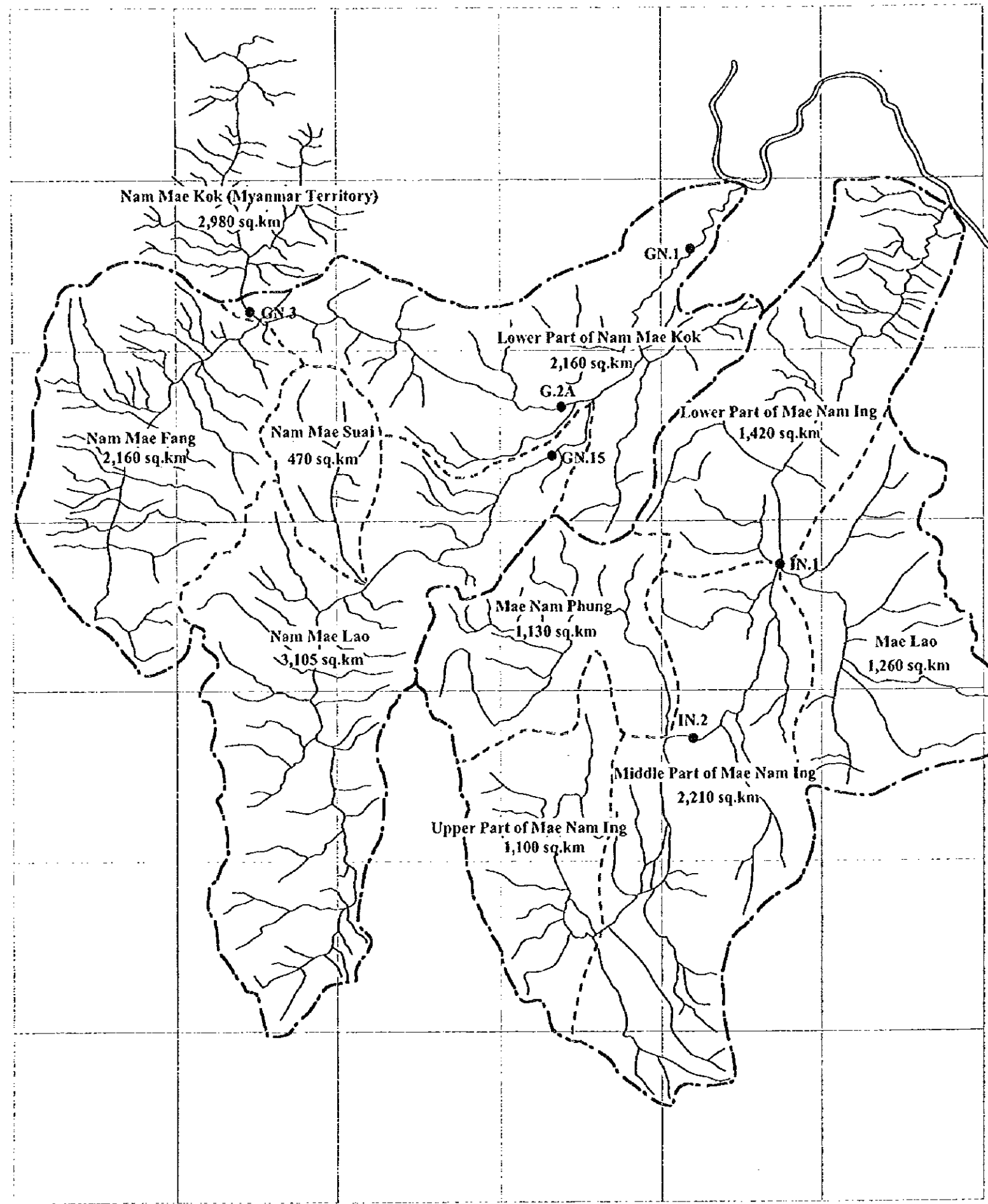
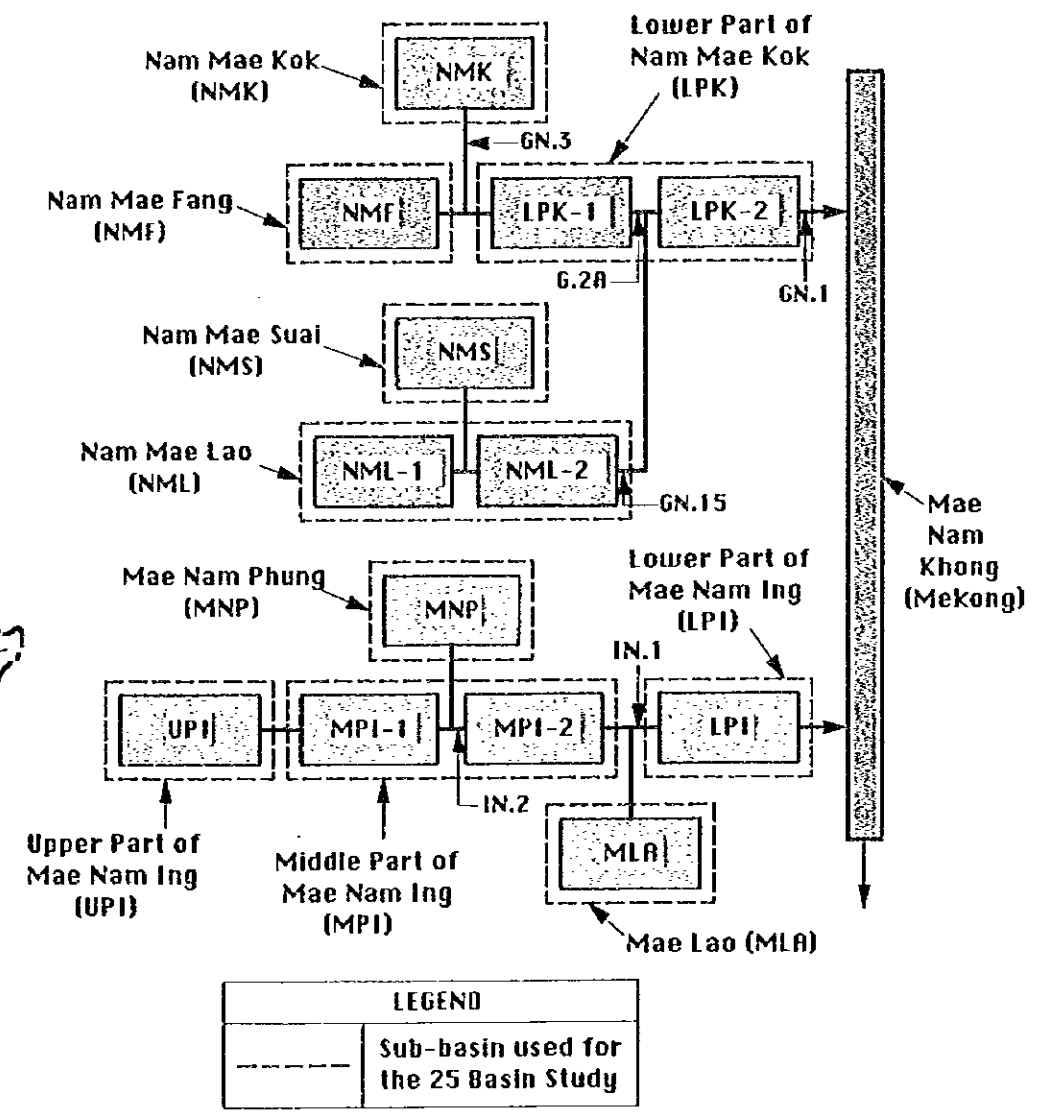


