TABLES

Table 1 ECONOMIC TARGETS OF FIFTH NATIONAL PLAN

Description	Unit	Fourth Plan (1977-1981)	Fifth Plan (1982-1986)
Trade deficit			
Average annual value	฿10^6	45,300	78,400
Trade deficit/GDP	%	7.6	5.9
Current account deficit			
Average annual value	฿10^6	37,400	53,000
Current account deficit/GDP	%	6.3	4.1
Export of goods			
Growth in value	%/yr	21.9	22.3
Growth in volume	%/yr	10.5	11.3
Import of goods			
Growth in value	%/yr	26.3	18.1
Growth in volume	%/yr	10.9	7.2
Economic growth			
GDP	%/yr	7.3	6.6
Agriculture	%/yr	3.5	4.5
Manufacturing	%/yr	9.3	7.6
Mining	%/yr	12.6	16.4
Population growth	%/yr	2.1	1.5

Data Source: NESDB

Table 2 INFRASTRUCTURE DEVELOPMENT PLAN

Infrastructure	Facilities	Construction Period
Ports	Sattahip: rehabilitation	1983 - 1984
	Sattahip: two new berths	1983 - 1986
	Sattahip: four new berths	1984 - 1990
	Laem Chabang: breakwater, etc.	1987 - 1988
	Laem Chabang: four new berths	1988 - 1992
	Sattahip or Laem Chabang: four new berths	1993 - 1997
Railway	Chachoengsao - Sattahip	1981 - 1983
	Sattahip - Map Ta Phut	1983 - 1985
	North East link	1983 - 1985
	Laem Chabang spur	1989 - 1991
Road/1	Sattahip - Rayong: upgrading	1985 - 1986
	Rayong bypass: extension	1985 - 1986
	Pattaya - Sattahip: upgrading	1985 - 1986
	Pattaya spur road: development	1985 - 1986
	Map Ta Phut - Route 319: upgrading	1986 - 1987
	Chon Buri - Pattaya: improvement	1986 - 1987
	Chon Buri bypass: upgrading	1986 - 1988
	Route 314: upgrading	1987 - 1990
	Chon Buri - Pattaya: upgrading	1989 - 1990
	Route 315: improvement	1990 - 1991
	Laem Chabang urban road	1990 - 1991
	Pattaya - Sattahip: improvement	1991 - 1995
	Siracha - Laem Chabang bypass	1991 - 1998
Water Supply/2	Dok Krai dam: extension	1982 - 1984
	Dok Krai - Map Ta Phut pipeline	1982 - 1984
	Nong Pla Lai dam	1983 - 1986
	Map Ta Phut - Sattahip pipeline	1983 - 1986
	Treatment works	1983 - 1984
	Map Ta Phut - Sattahip - Ban Phe pipeline	1985 - 1988
	Dok Krai - Laem Chabang - Map Prachan pipeline	1989 - 1991
	Thap Ma dam and pipeline	1992 - 1994
Electricity	Substation 3 at Rayong	1983
	Line from Substation 2 at Rayong	1983
	Substation at Laem Chabang	1991
	Ao Phai - Laem Chabang line	1991
Telephones	Map Ta Phut exchange	1985
	Laem Chabang exchange	1985
Telex	Map Ta Phut/Rayong/Sattahip exchange	1985

/1: Initial programme
/2: Phase I

Data Source: ESS

Table 3 PROJECTED POPULATION AND DOMESTIC WATER DEMAND

Year	Description	Unit	1	2	3	4	5	6	7	8	9	10	Total
1986	Population	10^3	310.4	154.6	14.8	112.9	82.1	18.3	113.5	17.8	25.7	188.0	1,038.1
	Urban	10^3	35.8	148.2	0	59.1	64.0	14.1	21.5	15.1	13.3	48.2	419.3
	Rural	10^3	274.6	6.4	13.8	53.8	18.1	4.2	92.0	2.7	12.4	139.8	618.8
	Water Demand	$10^6m^3/yr$	3.2	12.5	0.1	5.1	4.4	0.4	1.6	0.7	0.9	4.2	33.1
	Urban	$10^6m^3/yr$	1.4	12.4	0	4.8	4.3	0.4	1.0	0.7	0.8	3.3	29.1
	Rural	$10^6m^3/yr$	1.8	0.1	0.1	0.3	0.1	0	0.6	0	0.1	0.9	4.0
1991	Population	10^3	324.5	169.5	16.1	140.0	107.0	19.4	123.2	18.6	32.0	209.0	1,159.3
	Urban	10^3	37.0	163.1	0	81.4	87.0	14.8	24.4	15.9	19.4	57.5	500.5
	Rural	10^3	287.5	6.4	16.1	58.6	20.0	4.6	98.8	2.7	12.6	151.5	658.8
	Water Demand	$10^6m^3/yr$	5.1	12.8	0.2	7.1	8.0	0.8	2.9	0.9	1.6	6.0	45.4
	Urban	$10^6m^3/yr$	2.0	12.7	0	6.4	7.8	0.8	1.9	0.9	1.5	4.3	38.3
	Rural	$10^6m^3/yr$	3.1	0.1	0.2	0.7	0.2	0	1.0	0	0.1	1.7	7.1
1996	Population	10^3	327.7	191.3	16.4	173.7	130.9	20.2	125.2	19.1	38.9	228.2	1,271.6
	Urban	10^3	38.2	184.9	0	114.0	110.8	15.4	25.3	16.5	26.3	71.7	603.1
	Rural	10^3	289.5	6.4	16.4	59.7	20.1	4.8	99.9	2.6	12.6	156.5	668.5
	Water Demand	$10^6m^3/yr$	6.9	17.9	0.3	12.4	11.2	1.0	3.9	1.0	2.8	9.3	66.7
	Urban	$10^6m^3/yr$	2.3	17.8	0	11.4	10.9	0.9	2.4	1.0	2.6	6.8	56.1
	Rural	$10^6m^3/yr$	4.6	0.1	0.3	1.0	0.3	0.1	1.5	0	0.2	2.5	10.6
2001	Population	10^3	316.3	216.8	15.4	222.2	154.7	20.1	120.8	19.3	48.2	249.8	1,383.6
	Urban	10^3	39.2	210.8	0	166.4	136.7	15.9	25.8	16.9	35.9	90.8	738.4
	Rural	10^3	277.1	6.0	15.4	55.8	18.0	4.2	95.0	2.4	12.3	159.0	645.2
	Water Demand	$10^6m^3/yr$	8.3	23.4	0.3	19.8	15.5	1.1	4.9	1.1	4.2	12.9	91.5
	Urban	$10^6m^3/yr$	2.5	23.3	0	18.6	15.2	1.0	2.9	1.1	4.0	9.6	78.2
	Rural	$10^6m^3/yr$	5.8	0.1	0.3	1.2	0.3	0.1	2.0	0.0	0.2	3.3	13.3

Note: The water demand is indicated in terms of the source water demand.

