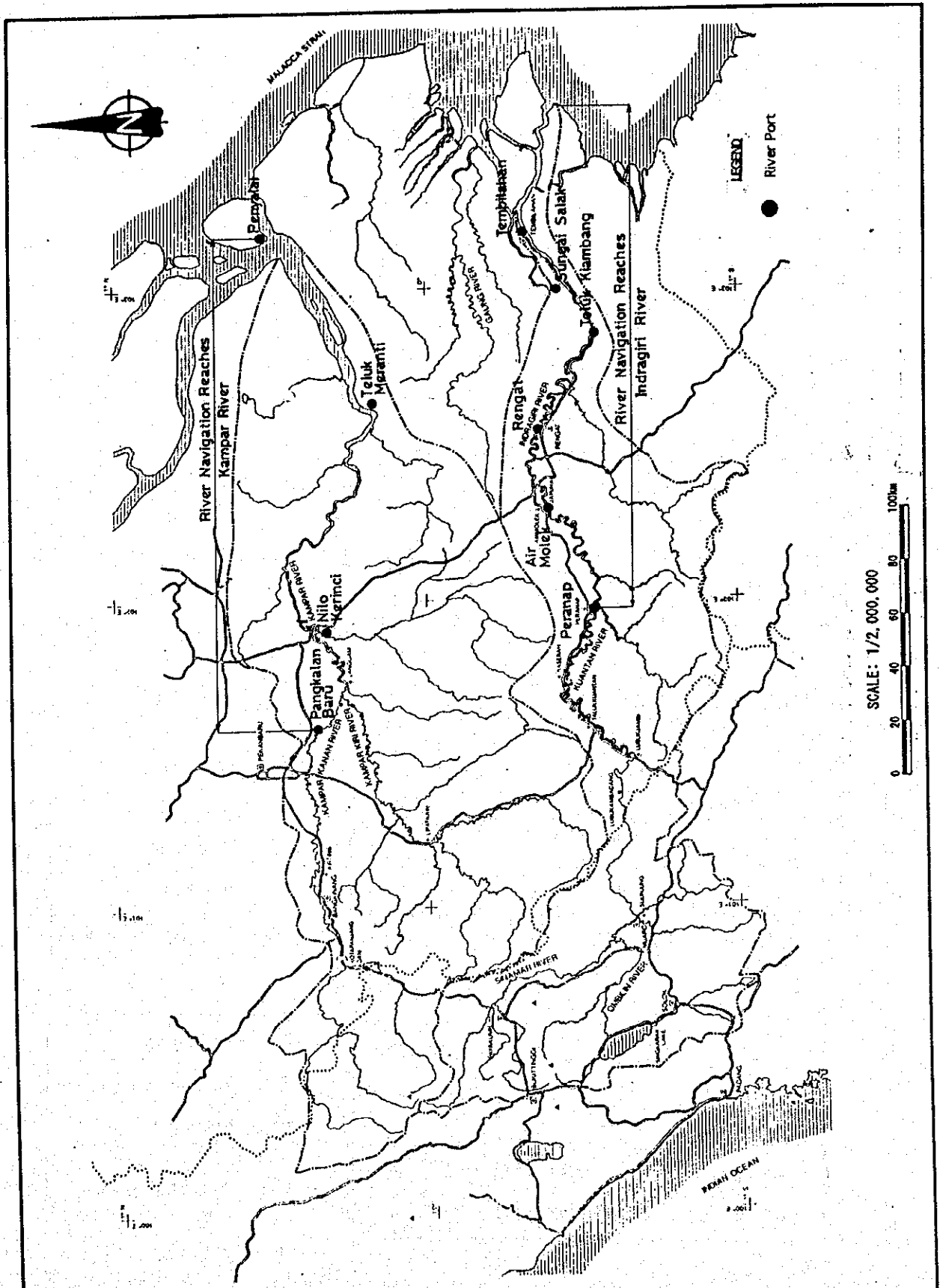
THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VIII.2.1 DISTRIBUTION OF
 GROUNDWATER POTENTIAL
 AREA (AQUIFER)



