Table 5.4.12(5) Water Balance for the West Bank Area in the Delta

Left Canal No.2 (Saphan Project) (9)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0.0	1.4	6.3		
1986	4.8	6.2	4.4	1.9	3.0	4.4	6.5	5.9	2.5	0.0	1.3	5.5	24.2	23.1
1987	4.4	4.2	4.5	0.5	4.2	3.3	8.3	7.9	2.5	0.3	0.0	1.0	26.7	19.9
1988	0.4	0.8	1.4	3.5	5.4	4.6	6.6	5.6	0.0	0.0	3.0	4.8	25.7	3.9
1989	6.1	4.2	4.1	1.9	3.7	2.8	7.2	6.3	0.8	0.0	0.0	0.0	22.7	22.2
1990	1.0	0.0	0.3	3.1	3.8	6.7	5.1	2.4	0.3	0.0	0.5	1.5	21.4	1.3
1991	0.8	0.0	0.0	0.0	2.2	4.8	7.6	3.9	1.0	0.0	0.6	0.0	19.5	2.8
1992	0.5	0.1	0.0	0.0	3.5	2.9	5.7	3.2	1.4	0.0	0.0	0.0	16.7	1.2
1993	0.7	0.0	0.0	0.0	0.2	4.4	2.5	0.0	0.2	0.0	0.5	0.0	7.3	0.7
1994	0.0	2.2	2.7	4.8	6.8	5.7	3.6	1.4	1.7	0.2	0.6	4.5	24.0	5.4
1995	1.8	1.6	0.9	3.5	4.9	3.7	2.7	2.6	4.0	2.9	3.4	7.0	21.4	9.6
1996	4.8	3.3	3.9	5.6	4.6	4.6	2.6	8.4	5.2	5.1	4.3	5.1	31.0	25.3
1997	3.6	2.7	1.9	3.9	4.1	3.0	4.4	3.6					19.0	22.7
1998														0.0
Mean													21.9	10.5

Left Canal No.1 (Saphan Project) (10)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0.0	0.1	0.9		
1986	0.9	2.2	2.2	1.2	1.2	2.5	1.9	2.2	1.2	0.0	0.0	0.0	10.2	6.3
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.4	0.0	0.0	0.2	2.3	0.0
1988	0.0	0.4	0.0	0.6	1.2	2.1	2.5	1.5	0.0	0.0	1.7	2.7	7.9	0.6
1989	2.6	2.6	1.0	0.0	1.6	1.9	2.4	1.9	0.0	0.0	0.0	0.0	7.8	10.6
1990	0.2	0.0	0.0	1.3	1.6	2.0	1.8	0.4	0.0	0.0	0.0	0.0	7.1	0.2
1991	0.0	0.0	0.0	0.0	1.9	3.1	2.6	1.2	0.4	0.0	0.2	0.0	9.2	0.0
1992	0.1	0.0	0.0	0.0	2.5	1.3	3.4	1.0	0.0	0.0	0.0	0.0	8.2	0.3
1993	0.0	0.0	0.0	0.0	0.3	2.8	1.5	0.5	0.0	0.0	0.3	0.0	5.1	0.0
1994	0.0	1.5	2.8	2.6	2.0	2.4	1.6	0.1	0.7	0.0	0.3	1.5	9.4	4.6
1995	1.1	0.7	0.9	0.8	1.4	2.0	1.3	0.0	0.6	0.5	1.0	2.2	6.1	4.5
1996	1.3	0.1	0.0	1.0	0.8	1.2	0.9	3.6	0.4	0.5	0.6	1.6	7.9	5.1
1997	0.9	1.0	0.3	0.8	1.1	1.5	2.1	0.6					6.1	4.9
1998														0.0
Mean													7.4	2.9

Table 5.4.12(6) Water Balance for the West Bank Area in the Delta

West Bank Total Diversion from Chao Phraya River

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										157.0	388.5	642.0		
1986	608.9	483.7	673.2	557.2	506.8	976.9	1,121.2	939.8	489.5	213.2	441.8	663.8	4,591.4	2,953.3
1987	671.7	553.1	444.4	387.2	655.9	616.6	1,143.0	1,023.4	407.4	170.6	240.4	492.4	4,233.5	2,988.0
1988	454.9	509.2	447.6	400.6	539.5	772.9	556.1	655.4	433.2	234.2	360.9	541.2	3,357.7	2,315.1
1989	665.7	618.7	460.1	382.5	660.5	807.3	1,066.0	1,000.1	447.1	239.2	276.3	488.4	4,363.5	2,880.8
1990	497.3	465.3	524.7	597.0	612.3	970.9	389.6	623.6	447.3	228.6	253.9	441.6	3,640.7	2,491.2
1991	413.7	283.9	249.1	164.5	564.7	904.2	916.1	750.6	425.4	207.4	218.8	235.8	3,725.5	1,870.8
1992	215.0	220.1	72.3	58.0	524.7	445.8	915.3	752.9	367.9	153.2	172.3	273.7	3,064.6	1,169.4
1993	284.1	325.8	448.6	273.0	411.6	562.3	533.7	338.3	300.0	61.3	70.8	70.8	2,418.9	1,657.7
1994	47.6	366.9	658.6	474.7	773.1	1,007.9	760.4	856.0	700.8	249.9	323.2	581.7	4,572.9	1,276.0
1995	698.2	749.9	643.9	629.1	654.8	536.0	769.2	540.0	498.8	397.2	557.8	986.4	3,627.9	3,246.8
1996	738.0	278.7	295.5	607.7	634.7	564.8	582.9	636.4	484.5	399.0	575.7	657.8	3,511.0	3,253.6
1997	633.1	558.0	439.1	493.8	657.0	545.4	974.3	833.9					3,504.4	3,262.7
1998														
Mean	494.0	451.1	446.4	418.8	599.6	725.9	810.7	745.9	454.7	225.9	323.4	506.3	3,737.1	2,373.0
Rate	20.2	7.7	5.5	11.2	16.8	22.1	26.4	12.4	6.0	21.4	7.1	7.7	3,638.2	2,401.1

Table 5.4.13(1) Water Balance for the East Bank Area in the Delta

Manorom Regulator (1)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										166	292	420		
1986	385	318	314	383	386	425	485	442	295	107	325	398	2416	1895
1987	328	247	191	118	284	117	266	440	298	91	125	354	1523	1596
1988	291	297	193	366	360	283	476	450	257	217	220	322	2192	1351
1989	305	321	342	269	246	357	356	458	296	146	174	374	1982	1727
1990	345	318	367	298	303	486	165	394	351	140	141	250	1997	1724
1991	274	146	127	52	182	372	414	395	282	115	119	188	1697	1078
1992	181	156	61	23	364	214	528	458	312	112	129	186	1899	820
1993	189	171	164	151	205	359	323	178	147	31	56	81	1363	951
1994	54	131	330	372	449	456	532	394	317	132	211	331	2520	683
1995	332	288	220	256	354	218	359	300	270	282	326	453	1757	1514
1996	489	302	327	446	472	508	421	369	348	237	291	405	2564	2179
1997	426	380	312	256	342	388	437	344	323	155	216	329	2090	2051
1998	339	224	112	244	267									1375
Mean													1992	1411

Maharaj Regulator (2)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0	15	77		
1986	68	59	37	37	128	153	178	169	85	0	22	15	750	256
1987	15	18	19	54	83	152	198	176	20	0	12	47	683	89
1988	45	45	28	28	96	125	167	177	62	3	19	23	655	177
1989	31	24	18	55	116	163	184	170	25	0	11	61	713	118
1990	77	52	31	39	75	121	114	170	78	0	5	28	597	232
1991	26	14	13	10	60	108	136	123	17	0	4	10	454	86
1992	12	11	6	2	61	83	175	157	27	3	13	10	505	43
1993	11	11	7	27	62	105	148	90	42	4	6	5	474	55
1994	3	26	20	27	132	131	166	138	32	2	13	26	626	64
1995	28	23	23	56	85	52	1	4	2	4	45	96	200	115
1996	100	77	48	22	69	79	93	76	27	7	25	89	366	370
1997	94	92	81	66	82	67	138	150	65	16	16	68	568	388
1998	68	57	47	49	73									272
Mean													548	146

Table 5.4.13(2) Water Balance for the East Bank Area in the Delta

Tham Moon Intake (3)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0.0	0.2	0.9		
1986	0.0	0.0	0.0	3.5	5.4	7.2	5.7	4.7	0.3	0.0	3.0	3.8	26.8	1.1
1987	2.9	2.7	2.9	0.0	3.3	4.6	6.0	6.6	0.7	0.0	0.0	0.9	21.2	15.3
1988	0.6	0.9	0.4	3.4	5.4	4.2	4.0	4.4	0.0	0.0	0.9	4.2	21.4	2.8
1989	4.5	3.3	3.5	1.2	2.5	4.6	6.5	5.3	0.3	0.0	0.0	0.6	20.4	16.4
1990	1.0	0.5	0.3	3.4	3.6	6.5	6.8	5.2	0.0	0.0	0.0	0.0	25.5	2.4
1991	0.6	0.0	0.0	0.0	2.4	3.2	8.0	4.1	1.0	0.0	0.0	0.0	18.7	0.6
1992	0.0	1.0	0.0	0.0	3.2	2.7	8.7	5.7	0.0	0.0	0.0	0.0	20.3	1.0
1993	1.3	1.0	0.0	0.0	0.7	4.3	4.2	2.4	1.1	0.0	0.0	0.0	12.7	2.3
1994	0.0	0.9	2.5	2.6	5.4	7.4	6.7	2.3	0.0	0.0	0.3	4.1	24.4	3.4
1995	3.5	1.6	0.0	1.4	4.2	2.8	0.0	0.0	0.0	1.3	2.7	6.8	8.4	9.5
1996	6.8	5.3	0.2	2.2	5.1	5.4	0.0	0.0	0.0	0.0	3.0	5.2	12.7	23.1
1997	3.4	2.2	1.5	3.1	3.8	1.8	1.6	3.5					13.8	15.3
1998														0.0
Mean													19.3	7.1

Ban Lek Intake (4)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0.0	0.0	0.4		
1986	0.3	0.3	0.1	4.7	5.3	5.2	4.6	4.7	0.0	0.0	2.6	4.8	24.5	1.1
1987	5.1	6.6	4.8	0.3	2.5	1.6	3.3	4.7	0.0	0.0	0.0	0.0	12.4	23.9
1988	0.3	0.0	0.0	3.5	4.7	2.2	0.7	4.5	0.0	0.0	1.4	4.8	15.6	0.3
1989	4.4	4.1	2.9	0.0	0.0	1.6	3.8	5.2	1.0	0.0	0.0	0.0	11.6	17.6
1990	0.0	0.0	0.0	2.6	3.8	4.8	1.4	4.5	0.0	0.0	0.2	0.7	17.1	0.0
1991	0.4	0.0	0.0	0.0	2.5	4.9	5.2	3.8	0.0	0.0	0.0	0.0	16.4	1.3
1992	0.0	0.5	0.0	0.0	2.8	3.7	5.5	2.6	0.0	0.0	0.0	0.0	14.6	0.5
1993	0.2	0.1	0.0	0.0	1.5	4.7	3.5	3.3	0.0	0.0	0.0	0.0	13.0	0.3
1994	0.0	0.3	0.0	0.9	5.3	4.7	4.1	1.5	0.0	0.0	1.4	7.3	16.5	0.3
1995	6.1	5.3	0.3	0.8	3.6	3.6	0.2	0.0	0.0	0.2	4.2	7.9	8.2	20.4
1996	5.5	4.4	0.3	0.2	4.8	3.9	0.0	0.0	0.0	0.0	1.6	4.1	8.9	22.5
1997	2.9	5.2	1.9	2.9	3.7	3.0	4.3	2.1					16.0	15.7
1998														0.0
Mean													14.4	8.0

Table 5.4.13(3) Water Balance for the East Bank Area in the Delta

Khao Kaew Intake (5)

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										0.0	0.0	0.0		
1986	0.0	0.0	0.0	5.9	10.8	13.6	10.9	10.0	0.4	0.0	3.6	9.3	51.6	0.0
1987	8.7	6.5	7.5	2.0	9.2	5.3	8.0	10.7	0.0	0.0	0.0	0.0	35.2	35.6
1988	0.0	0.0	0.0	7.6	10.2	5.4	1.4	5.8	0.0	0.0	4.1	11.7	30.4	0.0
1989	12.9	10.5	5.4	0.0	3.5	2.4	4.4	14.1	2.2	0.0	0.0	0.0	26.6	44.6
1990	0.0	0.0	0.0	8.5	11.0	13.0	3.9	7.9	0.3	0.0	1.9	1.2	44.6	0.0
1991	0.8	0.3	0.0	0.0	5.4	11.7	9.8	10.0	0.0	0.0	0.0	0.0	36.9	4.2
1992	0.0	1.3	0.0	0.0	6.0	7.3	10.4	5.2	0.0	0.0	0.2	1.2	28.9	1.3
1993	0.0	0.5	0.2	0.0	2.4	12.2	6.0	4.4	0.0	0.0	0.0	0.0	25.0	2.1
1994	0.0	0.0	0.0	1.0	10.3	10.5	6.4	6.1	1.0	0.0	2.2	11.0	35.3	0.0
1995	12.7	8.8	0.7	1.2	4.5	3.5	0.1	0.9	0.0	1.3	7.1	13.2	10.2	35.4
1996	12.2	7.5	1.7	3.2	8.9	11.7	3.4	0.0	0.0	0.0	3.0	11.0	27.2	43.0
1997	8.6	10.8	6.0	5.8	8.8	7.2	10.0	5.8					37.6	39.4
1998														0.0
Mean													32.0	15.1

East Bank Total Diversion from Chao Phraya River

	4	5	6	7	8	9	10	11	12	1	2	3	Wet	Dry
1985										166.0	307.2	498.3		
1986	453.3	377.3	351.1	434.1	535.5	604.0	684.2	630.4	380.7	107.0	356.2	430.9	3,268.9	2,153.2
1987	359.7	280.8	225.2	174.3	382.0	280.5	481.3	638.0	318.7	91.0	137.0	401.9	2,274.8	1,759.8
1988	336.9	342.9	221.4	408.5	476.3	419.8	649.1	641.7	319.0	220.0	245.4	365.7	2,914.4	1,531.1
1989	357.8	362.9	371.8	325.2	368.0	528.6	554.7	652.6	324.5	146.0	185.0	435.6	2,753.6	1,923.6
1990	423.0	370.5	398.3	351.5	396.4	631.3	291.1	581.6	429.3	140.0	148.1	279.9	2,681.2	1,958.4
1991	301.8	160.3	140.0	62.0	252.3	499.8	573.0	535.9	300.0	115.0	123.0	198.0	2,223.0	1,170.1
1992	193.0	169.8	67.0	25.0	437.0	310.7	727.6	628.5	339.0	115.0	142.2	197.2	2,467.8	865.8
1993	201.5	183.6	171.2	178.0	271.6	485.2	484.7	278.1	190.1	35.0	62.0	86.0	1,887.7	1,010.7
1994	57.0	158.2	352.5	403.5	602.0	609.6	715.2	541.9	350.0	134.0	227.9	379.4	3,222.2	750.7
1995	382.3	326.7	244.0	315.4	451.3	279.9	360.3	304.9	272.0	288.8	385.0	576.9	1,983.8	1,694.3
1996	613.5	396.2	377.2	473.6	559.8	608.0	517.4	445.0	375.0	244.0	323.6	514.3	2,978.8	2,637.6
1997	534.9	490.2	402.4	333.8	440.3	467.0	590.9	505.4					2,337.4	2,509.4
Mean	351.2	301.6	276.8	290.4	431.0	477.0	552.5	532.0	327.1	150.2	220.2	363.7	2,605.1	1,586.8
Rate	21.1	7.4	5.0	11.1	17.5	21.1	25.7	12.7	6.2	20.5	6.9	8.0	2,520.4	1,619.2