Table 4 INDUSTRIAL WATER DEMAND

(Unit: $10^6 m^3/yr$)

Description	1	2	3	4	5	6	7	8	9	10	Total
1986											
Projected by ESS	3.3	0	0	5.4	0	0	3.9	0	33.0	0	45.6
Existing	4.3	0	2.3	2.1	0.7	0	0	0	0	1.6	11.0
Total	7.6	0	2.3	7.5	0.7	0	3.9	0	33.0	1.6	56.6
1991											
Projected by ESS	6.6	0	0	13.9	0	0	3.9	0	35.8	0	60.2
Existing	4.3	0	2.3	2.1	0.7	0	0	0	0	1.6	11.0
Total	10.9	0	2.3	16.0	0.7	0	3.9	0	35.8	1.6	71.2
1996											
Projected by ESS	6.6	0	0	17.4	0	0	3.9	0	38.5	0	66.4
Existing	4.3	0	2.3	2.1	0.7	0	0	0	0	1.6	11.0
Total	10.9	0	2.3	19.5	0.7	0	3.9	0	38.5	1.6	77.4
2001											
Projected by ESS	6.6	0	0	25.7	0	0	3.9	0	41.3	0	77.5
Existing	4.3	0	2.3	2.1	0.7	0	0	0	0	1.6	11.0
Total	10.9	0	2.3	27.8	0.7	0	3.9	0	41.3	1.6	88.5

Note: Figures are indicated in terms of the source water demand.

Table 5 REPRESENTATIVE RIVER AND RIVER MAINTENANCE FLOW

Zone No.	Representative River	Balance Point	Maintenance Flow	
			m^3/s	$10^6 m^3/yr$
1	Khlong Luang	Khlong Luang damsite	0.06	1.9
1-1	Ban Bung	Ban Bung dam	0.013	0.4
2	Khlong Yai Cheng	Estuary	0	0
3	Bang Phra	Bang Phra dam	0.03	1.0/1
4	Khlong Bang Lamung	Estuary	1.01	3.2/2
5	Map Prachan	Map Prachon dam	0.08	2.5
6	Huai Yai	Estuary	0	0
7	—	—	-	-
8	Khlong Phayun	Estuary	0	0
9	Khlong Huai Yai	Estuary	0	0
10	Rayong	Ban Khai weir	0.38	12.0
10-1	Khlong Thap Ma	Thap Ma damsite	0.33	10.5

/1: It was 8.0 x $10^6 m^3/yr$ in Study Report on Long-term Water Supply Plan.

/2: River maintenance flow at Nongkho dam; to be withdrawn between the dam and the estuary.

Table 6 WATER BALANCE FOR 1986 UNDER PROPOSED WATER RESOURCES DEVELOPMENT CONDITIONS

(Unit: MCM/yr)

Zone	1	1-1	2	3	4	5	6	7	8	9	10	10-1	TOTAL
DEMANDS													
1. Domestic Water													
Urban	1.2	0.2	12.4	0	4.8	4.3	0.4	1.0	0.7	0.8	3.3	-	29.1
Rural	1.8	0	0.1	0.1	0.3	0.1	0	0.6	0	0.1	0.9	-	4.0
Sub-total	3.0	0.2	12.5	0.1	5.1	4.4	0.4	1.6	0.7	0.9	4.2		33.1
2. Industrial Water	0	4.3	0	7.7 1/	5.4	0.7	0	3.9	0	33.0	1.6	-	56.6
3. Irrigation Water	0	0	0	15.4 2/	0	0	0	0	0	0	140.9	-	156.3
4. Maintenance Flow	1.9	0.4	0	1.0	3.2	2.5	0	0	0	0	12.0	-	21.0
Total	4.9	4.9	12.5	24.2	13.7	7.6	0.4	5.5	0.7	33.9	158.7	-	267.0
Available Local Water	1.1	0.4	0	0	0	0	0	0	0.4	0.2	0	-	2.1
WITHDRAWAL	3.8	4.5	12.5	24.2	13.7	7.6	0.4	5.5	0.3	33.7	158.7	-	264.9
Available River Water	3.5	0	0	0	8.8	0	0.4	0	0	0	38.2	-	50.9
DEFICIT	0.3	4.5	12.5	24.2	4.9	7.6	0	5.5	0.3	33.7	120.5	-	214.0
Water Supply Capacity of Existing and Proposed Dam	0	11.7	0	34.7	12.6	9.2	0	0	0	0	159.3	-	227.5
BALANCE	0.3	-7.2	12.5	-10.5	-7.7	-1.6	0	5.5	0.3	33.7	-38.8	-	-13.5

1/ Including 3.3 MCM and 2.1 MCM/yr to be diverted to Zone 1 and Zone 4, respectively

2/ To be diverted to Zone 2

Note: (1) The proposed dam is New Ban Bung, which replaces the existing Ban Bung dam.

(2) Figures with a mark (-) in line of BALANCE mean an excess in supply capacity, while figures without mean a shortage.

Table 7 WATER BALANCE FOR 1991 UNDER PROPOSED WATER RESOURCES DEVELOPMENT CONDITIONS

(Unit: MCM/yr)

Zone	1	1-1	2	3	4	5	6	7	8	9	10	10-1	TOTAL
DEMANDS													
1. Domestic Water													
Urban	1.7	0.3	12.7	0	6.4	7.8	0.8	1.9	0.9	1.5	4.3	0	38.3
Rural	3.1	0	0.1	0.2	0.7	0.2	0	1.0	0	0.1	1.7	0	7.1
Sub-total	4.8	0.3	12.8	0.2	7.1	8.0	0.8	2.9	0.9	1.6	6.0	0	45.4
2. Industrial Water	0	4.3	0	11.0 1/	13.9	0.7	0	3.9	0	35.8	1.6	0	71.2
3. Irrigation Water	60.1	0	0	15.4 2/	0	0	0	0	0	0	140.9	0	216.4
4. Maintenance Flow	1.9	0.4	0	1.0	3.2	2.5	0	0	0	0	12.0	0	21.0
Total	66.8	5.0	12.8	27.6	24.2	11.2	0.8	6.8	0.9	37.4	160.5	0	354.0
Available Local Water	1.1	0.4	0	0	0	0	0	0	0.4	0.2	0	0	2.1
WITHDRAWAL	65.7	4.6	12.8	27.6	24.2	11.2	0.8	6.8	0.5	37.2	160.5	0	351.9
Available River Water	0	0	0	0	14.0	0	0.8	0	0	0	30.9	0	45.7
DEFICIT	65.7	4.6	12.8	27.6	10.2	11.2	0	6.8	0.5	37.2	129.6	0	306.2
Water Supply Capacity of Existing and Proposed Dams	79.8	11.7	0	34.7	12.6	9.2	0	0	0	0	221.7	0	369.7
BALANCE	-14.1	-7.1	12.8	-7.1	-2.4	2.0	0	6.8	0.5	37.2	-92.1	0	-63.5

1/ Including 6.6 MCM/yr and 2.1 MCM/yr to be diverted to Zone 1 and Zone 4 respectively

2/ To be diverted to Zone 2

Note; (1) The proposed dams are New Ban Bung, Khlong Luang and Khlong Yai.