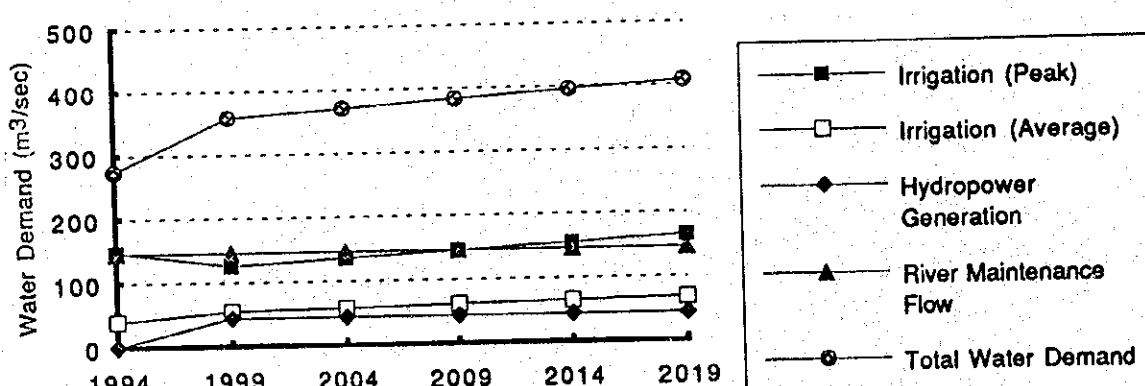
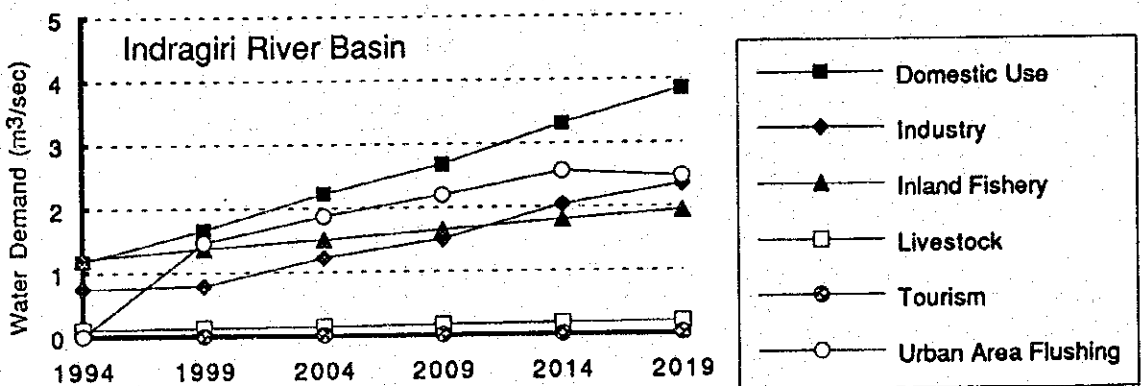
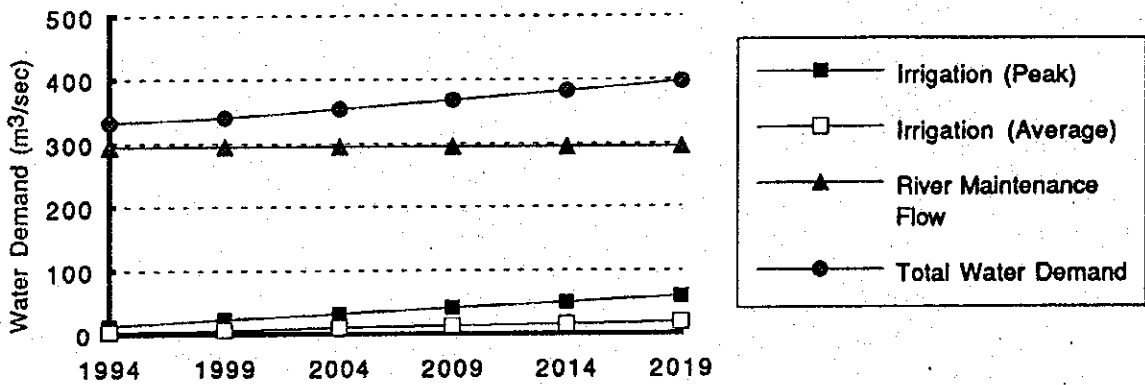
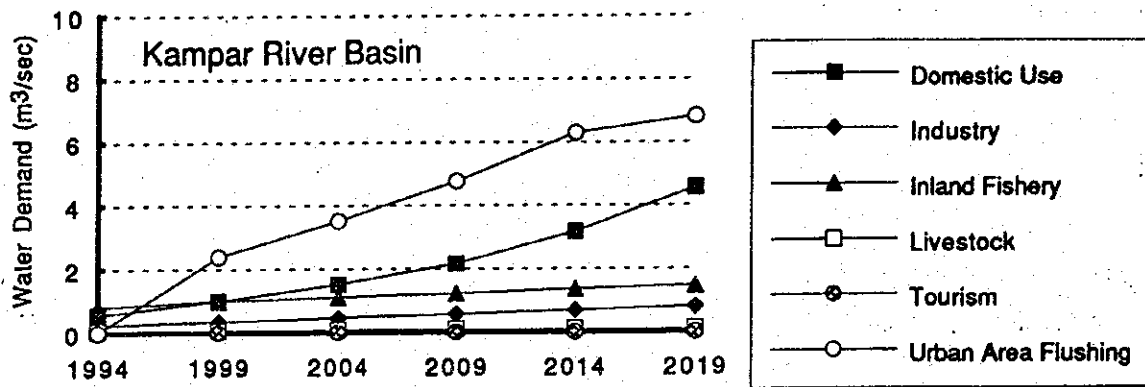
THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VIII.3.1 LOCATION OF DOMESTIC WATER SOURCE SITES



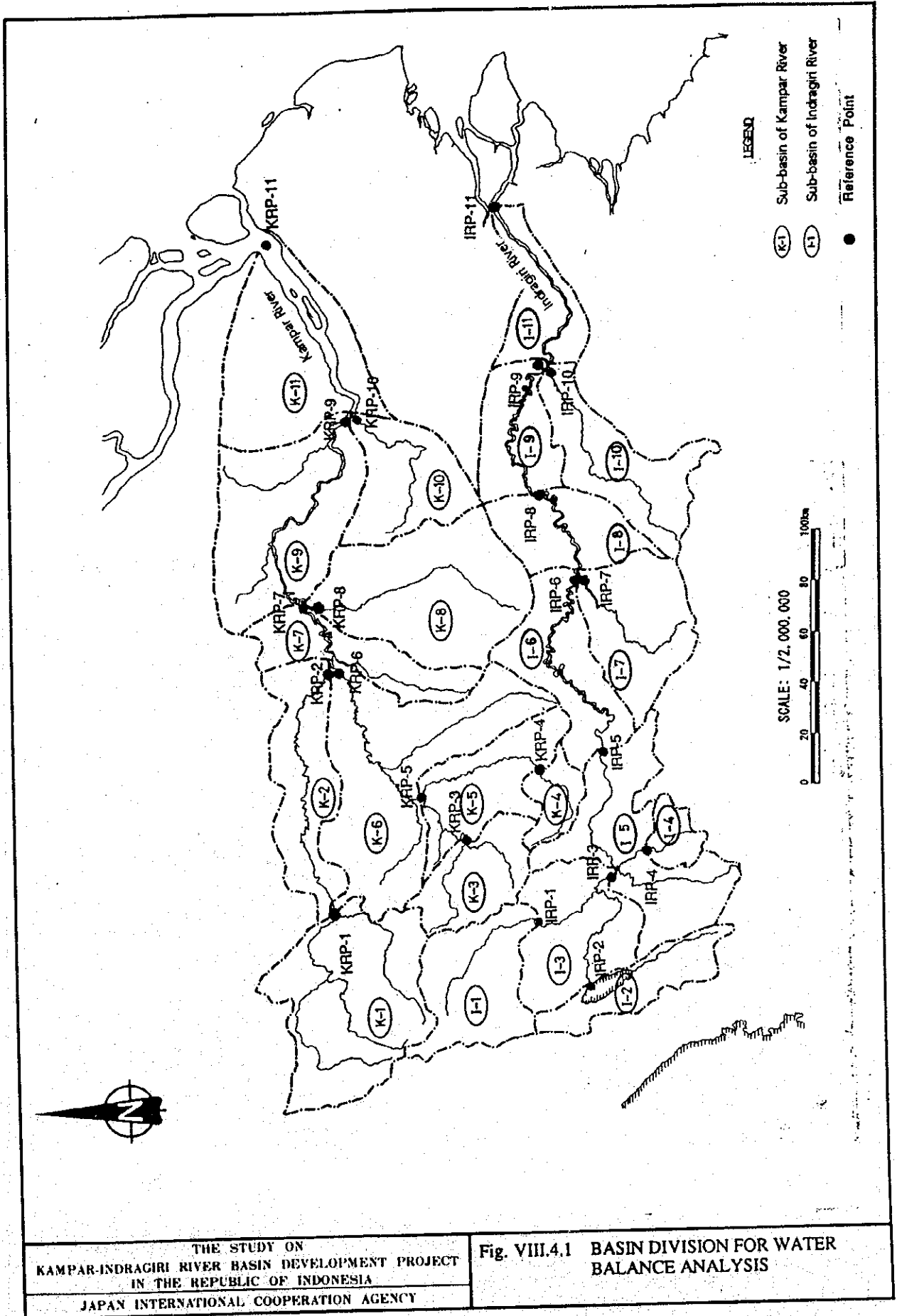
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 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