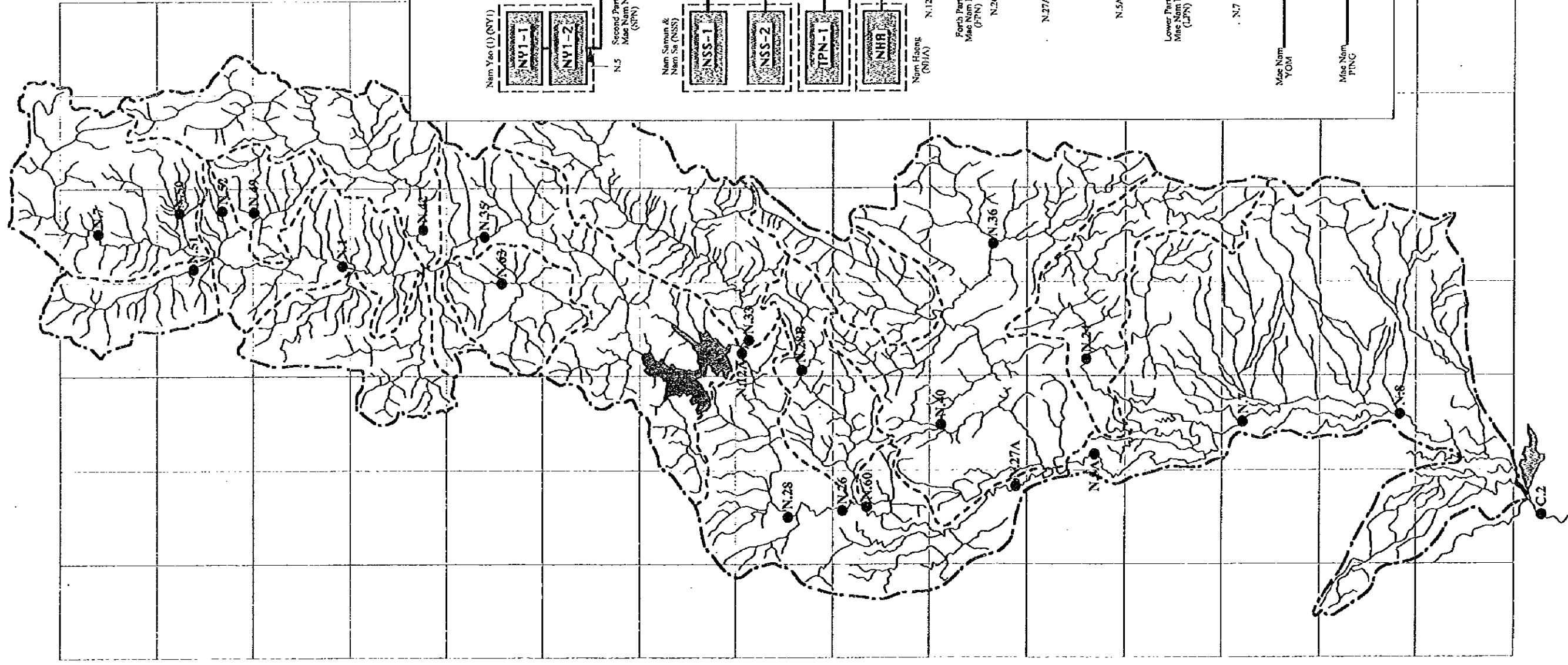
PART II**WATER RESOURCES DEVELOPMENT**

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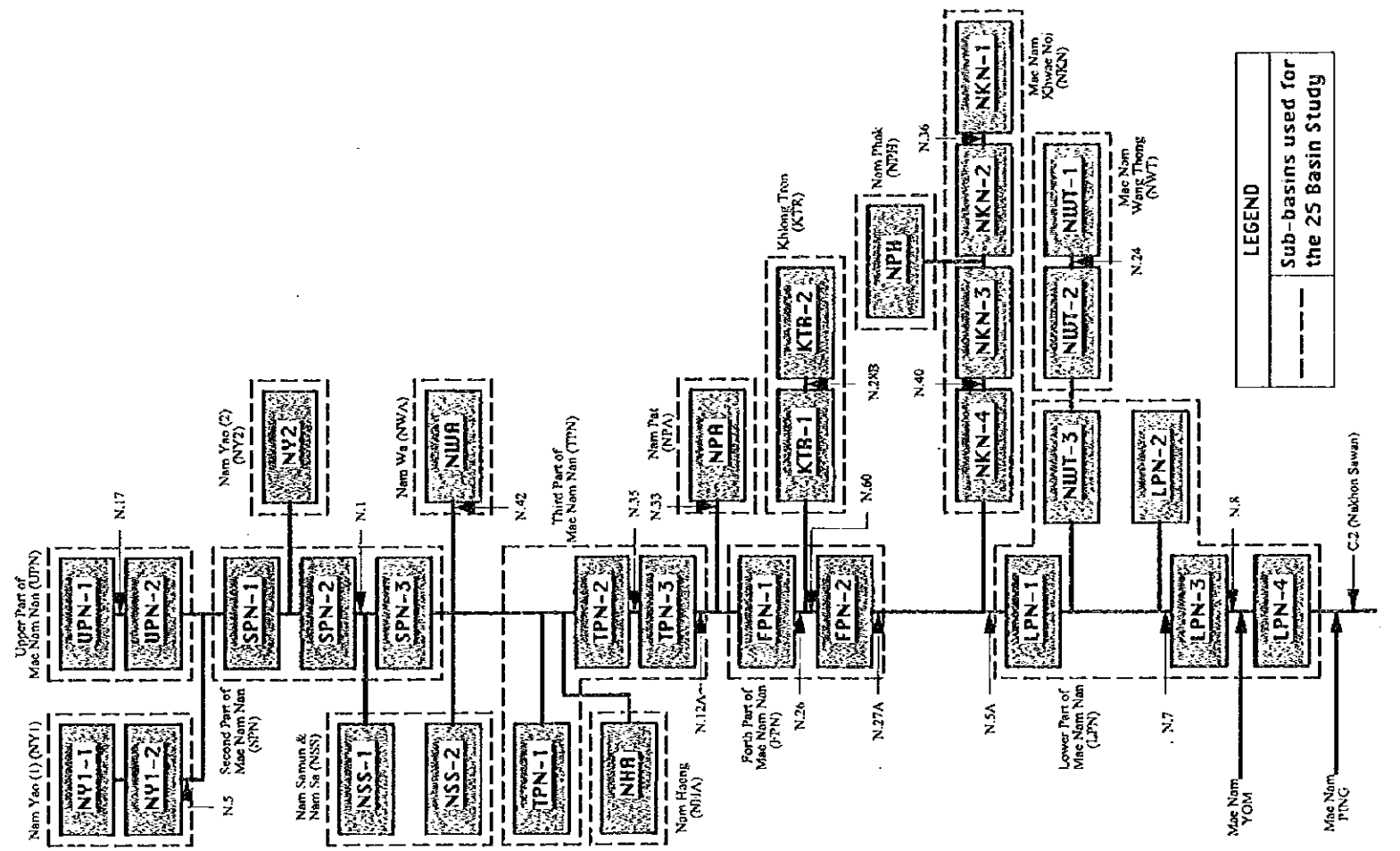