Table 5.4.14 Unit Area Water Use in the West/East Bank of Chao Phraya Delta

Unit Area Water Use in the West Bank

Year	Wet Season			Dry Season		
	Water Diverted (MCM)	Cropped Area (1,000 rai)	Rate of Water Use (m3/rai)	Water Diverted (MCM)	Cropped Area (1,000 rai)	Rate of Water Use (m3/rai)
1985	0.0			0.0		
1986	4,591.4	2,956.7	1,552.9	2,953.3	2,094.5	1,410.0
1987	4,233.5	3,041.3	1,392.0	2,988.0	1,962.4	1,522.6
1988	3,357.7	3,097.5	1,084.0	2,315.1	1,879.3	1,231.9
1989	4,363.5	3,144.3	1,387.7	2,880.8	2,168.4	1,328.5
1990	3,640.7	3,071.6	1,185.3	2,491.2	2,070.6	1,203.1
1991	3,725.5	3,072.6	1,212.5	1,870.8	1,603.5	1,166.7
1992	3,064.6	3,134.9	977.6	1,169.4	1,774.1	659.2
1993	2,418.9	3,217.9	751.7	1,657.7	1,655.8	1,001.1
1994	4,572.9	3,005.0	1,521.8	1,276.0	1,526.8	835.7
1995	3,627.9	2,956.2	1,227.2	3,246.8	2,035.0	1,595.5
1996	3,511.0	3,054.4	1,149.5	3,253.6	2,652.1	1,226.8
1997	3,504.4			3,262.7		
1998	0.0			0.0		
Mean	3,737.1	3,068.4	1,217.9	2,373.0	1,947.5	1,218.5

Unit Area Water Use in the East Bank

Year	Wet Season			Dry Season		
	Water Diverted (MCM)	Cropped Area (1,000 rai)	Rate of Water Use (m3/rai)	Water Diverted (MCM)	Cropped Area (1,000 rai)	Rate of Water Use (m3/rai)
1985	0.0			0.0		
1986	3,268.9	3,586.0	911.6	2,153.2	1,320.9	1,630.1
1987	2,274.8	3,530.8	644.3	1,759.8	1,154.9	1,523.8
1988	2,914.4	3,263.9	892.9	1,531.1	1,236.0	1,238.8
1989	2,753.6	3,475.0	792.4	1,923.6	1,227.8	1,566.7
1990	2,681.2	3,239.3	827.7	1,958.4	1,425.1	1,374.2
1991	2,223.0	3,132.5	709.7	1,170.1	837.9	1,396.5
1992	2,467.8	3,076.6	802.1	865.8	988.8	875.6
1993	1,887.7	3,156.2	598.1	1,010.7	994.0	1,016.8
1994	3,222.2	2,980.4	1,081.1	750.7	852.9	880.2
1995	1,983.8	2,907.1	682.4	1,694.3	1,060.9	1,597.0
1996	2,978.8	2,709.6	1,099.4	2,637.6	1,734.0	1,521.1
1997	2,337.4			2,509.4		
1998	#REF!			#REF!		
Mean	2,605.1	3,187.0	817.4	1,586.8	1,166.7	1,360.2

Remark: In the case if the total amount of water diverted or released from the Somboon, Klong 21, Klong 20, Klong 19, Bang Kanak, Tha Khai, Tha Thua, Paktakhong and Chalhahan Phichit regulators is considered, the rates of water use in wet and dry seasons would be 882 m^3/rai and 1,428 m^3/rai respectively (referring to the table shown in the next page).

Table 5.4.15(1) Computation of Additional Water Supply (Sample Case of 50% Guarantee)

Unit Water Requirement for Irrigation (m3/rai)

Zone	Dry Rice	Field Crops	Vege-table	Sugar Cane	Fruit Trees	Fish Pond
UW	1,850	1300	1,100	1,300	2,000	1,450
LW	1,000	900	800	875	1,250	925
UE	1,850	1300	1,100	1,300	2,000	1,450
LE	1,000	900	800	875	1,250	925

Cropping Intensity to be Guaranteed (%)

West Bank Area		East Bank Area	
Upper	Lower	Upper	Lower
50	50	50	50

Table 5.4.15(2) Additional Water Demand in Upper West Delta (Sample Case of 50% Guarantee)

Year	Whole Year Crops			Dry Season Crops			Total	Cropping Intensity (%)		Water	Additional
	Sugar Cane	Fruit Trees	Fish Pond	Dry Paddy	Field Crops	Vege-table	Area Harvested	Present	Proposed	Demand (MCM)	Water Supply (MCM)
1.1 Existing Condition (Projects 1 to 9, Total Irrigable Area = 2,299,000 rai)											
1986	49.2	10.4	4.6	927.0	34.0	4.8	1030.0	44.8		1855.9	0.0
1987	54.1	9.2	16.1	839.2	33.8	3.0	955.4	41.6		1711.8	0.0
1988	48.7	19.7	22.7	824.7	18.9	1.4	936.1	40.7		1687.4	0.0
1989	61.1	2.0	23.9	1094.8	10.0	2.0	1193.8	51.9		2158.7	0.0
1990	56.2	3.2	10.9	992.2	18.7	1.6	1082.8	47.1		1956.9	0.0
(86-90)	(53.9)	(8.9)	(15.6)	(935.6)	(23.1)	(2.6)	(1039.6)	(45.2)		(1874.1)	(0.0)
1991	146.4	6.6	8.4	465.7	29.4	6.8	663.3	28.9		1122.9	0.0
1992	157.7	44.4	14.2	551.8	37.2	1.7	807.0	35.1		1385.5	0.0
1993	171.1	28.6	13.4	460.8	27.0	4.3	705.2	30.7		1191.4	0.0
1994	121.3	27.7	11.6	403.8	23.5	4.4	592.3	25.8		1012.3	0.0
1995	175.9	40.6	13.2	965.8	13.5	4.2	1213.2	52.8		2137.9	0.0
1996	198.7	90.7	15.8	1428.5	6.2	5.7	1745.6	75.9		3119.7	0.0
(91-96)	(161.9)	(39.8)	(12.8)	(712.7)	(22.8)	(4.5)	(954.4)	(41.5)		(1661.6)	(0.0)
1.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 2,299,000 rai)											
1986	49.2	10.4	4.6	1046.5	34.0	4.8	1149.5	44.8	50.0	2076.9	221.1
1987	54.1	9.2	16.1	1033.3	33.8	3.0	1149.5	41.6	50.0	2070.9	359.1
1988	48.7	19.7	22.7	1038.1	18.9	1.4	1149.5	40.7	50.0	2082.2	394.8
1989	61.1	2.0	23.9	1094.8	10.0	2.0	1193.8	51.9	51.9	2158.7	0.0
1990	56.2	3.2	10.9	1058.9	18.7	1.6	1149.5	47.1	50.0	2080.3	123.4
(86-90)	(53.9)	(8.9)	(15.6)	(1054.3)	(23.1)	(2.6)	(1158.4)	(45.2)	(50.4)	(2093.8)	(219.7)
1991	146.4	6.6	8.4	951.9	29.4	6.8	1149.5	28.9	50.0	2022.4	899.5
1992	157.7	44.4	14.2	894.3	37.2	1.7	1149.5	35.1	50.0	2019.1	633.6
1993	171.1	28.6	13.4	905.1	27.0	4.3	1149.5	30.7	50.0	2013.3	822.0
1994	121.3	27.7	11.6	961.0	23.5	4.4	1149.5	25.8	50.0	2043.2	1030.8
1995	175.9	40.6	13.2	965.8	13.5	4.2	1213.2	52.8	52.8	2137.9	0.0
1996	198.7	90.7	15.8	1428.5	6.2	5.7	1745.6	75.9	75.9	3119.7	0.0
(91-96)	(161.9)	(39.8)	(12.8)	(1017.8)	(22.8)	(4.5)	(1259.5)	(41.5)	(54.8)	(2225.9)	(564.3)
1.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 2,180,000 rai)											
1986	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	44.8	50.0	1792.4	-63.4
1987	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	41.6	50.0	1792.4	80.6
1988	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	40.7	50.0	1792.4	105.0
1989	282.7	170.2	41.5	509.4	93.1	35.0	1132.0	51.9	51.9	1870.1	-288.5
1990	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	47.1	50.0	1792.4	-164.5
(86-90)	(282.7)	(170.2)	(41.5)	(475.8)	(93.1)	(35.0)	(1098.4)	(45.2)	(50.4)	(1808.0)	-(66.2)
1991	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	28.9	50.0	1792.4	669.5
1992	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	35.1	50.0	1792.4	407.0
1993	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	30.7	50.0	1792.4	601.1
1994	282.7	170.2	41.5	467.4	93.1	35.0	1090.0	25.8	50.0	1792.4	780.1
1995	282.7	170.2	41.5	527.8	93.1	35.0	1150.4	52.8	52.8	1904.2	-233.7
1996	282.7	170.2	41.5	1032.7	93.1	35.0	1655.2	75.9	75.9	2838.1	-281.5
(91-96)	(282.7)	(170.2)	(41.5)	(571.7)	(93.1)	(35.0)	(1194.3)	(41.5)	(54.8)	(1985.3)	(323.7)
1.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 2,180,000 rai)											
1986	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	44.8	50.0	1829.8	-26.1
1987	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	41.6	50.0	1829.8	117.9
1988	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	40.7	50.0	1829.8	142.3
1989	235.6	141.8	34.6	613.2	77.6	29.2	1132.0	51.9	51.9	1907.5	-251.2
1990	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	47.1	50.0	1829.8	-127.1
(86-90)	(235.6)	(141.8)	(34.6)	(579.6)	(77.6)	(29.2)	(1098.4)	(45.2)	(50.4)	(1845.3)	-(28.8)
1991	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	28.9	50.0	1829.8	706.8
1992	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	35.1	50.0	1829.8	444.3
1993	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	30.7	50.0	1829.8	638.4
1994	235.6	141.8	34.6	571.2	77.6	29.2	1090.0	25.8	50.0	1829.8	817.4
1995	235.6	141.8	34.6	631.6	77.6	29.2	1150.4	52.8	52.8	1941.5	-196.4
1996	235.6	141.8	34.6	1136.4	77.6	29.2	1655.2	75.9	75.9	2875.5	-244.2
(91-96)	(235.6)	(141.8)	(34.6)	(675.5)	(77.6)	(29.2)	(1194.3)	(41.5)	(54.8)	(2022.7)	(361.1)
1.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 2,180,000 rai)											
1986	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	44.8	50.0	1854.3	-1.6
1987	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	41.6	50.0	1854.3	142.4
1988	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	40.7	50.0	1854.3	166.8
1989	188.5	113.4	27.7	717.0	62.1	23.4	1132.0	51.9	51.9	1932.0	-226.7
1990	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	47.1	50.0	1854.3	-102.6
(86-90)	(188.5)	(113.4)	(27.7)	(683.4)	(62.1)	(23.4)	(1098.4)	(45.2)	(50.4)	(1869.8)	-(4.3)
1991	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	28.9	50.0	1854.3	731.3
1992	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	35.1	50.0	1854.3	468.8
1993	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	30.7	50.0	1854.3	662.9
1994	188.5	113.4	27.7	675.0	62.1	23.4	1090.0	25.8	50.0	1854.3	841.9
1995	188.5	113.4	27.7	735.4	62.1	23.4	1150.4	52.8	52.8	1966.0	-171.9
1996	188.5	113.4	27.7	1240.2	62.1	23.4	1655.2	75.9	75.9	2900.0	-219.7
(91-96)	(188.5)	(113.4)	(27.7)	(779.2)	(62.1)	(23.4)	(1194.3)	(41.5)	(54.8)	(2047.2)	(385.6)

Table 5.4.15(3) Additional Water Demand in Lower West Delta (Sample Case of 50% Guarantee)											
	Whole Year Crops			Dry Season Crops			Total	Cropping Intensity		Water	Additional
Year	Sugar	Fruit	Fish	Dry	Field	Vege-	Area	(%)		Demand	Water Supply
	Cane	Trees	Pond	Paddy	Crops	table	Harvested	Present	Proposed	(MCM)	(MCM)
2.1 Existing Condition (Projects 10 to 14, Total Irrigable Area = 1,447,000 rai)											
1986	0.4	102.4	23.1	880.3	12.3	46.0	1064.5	73.6		1077.9	0.0
1987	0.8	95.2	29.0	828.6	6.3	47.1	1007.0	69.6		1018.5	0.0
1988	1.9	99.4	23.4	772.9	5.5	40.1	943.2	65.2		957.5	0.0
1989	0.2	82.7	43.1	797.0	3.9	47.7	974.6	67.4		982.1	0.0
1990	1.9	83.4	28.3	825.7	1.9	46.6	987.8	68.3		996.8	0.0
(86-90)	(1.0)	(92.6)	(29.4)	(820.9)	(6.0)	(45.5)	(995.4)	(68.8)		(1006.5)	(0.0)
1991	2.5	79.3	31.7	800.6	1.4	24.7	940.2	65.0		952.3	0.0
1992	3.5	85.7	30.3	806.7	2.1	38.8	967.1	66.8		977.8	0.0
1993	2.5	91.8	27.4	786.5	2.2	40.2	950.6	65.7		962.9	0.0
1994	1.7	102.1	31.5	766.4	2.8	30.0	934.5	64.6		951.2	0.0
1995	1.7	113.3	31.5	643.4	2.1	29.8	821.8	56.8		841.4	0.0
1996	1.7	88.5	29.7	746.7	2.6	37.3	906.5	62.6		918.5	0.0
(91-96)	(2.3)	(93.5)	(30.4)	(758.4)	(2.2)	(33.5)	(920.1)	(63.6)		(934.0)	(0.0)
2.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 1,447,000 rai)											
1986	0.4	102.4	23.1	880.3	12.3	46.0	1064.5	73.6	73.6	1077.9	0.0
1987	0.8	95.2	29.0	828.6	6.3	47.1	1007.0	69.6	69.6	1018.5	0.0
1988	1.9	99.4	23.4	772.9	5.5	40.1	943.2	65.2	65.2	957.5	0.0
1989	0.2	82.7	43.1	797.0	3.9	47.7	974.6	67.4	67.4	982.1	0.0
1990	1.9	83.4	28.3	825.7	1.9	46.6	987.8	68.3	68.3	996.8	0.0
(86-90)	(1.0)	(92.6)	(29.4)	(820.9)	(6.0)	(45.5)	(995.4)	(68.8)	(68.8)	(1006.5)	(0.0)
1991	2.5	79.3	31.7	800.6	1.4	24.7	940.2	65.0	65.0	952.3	0.0
1992	3.5	85.7	30.3	806.7	2.1	38.8	967.1	66.8	66.8	977.8	0.0
1993	2.5	91.8	27.4	786.5	2.2	40.2	950.6	65.7	65.7	962.9	0.0
1994	1.7	102.1	31.5	766.4	2.8	30.0	934.5	64.6	64.6	951.2	0.0
1995	1.7	113.3	31.5	643.4	2.1	29.8	821.8	56.8	56.8	841.4	0.0
1996	1.7	88.5	29.7	746.7	2.6	37.3	906.5	62.6	62.6	918.5	0.0
(91-96)	(2.3)	(93.5)	(30.4)	(758.4)	(2.2)	(33.5)	(920.1)	(63.6)	(63.6)	(934.0)	(0.0)
2.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,300,000 rai)											
1986	6.5	119.2	41.6	743.8	2.6	42.6	956.4	73.6	73.6	973.4	-104.5
1987	6.5	119.2	41.6	692.2	2.6	42.6	904.7	69.6	69.6	921.8	-96.7
1988	6.5	119.2	41.6	634.9	2.6	42.6	847.4	65.2	65.2	864.5	-93.0
1989	6.5	119.2	41.6	663.1	2.6	42.6	875.6	67.4	67.4	892.7	-89.4
1990	6.5	119.2	41.6	674.9	2.6	42.6	887.4	68.3	68.3	904.5	-92.3
(86-90)	(6.5)	(119.2)	(41.6)	(681.8)	(2.6)	(42.6)	(894.3)	(68.8)	(68.8)	(911.4)	-(95.2)
1991	6.5	119.2	41.6	632.2	2.6	42.6	844.7	65.0	65.0	861.8	-90.5
1992	6.5	119.2	41.6	656.3	2.6	42.6	868.9	66.8	66.8	885.9	-91.9
1993	6.5	119.2	41.6	641.5	2.6	42.6	854.0	65.7	65.7	871.1	-91.8
1994	6.5	119.2	41.6	627.0	2.6	42.6	839.6	64.6	64.6	856.6	-94.5
1995	6.5	119.2	41.6	525.8	2.6	42.6	738.3	56.8	56.8	755.4	-86.0
1996	6.5	119.2	41.6	601.9	2.6	42.6	814.4	62.6	62.6	831.5	-87.0
(91-96)	(6.5)	(119.2)	(41.6)	(614.1)	(2.6)	(42.6)	(826.6)	(63.6)	(63.6)	(843.7)	-(90.3)
2.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,300,000 rai)											
1986	5.4	99.3	34.7	779.3	2.2	35.5	956.4	73.6	73.6	970.6	-107.3
1987	5.4	99.3	34.7	727.6	2.2	35.5	904.7	69.6	69.6	918.9	-99.5
1988	5.4	99.3	34.7	670.3	2.2	35.5	847.4	65.2	65.2	861.6	-95.9
1989	5.4	99.3	34.7	698.5	2.2	35.5	875.6	67.4	67.4	889.8	-92.3
1990	5.4	99.3	34.7	710.3	2.2	35.5	887.4	68.3	68.3	901.7	-95.1
(86-90)	(5.4)	(99.3)	(34.7)	(717.2)	(2.2)	(35.5)	(894.3)	(68.8)	(68.8)	(908.5)	-(98.0)
1991	5.4	99.3	34.7	667.6	2.2	35.5	844.7	65.0	65.0	858.9	-93.3
1992	5.4	99.3	34.7	691.8	2.2	35.5	868.9	66.8	66.8	883.1	-94.8
1993	5.4	99.3	34.7	676.9	2.2	35.5	854.0	65.7	65.7	868.3	-94.7
1994	5.4	99.3	34.7	662.5	2.2	35.5	839.6	64.6	64.6	853.8	-97.4
1995	5.4	99.3	34.7	561.2	2.2	35.5	738.3	56.8	56.8	752.5	-88.8
1996	5.4	99.3	34.7	637.3	2.2	35.5	814.4	62.6	62.6	828.6	-89.8
(91-96)	(5.4)	(99.3)	(34.7)	(649.5)	(2.2)	(35.5)	(826.6)	(63.6)	(63.6)	(840.9)	-(93.1)
2.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,300,000 rai)											
1986	4.3	79.4	27.8	814.7	1.8	28.4	956.4	73.6	73.6	967.7	-110.1
1987	4.3	79.4	27.8	763.0	1.8	28.4	904.7	69.6	69.6	916.1	-102.4
1988	4.3	79.4	27.8	705.7	1.8	28.4	847.4	65.2	65.2	858.8	-98.7
1989	4.3	79.4	27.8	733.9	1.8	28.4	875.6	67.4	67.4	887.0	-95.1
1990	4.3	79.4	27.8	745.8	1.8	28.4	887.4	68.3	68.3	898.8	-97.9
(86-90)	(4.3)	(79.4)	(27.8)	(752.6)	(1.8)	(28.4)	(894.3)	(68.8)	(68.8)	(905.7)	-(100.9)
1991	4.3	79.4	27.8	703.0	1.8	28.4	844.7	65.0	65.0	856.1	-96.2
1992	4.3	79.4	27.8	727.2	1.8	28.4	868.9	66.8	66.8	880.2	-97.6
1993	4.3	79.4	27.8	712.3	1.8	28.4	854.0	65.7	65.7	865.4	-97.5
1994	4.3	79.4	27.8	697.9	1.8	28.4	839.6	64.6	64.6	850.9	-100.2
1995	4.3	79.4	27.8	596.6	1.8	28.4	738.3	56.8	56.8	749.7	-91.7
1996	4.3	79.4	27.8	672.7	1.8	28.4	814.4	62.6	62.6	825.8	-92.7
(91-96)	(4.3)	(79.4)	(27.8)	(685.0)	(1.8)	(28.4)	(826.6)	(63.6)	(63.6)	(838.0)	-(96.0)