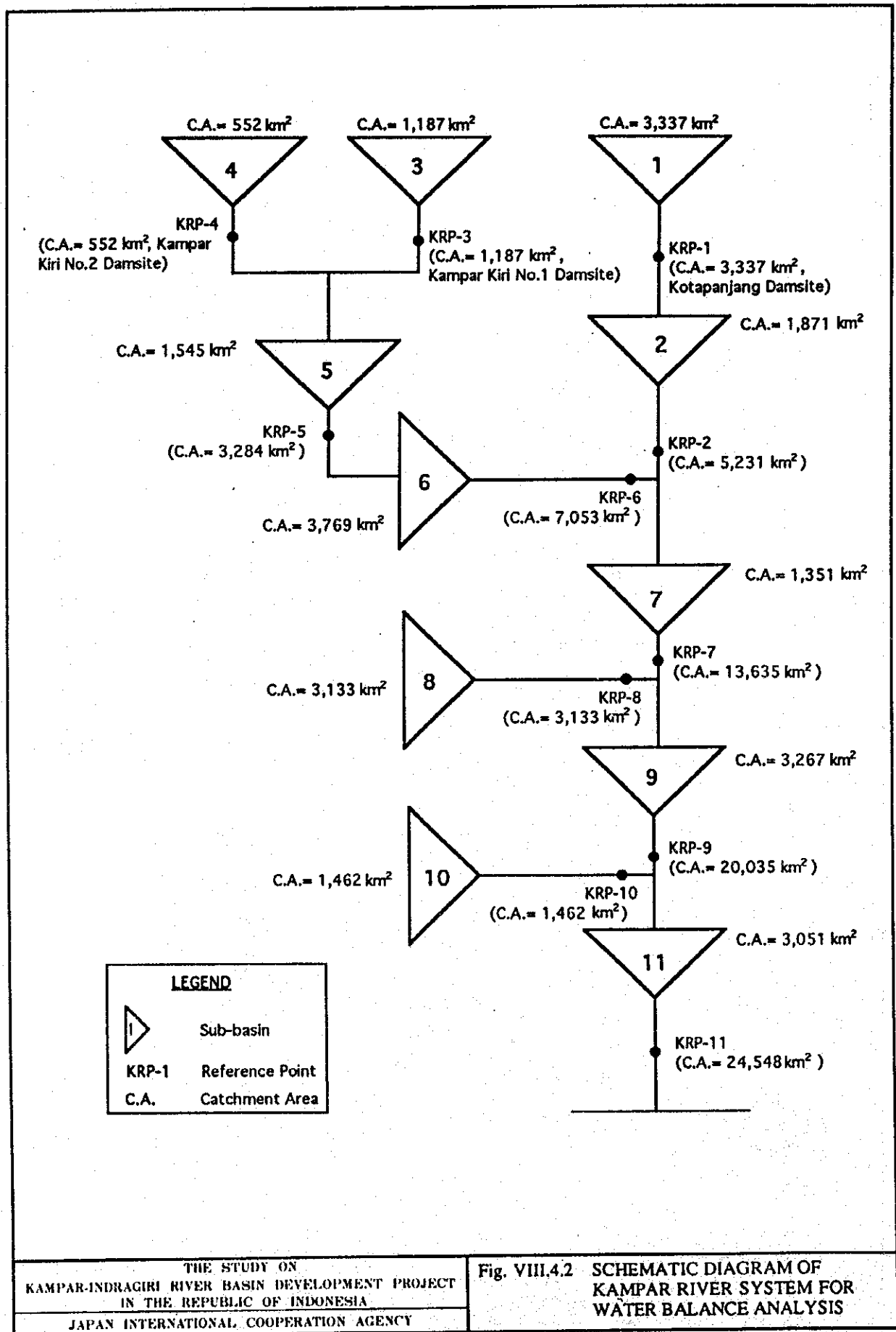
Fig. VIII.3.2 RIVER NAVIGATION REACHES



THE STUDY ON
KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VIII.3.3 FUTURE WATER DEMAND CURVES OF STUDY AREA





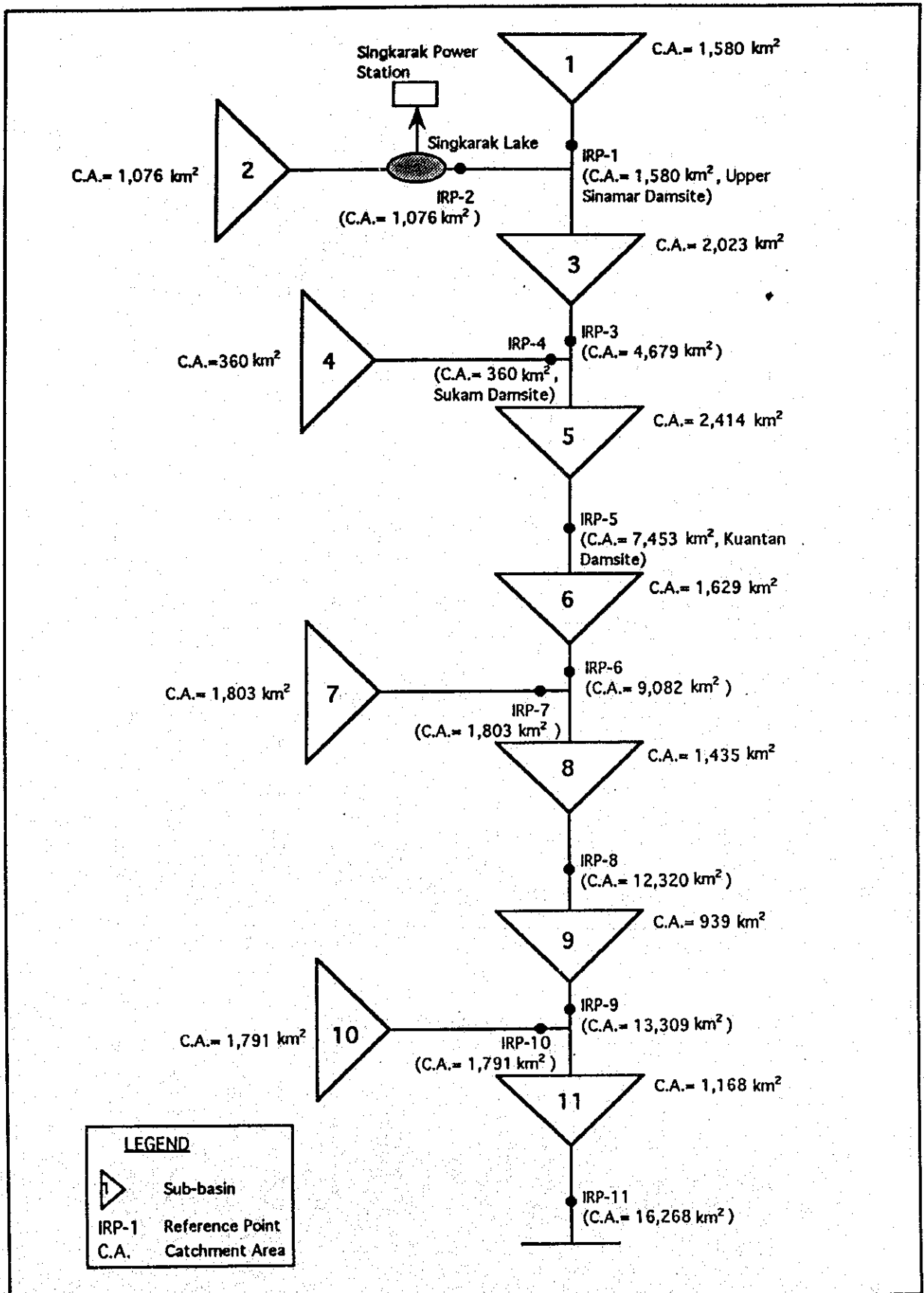
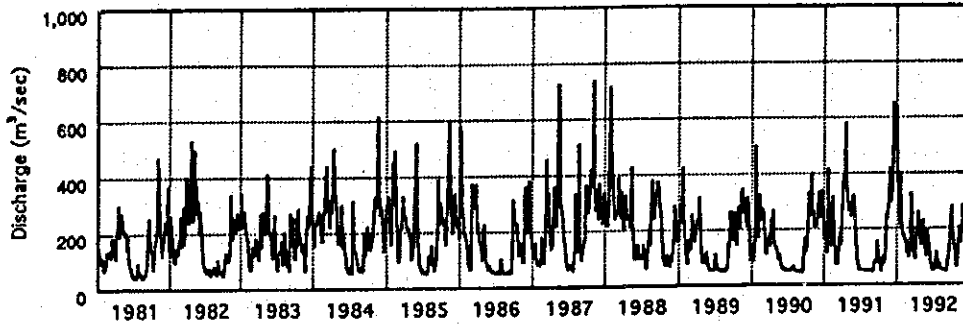