Kok and Ing River System Configuration



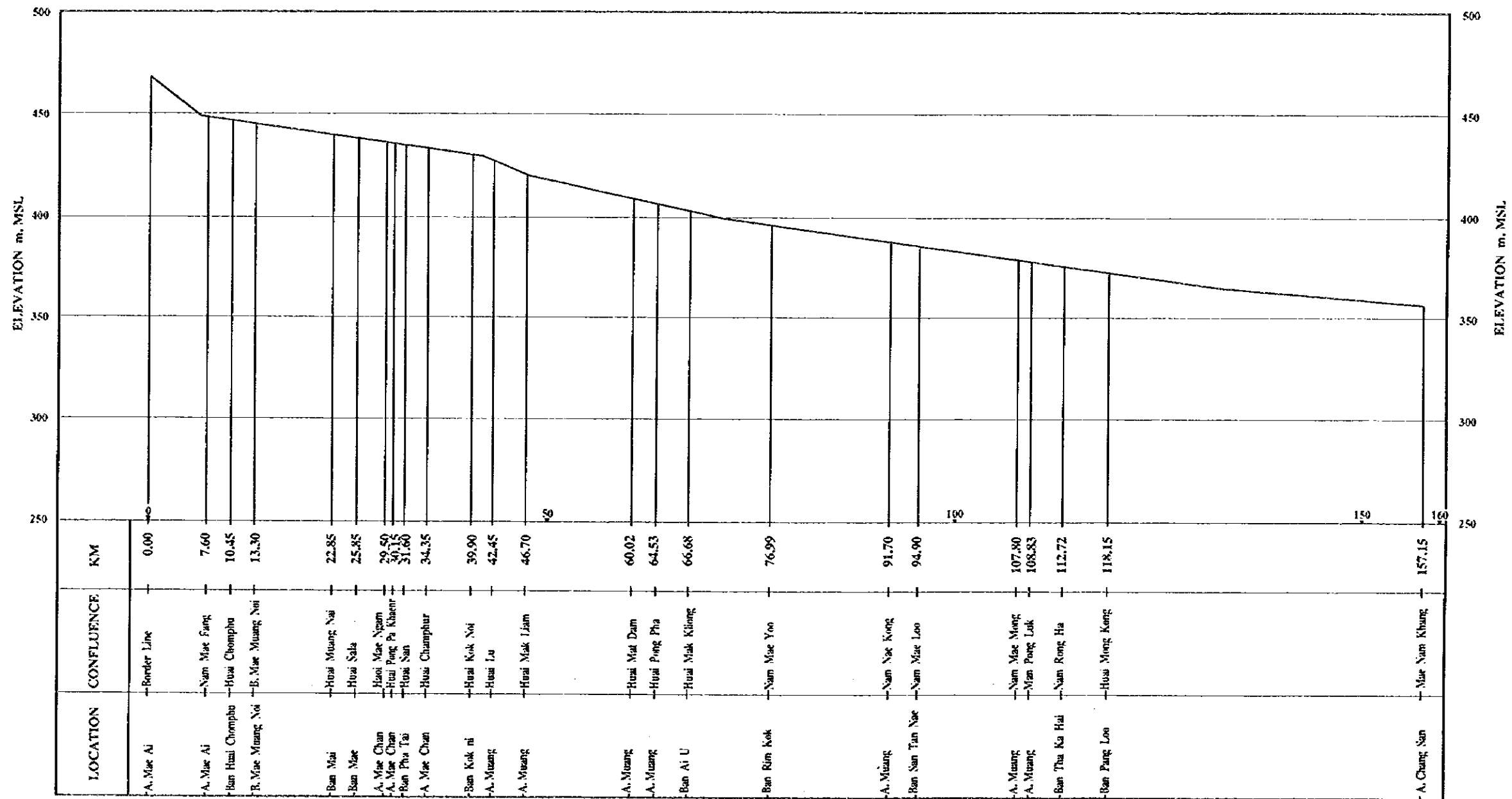


Nan River System Configuration

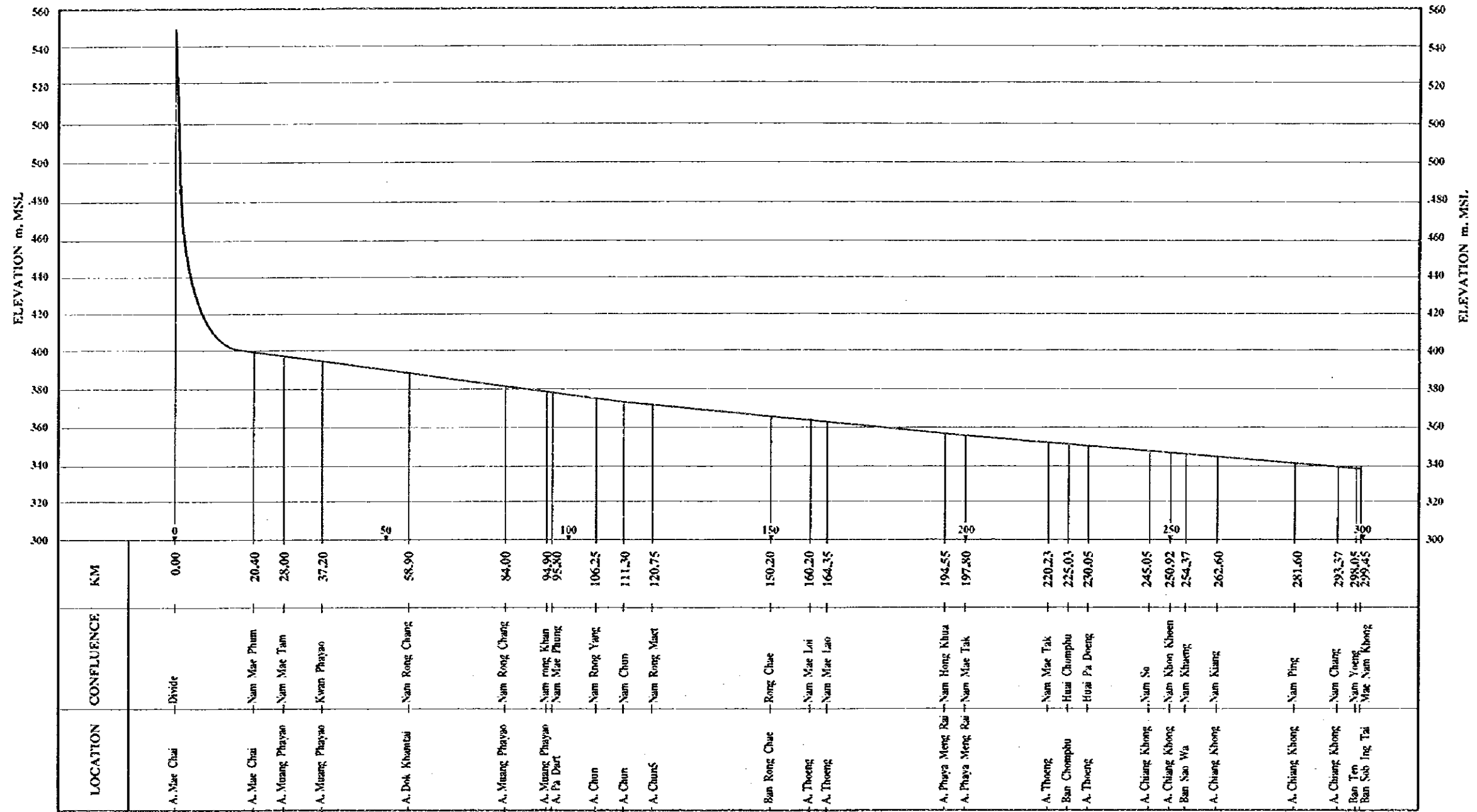


LEGEND
 - - - - Sub-basins used for the 25 Basin Study

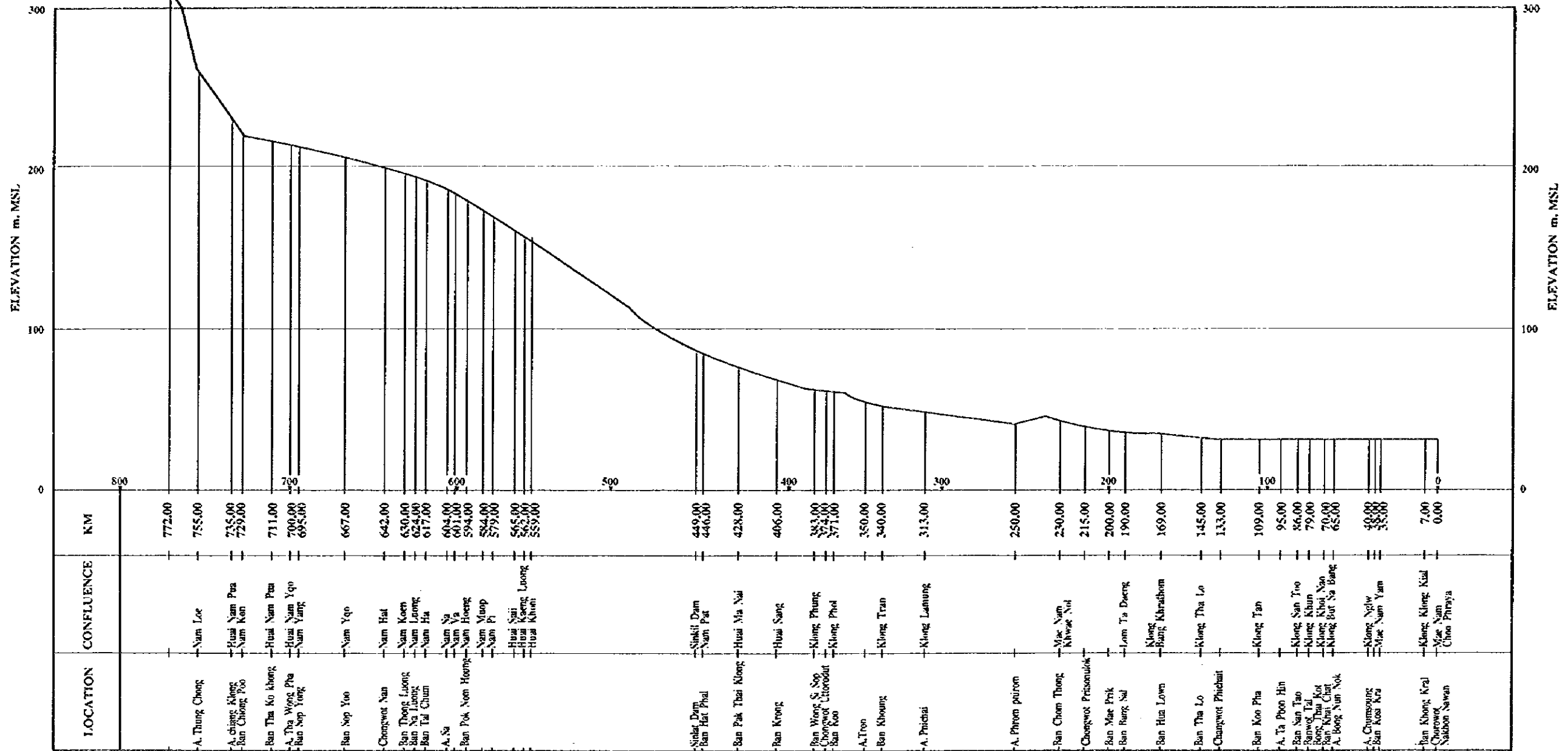
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT		
SCHEMATIC DIAGRAM OF NAN BASIN		Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)		Figure W-2
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.		