Table 5.4.15(4) Additional Water Demand in Upper East Delta (Sample Case of 50% Guarantee)

Year	Whole Year Crops: Sugar Cane	Whole Year Crops: Fruit Trees	Whole Year Crops: Fish Pond	Dry Season Crops: Dry Paddy	Dry Season Crops: Field Crops	Dry Season Crops: Vege-table	Total Area Harvested	Cropping Intensity (%): Present	Cropping Intensity (%): Proposed	Water Demand (MCM)	Additional Water Supply (MCM)
3.1 Existing Condition (Projects 15 to 21, Total Irrigable Area = 1,657,000 rai)											
1986	0.0	6.7	0.4	241.3	62.5	2.1	313.0	18.9		543.9	0.0
1987	0.5	12.0	0.7	159.7	58.1	4.4	235.4	14.2		401.5	0.0
1988	0.5	8.4	0.0	278.2	26.7	3.0	316.8	19.1		570.1	0.0
1989	0.0	8.0	1.4	139.0	28.3	0.4	177.1	10.7		312.4	0.0
1990	0.2	21.4	3.7	479.2	37.5	2.1	544.1	32.8		986.0	0.0
(86-90)	(0.2)	(11.3)	(1.2)	(259.5)	(42.6)	(2.4)	(317.3)	(19.1)		(562.8)	(0.0)
1991	8.7	17.4	1.9	39.2	54.0	3.7	124.9	7.5		195.7	0.0
1992	6.5	19.4	1.9	101.2	57.2	3.3	189.5	11.4		315.2	0.0
1993	9.7	20.4	2.4	28.5	48.0	4.6	113.6	6.9		177.1	0.0
1994	13.3	23.1	3.8	27.6	34.4	3.1	105.3	6.4		168.2	0.0
1995	14.0	43.4	3.7	205.0	36.7	3.0	305.8	18.5		540.6	0.0
1996	14.4	42.8	3.4	756.8	19.4	1.7	838.5	50.6		1536.4	0.0
(91-96)	(11.1)	(27.8)	(2.9)	(193.1)	(41.6)	(3.2)	(279.6)	(16.9)		(488.9)	(0.0)
3.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 1,657,000 rai)											
1986	0.0	6.7	0.4	756.8	62.5	2.1	828.5	18.9	50.0	1497.6	953.7
1987	0.5	12.0	0.7	752.8	58.1	4.4	828.5	14.2	50.0	1498.7	1097.2
1988	0.5	8.4	0.0	789.9	26.7	3.0	828.5	19.1	50.0	1516.8	946.6
1989	0.0	8.0	1.4	790.4	28.3	0.4	828.5	10.7	50.0	1517.5	1205.1
1990	0.2	21.4	3.7	763.6	37.5	2.1	828.5	32.8	50.0	1512.1	526.1
(86-90)	(0.2)	(11.3)	(1.2)	(770.7)	(42.6)	(2.4)	(828.5)	(19.1)	(50.0)	(1508.6)	(945.8)
1991	8.7	17.4	1.9	742.8	54.0	3.7	828.5	7.5	50.0	1497.3	1301.7
1992	6.5	19.4	1.9	740.2	57.2	3.3	828.5	11.4	50.0	1497.4	1182.2
1993	9.7	20.4	2.4	743.4	48.0	4.6	828.5	6.9	50.0	1499.6	1322.6
1994	13.3	23.1	3.8	750.8	34.4	3.1	828.5	6.4	50.0	1506.1	1337.9
1995	14.0	43.4	3.7	727.7	36.7	3.0	828.5	18.5	50.0	1507.6	967.0
1996	14.4	42.8	3.4	756.8	19.4	1.7	838.5	50.6	50.6	1536.4	0.0
(91-96)	(11.1)	(27.8)	(2.9)	(743.6)	(41.6)	(3.2)	(830.2)	(16.9)	(50.1)	(1507.4)	(1018.5)
3.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,570,000 rai)											
1986	59.3	142.0	33.0	404.7	121.4	24.6	785.0	18.9	50.0	1342.5	798.6
1987	59.3	142.0	33.0	404.7	121.4	24.6	785.0	14.2	50.0	1342.5	941.0
1988	59.3	142.0	33.0	404.7	121.4	24.6	785.0	19.1	50.0	1342.5	772.4
1989	59.3	142.0	33.0	404.7	121.4	24.6	785.0	10.7	50.0	1342.5	1030.1
1990	59.3	142.0	33.0	404.7	121.4	24.6	785.0	32.8	50.0	1342.5	356.5
(86-90)	(59.3)	(142.0)	(33.0)	(404.7)	(121.4)	(24.6)	(785.0)	(19.1)	(50.0)	(1342.5)	(779.7)
1991	59.3	142.0	33.0	404.7	121.4	24.6	785.0	7.5	50.0	1342.5	1146.8
1992	59.3	142.0	33.0	404.7	121.4	24.6	785.0	11.4	50.0	1342.5	1027.3
1993	59.3	142.0	33.0	404.7	121.4	24.6	785.0	6.9	50.0	1342.5	1165.4
1994	59.3	142.0	33.0	404.7	121.4	24.6	785.0	6.4	50.0	1342.5	1174.3
1995	59.3	142.0	33.0	404.7	121.4	24.6	785.0	18.5	50.0	1342.5	801.9
1996	59.3	142.0	33.0	414.2	121.4	24.6	794.5	50.6	50.6	1360.0	-176.4
(91-96)	(59.3)	(142.0)	(33.0)	(406.3)	(121.4)	(24.6)	(786.6)	(16.9)	(50.1)	(1345.4)	(856.6)
3.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,570,000 rai)											
1986	49.4	118.3	27.5	468.1	101.2	20.5	785.0	18.9	50.0	1360.8	816.8
1987	49.4	118.3	27.5	468.1	101.2	20.5	785.0	14.2	50.0	1360.8	959.3
1988	49.4	118.3	27.5	468.1	101.2	20.5	785.0	19.1	50.0	1360.8	790.7
1989	49.4	118.3	27.5	468.1	101.2	20.5	785.0	10.7	50.0	1360.8	1048.4
1990	49.4	118.3	27.5	468.1	101.2	20.5	785.0	32.8	50.0	1360.8	374.8
(86-90)	(49.4)	(118.3)	(27.5)	(468.1)	(101.2)	(20.5)	(785.0)	(19.1)	(50.0)	(1360.8)	(798.0)
1991	49.4	118.3	27.5	468.1	101.2	20.5	785.0	7.5	50.0	1360.8	1165.1
1992	49.4	118.3	27.5	468.1	101.2	20.5	785.0	11.4	50.0	1360.8	1045.6
1993	49.4	118.3	27.5	468.1	101.2	20.5	785.0	6.9	50.0	1360.8	1183.7
1994	49.4	118.3	27.5	468.1	101.2	20.5	785.0	6.4	50.0	1360.8	1192.6
1995	49.4	118.3	27.5	468.1	101.2	20.5	785.0	18.5	50.0	1360.8	820.2
1996	49.4	118.3	27.5	477.6	101.2	20.5	794.5	50.6	50.6	1378.3	-158.1
(91-96)	(49.4)	(118.3)	(27.5)	(469.7)	(101.2)	(20.5)	(786.6)	(16.9)	(50.1)	(1363.7)	(874.8)
3.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,570,000 rai)											
1986	39.5	94.6	22.0	531.5	81.0	16.4	785.0	18.9	50.0	1379.1	835.1
1987	39.5	94.6	22.0	531.5	81.0	16.4	785.0	14.2	50.0	1379.1	977.6
1988	39.5	94.6	22.0	531.5	81.0	16.4	785.0	19.1	50.0	1379.1	809.0
1989	39.5	94.6	22.0	531.5	81.0	16.4	785.0	10.7	50.0	1379.1	1066.7
1990	39.5	94.6	22.0	531.5	81.0	16.4	785.0	32.8	50.0	1379.1	393.1
(86-90)	(39.5)	(94.6)	(22.0)	(531.5)	(81.0)	(16.4)	(785.0)	(19.1)	(50.0)	(1379.1)	(816.3)
1991	39.5	94.6	22.0	531.5	81.0	16.4	785.0	7.5	50.0	1379.1	1183.4
1992	39.5	94.6	22.0	531.5	81.0	16.4	785.0	11.4	50.0	1379.1	1063.9
1993	39.5	94.6	22.0	531.5	81.0	16.4	785.0	6.9	50.0	1379.1	1202.0
1994	39.5	94.6	22.0	531.5	81.0	16.4	785.0	6.4	50.0	1379.1	1210.9
1995	39.5	94.6	22.0	531.5	81.0	16.4	785.0	18.5	50.0	1379.1	838.5
1996	39.5	94.6	22.0	541.0	81.0	16.4	794.5	50.6	50.6	1396.6	-139.8
(91-96)	(39.5)	(94.6)	(22.0)	(533.1)	(81.0)	(16.4)	(786.6)	(16.9)	(50.1)	(1382.0)	(893.1)

Table 5.4.15(5) Additional Water Demand in Lower East Delta (Sample Case of 50% Guarantee)

Year	Whole Year Crops			Dry Season Crops			Total Area	Cropping Intensity (%)		Water Demand	Additional Water Supply
	Sugar Cane	Fruit Trees	Fish Pond	Dry Paddy	Field Crops	Vege-table	Harvested	Present	Proposed	(MCM)	(MCM)
4.1 Existing Condition (Projects 22 to 25, Total Irrigable Area = 1,939,000 rai)											
1986	0.0	144.3	148.3	710.5	0.0	8.9	1012.0	52.2		1035.2	0.0
1987	0.0	117.0	153.0	645.3	2.6	1.6	919.5	47.4		936.7	0.0
1988	0.0	125.3	170.0	622.6	0.2	1.1	919.2	47.4		937.5	0.0
1989	0.0	141.5	165.8	738.8	2.5	2.1	1050.7	54.2		1073.0	0.0
1990	0.0	148.7	89.4	642.5	0.2	0.2	881.0	45.4		911.4	0.0
(86-90)	(0.0)	(135.4)	(145.3)	(671.9)	(1.1)	(2.8)	(956.5)	(49.3)		(978.8)	(0.0)
1991	0.0	143.5	97.9	470.5	0.2	0.9	713.0	36.8		741.3	0.0
1992	0.0	158.8	32.8	606.7	0.4	0.6	799.3	41.2		836.4	0.0
1993	0.0	167.8	116.6	595.3	0.3	0.4	880.4	45.4		913.5	0.0
1994	0.0	172.4	106.5	467.8	0.3	0.6	747.6	38.6		782.6	0.0
1995	0.0	159.8	73.5	521.1	0.5	0.2	755.1	38.9		789.4	0.0
1996	0.0	170.9	118.4	606.0	0.0	0.2	895.5	46.2		929.3	0.0
(91-96)	(0.0)	(162.2)	(91.0)	(544.6)	(0.3)	(0.5)	(798.5)	(41.2)		(832.1)	(0.0)
4.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 1,939,000 rai)											
1986	0.0	144.3	148.3	714.6	2.7	2.1	1012.0	52.2	52.2	1036.3	1.1
1987	0.0	117.0	153.0	695.3	2.6	1.6	969.5	47.4	50.0	986.7	50.0
1988	0.0	125.3	170.0	672.9	0.2	1.1	969.5	47.4	50.0	987.8	50.3
1989	0.0	141.5	165.8	738.8	2.5	2.1	1050.7	54.2	54.2	1073.0	0.0
1990	0.0	148.7	89.4	731.0	0.2	0.2	969.5	45.4	50.0	999.9	88.5
(86-90)	(0.0)	(135.4)	(145.3)	(710.5)	(1.6)	(1.4)	(994.2)	(49.3)	(51.3)	(1016.7)	(38.0)
1991	0.0	143.5	97.9	727.0	0.2	0.9	969.5	36.8	50.0	997.8	256.5
1992	0.0	158.8	32.8	776.9	0.4	0.6	969.5	41.2	50.0	1006.6	170.2
1993	0.0	167.8	116.6	684.4	0.3	0.4	969.5	45.4	50.0	1002.6	89.1
1994	0.0	172.4	106.5	689.7	0.3	0.6	969.5	38.6	50.0	1004.5	221.9
1995	0.0	159.8	73.5	735.5	0.5	0.2	969.5	38.9	50.0	1003.8	214.4
1996	0.0	170.9	118.4	680.0	0.0	0.2	969.5	46.2	50.0	1003.3	74.0
(91-96)	(0.0)	(162.2)	(91.0)	(715.6)	(0.3)	(0.5)	(969.5)	(41.2)	(50.0)	(1003.1)	(171.0)
4.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,750,000 rai)											
1986	0.0	206.3	112.9	594.2	0.0	0.0	913.4	52.2	52.2	956.5	-78.7
1987	0.0	206.3	112.9	555.8	0.0	0.0	875.0	47.4	50.0	918.1	-18.6
1988	0.0	206.3	112.9	555.8	0.0	0.0	875.0	47.4	50.0	918.1	-19.4
1989	0.0	206.3	112.9	629.1	0.0	0.0	948.3	54.2	54.2	991.4	-81.6
1990	0.0	206.3	112.9	555.8	0.0	0.0	875.0	45.4	50.0	918.1	6.7
(86-90)	(0.0)	(206.3)	(112.9)	(578.1)	(0.0)	(0.0)	(897.3)	(49.3)	(51.3)	(940.4)	-(38.3)
1991	0.0	206.3	112.9	555.8	0.0	0.0	875.0	36.8	50.0	918.1	176.8
1992	0.0	206.3	112.9	555.8	0.0	0.0	875.0	41.2	50.0	918.1	81.7
1993	0.0	206.3	112.9	555.8	0.0	0.0	875.0	45.4	50.0	918.1	4.6
1994	0.0	206.3	112.9	555.8	0.0	0.0	875.0	38.6	50.0	918.1	135.5
1995	0.0	206.3	112.9	555.8	0.0	0.0	875.0	38.9	50.0	918.1	128.7
1996	0.0	206.3	112.9	555.8	0.0	0.0	875.0	46.2	50.0	918.1	-11.2
(91-96)	(0.0)	(206.3)	(112.9)	(555.8)	(0.0)	(0.0)	(875.0)	(41.2)	(50.0)	(918.1)	(86.0)
4.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,750,000 rai)											
1986	0.0	171.9	94.1	647.4	0.0	0.0	913.4	52.2	52.2	949.3	-85.9
1987	0.0	171.9	94.1	609.0	0.0	0.0	875.0	47.4	50.0	910.9	-25.8
1988	0.0	171.9	94.1	609.0	0.0	0.0	875.0	47.4	50.0	910.9	-26.6
1989	0.0	171.9	94.1	682.3	0.0	0.0	948.3	54.2	54.2	984.2	-88.8
1990	0.0	171.9	94.1	609.0	0.0	0.0	875.0	45.4	50.0	910.9	-0.5
(86-90)	(0.0)	(171.9)	(94.1)	(631.3)	(0.0)	(0.0)	(897.3)	(49.3)	(51.3)	(933.2)	-(45.5)
1991	0.0	171.9	94.1	609.0	0.0	0.0	875.0	36.8	50.0	910.9	169.6
1992	0.0	171.9	94.1	609.0	0.0	0.0	875.0	41.2	50.0	910.9	74.5
1993	0.0	171.9	94.1	609.0	0.0	0.0	875.0	45.4	50.0	910.9	-2.6
1994	0.0	171.9	94.1	609.0	0.0	0.0	875.0	38.6	50.0	910.9	128.4
1995	0.0	171.9	94.1	609.0	0.0	0.0	875.0	38.9	50.0	910.9	121.5
1996	0.0	171.9	94.1	609.0	0.0	0.0	875.0	46.2	50.0	910.9	-18.4
(91-96)	(0.0)	(171.9)	(94.1)	(609.0)	(0.0)	(0.0)	(875.0)	(41.2)	(50.0)	(910.9)	(78.8)
4.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,750,000 rai)											
1986	0.0	137.5	75.3	700.6	0.0	0.0	913.4	52.2	52.2	942.1	-93.1
1987	0.0	137.5	75.3	662.2	0.0	0.0	875.0	47.4	50.0	903.7	-33.0
1988	0.0	137.5	75.3	662.2	0.0	0.0	875.0	47.4	50.0	903.7	-33.8
1989	0.0	137.5	75.3	735.5	0.0	0.0	948.3	54.2	54.2	977.0	-96.0
1990	0.0	137.5	75.3	662.2	0.0	0.0	875.0	45.4	50.0	903.7	-7.7
(86-90)	(0.0)	(137.5)	(75.3)	(684.5)	(0.0)	(0.0)	(897.3)	(49.3)	(51.3)	(926.1)	-(52.7)
1991	0.0	137.5	75.3	662.2	0.0	0.0	875.0	36.8	50.0	903.7	162.4
1992	0.0	137.5	75.3	662.2	0.0	0.0	875.0	41.2	50.0	903.7	67.4
1993	0.0	137.5	75.3	662.2	0.0	0.0	875.0	45.4	50.0	903.7	-9.8
1994	0.0	137.5	75.3	662.2	0.0	0.0	875.0	38.6	50.0	903.7	121.2
1995	0.0	137.5	75.3	662.2	0.0	0.0	875.0	38.9	50.0	903.7	114.3
1996	0.0	137.5	75.3	662.2	0.0	0.0	875.0	46.2	50.0	903.7	-25.6
(91-96)	(0.0)	(137.5)	(75.3)	(662.2)	(0.0)	(0.0)	(875.0)	(41.2)	(50.0)	(903.7)	(71.6)