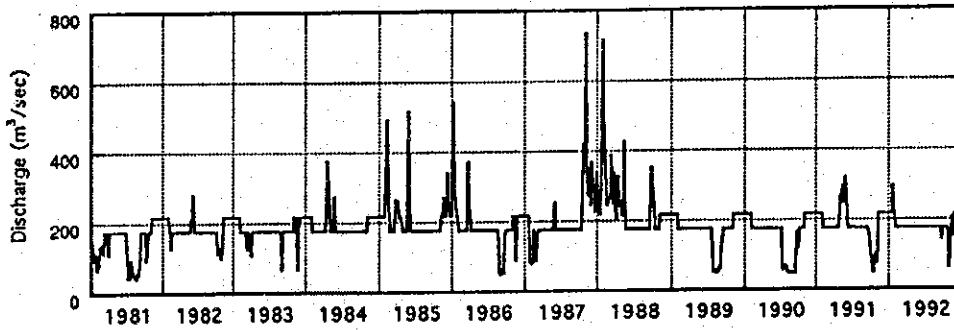


Fig. VIII.4.3 SCHEMATIC DIAGRAM OF INDRAGIRI RIVER SYSTEM FOR WATER BALANCE ANALYSIS

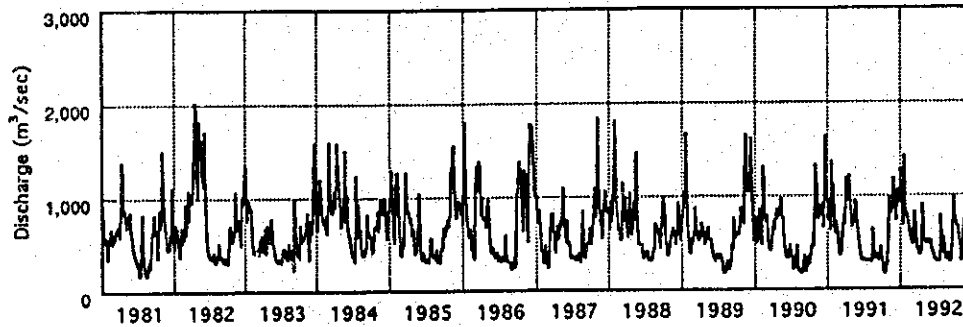
Reference Point KRP-1 (without Kotapanjang Dam)



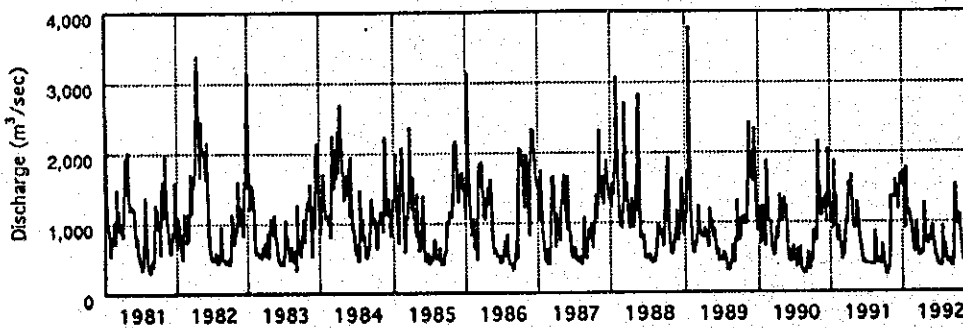
Reference Point KRP-1 (with Kotapanjang Dam)