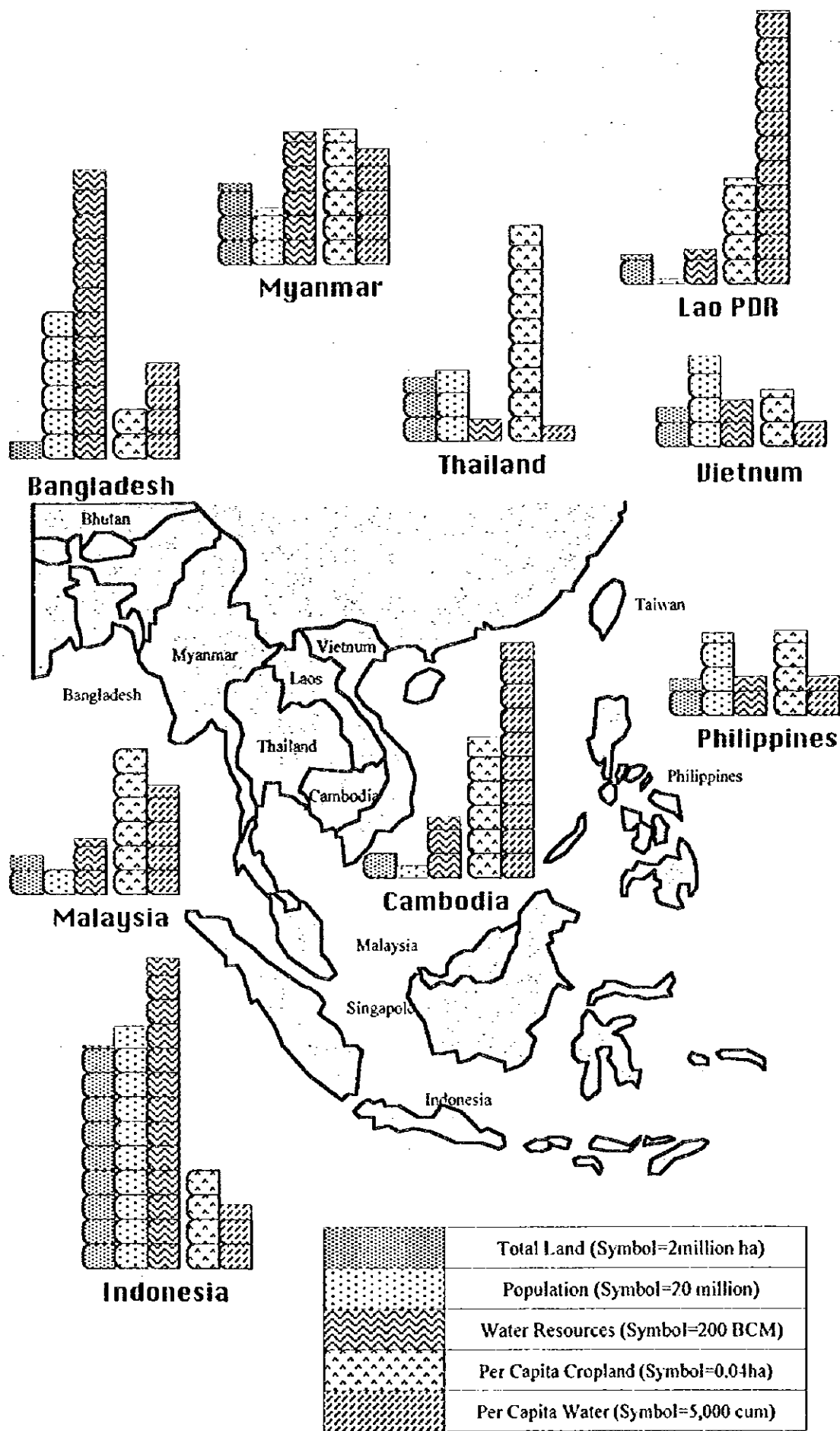
THE STUDY ON KOK-ING-NAN WATER DIVERSION PROJECT	
PROFILE OF THE KOK RIVER WITHIN THAILAND	MAP & Draw- log No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure W-3
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



THE STUDY ON KOK-ING-NAN WATER DIVERSION PROJECT	
PROFILE OF THE ING RIVER	MAP & Draw- Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure W-4
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



THE STUDY ON KOK-ING-NAN WATER DIVERSION PROJECT
 PROFILE OF THE NAN RIVER
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
 SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.
 MAP & Draw-
 Ing No.
 Figure W-5



Annual Internal Renewable Water Resources in Southeastern Countries

Country	1995 Population (Thousand)	Total Land Area (1,000 ha)	Annual Renewable Water Resources			Annual Withdrawals				Sectoral Withdrawals (%)		
			Total (BCM)	Per Capita (cu m)	Specific Yield (mm)	Year of Data	Amount (BCM)	% of Water Resources	Per Capita (cu m)	Domestic	Industry	Agriculture
Bangladesh	120,433	13,017	2,357.0	19,571	18,100	1987	22.50	1	220	3	1	96
Cambodia	10,251	17,652	498.1	48,590	2,820	1987	0.52	0	64	5	1	95
Indonesia	197,588	181,157	2,530.0	12,804	1,400	1987	16.59	1	96	13	11	76
Lao PDR	4,882	23,080	270.0	55,305	1,170	1987	0.99	0	259	8	10	82
Malaysia	20,140	32,855	456.0	22,642	1,390	1975	9.42	2	768	23	30	47
Myanmar	46,527	65,755	1,082.0	23,255	1,650	1987	3.96	0	101	7	3	90
Philippines	67,581	29,817	323.0	4,779	1,080	1975	29.50	9	686	18	21	61
Thailand	58,791	51,049	179.0	3,045	350	1987	31.90	19	603	4	6	90
Vietnam	74,545	32,549	376.0	5,044	1,160	1992	28.90	8	414	13	9	78

Note: Data source = World Resources, 1996-97

Land Area and Land Use

Country	1995 Population (Thousand)	Total Land Area (1,000 ha)	1995 Population Density (Per 1,000ha)	Cropland			Forest and Woodland		
				1991-93 Land Area (1,000ha)	% Change since 1981-83	Per Capita (ha)	1991-93 Land Area (1,000ha)	% Change since 1981-83	Per Capita (ha)
Bangladesh	120,433	13,017	9,252	9,703	6.1	0.08	1,896	(-)12.2	0.02
Cambodia	10,251	17,652	581	2,367	47.9	0.23	11,667	(-)11.3	1.14
Indonesia	197,588	181,157	1,091	30,993	19.2	0.16	111,258	(-)3.7	0.56
Lao PDR	4,882	23,080	212	807	11.6	0.17	703	(-)11.3	0.14
Malaysia	20,140	32,855	613	4,880	0.4	0.24	20,347	(-)1.8	1.01
Myanmar	46,527	65,755	708	10,061	(-)0.1	0.22	32,397	0.9	0.70
Philippines	67,581	29,817	2,267	9,177	3.8	0.14	13,600	13.4	0.20
Thailand	58,791	51,049	1,151	20,775	9.4	0.35	13,557	(-)13.3	0.23
Vietnam	74,545	32,549	2,290	6,607	0.4	0.09	9,639	(-)8.8	0.13

Note: Data source = World Resources, 1996-97

25 Main River Basins in Thailand

Code	Basin Name	Basin Area (sq. km)	Code	Basin Name	Basin Area (sq. km)
01	Salween	17,920	14	Mae Klong	30,837
02	Khong	57,422	15	Prachinburi	10,481
03	Kok	*7,895	16	Bang Pakong	7,978
04	Chi	49,477	17	Tonele Sap	4,150
05	Mun	69,700	18	Eastern Coast	13,830
06	Ping	33,898	19	Phechaburi	5,603
07	Wang	10,791	20	Western Coast	6,745
08	Yom	23,616	21	South-East Coast	26,353
09	Nan	34,330	22	Tapi	12,225
10	Chao Phraya	20,125	23	Songkhla Lake	8,495
11	Sakae Krung	5,191	24	Pattani	3,858
12	Pasak	16,292	25	South-West Coast	21,172
13	Tha Chin	13,682		Total	512,066

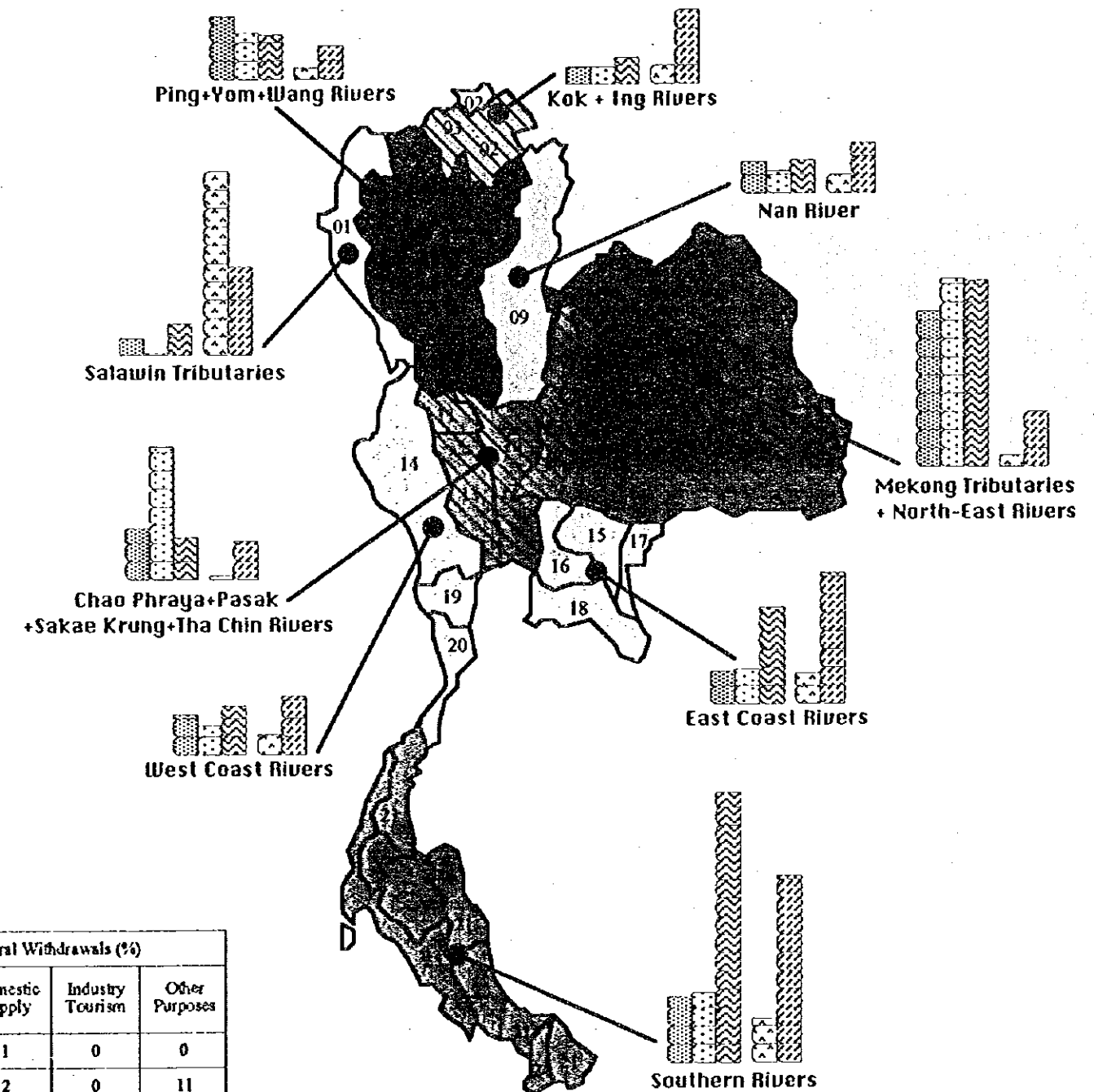
Note: Basin area of 2,980 sq. km in Myanmar territory is not counted.