(2) Figures with a mark (-) in line of BALANCE mean an excess in supply capacity, while figures without mark mean a shortage.

Table 8 WATER BALANCE FOR 1996 UNDER PROPOSED WATER RESOURCES DEVELOPMENT CONDITIONS

(Unit: MCM/yr)

Zone	1	1-1	2	3	4	5	6	7	8	9	10	10-1	TOTAL
DEMANDS													
1. Domestic Water													
Urban	1.9	0.4	17.8	0	11.4	10.9	0.9	2.4	1.0	2.6	6.8	0	56.1
Rural	4.6	0	0.1	0.3	1.0	0.3	0.1	1.5	0	0.2	2.5	0	10.6
Sub-total	6.5	0.4	17.9	0.3	12.4	11.2	1.0	3.9	1.0	2.8	9.3	0	66.7
2. Industrial Water	0	4.3	0	11.0 1/	17.4	0.7	0	3.9	0	38.5	1.6	0	77.4
3. Irrigation Water	60.1	0	0	15.4 2/	0	0	0	0	0	0	140.9	30.6	247.0
4. Maintenance Flow	1.9	0.4	0	1.0	3.2	2.5	0	0	0	0	12.0	10.5	31.5
Total	68.5	5.1	17.9	27.7	33.0	14.4	1.0	7.8	1.0	41.3	163.8	41.1	422.6
Available Local Water	1.1	0.4	0	0	0	0	0	0	0.4	0.2	0	0	2.1
WITHDRAWAL	67.4	4.7	17.9	27.7	33.0	14.4	1.0	7.8	0.6	41.1	163.8	41.1	420.5
Available River Water	0	0		0	16.8	0	0.9	0	0	0	31.3	0	49.0
DEFICIT	67.4	4.7	17.9	27.7	16.2	14.4	0.1	7.8	0.6	41.1	132.5	41.1	371.5
Water Supply Capacity of Existing and Proposed Dams	79.8	11.7	0	34.7	12.6	9.2	0	0	0	0	221.7	41.3	411.0
BALANCE	-12.4	-7.0	17.9	-7.0	3.6	5.2	0.1	7.8	0.6	41.1	-89.2	-0.2	-39.5

1/ Including 6.6 MCM/yr and 2.1 MCM/yr to be diverted to Zone 1 and Zone 4 respectively

2/ To be diverted to Zone 2

Note; (1) The proposed dams are New Ban Bung, Khlong Luang, Khlong Yai and Khlong Thap Ma.

(2) Figures with a mark (-) in line of BALANCE mean an excess in supply capacity, while figures without mark mean a shortage.

Table 9 WATER BALANCE FOR 2001 UNDER PROPOSED WATER RESOURCES DEVELOPMENT CONDITIONS

(Unit: MCM/yr)

Zone	1	1-1	2	3	4	5	6	7	8	9	10	10-1	TOTAL
DEMANDS													
1. Domestic Water													
Urban	2.1	0.4	23.3	0	18.5	15.2	1.0	2.9	1.1	4.0	9.7	0	78.2
Rural	5.8	0	0.1	0.3	1.2	0.3	0.1	2.0	0	0.2	3.3	0	13.3
Sub-total	7.9	0.4	23.4	0.3	19.7	15.5	1.1	4.9	1.1	4.2	13.0	0	91.5
2. Industrial Water	0	4.3	0	11.0 1/	25.7	0.7	0	3.9	0	41.3	1.6	0	88.5
3. Irrigation Water	60.1	0	0	15.4 2/	0	0	0	0	0	0	140.9	30.6	247.0
4. Maintenance Flow	1.9	0.4	0	1.0	3.2	2.5	0	0	0	0	12.0	10.5	31.5
Total	69.9	5.1	23.4	27.7	48.6	18.7	1.1	8.8	1.1	45.5	167.5	41.1	458.5
Available Local Water	1.1	0.4	0	0	0	0	0	0	0.4	0.2	0	0	2.1
WITHDRAWAL	68.8	4.7	23.4	27.7	48.6	18.7	1.1	8.8	0.7	45.3	167.5	41.1	456.4
Available River Water	0	0	0	0	19.6	0	1.0	0	0	0	31.8	0	52.4
DEFICIT	68.8	4.7	23.4	27.7	29.0	18.7	0.1	8.8	0.7	45.3	135.7	41.1	404.0
Water Supply Capacity of Existing and Proposed Dams	79.8	11.7	0	34.7	12.6	9.2	0	0	0	0	221.7	41.3	411.0
BALANCE	-11.0	-7.0	23.4	-7.0	16.4	9.5	0.1	8.8	0.7	45.3	-86.0	-0.2	-7.0

1/ Including 6.6 MCM/yr and 2.1 MCM/yr to be diverted to Zone 1 and Zone 4 respectively

2/ To be diverted to Zone 2

Note; (1) The proposed dams are New Ban Bung, Khlong Luang, Khlong Yai and Khlong Thap Ma.

(2) Figures with a mark (-) in line of BALANCE mean an excess in supply capacity, while figures without mark mean a shortage.

Table 10 SALIENT FEATURES OF DAMS IN OPERATION, UNDER CONSTRUCTION AND PLANNING

Description	Unit	Existing						Under construction	Under planning	
		Bang Phra	Map Prachan	Dok Krai	Ban Bung	Phluta Luang	Khlong Bang Phai	Nong Kho	New Ban Bung	Nong Pla Lai
1. Purpose		D & I, A	D & I, A	D & I, A, F	D & I, A	D & I	D & I	D & I, A	D & I, A	A, F
2. Year of completion		1975	1979	1975	1958	N.A	N.A	-	-	-
3. Zone		3	5	10	1-1	7	7	4	1-1	10
4. Name of river		Huai Sukhrip	Huai Nong Pru	Khlong Dok Krai	Ban Bung	Phluta Luang	Khlong Bang Phai	Huai Nong Kho	Ban Bung	Nong Pla Lai
5. Catchment area	km^3	123	37.9	291	51.2			48.3	51.2	408
6. Average annual inflow	$10^6 m^3$	43.9/1	13.5/1	103.8	12.2/1			17.2/1	12.2/1	126.1
7. Reservoir										
Gross storage capacity	$10^6 m^3$	120.0	17.0	70.8	2.9			26.0	21.9	200.7
Surcharge capacity	$10^6 m^3$	10.0	2.2	20.0	1.0			7.0	7.8	43.5
Active storage capacity	$10^6 m^3$	104.0	14.0	46.8	0.4			18.0	12.5	144.4
Dead storage capacity	$10^6 m^3$	6.0/2	0.8	4.0	1.5			1.0	1.6	12.8
Flood water surface	El.m	30.6	45.7	52.6	77.1			66.5	84.3	47.0
High water surface	El.m	30.0/3	45.0	50.6/3	76.3			65.0	82.1	45.0
Low water surface	El.m	18.8/3	36.0	38.6/3	75.8			57.5	76.1	33.3
Reservoir surface area at HWS	km^2	15.8	2.8	8.8	1.2			4.4	3.2	20.2
Net regulated outflow	$10^6 m^3/yr$	34.7	9.2	56.8	2.2			12.6	11.7	102.5
8. Dam										
Type		Earth-fill	Earth-fill	Earth-fill	Earth-fill			Earth-fill	Earth-fill	Earth-fill
Height	m	24.0	17.0	24.6	8.5			17.0	21.5	31.0
Crest elevation	El.m	31.5	47.0	54.6	78.8			68.0	86.3	49.0
Crest length	m	1,720	2,060	1,500	1,400			2,000	2,800	4,000
Volume	$10^6 m^3$	N.A.	N.A.	N.A.	N.A.			N.A.	1.4	3.2
9. Spillway										
Type		Morning glory	Morning glory	Morning glory	Open Chute			Open chute	Open chute	Open chute
Discharge capacity	m /s	65.0	37.0	N.A.	N.A.			108	125	700
Crest elevation of overflow section	El.m	300	45.0	50.6	76.3			65.0	82.1	38.0
Crest length of overflow section	m	N.A	ø6.0	ø10.0	N.A.			40.0	20.0	20.0