Reference Point KRP-7 (with Kotapanjang Dam)

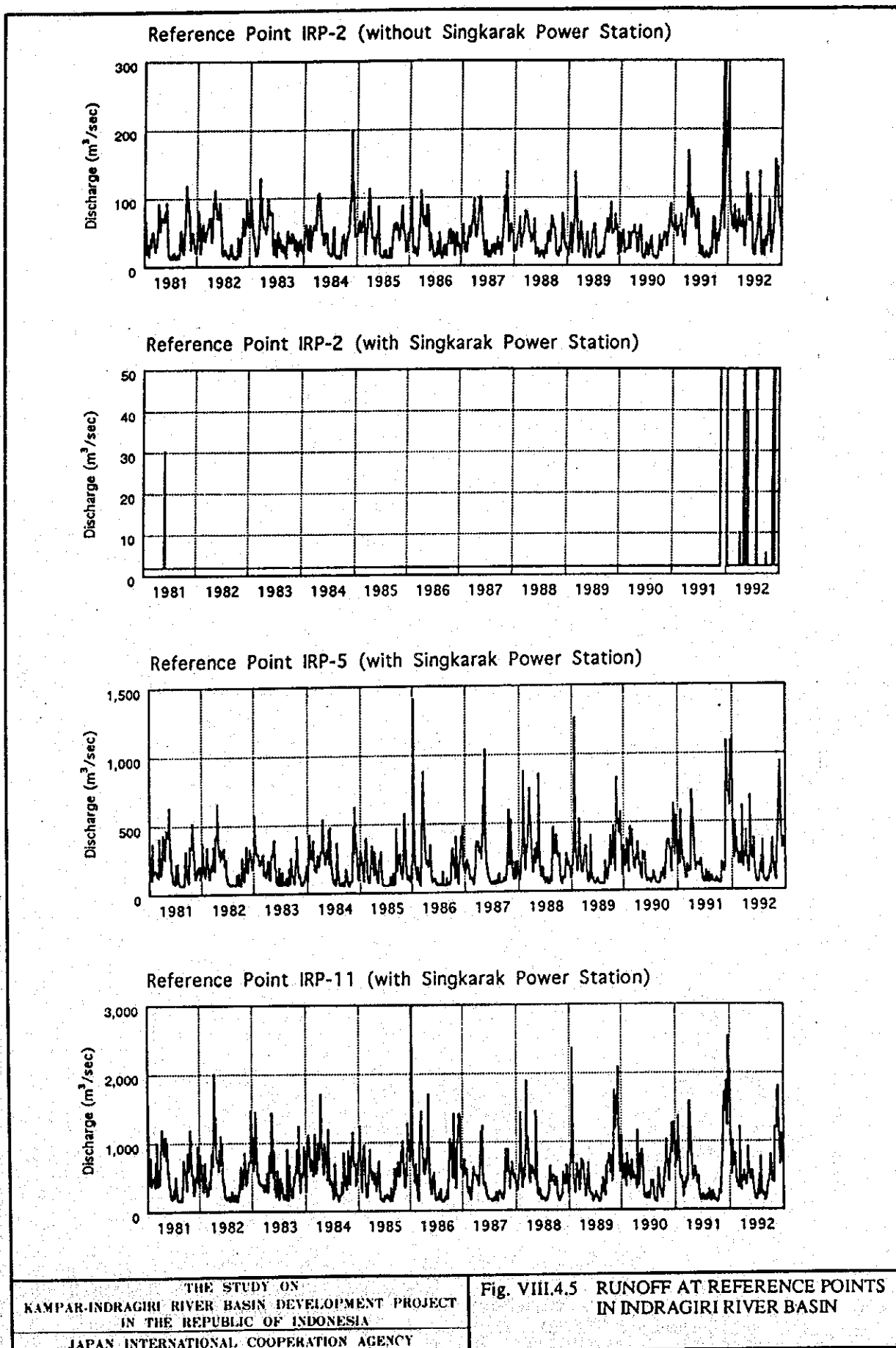


Reference Point KRP-11 (with Kotapanjang Dam)