River Systems	25 Main River Basins
Kok + Ing Rivers	03 + Part of 02
Nan River	09
Ring + Yom + Wang Rivers	06 + 07 + 08
Chao Phraya + Pasak + Sakae Krung + Tha Chin Rivers	10 + 11 + 12 + 13
West Coast Rivers	14 + 19 + 20
East Coast Rivers	15 + 16 + 17 + 18
Southern Rivers	21 + 22 + 23 + 24 + 25
Salween Tributaries	01
Mekong Tributaries + North-East Rivers	Most of 02 + 04 + 05

Available Water Resources in River Basins of Thailand

River Basin	Population (Thousand)	Watershed Area (sq. km)	Available Water Resources (MCM)	Per Capita Water Resources (cu m)	Specific Runoff Yield (mm)	Annual Withdrawals (MCM)	Sectoral Withdrawals (%)			
							Irrigation	Domestic Supply	Industry Tourism	Other Purposes
Kok River + Ing River	1,766	17,994(*)	7,224	4,090	401	1,160	99	1	0	0
Nan River	2,384	34,330	9,158	3,841	267	3,290	87	2	0	11
Ping + Yom + Wang Rivers	5,068	68,305	12,026	2,373	176	4,545	83	5	0	12
Chao Phraya + Pasak + Sakae Krung + Tha Chin Rivers	14,513	55,290	11,702	806	212	14,611	68	9	4	19
West Coast Rivers	3,148	43,185	13,731	4,362	318	12,447	62	1	0	37
East Coast Rivers	3,861	36,439	26,361	6,827	723	7,333	95	2	1	2
Southern Rivers	7,604	72,103	73,824	9,708	1,024	8,527	57	3	1	39
Salawin Tributaries	214	17,920	8,566	40,028	478	622	99	0	0.5	0.5
Northeast Rivers + Mekong	20,543	169,480	50,867	2,476	300	10,072	92	7	1	0
Total	59,101	515,046(*)	213,459	3,612	414	62,607	75	5	1	19

Note: (*) 2,980 sq. km in the Myanmar territory included.



THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
LAND & WATER RESOURCES IN THAILAND	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure W-7
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

25 Main River Basins in Thailand

Code	Basin Name	Basin Area (sq.km)	Code	Basin Name	Basin Area (sq.km)
01	Salaween	17,920	14	Mae Klong	30,837
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03	Kok	*7,895	16	Bang Pakong	7,978
04	Chi	49,477	17	Tonele Sap	4,150
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10	Chao Phraya	20,125	23	Songkhla Lake	8,495
11	Sakae Krung	5,191	24	Pattani	3,858
12	Pasak	16,292	25	South-West Coast	21,172
13	Tha Chin	13,682		Total	512,066

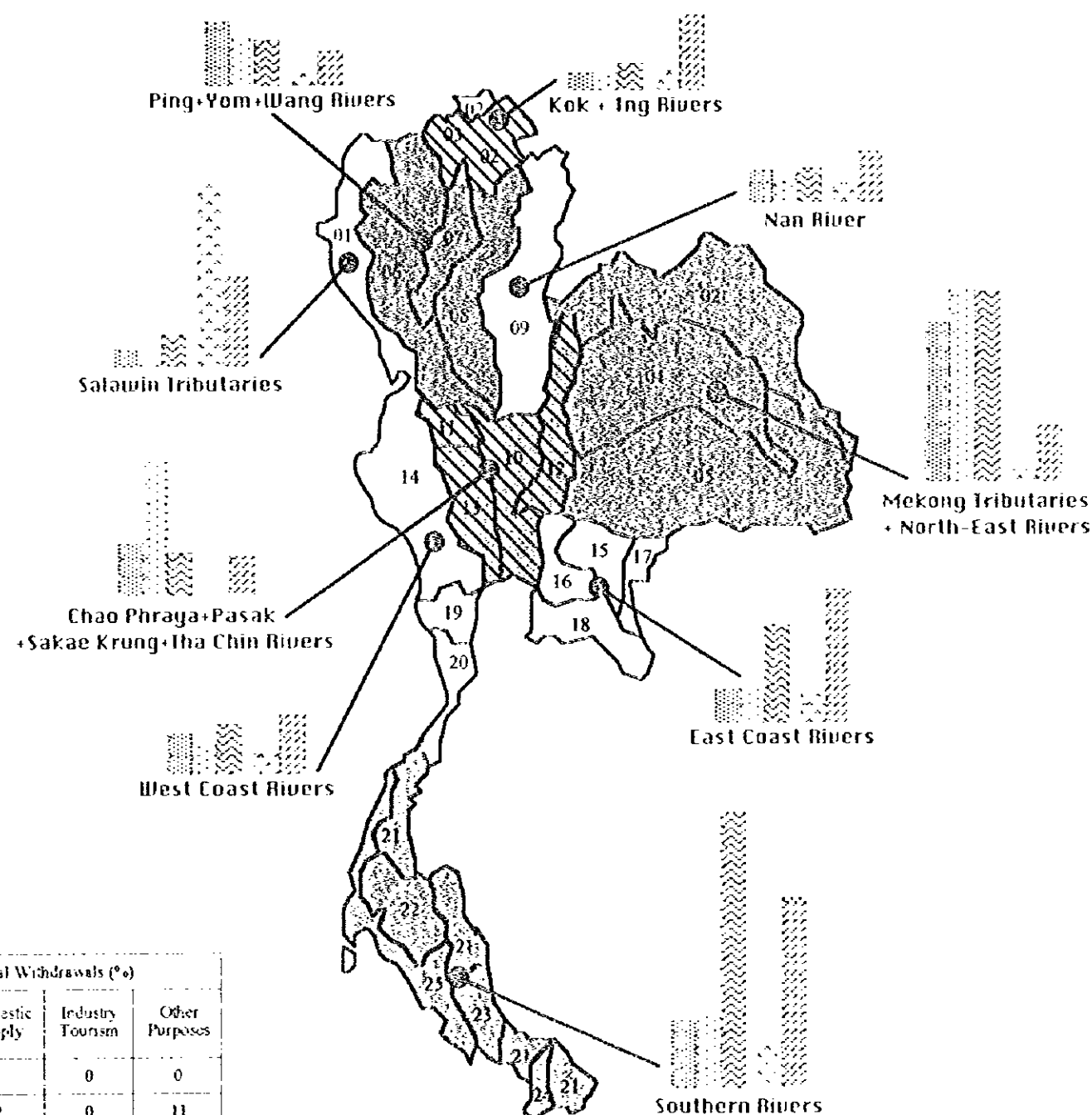
Note: Basin area of 2,980 sq km in Myanmar territory is not counted