/1 : Estimated from Dok Krai

/2 : Derived from the area-storage curve prepared by RID

/3 : Estimated assuming sediment deposits in horizontal layer.

Note; N.A. : Not available

D & I : Domestic and industrial water supply

A : Irrigation

F : Flood control

Table 11 PEATURES OF POTENTIAL DAM SCHEMES AT SELECTED DEVELOPMENT SCALE

	Unit	Khlong Luang	Pa Daeng	Huai Bung	Huai Takhian Tia	Khlong Na Klua	Huai Chak Nok	Huai Yai	Khlong Thap Ma	Khlong Yai
Reservoir										
Catchment area	km^2	526.0	53.8	68.5	33.0	22.3	18.1	65.9	158.0	218.0
Average annual run-off	$10^6 m^3$	125.2	18.8	23.9	11.5	7.8	6.3	23.0	55.2	87.0
High Water surface	El.m.	39.7	66.6	28.0	30.3	31.1	14.7	25.6	25.6	50.3
Low water surface	El.m.	33.8	61.7	22.3	25.0	25.0	10.0	19.9	16.2	40.6
Reservoir storage capacity										
Gross storage	$10^6 m^3$	141.0	16.6	21.2	10.2	6.9	5.6	20.4	59.9	93.6
Active storage	$10^6 m^3$	125.2	15.0	19.1	9.2	6.2	5.0	18.4	55.2	87.0
Dead storage	$10^6 m^3$	15.8	1.6	2.1	1.0	0.7	0.6	2.0	4.7	6.6
Reservoir surface area at HWS	km^2	32.8	5.4	5.9	2.8	1.8	1.5	4.6	10.4	16.8
Net regulated outflow	$10^6 m^3$	80.4	11.6	16.0	7.8	5.2	4.3	15.6	41.3	62.4
Dam										
Type of dam		Earth-fill	Earth-fill	Earth-fill	Earth-fill	Earth-fill	Earth-fill	Earth-fill	Earth-fill	Earth-fill
Dam crest elevation	El.m.	42.7	69.6	31.0	33.3	34.1	17.7	28.6	28.6	53.3
Length of dam crest	m.	3,790.0	1,880.0	2,730.0	1,900.0	1,400.0	1,410.0	3,720.0	770.0	4,090.0
Dam height	m.	19.7	15.1	14.5	13.8	14.6	11.2	14.1	20.1	21.3
Dam volume	$10^3 m^3$	2,070.0	578.0	760.0	570.0	560.0	400.0	1,910.0	870.0	2,570.0

Table 12 SUMMARY OF CLIMATE

Climatological Features	Observation Station	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual	Data Source
Air Temparature (°C)															
Mean	Chon Buri	29.6	29.3	28.9	28.6	28.3	27.9	27.3	26.7	25.8	25.9	27.4	28.8	27.9	(1)
	Sattahip	29.7	29.2	28.9	28.4	28.4	27.9	27.1	26.5	26.1	26.7	27.9	28.9	27.9	(1)
	B. Nong Mapring	28.1	28.1	27.8	27.9	27.7	27.4	27.2	26.0	25.0	24.7	26.0	27.4	26.9	(2)
Mean Max.	Chon Buri	34.1	33.3	32.5	31.9	31.6	31.2	31.3	31.1	31.0	31.3	32.1	33.2	32.0	(1)
	Sattahip	34.6	33.3	32.7	32.4	32.5	32.2	31.9	32.2	32.4	33.2	33.6	34.1	32.9	(1)
	B. Nong Mapring	35.1	33.5	33.4	33.0	32.9	32.9	33.1	32.9	33.1	33.5	33.7	34.9	33.5	(2)
Mean Min.	Chon Buri	25.4	25.4	25.5	25.0	24.9	24.4	23.8	22.1	20.3	20.1	22.4	24.2	23.6	(1)
	Sattahip	26.5	26.2	26.4	25.7	25.6	25.0	24.0	22.6	21.6	22.1	24.2	25.6	24.6	(1)
	B. Nong Mapring	21.6	22.6	21.5	22.0	21.6	20.9	21.2	19.1	16.7	15.9	18.3	20.0	20.1	(2)
Extreme Max.	Chon Buri	38.0	37.8	37.1	35.5	34.7	34.4	34.8	35.2	36.1	36.2	36.6	37.0	38.0	(1)
	Sattahip	40.5	40.5	37.2	37.8	37.2	37.4	36.2	37.4	38.3	39.0	39.4	39.5	40.5	(1)
	B. Nong Mapring	40.0	40.0	39.0	43.5	39.0	40.0	38.9	40.0	38.5	38.5	39.4	39.3	43.5	(2)
Extreme Min.	Chon Buri	20.4	21.2	21.0	20.5	20.9	20.6	18.2	14.2	12.0	9.9	16.5	17.5	9.9	(1)
	Sattahip	21.0	21.5	20.9	19.0	21.5	19.0	19.5	15.0	12.8	12.3	16.8	18.7	12.3	(1)
	B. Nong Mapring	16.2	18.5	18.5	19.0	20.2	19.5	15.2	10.5	9.0	8.0	10.0	9.8	8.0	(2)
Relative Humidity (%)															
Mean	Chon Buri	71.0	75.0	75.0	75.0	76.0	80.0	80.0	73.0	66.0	67.0	71.0	71.0	73.0	(1)
	Sattahip	77.0	79.0	76.0	77.0	77.0	81.0	83.0	76.0	70.0	70.0	75.0	76.0	76.0	(1)
	B. Nong Mapring	92.2	94.5	94.9	94.8	94.9	95.6	94.6	90.1	88.0	92.5	92.8	93.5	93.2	(2)
Mean Max.	Chon Buri	87.6	88.8	87.6	88.5	90.0	92.3	93.0	89.5	85.1	85.0	88.2	87.8	88.6	(1)
	Sattahip	87.3	88.8	86.0	87.4	87.6	90.7	93.3	89.0	84.7	84.2	88.2	87.6	87.9	(1)
Mean Min.	Chon Buri	56.7	60.8	61.8	62.9	64.0	67.1	66.7	57.2	50.1	52.0	56.2	56.6	59.3	(1)
	Sattahip	61.1	66.6	65.5	64.2	65.9	68.3	69.1	60.7	53.0	51.2	57.0	59.9	61.9	(1)
Extreme Min.	Chon Buri	29.0	32.0	42.0	43.0	45.0	46.0	42.0	29.0	22.0	20.0	25.0	23.0	20.0	(1)
	Sattahip	33.0	43.0	43.0	47.0	48.0	45.0	38.0	28.0	21.0	25.0	17.0	29.0	17.0	(1)
Evaporation (mm)															
	B. Nong Mapring	111.3	102.4	93.3	95.0	90.0	77.7	91.2	96.7	101.7	99.4	93.5	112.0	1,164.2	(2)
	Bang Phra	115.9	109.7	101.0	97.3	91.8	78.3	85.1	87.5	84.7	76.2	76.9	103.1	1,110.1	(2)
	Ban Mai	121.3	111.6	107.7	106.6	103.8	90.9	98.8	96.6	107.7	109.1	107.5	125.9	1,287.5	(2)
Wind Velocity (km/hr)															
	Chon Buri	11.9	10.9	13.2	12.2	12.0	9.8	9.3	11.5	12.2	11.9	13.0	13.2	11.7	(1)
	Sattahip	13.3	13.3	18.2	17.4	16.9	13.7	10.7	12.6	13.2	11.1	12.6	13.7	13.9	(1)
Cloud Cover (Oktas)															
	Chon Buri	4.7	6.1	6.5	6.7	6.9	6.7	5.8	4.5	3.6	3.9	3.8	4.0	5.2	(1)
	Sattahip	4.9	6.4	6.5	6.8	6.9	6.9	6.0	4.8	3.7	3.9	4.1	4.3	5.4	(1)
Rainfall (mm)															
	Rayong	62.9	210.7	120.8	122.3	112.2	203.6	203.6	63.2	8.6	17.8	47.6	53.3	1,226.6	(2)
	Ban Khai	87.8	215.3	161.3	123.9	131.4	238.7	195.9	68.2	11.5	24.6	30.1	42.2	1,330.8	(2)
	Sattahip	76.3	193.6	74.4	98.4	97.0	211.5	275.0	86.5	15.5	21.6	41.5	53.6	1,244.9	(2)
	Bang Lamung	102.6	158.6	89.6	94.5	113.6	220.1	252.7	61.5	9.3	10.4	36.9	48.7	1,198.4	(2)
	Si Racha	88.3	150.6	110.8	113.6	131.7	257.7	218.1	51.3	13.7	11.1	31.4	38.7	1,216.5	(2)
	Bang Phra	113.2	161.9	120.3	124.7	154.6	295.4	222.6	48.9	10.2	10.5	41.2	45.6	1,349.1	(2)
	Chon Buri	77.6	158.8	119.4	152.2	162.4	295.2	210.9	53.9	6.0	13.9	23.3	34.1	1,307.6	(2)
	Ban Bung	94.5	151.9	117.8	129.4	136.7	217.5	182.2	41.2	9.4	8.1	26.3	45.3	1,160.3	(2)