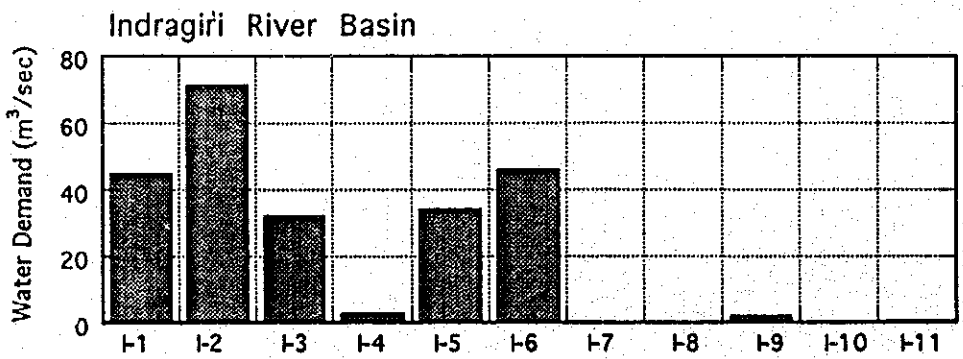
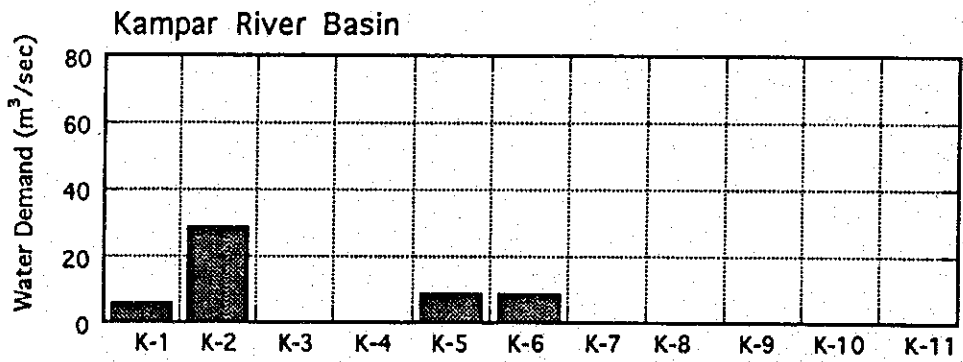
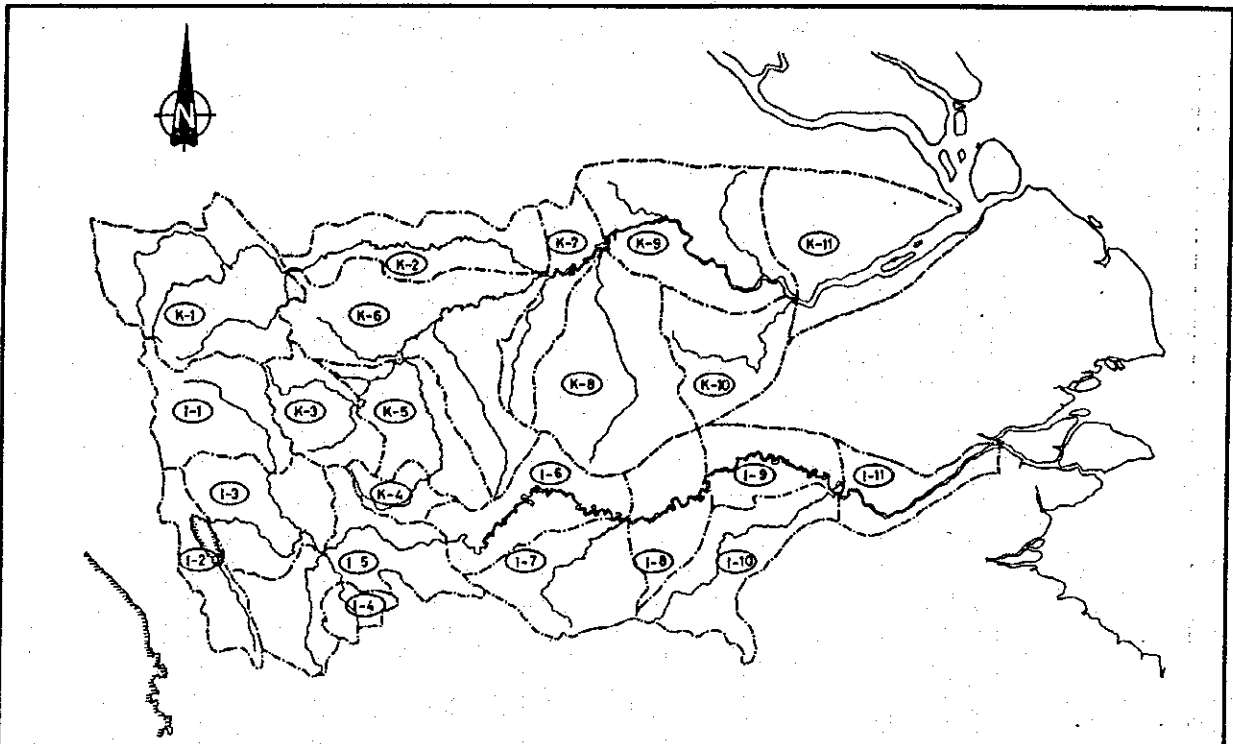
THE STUDY ON
KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VIII.4.4 RUNOFF AT REFERENCE POINTS
IN KAMPAR RIVER BASIN



THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

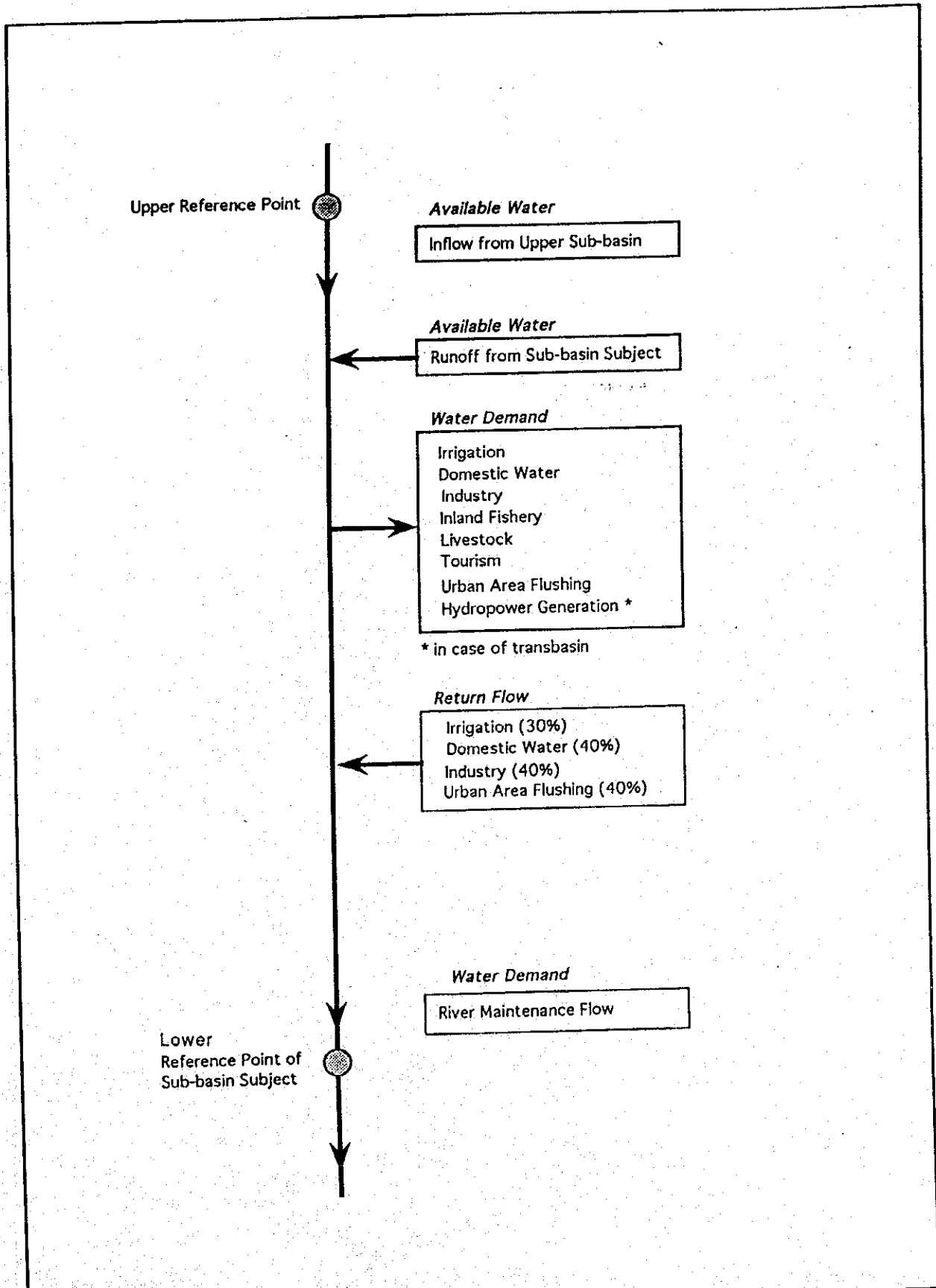
Fig. VIII.4.5 RUNOFF AT REFERENCE POINTS
 IN INDRAGIRI RIVER BASIN



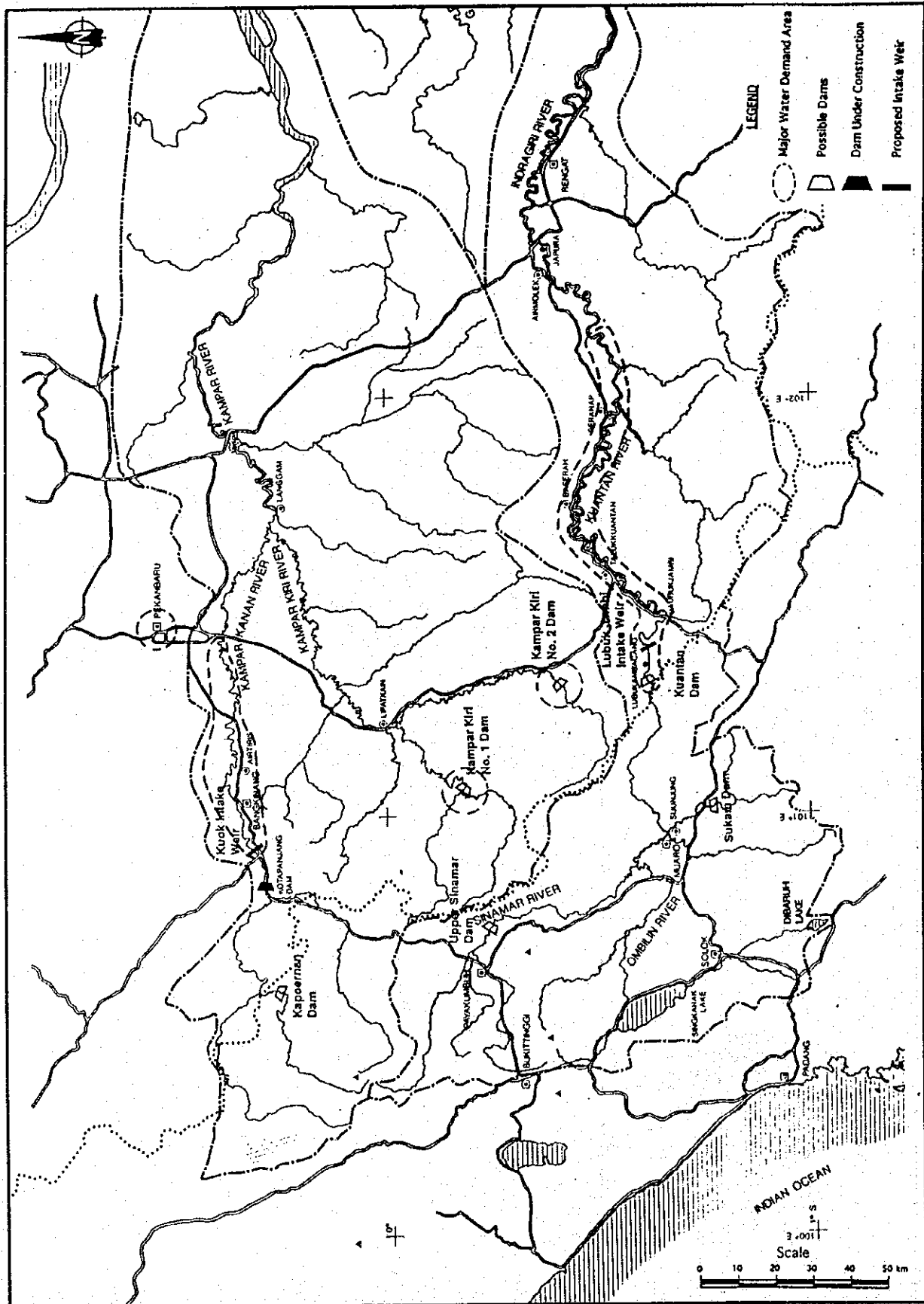
THE STUDY ON
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 IN THE REPUBLIC OF INDONESIA