Table 5.4.15(6) Additional Water Demand in the Whole Delta (Sample Case of 50% Guarantee)

Year	Whole Year Crops			Dry Season Crops			Total Area	Cropping Intensity (%)		Water Demand	Additional Water Supply
	Sugar Cane	Fruit Trees	Fish Pond	Dry Paddy	Field Crops	Vege-table	Harvested	Present	Proposed	(MCM)	(MCM)
5.1 Existing Condition (Projects 1 to 25, Total Irrigable Area = 7,342,000 rai)											
1986	49.6	263.8	176.4	2759.1	108.8	61.8	3419.5	46.6		4512.9	0.0
1987	55.4	233.4	198.8	2472.8	100.8	56.1	3117.3	42.5		4068.5	0.0
1988	51.1	252.8	216.1	2498.4	51.3	45.6	3115.3	42.4		4152.6	0.0
1989	61.3	234.2	234.2	2769.6	44.7	52.2	3396.2	46.3		4526.1	0.0
1990	58.3	256.7	132.3	2939.6	58.3	50.5	3495.7	47.6		4851.1	0.0
(86-90)	(55.1)	(248.2)	(191.6)	(2687.9)	(72.8)	(53.2)	(3308.8)	(45.1)		(4422.2)	(0.0)
1991	157.6	246.8	139.9	1776.0	85.0	36.1	2441.4	33.3		3012.2	0.0
1992	167.7	308.3	79.2	2066.4	96.9	44.4	2762.9	37.6		3514.9	0.0
1993	183.3	308.6	159.8	1871.1	77.5	49.5	2649.8	36.1		3244.9	0.0
1994	136.3	325.3	153.4	1665.6	61.0	38.1	2379.7	32.4		2914.3	0.0
1995	191.6	357.1	121.9	2335.3	52.8	37.2	3095.9	42.2		4309.4	0.0
1996	214.8	392.9	167.3	3538.0	28.2	44.9	4386.1	59.7		6503.9	0.0
(91-96)	(175.2)	(323.2)	(136.9)	(2208.7)	(66.9)	(41.7)	(2952.6)	(40.2)		(3916.6)	(0.0)
5.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 7,342,000 rai)											
1986	49.6	263.8	176.4	3398.2	111.5	55.0	4054.5	46.6	55.2	5688.7	1175.8
1987	55.4	233.4	198.8	3310.0	100.8	56.1	3954.5	42.5	53.9	5574.8	1506.3
1988	51.1	252.8	216.1	3273.8	51.3	45.6	3890.7	42.4	53.0	5544.3	1391.7
1989	61.3	234.2	234.2	3421.0	44.7	52.2	4047.6	46.3	55.1	5731.2	1205.1
1990	58.3	256.7	132.3	3379.2	58.3	50.5	3935.3	47.6	53.6	5589.1	738.0
(86-90)	(55.1)	(248.2)	(191.6)	(3356.4)	(73.3)	(51.9)	(3976.5)	(45.1)	(54.2)	(5625.6)	(1203.4)
1991	157.6	246.8	139.9	3222.3	85.0	36.1	3887.7	33.3	53.0	5469.8	2457.6
1992	167.7	308.3	79.2	3218.1	96.9	44.4	3914.6	37.6	53.3	5500.9	1986.0
1993	183.3	308.6	159.8	3119.4	77.5	49.5	3898.1	36.1	53.1	5478.5	2233.6
1994	136.3	325.3	153.4	3167.9	61.0	38.1	3882.0	32.4	52.9	5504.9	2590.6
1995	191.6	357.1	121.9	3072.4	52.8	37.2	3833.0	42.2	52.2	5490.8	1181.4
1996	214.8	392.9	167.3	3612.0	28.2	44.9	4460.1	59.7	60.7	6577.9	74.0
(91-96)	(175.2)	(323.2)	(136.9)	(3235.4)	(66.9)	(41.7)	(3979.3)	(40.2)	(54.2)	(5670.4)	(1753.9)
5.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 6,800,000 rai)											
1986	348.5	637.6	229.1	2210.2	217.2	102.2	3744.7	46.6	55.1	5064.8	551.9
1987	348.5	637.6	229.1	2120.1	217.2	102.2	3654.7	42.5	53.7	4974.8	906.3
1988	348.5	637.6	229.1	2062.8	217.2	102.2	3597.4	42.4	52.9	4917.5	764.9
1989	348.5	637.6	229.1	2206.3	217.2	102.2	3740.9	46.3	55.0	5096.7	570.6
1990	348.5	637.6	229.1	2102.9	217.2	102.2	3637.4	47.6	53.5	4957.5	106.4
(86-90)	(348.5)	(637.6)	(229.1)	(2140.5)	(217.2)	(102.2)	(3675.0)	(45.1)	(54.0)	(5002.3)	(580.0)
1991	348.5	637.6	229.1	2060.1	217.2	102.2	3594.7	33.3	52.9	4914.8	1902.6
1992	348.5	637.6	229.1	2084.3	217.2	102.2	3618.9	37.6	53.2	4938.9	1424.0
1993	348.5	637.6	229.1	2069.5	217.2	102.2	3604.0	36.1	53.0	4924.1	1679.3
1994	348.5	637.6	229.1	2055.0	217.2	102.2	3589.6	32.4	52.8	4909.7	1995.4
1995	348.5	637.6	229.1	2014.2	217.2	102.2	3548.7	42.2	52.2	4920.2	610.8
1996	348.5	637.6	229.1	2604.6	217.2	102.2	4139.1	59.7	60.9	5947.7	-556.1
(91-96)	(348.5)	(637.6)	(229.1)	(2147.9)	(217.2)	(102.2)	(3682.5)	(40.2)	(54.2)	(5092.6)	(1176.0)
5.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 6,800,000 rai)											
1986	290.4	531.3	190.9	2465.9	181.0	85.2	3744.7	46.6	55.1	5110.4	597.6
1987	290.4	531.3	190.9	2375.9	181.0	85.2	3654.7	42.5	53.7	5020.4	951.9
1988	290.4	531.3	190.9	2318.6	181.0	85.2	3597.4	42.4	52.9	4963.1	810.5
1989	290.4	531.3	190.9	2462.1	181.0	85.2	3740.9	46.3	55.0	5142.3	616.2
1990	290.4	531.3	190.9	2358.6	181.0	85.2	3637.4	47.6	53.5	5003.2	152.1
(86-90)	(290.4)	(531.3)	(190.9)	(2396.2)	(181.0)	(85.2)	(3675.0)	(45.1)	(54.0)	(5047.9)	(625.6)
1991	290.4	531.3	190.9	2315.9	181.0	85.2	3594.7	33.3	52.9	4960.4	1948.2
1992	290.4	531.3	190.9	2340.1	181.0	85.2	3618.9	37.6	53.2	4984.6	1469.7
1993	290.4	531.3	190.9	2325.2	181.0	85.2	3604.0	36.1	53.0	4969.7	1724.9
1994	290.4	531.3	190.9	2310.8	181.0	85.2	3589.6	32.4	52.8	4955.3	2041.0
1995	290.4	531.3	190.9	2269.9	181.0	85.2	3548.7	42.2	52.2	4965.8	656.4
1996	290.4	531.3	190.9	2860.3	181.0	85.2	4139.1	59.7	60.9	5993.3	-510.5
(91-96)	(290.4)	(531.3)	(190.9)	(2403.7)	(181.0)	(85.2)	(3682.5)	(40.2)	(54.2)	(5138.2)	(1221.6)
5.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 6,800,000 rai)											
1986	232.3	425.0	152.7	2721.7	144.8	68.2	3744.7	46.6	55.1	5143.2	630.3
1987	232.3	425.0	152.7	2631.7	144.8	68.2	3654.7	42.5	53.7	5053.2	984.7
1988	232.3	425.0	152.7	2574.3	144.8	68.2	3597.4	42.4	52.9	4995.8	843.3
1989	232.3	425.0	152.7	2717.8	144.8	68.2	3740.9	46.3	55.0	5175.1	648.9
1990	232.3	425.0	152.7	2614.4	144.8	68.2	3637.4	47.6	53.5	5035.9	184.8
(86-90)	(232.3)	(425.0)	(152.7)	(2652.0)	(144.8)	(68.2)	(3675.0)	(45.1)	(54.0)	(5080.6)	(658.4)
1991	232.3	425.0	152.7	2571.6	144.8	68.2	3594.7	33.3	52.9	4993.2	1981.0
1992	232.3	425.0	152.7	2595.8	144.8	68.2	3618.9	37.6	53.2	5017.3	1502.4
1993	232.3	425.0	152.7	2581.0	144.8	68.2	3604.0	36.1	53.0	5002.5	1757.6
1994	232.3	425.0	152.7	2566.5	144.8	68.2	3589.6	32.4	52.8	4988.0	2073.8
1995	232.3	425.0	152.7	2525.7	144.8	68.2	3548.7	42.2	52.2	4998.5	689.2
1996	232.3	425.0	152.7	3116.1	144.8	68.2	4139.1	59.7	60.9	6026.1	-477.8
(91-96)	(232.3)	(425.0)	(152.7)	(2659.5)	(144.8)	(68.2)	(3682.5)	(40.2)	(54.2)	(5170.9)	(1254.4)

Table 5.4.16(1) Computation of Additional Water Supply - Lower Nan Sub-Basin (50% Case)

Unit Water Requirement for Irrigation (m3/rai)						
Zone	Dry Rice	Field Crops	Vege-table	Sugar Cane	Fruit Trees	Fish Pond
Nan	1,850	1300	1100	1,300	2,000	1,450
Minimum Cropping Intensity to be Guaranteed =					50	

Table 5.4.16(2) Additional Water Demand in Lower Nan Basin (w/o System Expansion)(50% Case)