Data Source: (1) Climatological Data of Thailand, 25 Year Period (1951-1975), MD.
(2) RID

Table 13 MONTHLY MEAN RUN-OFF AT KHLONG THAP MA DAMSITE

(Unit: m^3/s)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Mean
1968	1.13	4.08	4.91	2.77	1.72	1.88	4.90	3.00	0.87	0.84	0.36	0.38	2.25
1969	0.15	0.77	1.32	0.86	1.07	3.48	4.49	3.89	1.11	0.56	1.17	0.36	1.60
1970	0.92	4.42	3.22	1.28	0.96	1.31	3.70	1.13	5.85	1.43	0.69	0.69	2.15
1971	1.03	1.27	0.84	0.28	0.58	2.39	4.86	2.35	0.82	0.41	0.54	0.34	1.31
1972	2.94	0.54	0.49	0.14	0.04	7.61	9.95	4.43	1.59	0.56	0.59	0.75	2.47
1973	0.31	1.81	2.21	2.08	2.16	3.59	5.09	2.57	0.99	0.49	0.38	0.48	1.85
1974	2.01	1.87	0.78	0.54	1.05	3.13	7.32	4.03	1.32	1.01	0.84	0.62	2.05
1975	0.64	1.68	1.99	0.69	0.84	1.52	8.40	4.51	1.90	0.50	0.54	0.48	1.98
1976	0.87	1.86	0.36	0.16	3.28	2.76	4.44	4.91	1.36	0.58	0.45	0.22	1.78
1977	0.76	1.46	0.56	1.25	0.99	0.66	6.24	1.58	0.40	0.33	0.53	0.27	1.26
1978	0.81	2.87	1.21	1.93	1.24	2.26	4.05	1.98	0.50	0.35	0.25	0.14	1.47
1979	0.18	0.53	1.12	0.20	0.30	2.04	1.24	0.37	0.34	0.10	0.61	0.22	0.60
1980	0.25	0.35	1.85	0.68	0.87	0.94	6.96	3.38	0.90	0.21	0.92	0.77	1.51
1981	1.41	4.05	1.72	1.23	1.38	2.71	4.43	6.44	2.17	0.65	0.35	0.53	2.26
Mean	0.96	1.97	1.61	1.00	1.18	2.59	5.43	3.18	1.44	0.58	0.59	0.45	1.75

River System : Rayong

Catchment Area : 158 km^2

Zone No. : 10

Table -

Table 14 SOIL GROUP, SOIL SERIES AND THEIR EXTENSION IN THE KHLONG THAP MA SCHEME AREA

Soil Group	Soil Series	Map Symbol	Surveyed Area (ha)	Surveyed Area (%)	Scheme Area (ha)	Scheme Area (%)
Soils of Beach and Dune Sand	Rayong series (Ry)	1	2,460	6	290	10.4
	Phattaya series (Py)	2	2,190	5	140	5.0
	Ban Thon series (Bh)	3	2,260	5	190	6.8
	Ban Thon deep phase (Bh-d)	4	560	1	-	-
			7,470	17	620	22.2
Soils of Recent Alluvium	Wan Phrieng, loamy var. (Wp-l)	6	300	-	-	-
Soils of Semi-recent Alluvium	Alluvial soils, poorly drained (Ac-pd)	8	7,150	17	1,640	58.6
	Chonburi series (Cb)	9	290	-	-	-
	Klaeng series (Kl)	12	30	-	-	-
	Khok Khian series (Ko)	14	5,010	12	110	3.9
			12,480	29	1,750	62.5
Soils of Old Alluvium	Ta Sae series (Te)	19	190	-	-	-
	Ta Sae, mottled var. (Te-m)	20	50	-	-	-
	Kho Hong & Ta Sae soils (Kh & Te)	21	360	-	-	-
	Khlong Chak series (Kc)	27	170	-	-	-
	Ranong series (Rg)	34	-	-	-	-
	Ban Bung series (Bbg)	35	1,700	4	10	0.4
	Sattahip series (Sh)	36	1,480	3	10	0.4
	Ban Bung & Sattahip soils (Bbg & Sh)	37	1,500	4	-	-
			5,450	11	20	0.8
Soils of Transported Material and Residuum, and Others	Thung Wa series (Tg)	39	510	1	-	-
	Sattahip & Thung Wa soils (Sh & Tg)	40	170	-	120	4.2
	Khlong Nok Krathung series (Knk)	41	960	2	40	1.4
	Chalong, coarse loamy var. (Chl-co)	42	1,460	3	-	-
	Chalong, gravelly var. (Chl-g)	43	20	-	-	-
	Chalong, coarse loamy & Ch (Chl-co & Chl)	44	850	2	-	-
	Huai Pong series (Hp)	46	7,530	18	220	7.8
	Phangnga series (Pga)	48	2,270	5	-	-
	Huai Pong/Phangnga asso. (Hp/Pga)	49	790	2	30	1.1
	Phuket series (Pk)	50	290	-	-	-
	Thai Muang series (Tim)	52	70	-	-	-
	Map Bon & Thai Muang soils (Mb & Tim)	55	80	-	-	-
	Marsh	59	970	2	-	-
	Slope Complex (SC)	60	620	1	-	-
			16,590	36	410	14.5
	Total		42,290	100	2,800	100.0