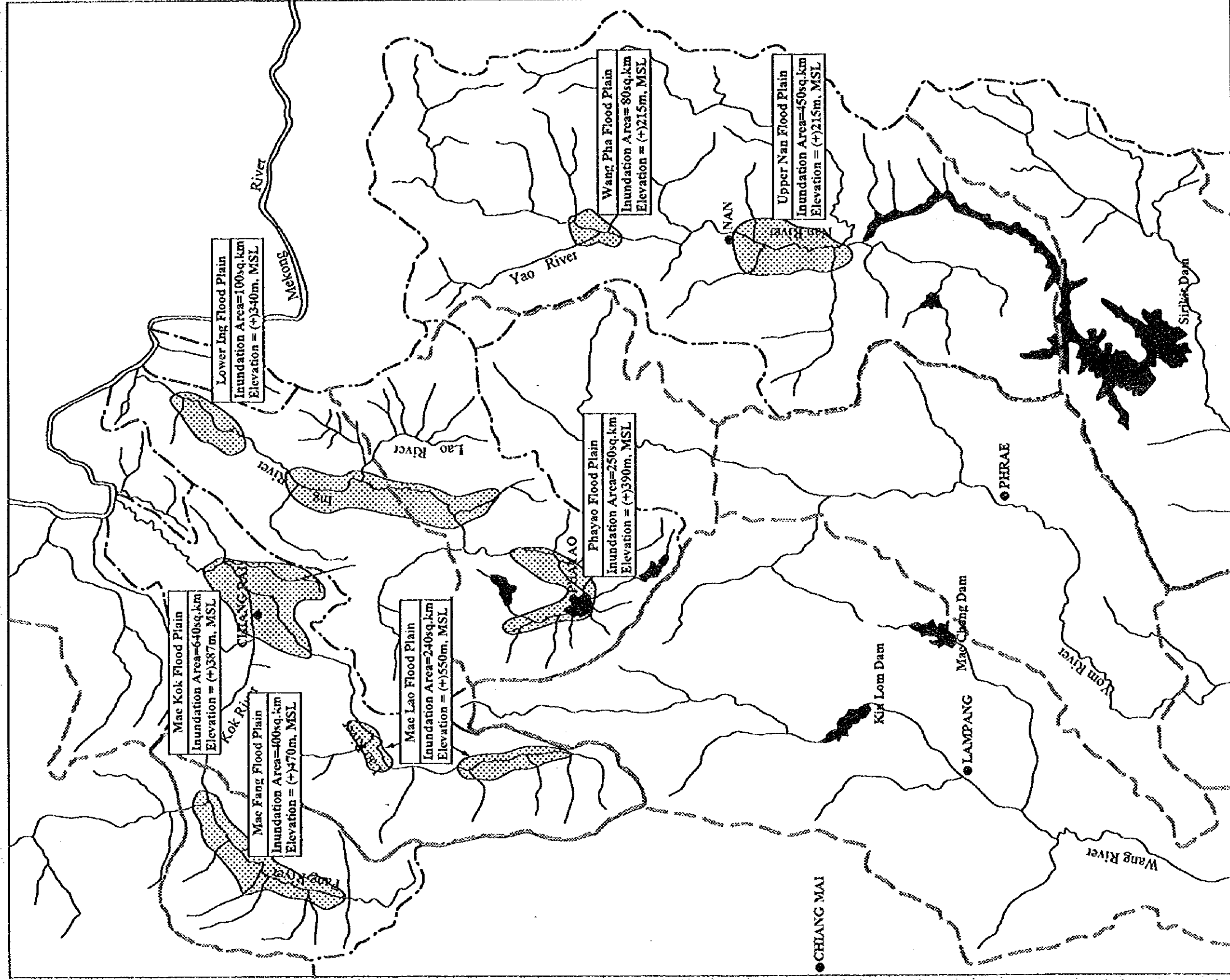
River Systems	25 Main River Basins
Kok + Ing Rivers	03 + Part of 02
Nan River	09
Ring + Yom + Wang Rivers	06 + 07 + 08
Chao Phraya + Pasak + Sakae Krung + Tha Chin Rivers	10 + 11 + 12 + 13
West Coast Rivers	14 + 19 + 20
East Coast Rivers	15 + 16 + 17 + 18
Southern Rivers	21 + 22 + 23 + 24 + 25
Salaween Tributaries	01
Mekong Tributaries + North-East Rivers	Most of 02 + 04 + 05

Available Water Resources in River Basins of Thailand

River Basin	Population (Thousand)	Watershed Area (sq km)	Available Water Resources (MCM)	Per Capita Water Resources (cu m)	Specific Runoff Yield (mm)	Annual Withdrawals (MCM)	Sectoral Withdrawals (%)			
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Kok River + Ing River	1,766	17,994(*)	7,224	4,090	401	1,160	99	1	0	0
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East Coast Rivers	3,861	36,439	26,361	6,827	723	7,333	95	2	1	2
Southern Rivers	7,604	72,103	73,824	9,708	1,024	8,527	57	3	1	39
Salawin Tributaries	214	17,920	8,566	40,028	478	622	99	0	0.5	0.5
Northeast Rivers + Mekong	20,543	169,480	50,867	2,476	300	10,072	92	7	1	0
Total	59,101	515,046(*)	213,459	3,612	414	62,607	75	5	1	19

Note: (*) 2,980 sq km in the Myanmar territory included





THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

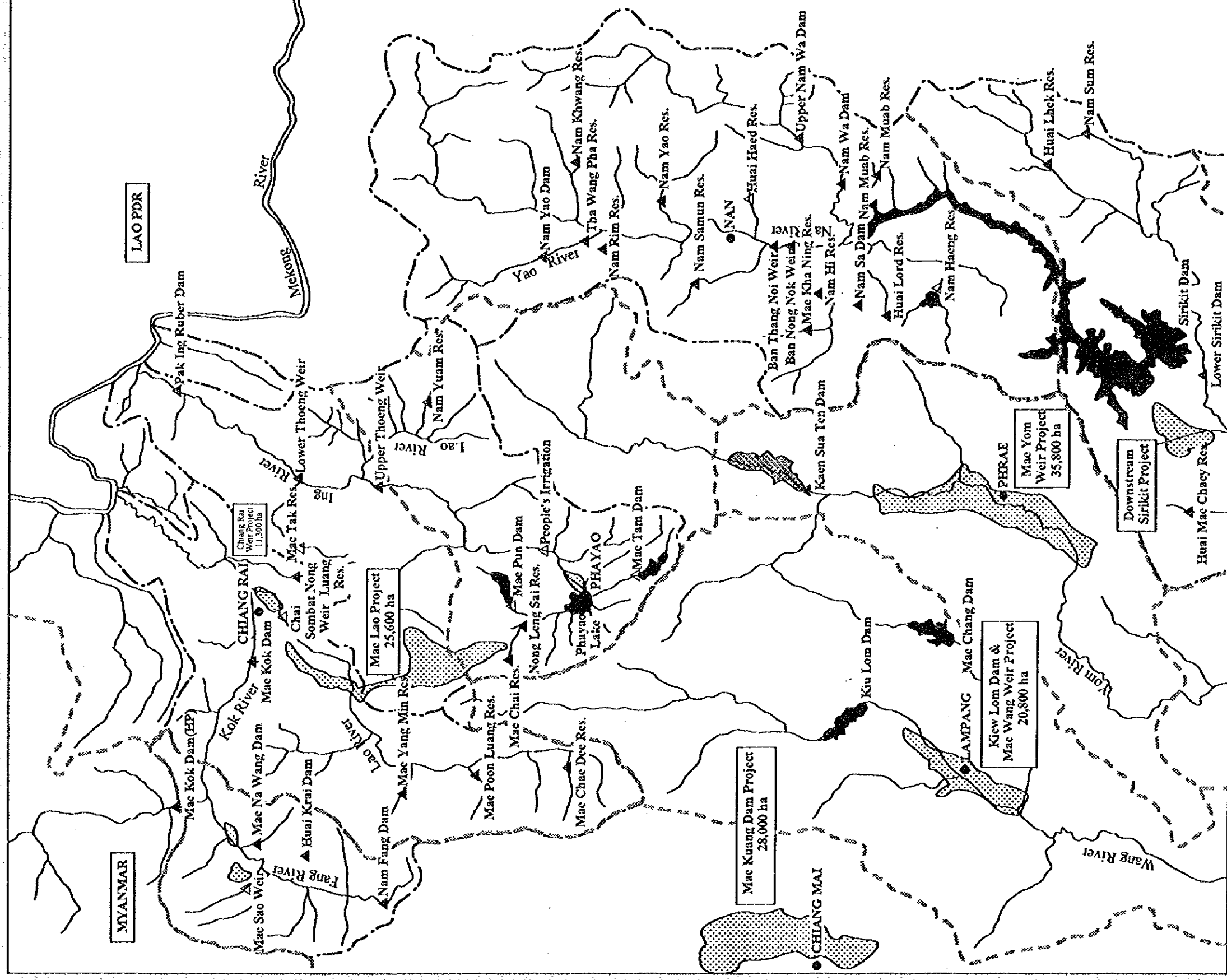
LOCATION OF FLOOD PLAIN IN
KOK, ING AND UPPER NAN BASIN

Map &
Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Figure W-8

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.



THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

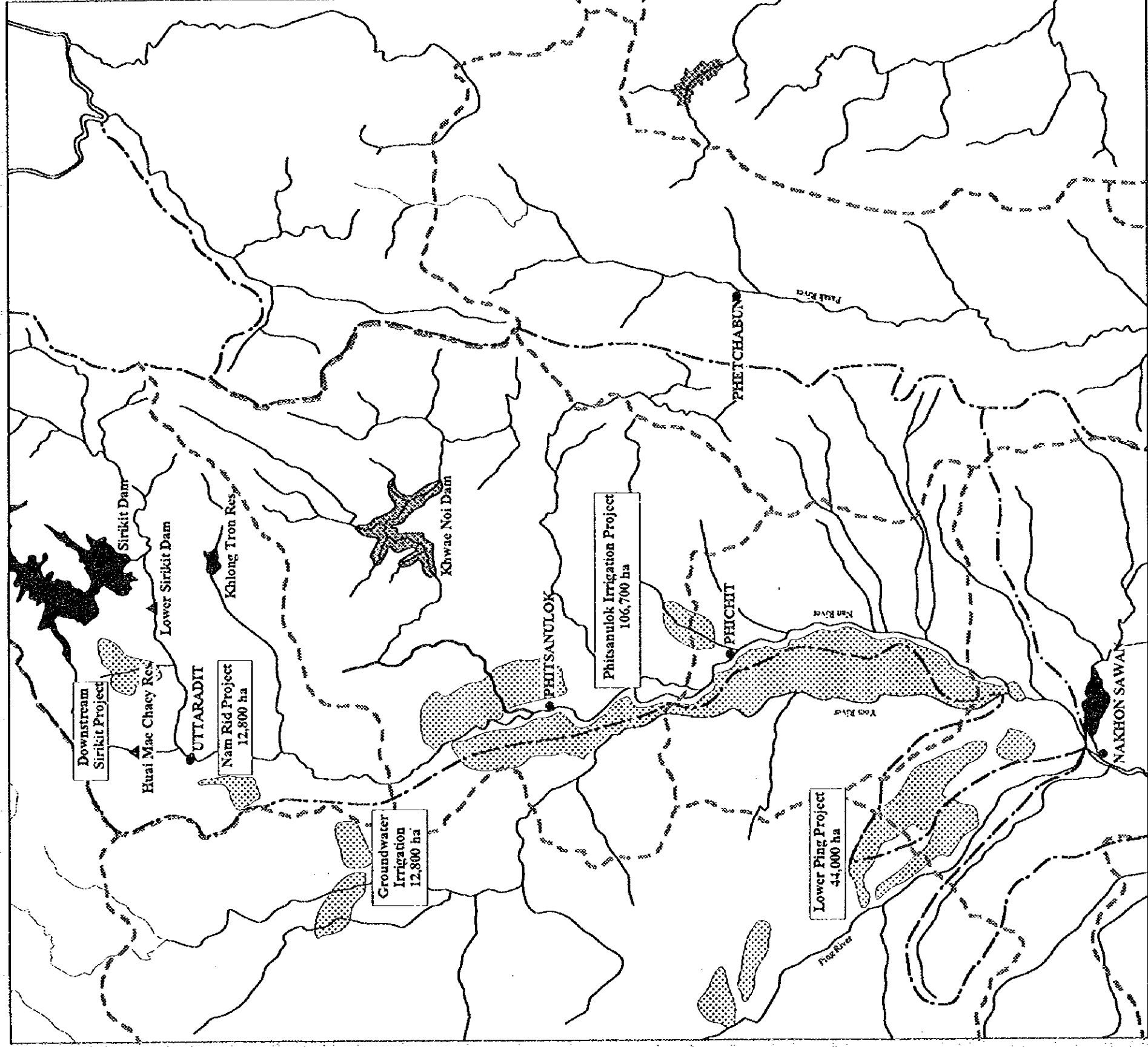
LOCATION OF EXISTING & PROPOSED WATER RESOURCES DEVELOPMENT PROJECT (1/3)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Map & Drawing No.

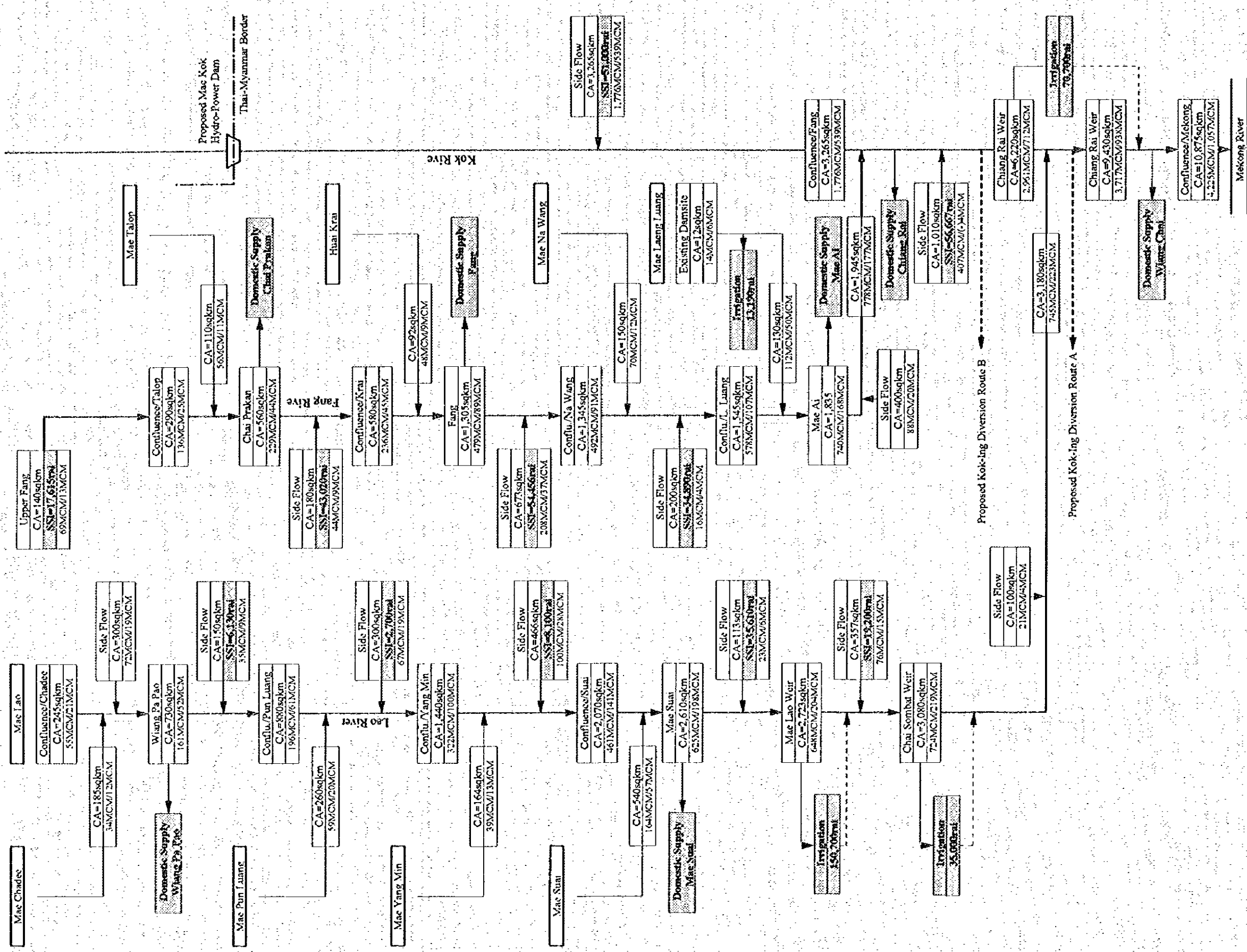
Figure W-9



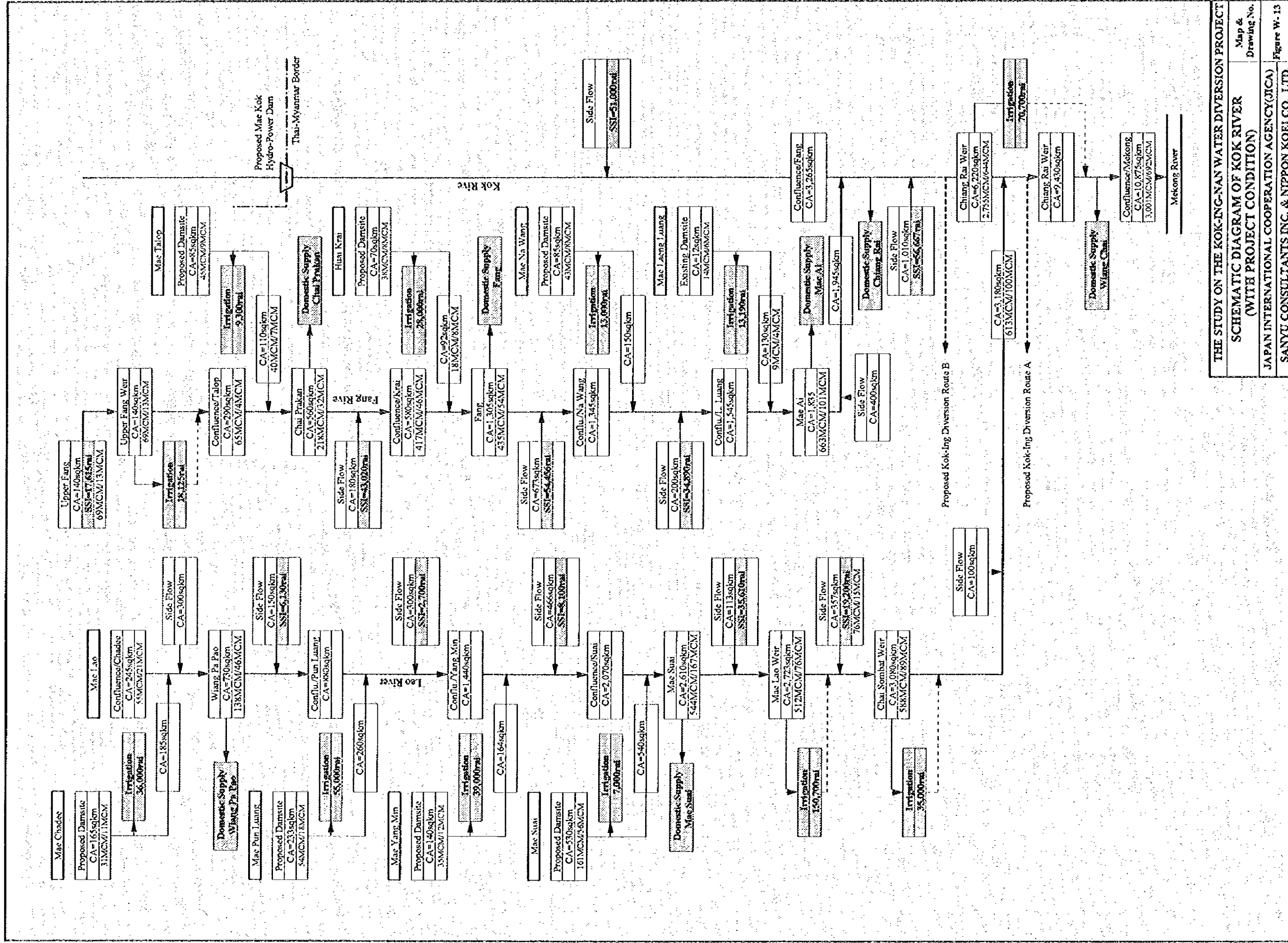
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
LOCATION OF EXISTING & PROPOSED WATER RESOURCES DEVELOPMENT PROJECT (2/3)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure W-10
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