Year	Whole Year Crops			Dry Season Crops			Total Area	Cropping Intensity (%)		Water Demand	Additional Water Supply
	Sugar Cane	Fruit Trees	Fish Pond	Dry Paddy	Field Crops	Vege-table	Harvested	Present	Proposed	(MCM)	(MCM)
1.1 Existing Condition (Phitsanulok Irrigation Project, Total Irrigable Area = 667,100 rai)											
1991	0.0	0.0	1.0	429.9	13.0	0.0	443.9	66.5		813.7	0.0
1992	0.0	0.0	0.3	251.8	12.4	0.0	264.5	39.6		482.4	0.0
1993	0.0	0.0	0.0	225.3	43.0	0.4	268.7	40.3		473.1	0.0
1994	0.0	0.0	0.0	320.3	53.8	0.2	374.3	56.1		662.7	0.0
1995	0.0	0.0	0.0	508.5	0.1	0.7	509.3	76.3		941.6	0.0
1996	0.0	0.0	0.0	566.5	0.0	0.0	566.5	84.9		1048.0	0.0
(91-96)	(0.0)	(0.0)	(0.2)	(383.7)	(20.4)	(0.2)	(404.5)	(60.6)		(736.9)	(0.0)
1.2 Existing Condition with Minimum Guarantee (Total Irrigable Area = 667,100 rai)											
1991	0.0	0.0	1.0	429.9	13.0	0.0	443.9	66.5	66.5	813.7	0.0
1992	0.0	0.0	0.3	320.9	12.4	0.0	333.6	39.6	50.0	610.1	127.7
1993	0.0	0.0	0.0	290.2	43.0	0.4	333.6	40.3	50.0	593.1	120.0
1994	0.0	0.0	0.0	320.3	53.8	0.2	374.3	56.1	56.1	662.7	0.0
1995	0.0	0.0	0.0	508.5	0.1	0.7	509.3	76.3	76.3	941.6	0.0
1996	0.0	0.0	0.0	566.5	0.0	0.0	566.5	84.9	84.9	1048.0	0.0
(91-96)	(0.0)	(0.0)	(0.2)	(406.0)	(20.4)	(0.2)	(426.9)	(60.6)	(64.0)	(778.2)	(41.3)
1.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 634,000 rai)											
1991	0.0	53.3	11.4	285.0	60.8	11.4	421.9	66.5	66.5	741.9	-71.8
1992	0.0	53.3	11.4	180.1	60.8	11.4	317.0	39.6	50.0	547.9	65.5
1993	0.0	53.3	11.4	180.1	60.8	11.4	317.0	40.3	50.0	547.9	74.7
1994	0.0	53.3	11.4	218.8	60.8	11.4	355.7	56.1	56.1	619.5	-43.2
1995	0.0	53.3	11.4	347.1	60.8	11.4	484.0	76.3	76.3	856.9	-84.8
1996	0.0	53.3	11.4	401.5	60.8	11.4	538.4	84.9	84.9	957.4	-90.6
(91-96)	(0.0)	(53.3)	(11.4)	(268.8)	(60.8)	(11.4)	(405.7)	(60.6)	(64.0)	(711.9)	-(25.0)
1.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 634,000 rai)											
1991	0.0	44.4	9.5	307.8	50.7	9.5	421.9	66.5	66.5	748.3	-65.3
1992	0.0	44.4	9.5	202.9	50.7	9.5	317.0	39.6	50.0	554.3	71.9
1993	0.0	44.4	9.5	202.9	50.7	9.5	317.0	40.3	50.0	554.3	81.2
1994	0.0	44.4	9.5	241.6	50.7	9.5	355.7	56.1	56.1	625.9	-36.8
1995	0.0	44.4	9.5	369.9	50.7	9.5	484.0	76.3	76.3	863.3	-78.3
1996	0.0	44.4	9.5	424.3	50.7	9.5	538.4	84.9	84.9	963.9	-84.2
(91-96)	(0.0)	(44.4)	(9.5)	(291.6)	(50.7)	(9.5)	(405.7)	(60.6)	(64.0)	(718.3)	-(18.6)
1.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 634,000 rai)											
1991	0.0	35.5	7.6	330.6	40.6	7.6	421.9	66.5	66.5	754.7	-58.9
1992	0.0	35.5	7.6	225.7	40.6	7.6	317.0	39.6	50.0	560.7	78.3
1993	0.0	35.5	7.6	225.7	40.6	7.6	317.0	40.3	50.0	560.7	87.6
1994	0.0	35.5	7.6	264.4	40.6	7.6	355.7	56.1	56.1	632.4	-30.3
1995	0.0	35.5	7.6	392.7	40.6	7.6	484.0	76.3	76.3	869.7	-71.9
1996	0.0	35.5	7.6	447.1	40.6	7.6	538.4	84.9	84.9	970.3	-77.7
(91-96)	(0.0)	(35.5)	(7.6)	(314.4)	(40.6)	(7.6)	(405.7)	(60.6)	(64.0)	(724.8)	-(12.2)
2.1 Existing Condition (DEDP Pump Irrigation Project, Total Irrigable Area = 392,000 rai)											
(91-96)	(0.0)	(0.0)	(0.1)	(186.1)	(4.9)	(4.9)	(196.0)	(50.0)		(356.2)	(0.0)
2.2 Existing Condition with Minimum Guarantee (DEDP Pump Irrigation Project, Total Irrigable Area = 392,000 rai)											
(91-96)	(0.0)	(0.0)	(0.1)	(186.1)	(4.9)	(4.9)	(196.0)	(50.0)	(50.0)	(356.2)	(0.0)
2.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 485,600 rai)											
(91-96)	(0.0)	(48.0)	(8.8)	(130.7)	(46.6)	(8.8)	(242.8)	(50.0)	(50.0)	(420.7)	(64.5)
2.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 485,600 rai)											
(91-96)	(0.0)	(40.0)	(7.3)	(149.4)	(38.8)	(7.3)	(242.8)	(50.0)	(50.0)	(425.4)	(69.3)
2.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 485,600 rai)											
(91-96)	(0.0)	(32.0)	(5.8)	(168.1)	(31.0)	(5.8)	(242.8)	(50.0)	(50.0)	(430.2)	(74.0)
3.1 Existing Condition (Phitsanulok + DEDP Pump, Total Irrigable Area = 1,059,100 rai)											
(91-96)	(0.0)	(0.0)	(0.3)	(569.8)	(25.3)	(5.1)	(600.5)	(56.7)		(1,093.1)	(0.0)
3.2 Existing Condition with Minimum Guarantee (Phitsanulok + DEDP Pump, Total Irrigable Area = 1,059,100 rai)											
(91-96)	(0.0)	(0.0)	(0.3)	(592.1)	(25.3)	(5.1)	(622.9)	(56.7)	(58.8)	(1,134.4)	(41.3)
3.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,119,600 rai)											
(91-96)	(0.0)	(101.3)	(20.2)	(399.5)	(107.4)	(20.2)	(648.5)	(56.7)	(57.9)	(1,132.6)	(39.5)
3.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,119,600 rai)											
(91-96)	(0.0)	(84.4)	(16.8)	(441.0)	(89.5)	(16.8)	(648.5)	(56.7)	(57.9)	(1,143.8)	(50.7)
3.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 1,119,600 rai)											
(91-96)	(0.0)	(67.5)	(13.4)	(482.5)	(71.6)	(13.4)	(648.5)	(56.7)	(57.9)	(1,155.0)	(61.8)

Table 5.4.16(3) Additional Water Demand in Lower Nan Basin (with System Expansion)(50% Case)											
	Whole Year Crops			Dry Season Crops			Total	Cropping Intensity		Water	Additional
Year	Sugar	Fruit	Fish	Dry	Field	Vege-	Area	(%)		Demand	Water Supply
	Cane	Trees	Pond	Paddy	Crops	table	Harvested	Present	Proposed	(MCM)	(MCM)
1.1 Existing Condition (Phitsanulok Irrigation Project, Extended Irrigable Area = 500,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	
1.2 Existing Condition with Minimum Guarantee (Extended Irrigable Area = 500,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	
1.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 500,000 rai)											
(91-96)	(0.0)	(42.0)	(9.0)	(142.0)	(48.0)	(9.0)	(250.0)	(0.0)	(50.0)	(432.1)	(432.1)
1.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 500,000 rai)											
(91-96)	(0.0)	(35.0)	(7.5)	(160.0)	(40.0)	(7.5)	(250.0)	(0.0)	(50.0)	(437.1)	(437.1)
1.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Total Irrigable Area = 500,000 rai)											
(91-96)	(0.0)	(28.0)	(6.0)	(178.0)	(32.0)	(6.0)	(250.0)	(0.0)	(50.0)	(442.2)	(442.2)
2.1 Existing Condition (DEDP Pump Irrigation Project, Extended Irrigable Area = 200,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	
2.2 Existing Condition with Minimum Guarantee (DEDP Pump Irrigation Project, Extended Irrigable Area = 200,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	
2.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 200,000 rai)											
(91-96)	(0.0)	(9.6)	(3.6)	(64.0)	(19.2)	(3.6)	(100.0)	(0.0)	(50.0)	(171.7)	(171.7)
2.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 200,000 rai)											
(91-96)	(0.0)	(8.0)	(3.0)	(70.0)	(16.0)	(3.0)	(100.0)	(0.0)	(50.0)	(174.0)	(174.0)
2.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 200,000 rai)											
(91-96)	(0.0)	(6.4)	(2.4)	(76.0)	(12.8)	(2.4)	(100.0)	(0.0)	(50.0)	(176.2)	(176.2)
3.1 Existing Condition (Phitsanulok + DEDP Pump, Extended Irrigable Area = 700,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	(0.0)
3.2 Existing Condition with Minimum Guarantee (Phitsanulok + DEDP Pump, Extended Irrigable Area = 700,000 rai)											
(91-96)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)		(0.0)	(0.0)
3.3 Projected High Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 700,000 rai)											
(91-96)	(0.0)	(51.6)	(12.6)	(206.0)	(67.2)	(12.6)	(350.0)	(0.0)	(70.7)	(603.8)	(603.8)
3.4 Projected Median Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 700,000 rai)											
(91-96)	(0.0)	(43.0)	(10.5)	(230.0)	(56.0)	(10.5)	(350.0)	(0.0)	(70.7)	(611.1)	(611.1)
3.5 Projected Low Growth Condition in 2016 with Minimum Guarantee (Extended Irrigable Area = 700,000 rai)											
(91-96)	(0.0)	(34.4)	(8.4)	(254.0)	(44.8)	(8.4)	(350.0)	(0.0)	(70.7)	(618.4)	(618.4)