Table 15 ECONOMIC COMPARISON OF ALTERNATIVES, KHLONG THAP MA DAM SCHEME

(Unit: ฿ 10^6)

Alternatives	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	4-1	4-2	4-3
Features												
Dam Crest El. (m)	26.2	26.8	27.7	26.8	27.7	28.4	26.2	27.7	28.9	26.8	28.4	30
H.W.L. (m)	22.6	23.4	24.3	23.4	24.3	25.1	22.8	24.3	25.7	23.4	25.1	26.8
Active Storage (10^6 m^3)	31	35.5	42.5	35.5	42.5	49.5	31	42.5	56.1	35.5	49.5	68.5
Irrigation Area (ha)	1,900	2,100	2,400	1,900	2,200	2,400	1,500	2,000	2,400	1,500	2,000	2,400
Cropping Intensity (%)	150	150	150	160	160	160	170	170	170	180	180	180
Cost												
1. Dam Works	303.93	318.78	342.54	318.78	342.54	359.37	303.93	342.54	371.25	318.78	359.37	436.59
2. Irrigation Facilities	95.04	105.93	128.70	95.04	111.87	128.70	80.19	100.98	128.70	80.19	100.98	128.70
3. Engineering Service	42.75	45.65	50.99	44.23	48.80	52.67	40.82	47.38	53.86	42.30	49.06	60.39
4. Government Administration	10.83	11.67	13.29	11.13	12.44	13.62	10.09	11.90	13.86	10.39	12.24	15.17
Base Cost	452.55	482.03	535.51	469.18	515.65	554.36	435.03	502.80	567.67	451.66	521.65	640.85
5. Physical Contingency	82.88	88.35	97.88	86.43	94.90	102.35	80.25	92.97	105.10	83.80	97.45	118.63
Project Cost	535.43	570.39	633.39	555.61	610.55	656.71	515.28	595.77	672.77	535.46	619.10	759.47
Annual Equivalent Cost	43.77	46.63	51.77	45.41	49.91	53.68	42.12	48.70	54.99	43.77	50.61	62.07
6. O & M Cost	1.99	2.12	2.36	2.07	2.27	2.44	1.92	2.22	2.50	1.99	2.30	2.83
7. Replacement Cost	1.60	1.76	2.02	1.60	1.85	2.02	1.26	1.68	2.02	1.26	1.68	2.02
(I) Annual Cost	47.36	50.51	56.15	49.08	54.03	58.14	45.30	52.60	59.51	47.02	54.59	66.92
Benefit												
8. Irrigation Benefit	53.33	58.95	67.37	58.87	68.17	74.37	51.03	68.04	81.65	55.79	74.38	89.26
9. Production Foregone	2.21	2.38	2.65	2.38	2.65	2.90	2.21	2.65	3.09	2.38	2.90	3.45
(II) Annual Benefit	51.13	56.57	64.72	56.49	65.52	71.47	48.82	65.40	78.56	53.41	71.48	85.81
(III) Net Benefit (B-C)	3.77	6.06	8.58	7.41	11.49	13.33	3.52	12.80	19.05	6.38	16.89	18.88
(IV) Benefit-Cost Ratio (B/C)	1.08	1.12	1.15	1.15	1.21	1.23	1.08	1.24	1.32	1.14	1.31	1.28

Table 16 INVESTMENT COST BY COMPONENT

(Unit: ฿10³)

	Description	Foreign Currency Portion	Local Currency Portion	Total
I.	Dam			
1.	Preparatory Work	5,140	9,250	14,390
2.	Care of River	1,290	2,310	3,600
3.	Dam	118,130	189,830	307,960
4.	Spillway	10,270	40,700	50,970
5.	Contractor's Administration Cost	4,720	8,470	13,190
6.	Contractor's Profit	8,760	15,740	24,500
7.	Tax	-	12,820	12,820
	Sub-total	148,310	279,120	427,430
8.	Compensation & Relocation	-	294,300	294,300
9.	Engineering Services	29,920	12,820	42,740
10.	Administration Cost of Executive Agency	-	8,550	8,550
	Sub-total	178,230	594,790	773,020
11.	Physical Contingency	26,740	89,220	115,960
	Sub-total	204,970	684,010	888,980
12.	Price Contingency	89,520	297,460	386,980
	Total	294,490	981,470	1,275,960
II.	Irrigation and Drainage System			
1.	Preparatory Work	3,100	18,900	22,000
2.	Intake Structure	6,300	10,600	16,900
3.	Canal Construction	24,400	58,100	32,500
4.	Contractor's Administration Cost	1,180	3,070	4,250
5.	Contractor's Profit	2,200	5,690	7,890
6.	Tax	-	4,130	4,130
	Sub-total	37,180	100,490	137,670
7.	Compensation & Relocation	-	11,090	11,090
8.	Engineering Services	12,530	5,370	17,900
9.	Administration Cost of Executive Agency	8,930	5,730	14,660
	Sub-total	58,640	122,680	181,320
10.	Physical Contingency	8,800	18,400	27,200
	Sub-total	67,440	141,080	208,520
11.	Price Contingency	29,560	77,300	106,860
	Total	97,000	218,380	315,380
	Grand Total	391,490	1,199,850	1,591,340

Table 17 DISBURSEMENT SCHEDULE OF INVESTMENT COST

(Unit: ₿ 10^3)