Fig. VIII.4.6 FUTURE WATER DEMAND IN 2019
 BY SUB-BASIN

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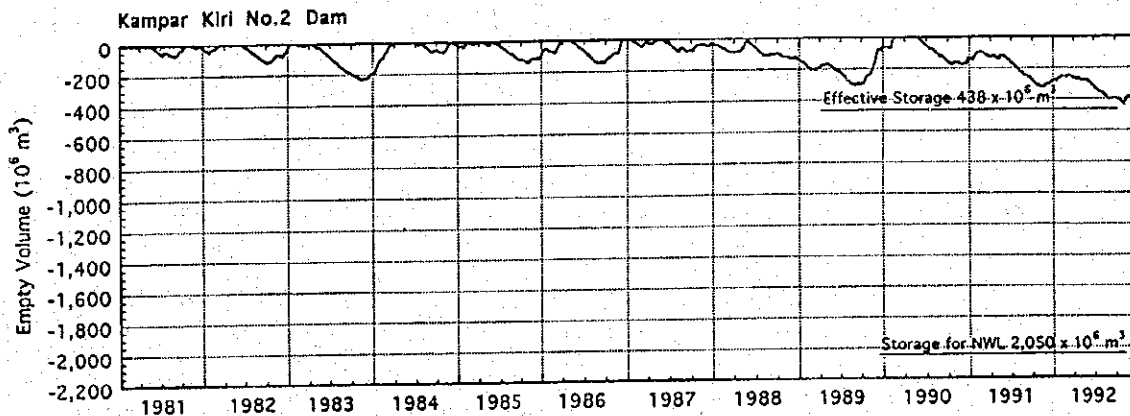
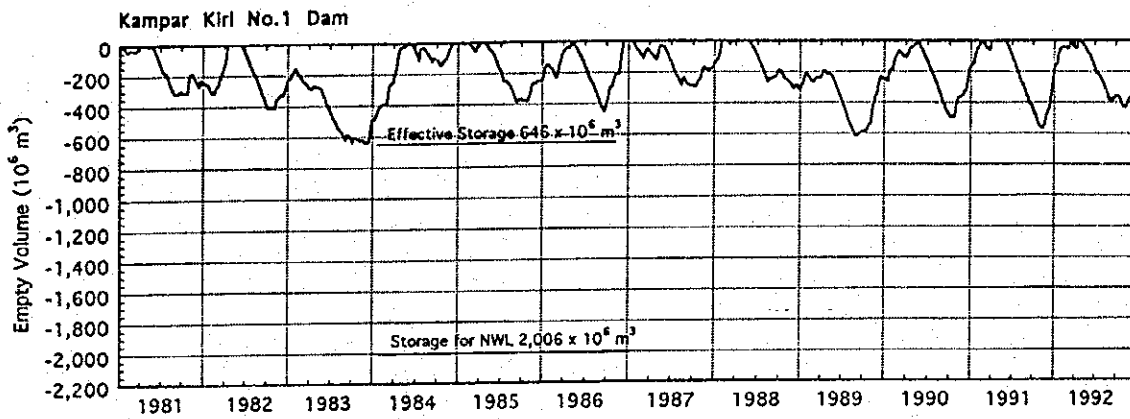


<p>THE STUDY ON KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT IN THE REPUBLIC OF INDONESIA JAPAN INTERNATIONAL COOPERATION AGENCY</p>	<p>Fig. VIII.4.7 SCHEMATIC DIAGRAM OF WATER BALANCE</p>
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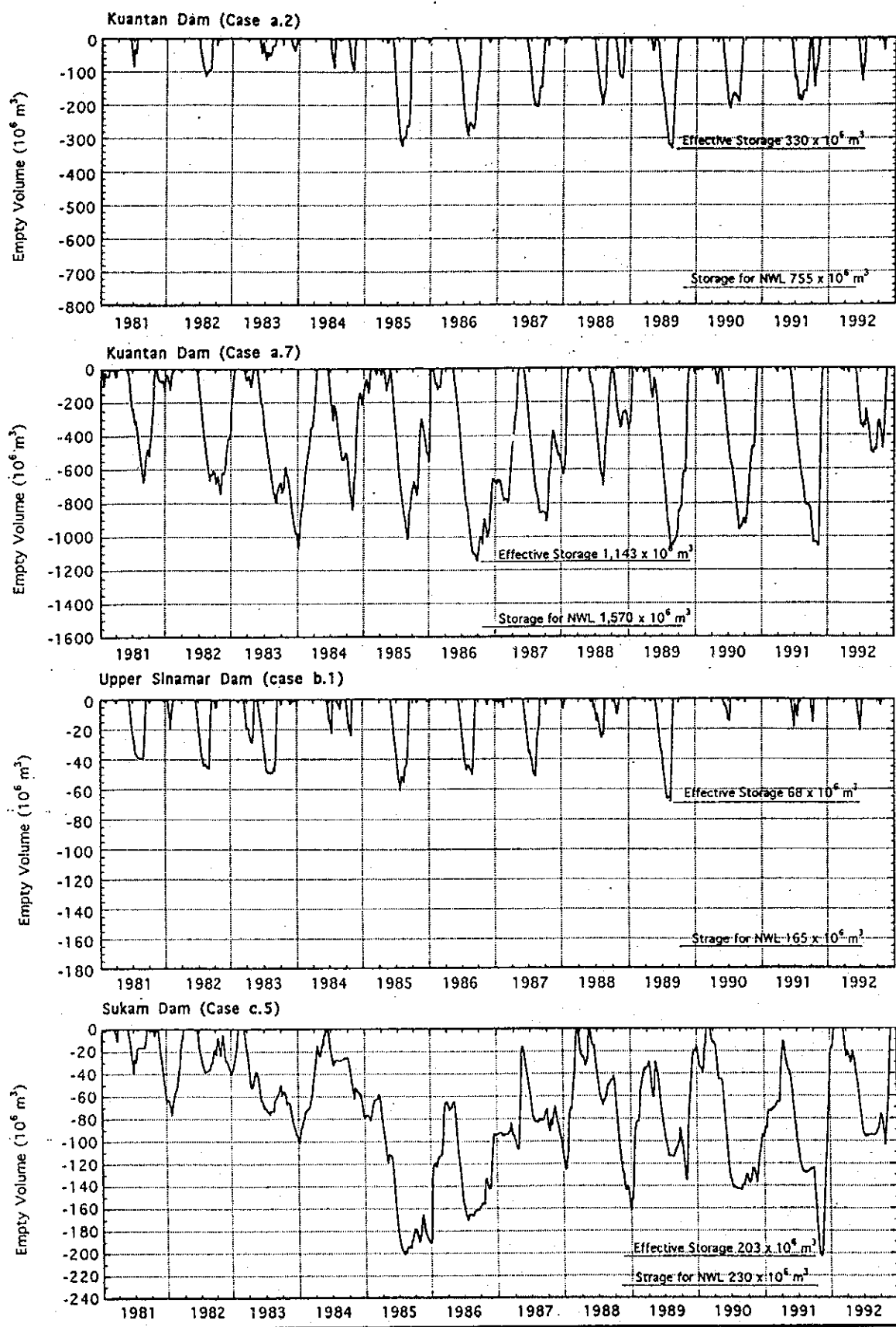
THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
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Fig. VIII.6.1 MAJOR WATER DEMAND AREA



THE STUDY ON
KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
IN THE REPUBLIC OF INDONESIA
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Fig. VIII.6.2 (1/2) RESULT OF STUDY ON
RESERVOIR OPERATION



THE STUDY ON
 KAMPAR-INDRAGIRI RIVER BASIN DEVELOPMENT PROJECT
 IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. VIII.6.2 (2/2) RESULT OF STUDY ON
 RESERVOIR OPERATION