Figure 5.4.1 Location of Regulators in the Chao Phraya Delta

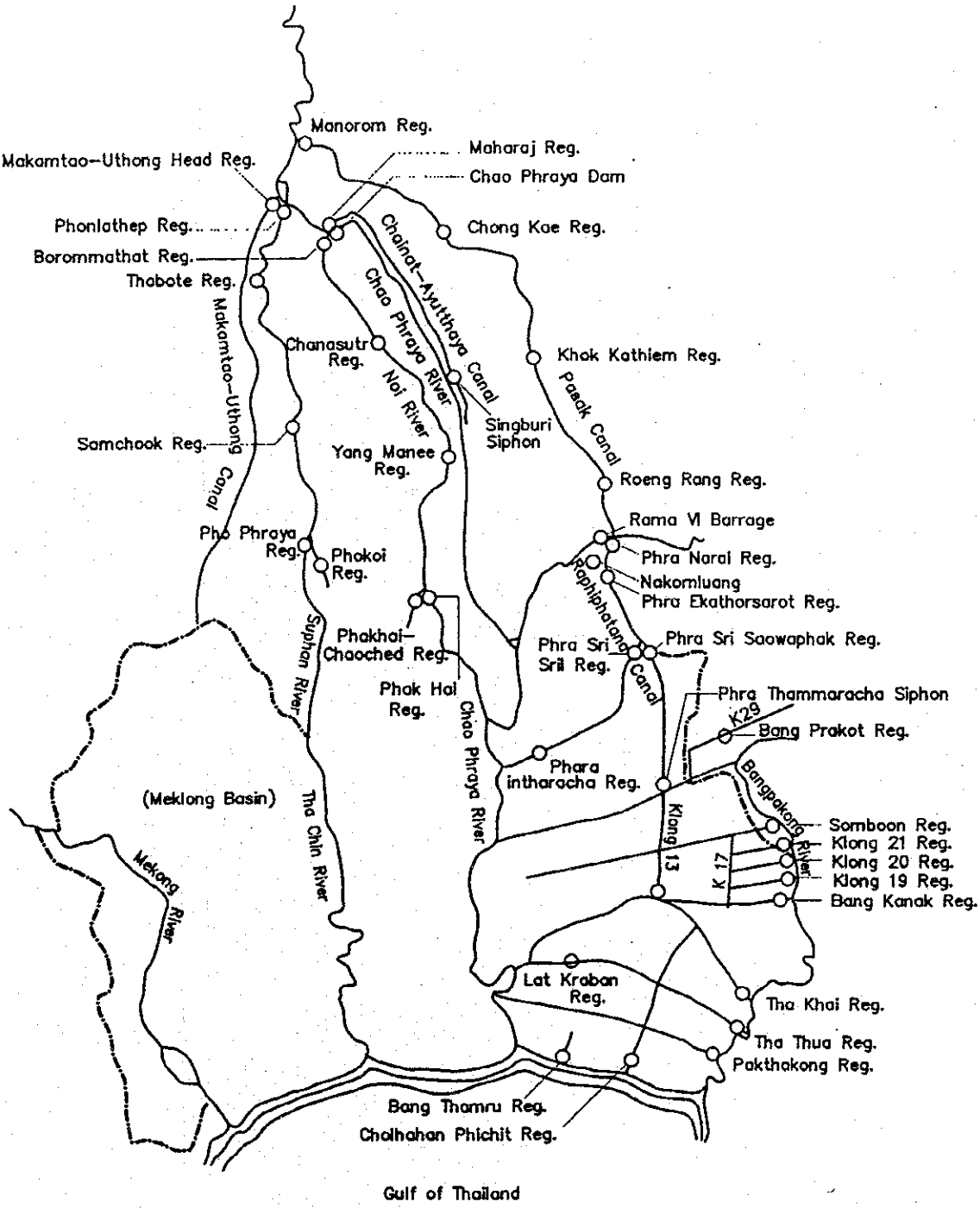


Figure 5.4.2 Irrigation Systems in the Chao Phraya Delta West Bank Area

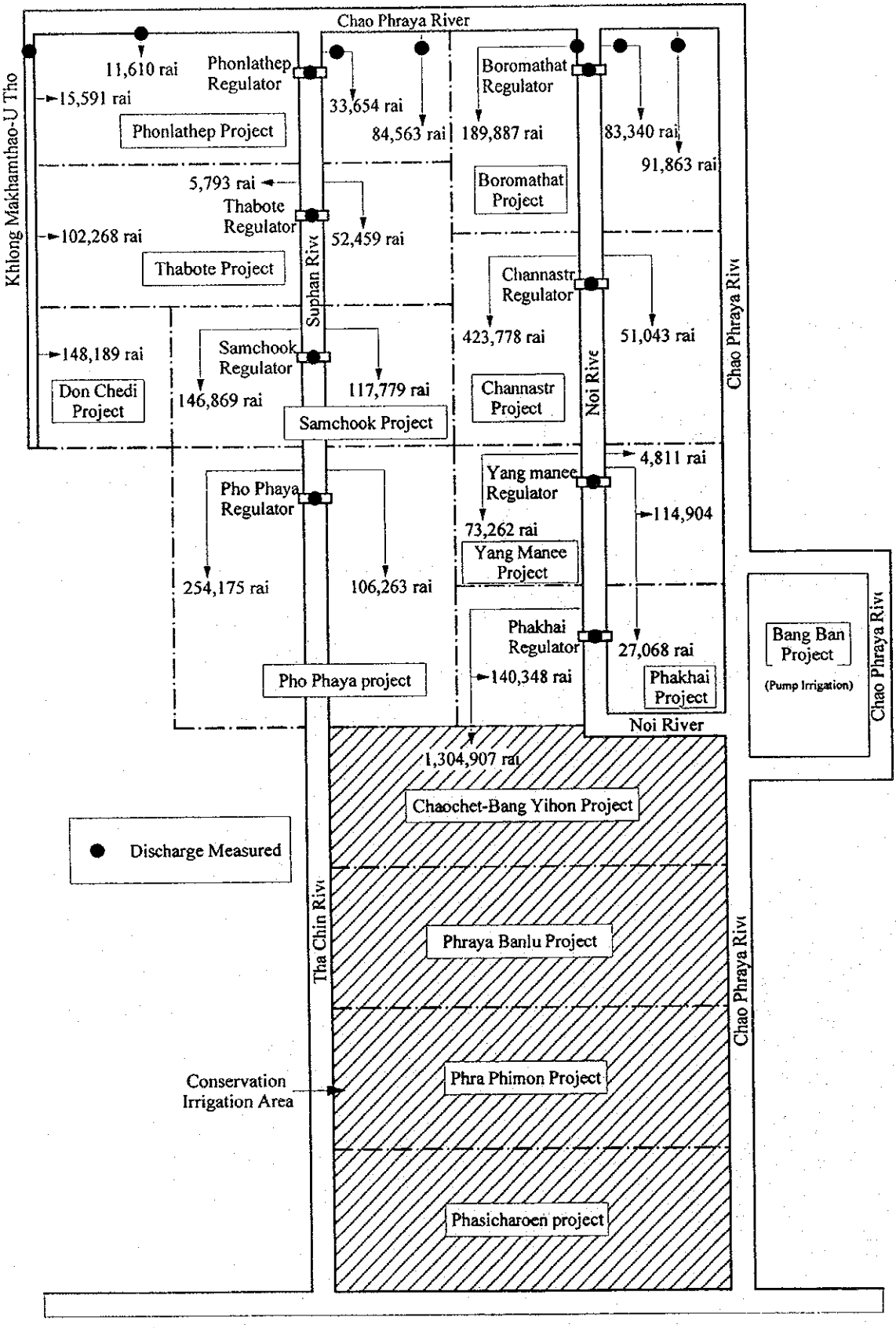


Figure 5.4.3 Irrigation Systems in the Chao Phraya Delta East Bank Area

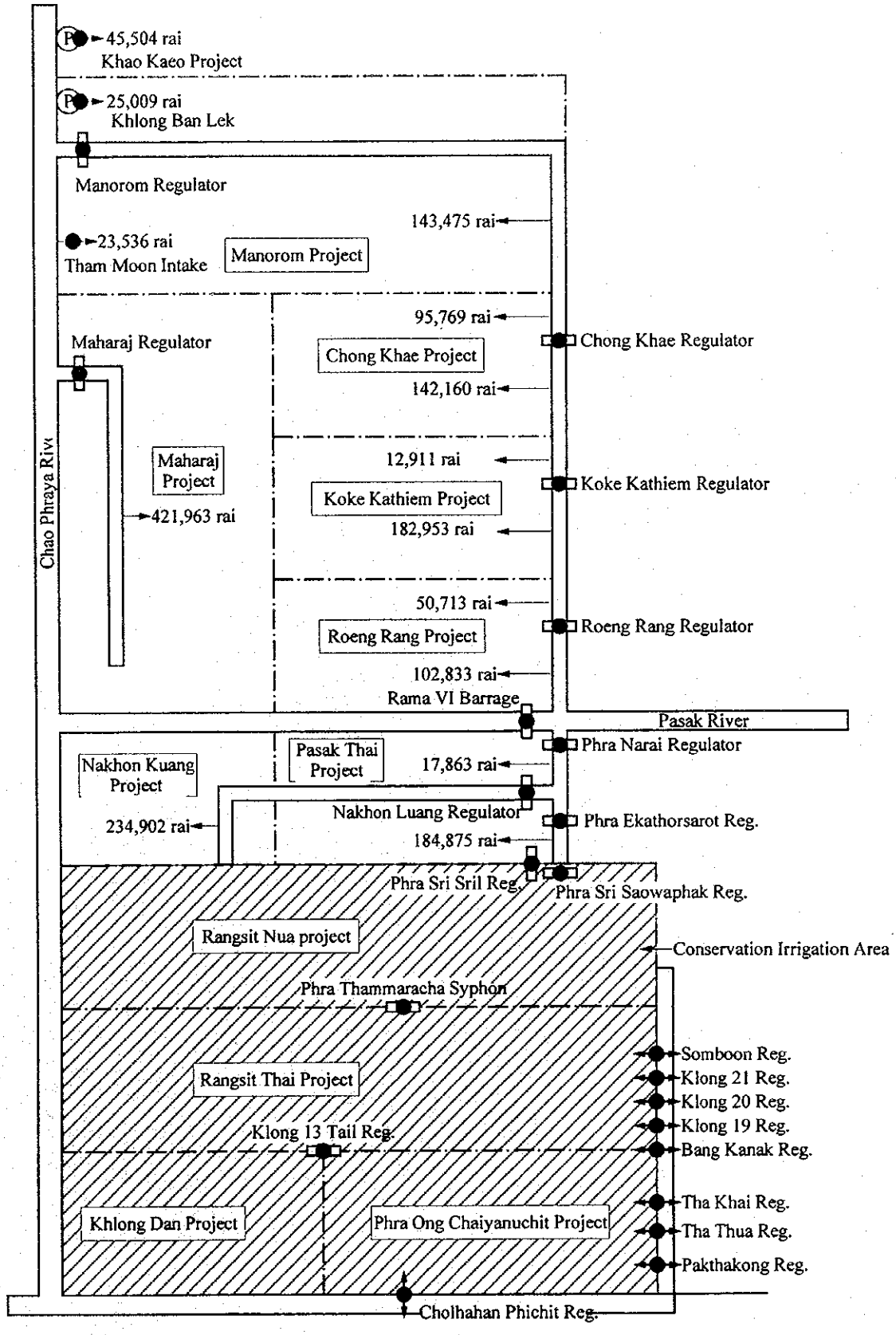
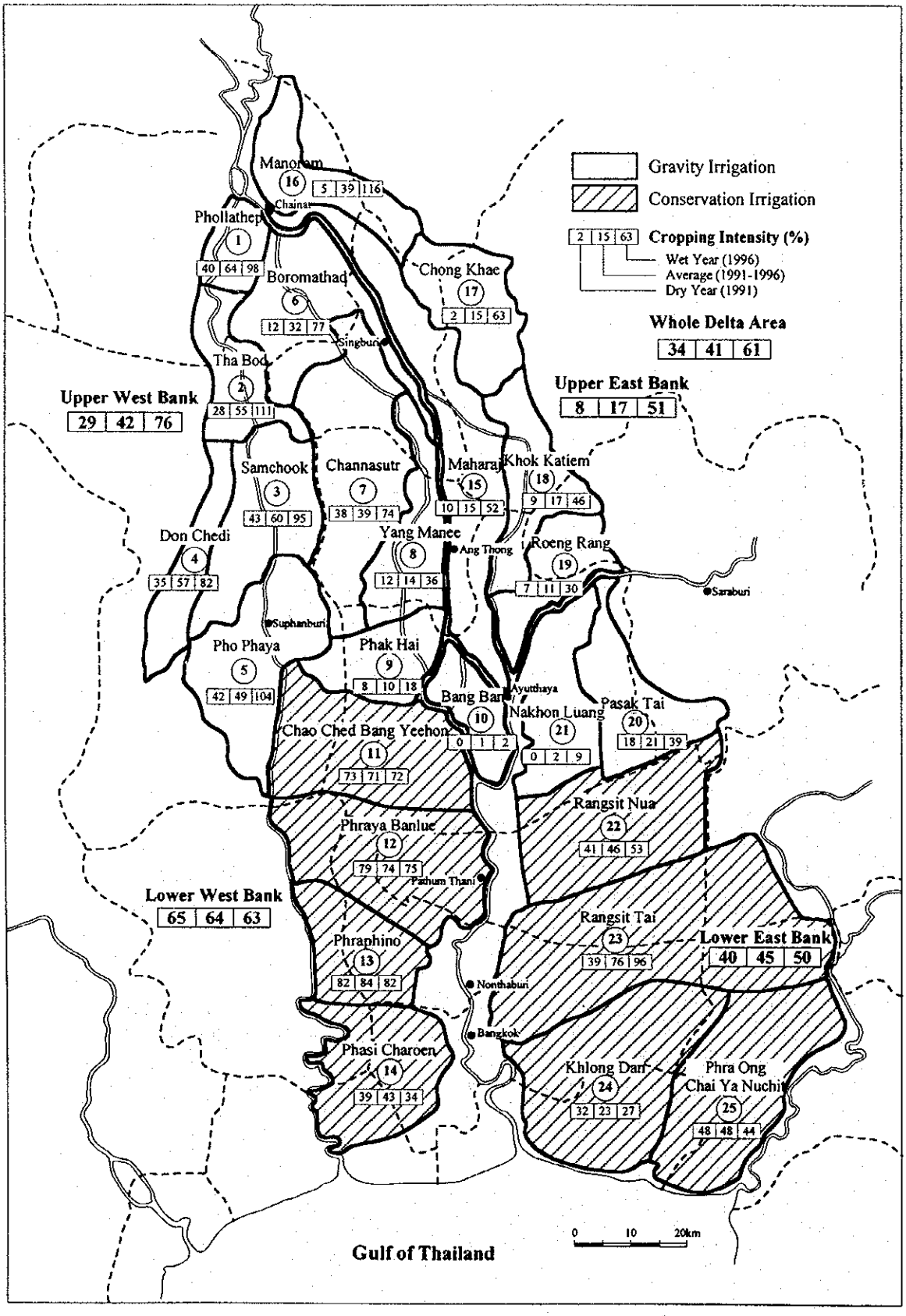


Figure 5.4.4 Dry Season Cropping Intensities in 25 Large-Scale Irrigation Sub-Projects in Chao Phraya Delta



デルタ平面図(A4,Intensity)

Figure 5.4.5 Evaluation of Current Water Shortage for Dry Season Cropping (Sample Case with the Minimum Guarantee of 50% of Cropping)

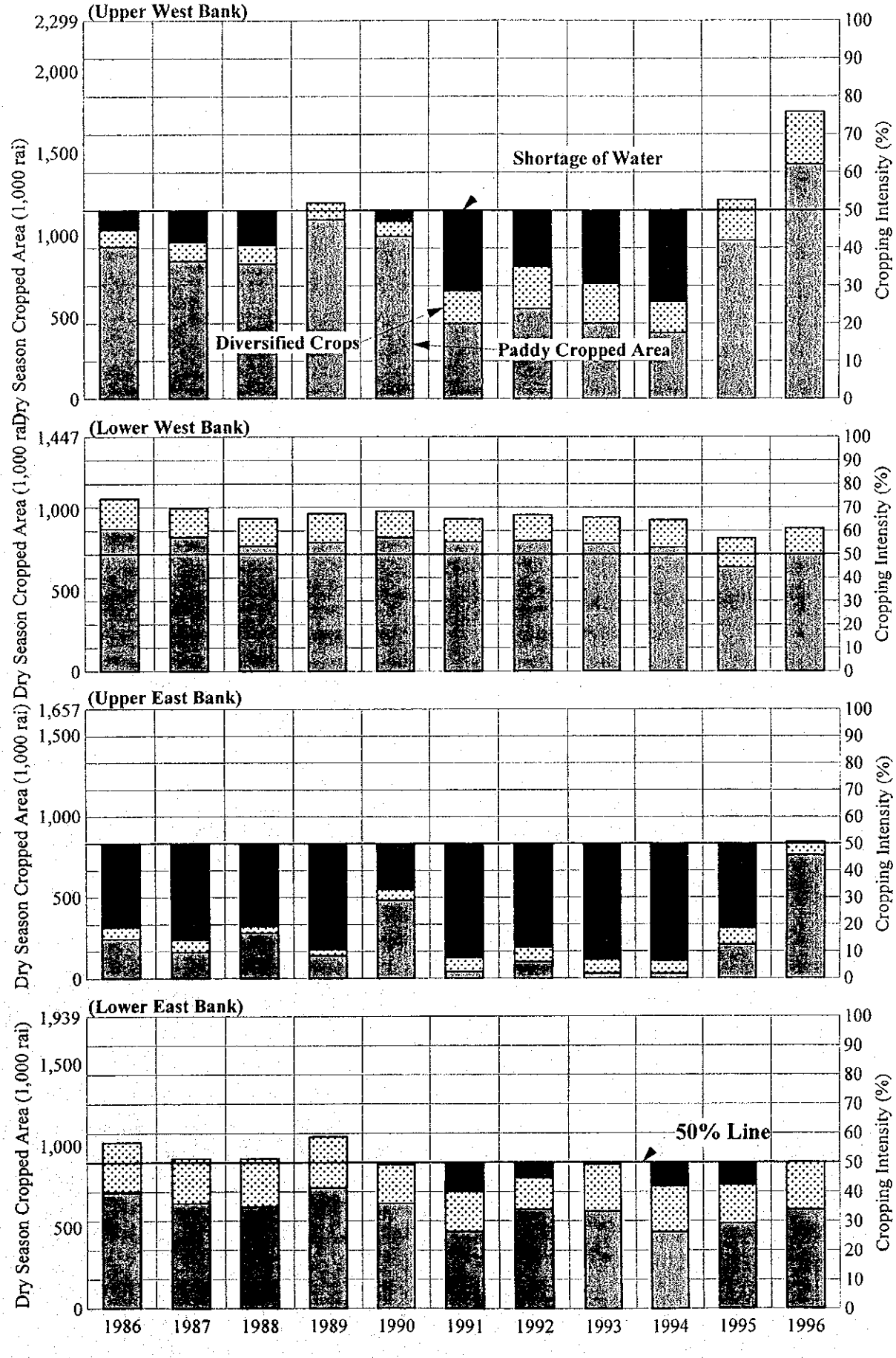
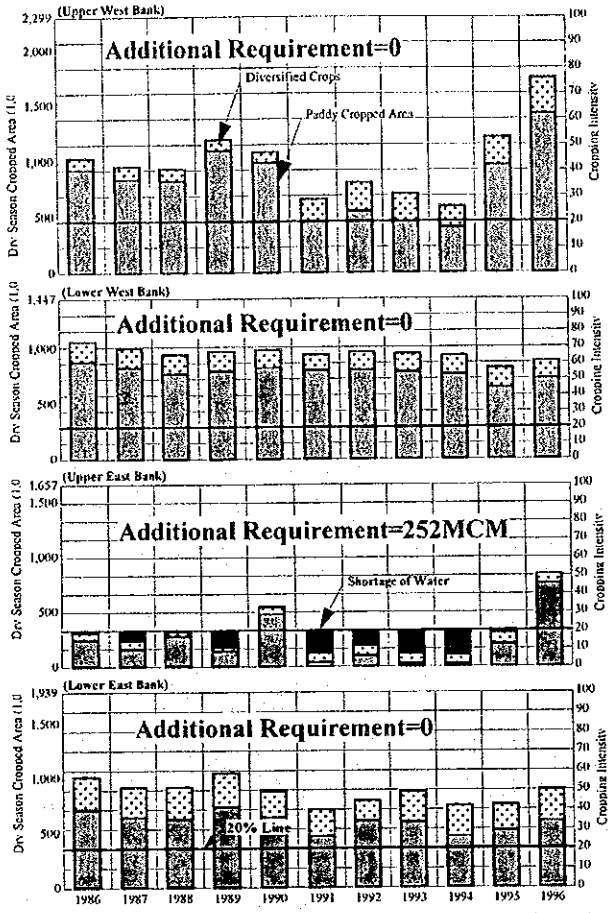
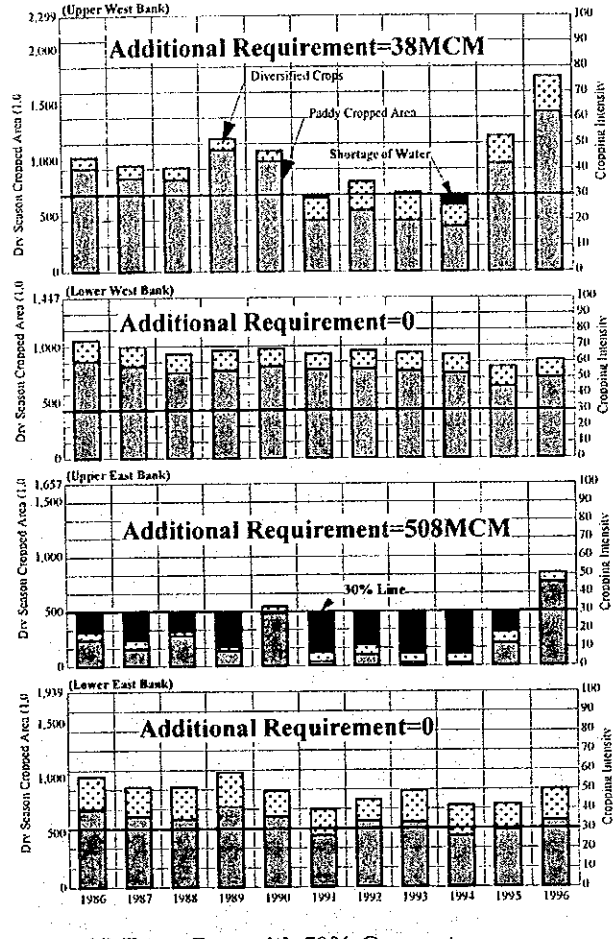


Figure 5.4.6(1) Evaluation of Current Water Shortage for Dry Season Cropping (1/2)