Item	Summary			1985		1986		1987		1988		1989	
	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1. Compensation & Relocation	305,390	-	305,390	-	147,150	-	149,370	-	4,430	-	3,330	-	1,110
2. Dam	427,430	148,310	279,120	-	-	4,450	8,370	57,840	94,900	48,940	83,740	37,080	92,110
3. Irrigation	137,670	37,180	100,490	-	-	-	9,510	15,620	39,010	13,500	31,960	8,060	20,010
Sub-total	870,490	185,490	685,000	-	147,150	4,450	167,250	73,460	138,340	62,440	119,030	45,140	113,230
4. Engineering Services	60,640	42,450	18,190	7,500	3,210	7,460	3,200	10,290	3,980	9,700	3,910	7,500	3,890
5. Administration Cost of Exec. Agency	23,210	8,930	14,280	-	2,680	-	3,300	2,680	3,160	3,570	2,550	2,680	2,590
Sub-total	954,340	236,870	717,470	7,500	153,040	11,910	173,750	86,430	145,480	75,710	125,490	55,320	119,710
6. Physical Contingency	143,160	35,540	107,620	1,130	22,960	1,790	26,060	12,960	21,830	11,360	18,820	8,300	17,950
Sub-total	1,097,500	272,410	825,090	8,630	176,000	13,700	199,810	99,390	167,310	87,070	144,310	63,620	137,660
7. Price Contingency	493,840	119,080	374,760	1,450	36,960	3,560	66,120	35,810	77,430	40,880	88,080	37,380	106,170
Grand Total	1,591,340	391,490	1,199,850	10,080	212,960	17,260	265,930	135,200	244,740	127,950	232,390	101,000	243,830

Table 18 MAJOR CONSTRUCTION PLANT AND EQUIPMENT OF KHLONG THAP MA DAM

Item	Capacity	Quantity
Concrete plant		1 set
Bulldozer W/R	32 tons	5 nos.
Bulldozer	32 tons	3 nos.
- do -	21 tons	4 nos.
- do -	16 tons	5 nos.
Back hoe	1.2 m^3	3 nos.
- do -	0.7 m^3	3 nos.
Power shovel	1.2 m^3	2 nos.
Tractor shovel	3.2 m^3	3 nos.
- do -	2.2 m^3	2 nos.
- do -	1.8 m^3	1 no.
Wheel loader	3.2 m^3	1 no.
- do -	2.2 m^3	1 no.
- do -	1.8 m^3	1 no.
Dump truck	15 tons	60 nos.
- do -	8 tons	58 nos.
Vibration roller	10 tons	4 nos.
Agitator truck	3.2 m^3	4 nos.
Motor grader	3.7 m	2 nos.
Road roller	8/10 tons	4 nos.
Hydraulic crane	25 tons	1 no.
Water tanker	8 m^3	6 nos.
Asphalt spreader	30 l/min	6 nos.
Tractor & trailer	30 tons	1 no.
Spare parts	-	L.S.

Table 19 FINANCIAL AND ECONOMIC PRICE OF AGRICULTURAL INPUTS AND OUTPUTS

(Unit: Baht/ton)

Item		Financial Price	Economic Price
Rice (paddy) - Local variety		2,900	8,360
Rice (paddy) - Improved variety		2,800	7,940
Groundnuts		5,500	10,440
Vegetables		4,500	7,520
Durian		7,200	11,990
Rambutan		5,400	8,970
Seed	- Rice	3,600	10,030
	- Groundnuts	8,500	15,220
	- Vegetables	22/kg	36/kg
Fertilizer	- Compound (16:20:0)	6,400	10,640
	- Compound (15:15:15)	6,500	10,800
	- Compound (13:13:21)	6,400	10,640
Agro-chemicals			
	- Insecticides	78/500 gr	130/500 gr
	- Herbicides	78/2 ℓ	130/500 gr
	- Rodenticides	2.4/kg	3/kg
Wage	- Light work	30/day	34/day
	- Heavy wage	40/day	45/day

Note; Detail of economic price is presented in the Sectoral Report III, " Agriculture Development Plan."

Table 20 AGRICULTURAL BENEFIT

Crop	Price (฿/t)	Production (t/ha)	Gross Production Value (฿/ha)	Production Cost (฿/ha)	Net Production Value (฿/ha)	Area (ha)	Benefit (฿ 10^3)
With Project							
Rice (Local)	8,360	4.0	33,440	6,930	26,510	440	11,664
Rice /1	7,940	4.5	35,730	8,800	26,930	1,880	50,628
(High Yielding) /2	7,940	5.0	39,700	9,290	30,410	820	24,936
Groundnuts	10,440	2.5	26,100	4,990	21,110	700	14,777
Vegetable	7,520	10.0	75,200	15,600	59,600	150	8,940
Fruit Trees	10,470	7.0	73,290	9,050	64,240	80	5,139
Total						4,070	116,084
Without Project							
Rice (Local)	8,360	1.8	15,050	4,480	10,570	1,180	12,473
Rice (High Yielding)	7,940	2.3	18,260	7,220	11,040	780	8,611
Groundnuts	10,440	1.3	13,570	2,910	10,660	20	213
Sugarcane	500	45.3	22,670	8,140	14,530	120	1,744
Cassava	1,250	16.0	20,000	3,180	16,820	510	8,578
Fruit Trees	10,470	5.0	52,350	5,640	46,710	60	2,803
Total						2,670	34,422

/1: Wet Season

/2: Dry Season

Table 2] DISBURSEMENT SCHEDULE OF ECONOMIC INVESTMENT COST

(Unit: ¥ 10^3)

Item	Summary			1985		1986		1987		1988		1989	
	Total	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1. Dam	374,660	148,310	226,350	-	-	4,450	6,790	57,840	76,960	48,940	67,900	37,080	74,700
2. Irrigation	119,080	37,180	81,900	-	-	-	7,850	15,620	31,760	13,500	26,000	8,060	16,290
Sub-total	493,740	185,490	308,250	-	-	4,450	14,640	73,460	108,720	62,440	93,900	45,140	90,990
3. Engineering Services	57,920	42,450	15,470	7,500	2,720	7,460	2,730	10,290	3,380	9,700	3,330	7,500	3,310
4. Administration Cost of Exec. Agency	21,300	8,930	12,370	-	490	-	1,130	2,680	3,980	3,570	3,310	2,680	3,460
Sub-total	572,960	236,870	336,090	7,500	3,210	11,910	18,500	86,430	116,080	75,710	100,540	55,320	97,760
5. Physical Contingency	85,940	35,540	50,400	1,130	480	1,790	2,770	12,960	17,420	11,360	15,070	8,300	14,660
Grand Total	658,900	272,410	386,490	8,630	3,690	13,700	21,270	99,390	133,500	87,070	115,610	63,620	112,420

Table 22 BENEFIT - COST STREAM

(Unit: ₩ 10^6)