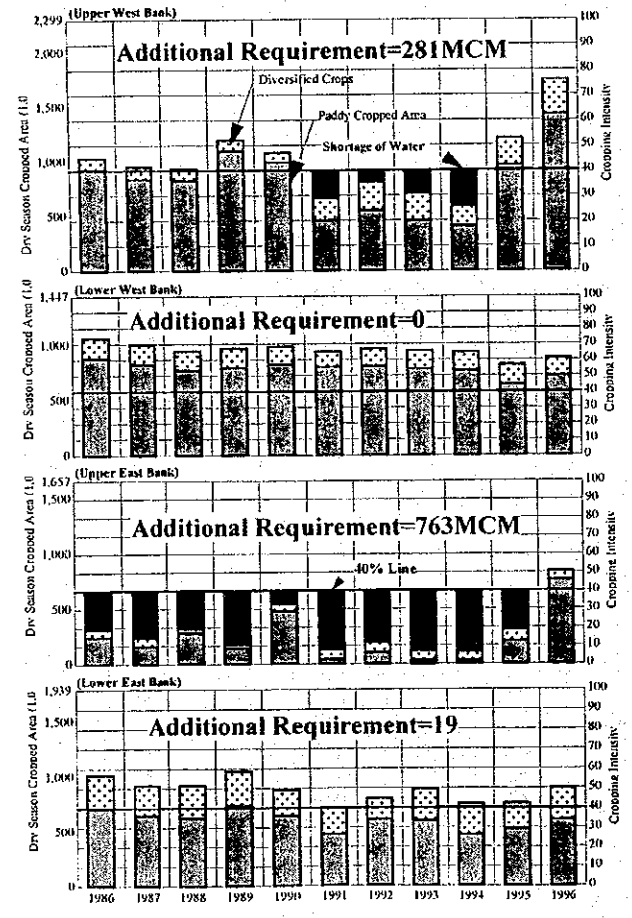
(1) For a Case with 20% Guarantee



(2) For a Case with 30% Guarantee



(3) For a Case with 40% Guarantee



(4) For a Case with 50% Guarantee

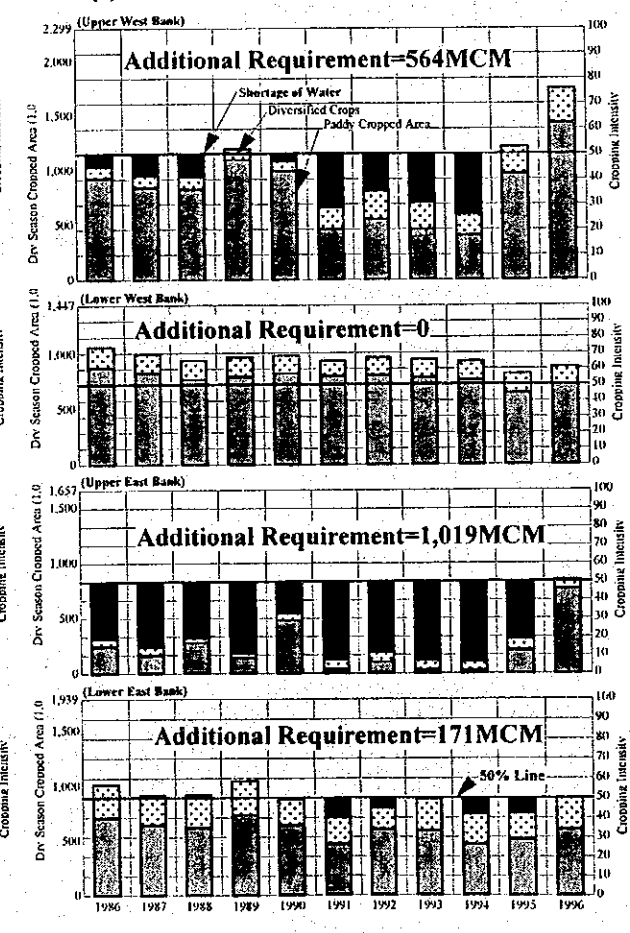
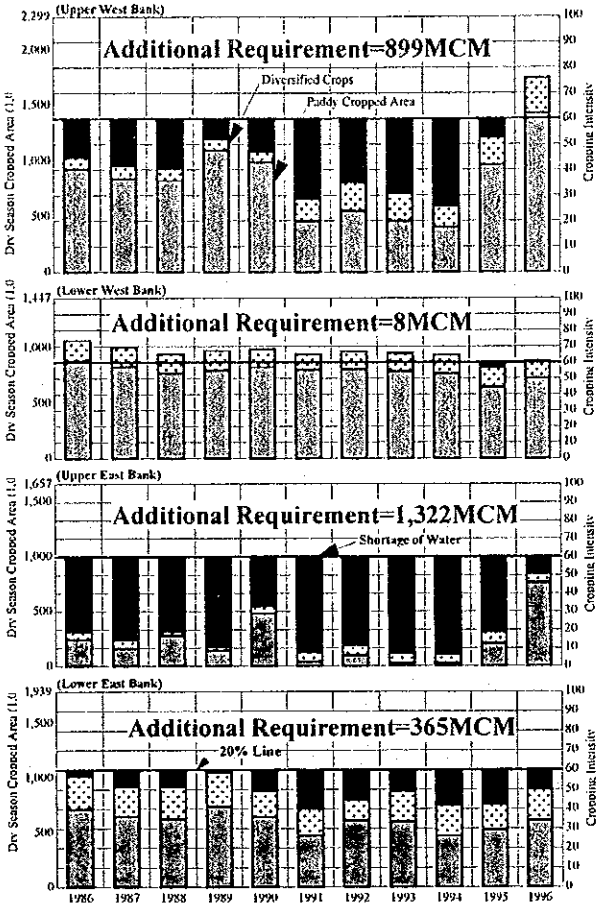
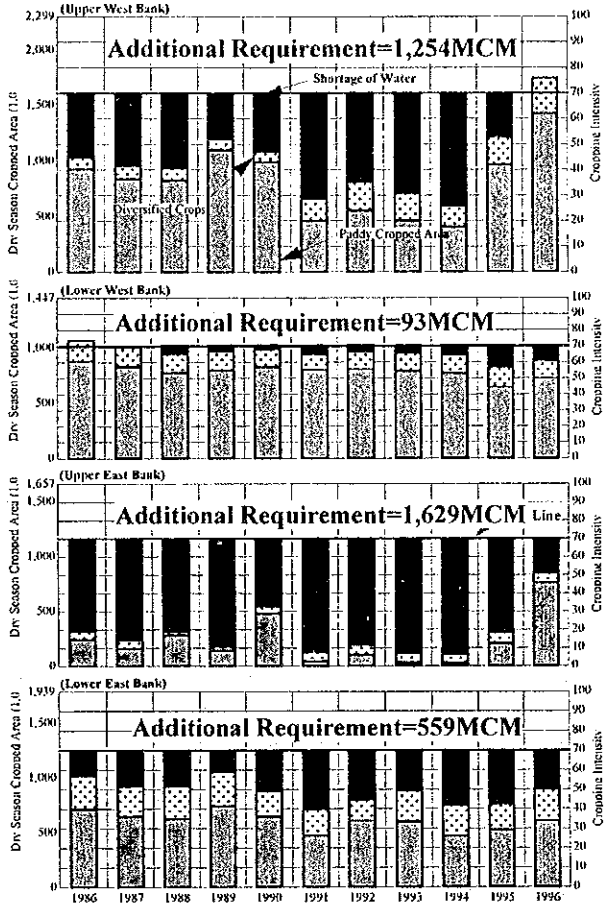


Figure 5.4.6(2) Evaluation of Current Water Shortage for Dry Season Cropping (2/2)

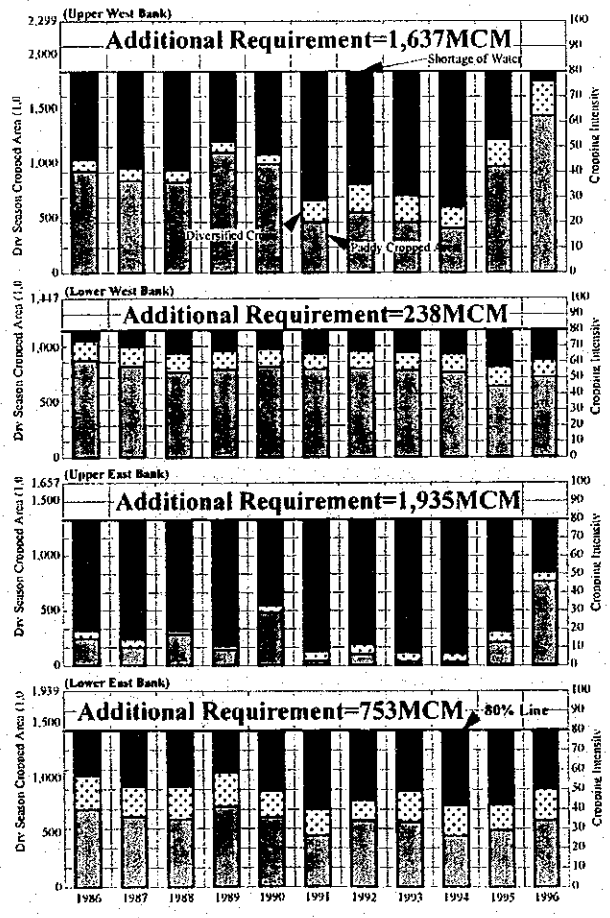
(5) For a Case with 60% Guarantee



(6) For a Case with 70% Guarantee



(7) For a Case with 80% Guarantee



(8) For a Case with 90% Guarantee

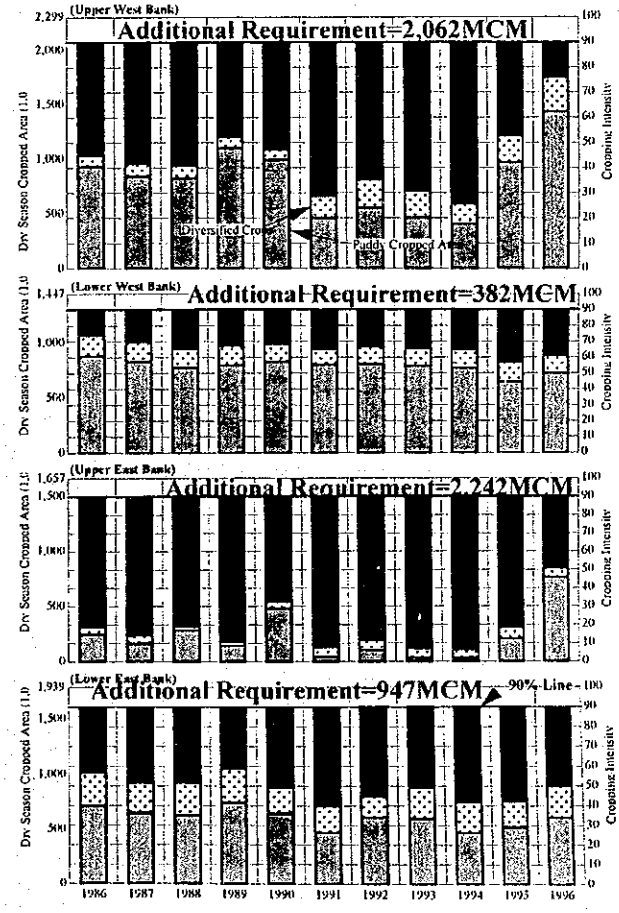


Figure 5.4.7 Irrigation Water Demand for Various Cases of Minimum Cropping Intensity to be Guaranteed

(Lower Nan, Existing Irrigation System)

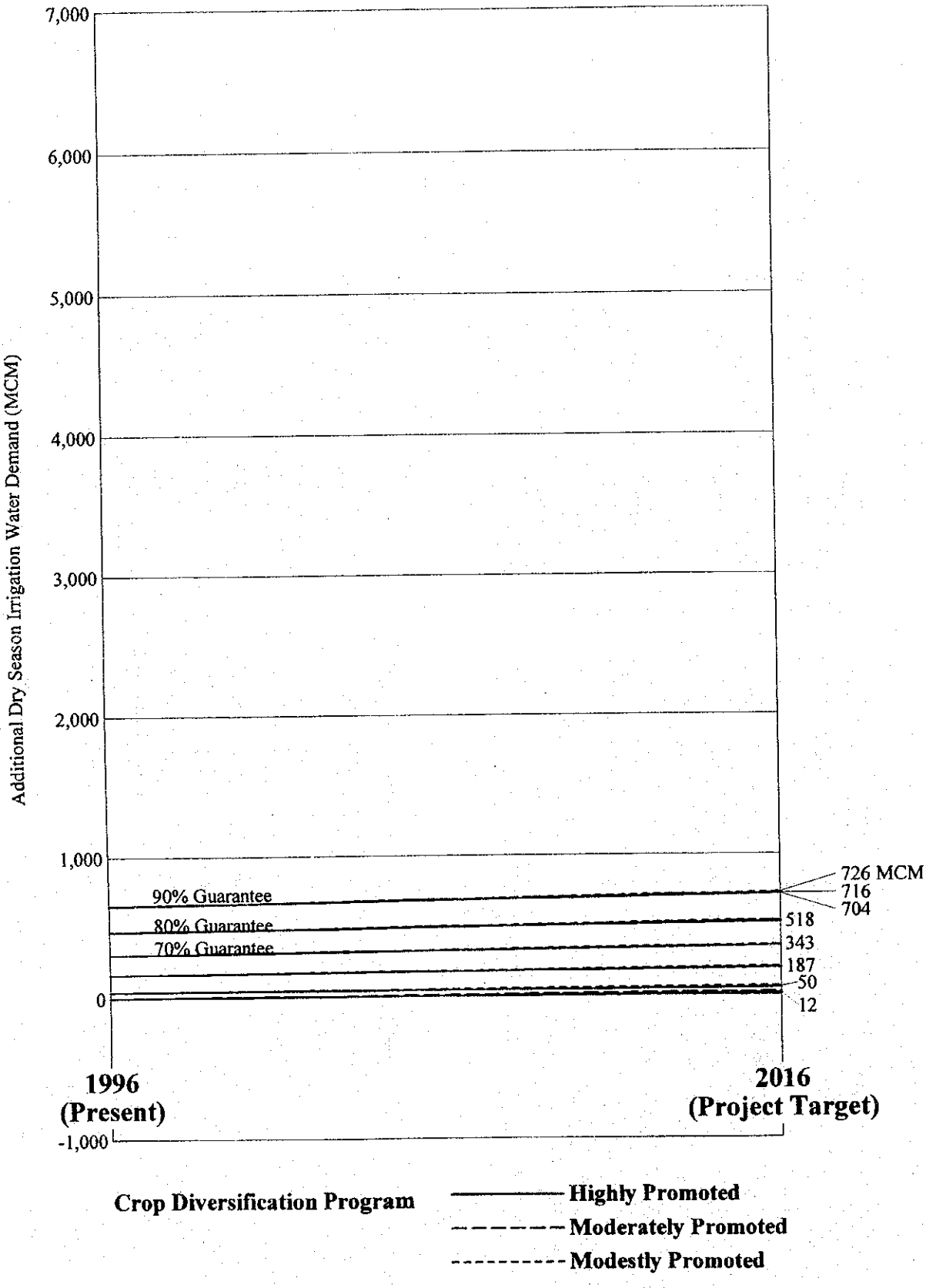


Figure 5.4.8 Irrigation Water Demand for Various Cases of Minimum Cropping Intensity to be Guaranteed **(Lower Nan, Expanded Irrigation System)**

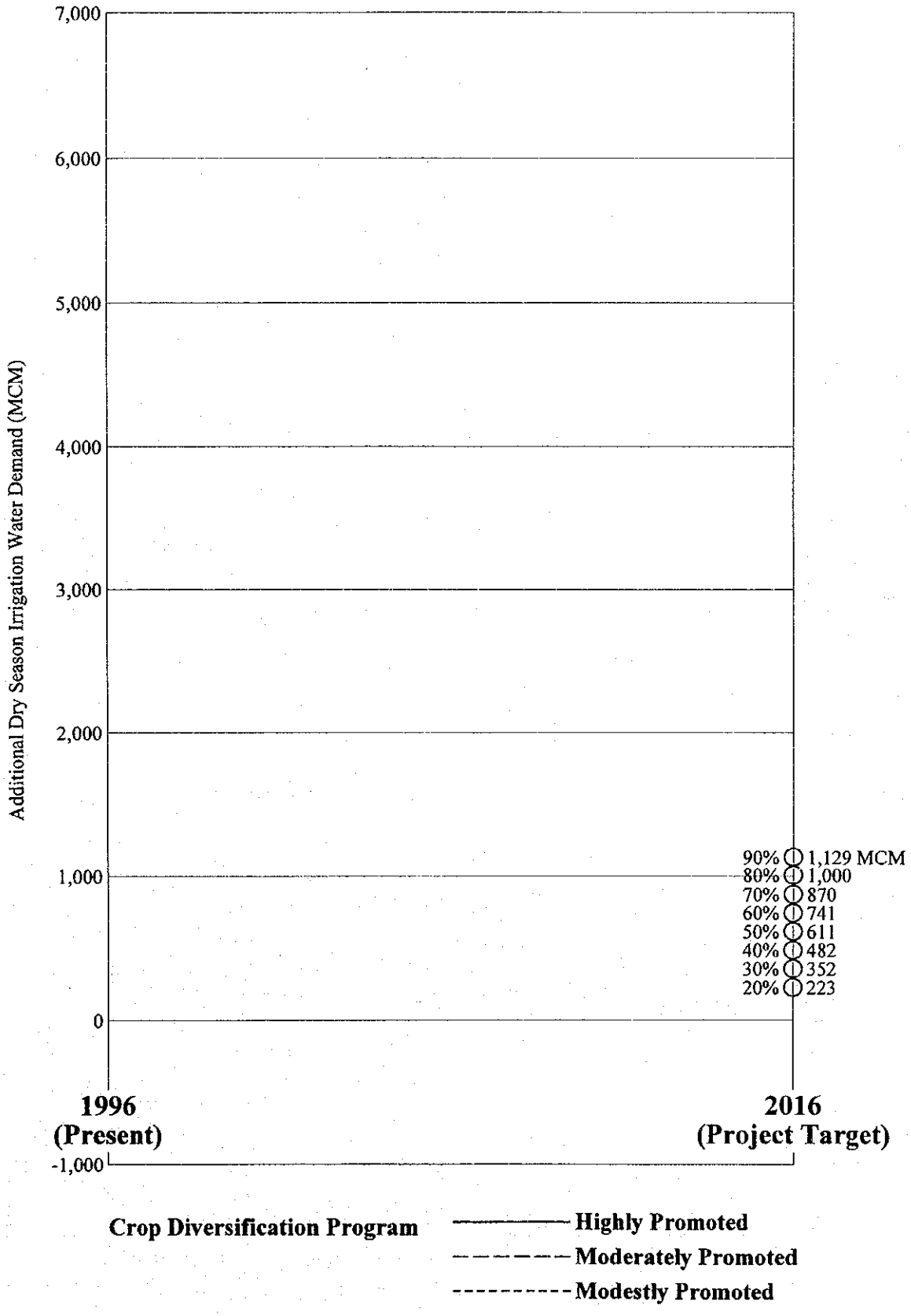


Figure 5.4.9 Irrigation Water Demand for Various Cases of Minimum Cropping Intensity to be Guaranteed
(Lower Nan, Existing System + Expanded System)