No.	Year	Cost				Benefit			
		Investment Cost	O&M Cost	Replacement Cost	Total (C)	Irrigation Water Supply	Flood Control	Total (B)	(B)-(C)
1	1985	12.3	0.0	0.0	12.3	0.0	0.0	0.0	-12.3
2	1986	35.0	0.0	0.0	35.0	0.0	0.0	0.0	-35.0
3	1987	232.9	0.0	0.0	232.9	0.0	0.0	0.0	-232.9
4	1988	202.7	0.0	0.0	202.7	0.0	0.0	0.0	-202.7
5	1989	176.0	0.7	0.0	176.8	16.9	19.4	36.3	-140.4
6	1990	0.0	2.4	0.0	2.4	45.9	19.4	65.3	62.9
7	1991	0.0	2.4	0.0	2.4	62.2	19.4	81.6	79.2
8	1992	0.0	2.4	0.0	2.4	70.4	19.4	89.8	87.4
9	1993	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
10	1994	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
11	1995	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
12	1996	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
13	1997	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
14	1998	0.0	2.4	8.1	10.5	78.6	19.4	98.0	87.5
15	1999	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
16	2000	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
17	2001	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
18	2002	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
19	2003	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
20	2004	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
21	2005	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
22	2006	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
23	2007	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
24	2008	0.0	2.4	8.1	10.5	78.6	19.4	98.0	87.5
25	2009	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
26	2010	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
27	2011	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
28	2012	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
29	2013	0.0	2.4	7.6	10.1	78.6	19.4	98.0	87.9
30	2014	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
31	2015	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
32	2016	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
33	2017	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
34	2018	0.0	2.4	8.1	10.5	78.6	19.4	98.0	87.5
35	2019	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
36	2020	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
37	2021	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
38	2022	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
39	2023	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
40	2024	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
41	2025	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
42	2026	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
43	2027	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
44	2028	0.0	2.4	8.1	10.5	78.6	19.4	98.0	87.5
45	2029	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
46	2030	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
47	2031	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
48	2032	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
49	2033	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
50	2034	0.0	2.4	0.0	2.4	78.6	19.4	98.0	95.5
	Total	658.9	110.2	39.9	809.0	3,494.9	892.4	4,387.3	3,578.3

Table 23 DISBURSEMENT SCHEDULE OF ALLOCATED INVESTMENT COST FOR IRRIGATION DEVELOPMENT

(Unit: ฿10^3)

Year	Foreign Currency Portion	Local Currency Portion	Total
1985	8,590	166,590	175,180
1986	14,060	211,980	226,040
1987	112,630	207,980	320,610
1988	107,290	196,710	304,000
1989	84,070	200,660	284,730
Total	326,640	983,920	1,310,560

Table 24 FINANCIAL CASH FLOW STATEMENT FOR IRRIGATION DEVELOPMENT

(Unit: 10^3)

No.	Year	Loan Disbursement	Accumulated Loan	Outflow				Inflow			Balance of Payment
				OM & R Cost	Repayment of Loan Interest	Repayment of Loan Capital	Total (A)	Project Revenue	Government Subsidy	Total (B)	(B) - (A)
1	1985	8,590	8,590	0	300	0	300	0	300	300	0
2	1986	14,060	22,650	0	792	0	792	0	792	792	0
3	1987	112,630	135,280	0	4,734	0	4,734	0	4,734	4,734	0
4	1988	107,290	242,570	0	8,489	0	8,489	0	8,489	8,489	0
5	1989	84,070	326,640	690	11,432	0	12,122	690	11,432	12,122	0
6	1990	0	326,640	2,290	11,432	0	13,722	2,290	11,432	13,722	0
7	1991	0	326,640	2,290	11,432	0	13,722	2,290	11,432	13,722	0
8	1992	0	326,640	2,290	11,432	0	13,722	2,290	11,432	13,722	0
9	1993	0	326,640	2,290	11,432	0	13,722	2,290	11,432	13,722	0
10	1994	0	326,640	2,290	11,432	429	14,151	2,290	11,861	14,151	0
11	1995	0	326,210	2,290	11,417	1,132	14,839	2,290	12,549	14,839	0
12	1996	0	325,078	2,290	11,377	6,764	20,431	2,290	18,141	20,431	0
13	1997	0	318,314	2,290	11,140	12,128	25,559	2,290	23,269	25,559	0
14	1998	0	306,185	11,220	10,716	16,332	38,268	2,290	35,978	38,268	0
15	1999	0	289,853	2,290	10,144	16,332	28,766	2,290	26,476	28,766	0
16	2000	0	273,521	2,290	9,573	16,332	28,195	2,290	25,905	28,195	0
17	2001	0	257,189	2,290	9,001	16,332	27,623	2,290	25,333	27,623	0
18	2002	0	240,857	2,290	8,430	16,332	27,052	2,290	24,762	27,052	0
19	2003	0	224,525	2,290	7,858	16,332	26,480	2,290	24,190	26,480	0
20	2004	0	208,193	2,290	7,286	16,332	25,908	2,290	23,618	25,908	0
21	2005	0	191,861	2,290	6,715	16,332	25,337	2,290	23,047	25,337	0
22	2006	0	175,529	2,290	6,143	16,332	24,765	2,290	22,475	24,765	0
23	2007	0	159,197	2,290	5,571	16,332	24,193	2,290	21,903	24,193	0
24	2008	0	142,865	11,220	5,000	16,332	32,552	2,290	30,262	32,552	0
25	2009	0	126,533	2,290	4,428	16,332	23,050	2,290	20,760	23,050	0
26	2010	0	110,201	2,290	3,857	16,332	22,479	2,290	20,189	22,479	0
27	2011	0	93,869	2,290	3,285	16,332	21,907	2,290	19,617	21,907	0
28	2012	0	77,537	2,290	2,713	16,332	21,335	2,290	19,045	21,335	0
29	2013	0	61,205	10,730	2,142	16,332	29,204	2,290	26,914	29,204	0
30	2014	0	44,873	2,290	1,570	15,902	19,763	2,290	17,473	19,763	0
31	2015	0	28,971	2,290	1,013	15,199	18,503	2,290	16,213	18,503	0
32	2016	0	13,771	2,290	482	9,568	12,340	2,290	10,050	12,340	0
33	2017	0	4,203	2,290	147	4,203	6,640	2,290	4,350	6,640	0
34	2018	0	0	11,220	0	0	11,220	2,290	8,930	11,220	0
35	2019	0	0	2,290	0	0	2,290	2,290	0	2,290	0
36	2020	0	0	2,290	0	0	2,290	2,290	0	2,290	0
37	2021	0	0	2,290	0	0	2,290	2,290	0	2,290	0
38	2022	0	0	2,290	0	0	2,290	2,290	0	2,290	0
39	2023	0	0	2,290	0	0	2,290	2,290	0	2,290	0
40	2024	0	0	2,290	0	0	2,290	2,290	0	2,290	0
41	2025	0	0	2,290	0	0	2,290	2,290	0	2,290	0
42	2026	0	0	2,290	0	0	2,290	2,290	0	2,290	0
43	2027	0	0	2,290	0	0	2,290	2,290	0	2,290	0
44	2028	0	0	11,220	0	0	11,220	2,290	8,930	11,220	0
45	2029	0	0	2,290	0	0	2,290	2,290	0	2,290	0
46	2030	0	0	2,290	0	0	2,290	2,290	0	2,290	0
47	2031	0	0	2,290	0	0	2,290	2,290	0	2,290	0
48	2032	0	0	2,290	0	0	2,290	2,290	0	2,290	0
49	2033	0	0	2,290	0	0	2,290	2,290	0	2,290	0
50	2034	0	0	2,290	0	0	2,290	2,290	0	2,290	0