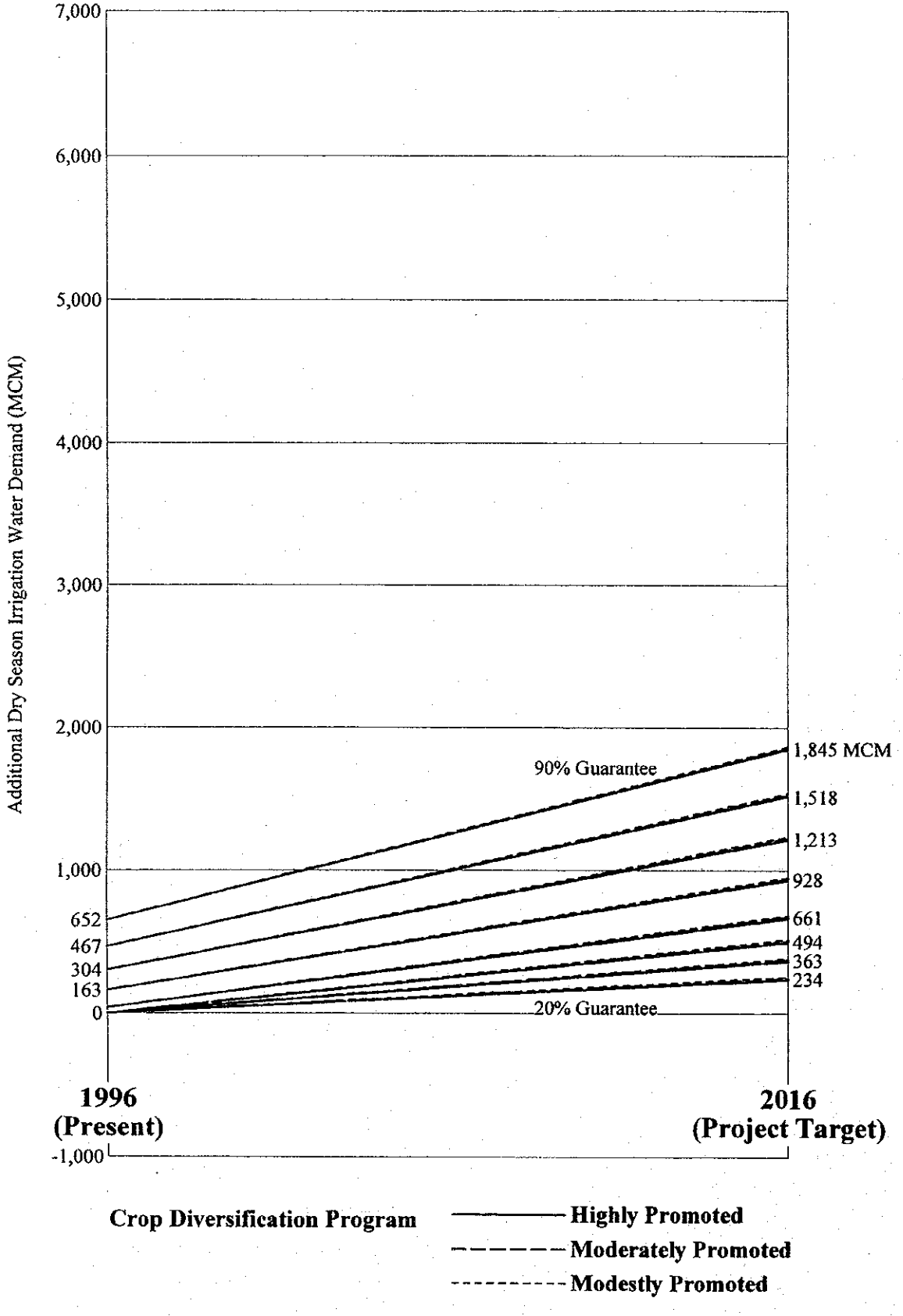


Figure 5.4.10 Irrigation Water Demand for Various Cases of Minimum Cropping Intensity to be Guaranteed
(Chao Phraya Delta + Lower Nan, Existing)

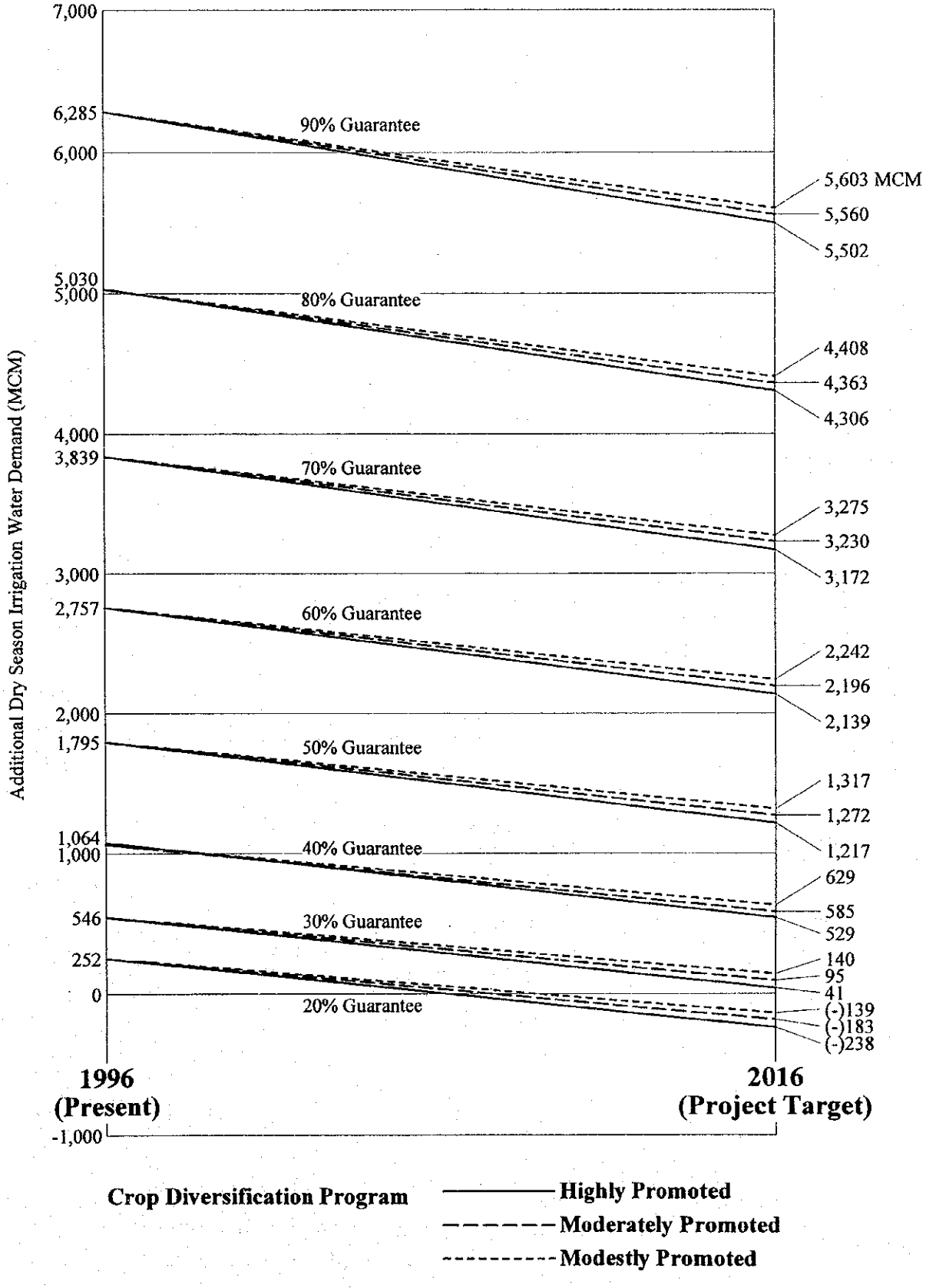
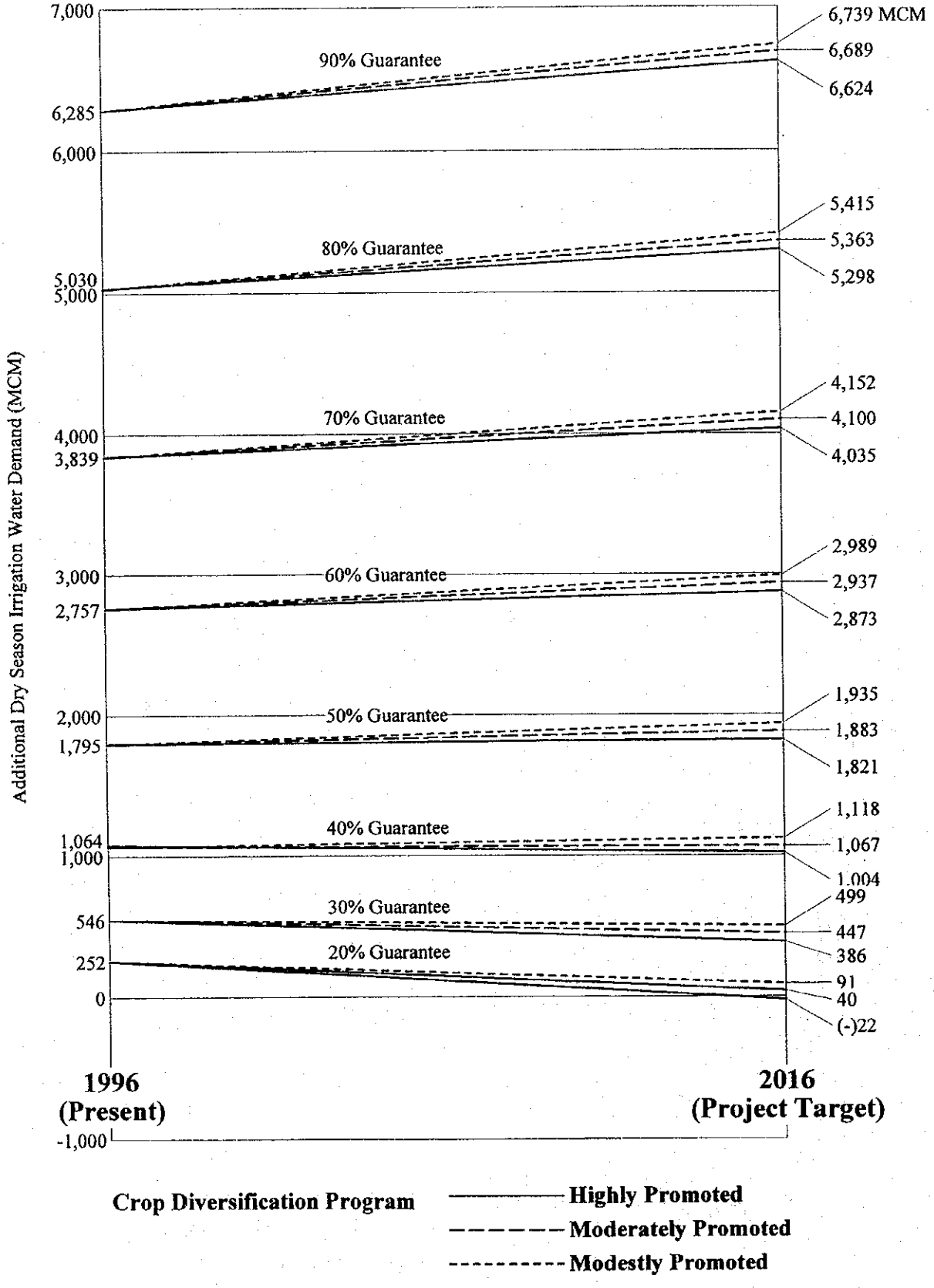


Figure 5.4.11 Irrigation Water Demand for Various Cases of Minimum Cropping Intensity to be Guaranteed

(Chao Phraya Delta + Lower Nan, Existing & Expanded)



CHAPTER 6.

IDENTIFICATION OF KOK-ING-NAN PROJECT

CHAPTER 6. IDENTIFICATION OF KOK-ING-NAN PROJECT

The Chapter 6 of the Supporting Report provides information to be added to "6.3 Water Agreement on the Development of Mekong Tributary Basins" of the Main Report.

Water Agreement

In the Agreement on the Cooperation for the sustainable Development of the Mekong River Basin, the Article 5 for Reasonable and Equitable Utilization and Article 6 for Maintenance of Flows on the Mainstream declare;

Article 5:

To utilize the waters of the Mekong River system in a reasonable and equitable manner in their respective territories, pursuant to all relevant factors and circumstances, the Rules for Water Utilization and Inter-basin Diversion provided for under Article 26 and the provisions of A and B below:

A. On tributaries of the Mekong River, including Tonle Sap, intra-basin uses and inter basin diversions shall be subject to notification to the Joint Committee.
B. On the mainstream of the Mekong River:
   1. During the wet season:
      a) Intra-basin use shall be subject to notification to the Joint Committee.
      b) Inter-basin diversion shall be subject to prior consultation which aims at arriving at an agreement by the Joint Committee.
   2. During the dry season:
      a) Intra-basin use shall be subject to prior consultation which aims at arriving at an agreement by the Joint Committee.
      b) Any inter-basin diversion project shall be agreed upon by the Joint Committee through a specific agreement for each project prior to any proposed diversion. However, should there be a surplus quantity of water available in excess of the proposed uses of all parties in any dry season, verified and unanimously confirmed as such by the Joint Committee, an inter-basin diversion of the surplus could be made subject to prior consultation.

Article 6:

To cooperate in the maintenance of the flows on the mainstream from diversions, storage releases, or other actions of a permanent nature; except in the cases of historically severe droughts and/or floods:

A. Of not less than the acceptable minimum monthly natural flow during each month of the dry season;
B. To enable the acceptable natural reverse flow of the Tonle Sap to take place

during the wet season; and,

C. To prevent average daily peak flows greater than what naturally occur on the average during the flood season.

The Joint Committee shall adopt guidelines for the locations and levels of the flows, and monitor and take action necessary for their maintenance as provided in Article 26.

Article 26

In addition, the Article 26 for Rules for Water Utilization and Inter-Basin Diversions states that; The Joint Committee shall prepare and propose for approval of the Council, inter alia, Rules for Water Utilization and Inter-basin Diversion pursuant to Articles 5 and 6, including but not limited to: 1) establishing the time frame for the wet and dry seasons; 2) establishing the location of hydrological stations, and determining and maintaining the flow level requirements at each station; 3) setting out criteria for determining surplus quantities of water during the dry season on the mainstream; 4) improving upon the mechanism to monitor intra-basin use; and, 5) setting up a mechanism to monitor inter-basin diversions from the mainstream.

Definition of Terms

For the purpose of this Agreement, it shall be understood that the following meanings to the underlined terms shall apply except where otherwise inconsistent with the context:

Agreement under Article 5: A decision of the Joint Committee resulting from **prior consultation** and evaluation on any **proposed use** for inter-basin diversions during the wet season from the mainstream as well as for intra-basin use or inter-basin diversions of these waters during dry season. The objective of this **agreement** is to achieve an optimum use and prevention of waste of the waters through a dynamic and practical consensus in conformity with the Rules for Water Utilization and Inter-Basin Diversions set forth in Article 26.

Acceptable minimum monthly natural flow: The acceptable minimum monthly natural flow during each month of the dry season.

Acceptable natural reverse flow: The wet season flow level in the Mekong River at Kratie that allows the reverse flow of the Tonle Sap to an agreed upon optimum level of the Great Lake.

Basin Development Plan: The general planning tool and process that the Joint Committee would use as a blueprint to identify, categorize and prioritize the projects and programs to seek assistance for and to implement the plan at the basin level.

Environment: The conditions of water and land resources, air, flora, and fauna that exists in a particular region.

Notification: Timely providing information by a riparian to the Joint Committee on its proposed use of water according to the format, content and procedures set forth in the

Rules for Water Utilization and Inter-Basin Diversions under Article 26.

Prior Consultation: Timely notification plus additional data and information to the Joint Committee as provided in the Rules for Water Utilization and Inter-Basin Diversions under Article 26, that would allow the other member riparians to discuss and evaluate the impact of the proposed use upon their uses of water and any other affects, which is the basis for arriving at an agreement. Prior consultation is neither a right to veto the use nor unilateral right to use water by any riparian without taking into account other riparians' rights.

Proposed use: Any proposal for a definite use of waters of the Mekong River system by any riparian, excluding domestic and minor uses of water not having a significant impact on mainstream flows.

Notification of Two Tributaries Projects of Thailand

The proposed Kok-Ing-Nan water diversion project was officially notified to the Joint Committee at the special session held on 20-21 November 1995 in Ho Chi Minh city of Vietnam for its commencement of the feasibility study.