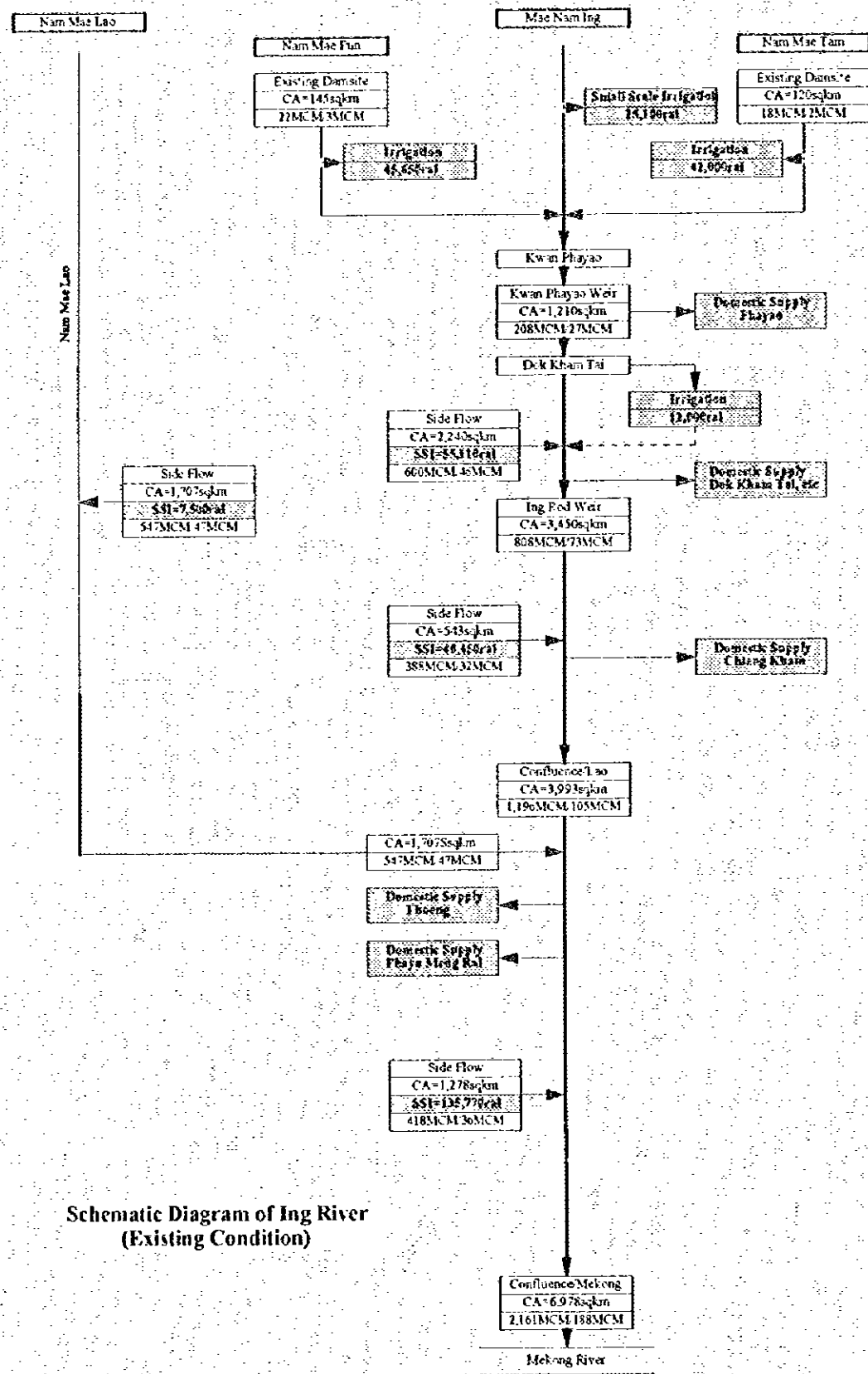
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
 LOCATION OF EXISTING & PROPOSED
 WATER RESOURCES DEVELOPMENT PROJECT (3/3)
 JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
 SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD. Map & Drawing No. Figure W-11



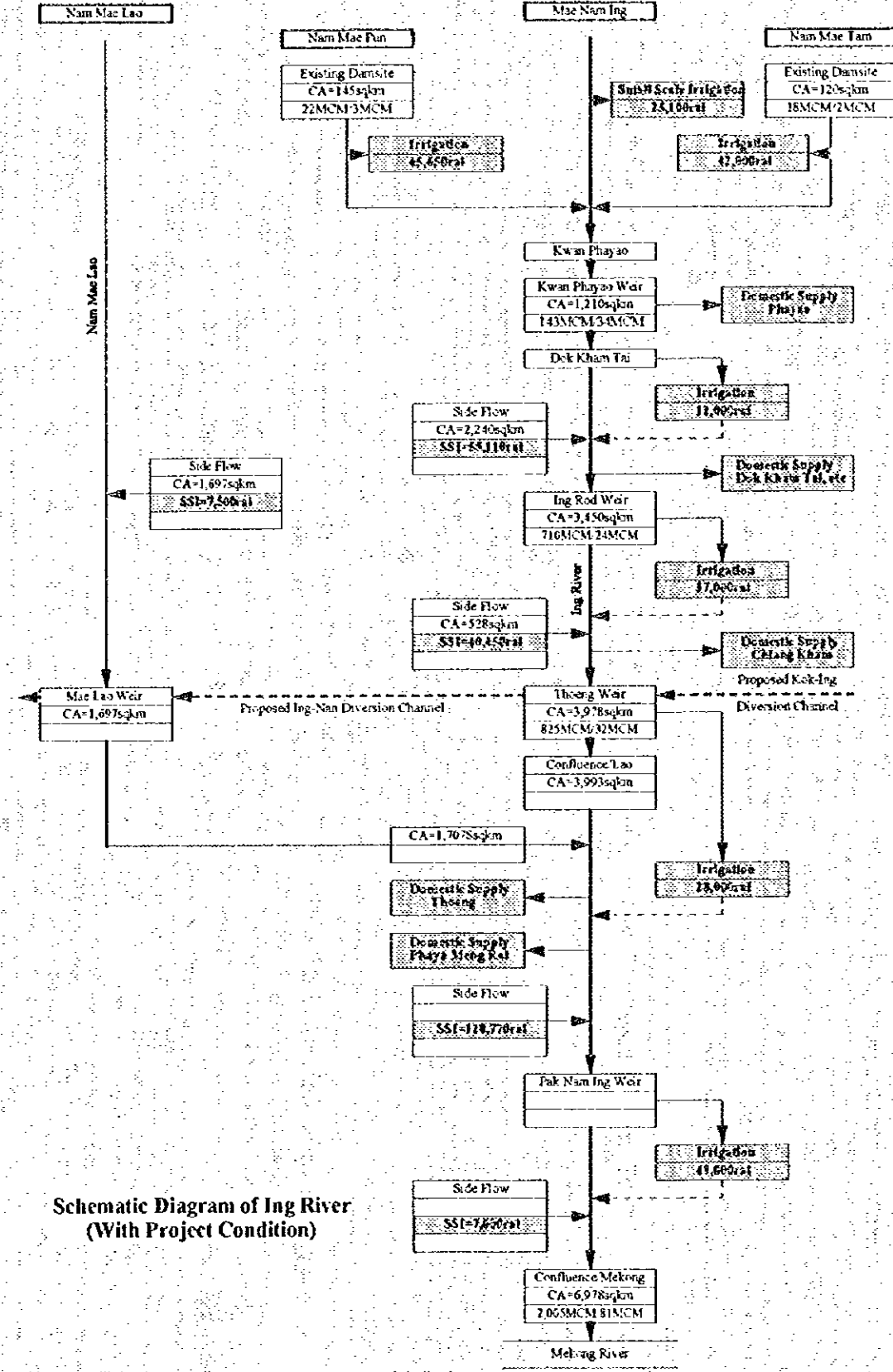
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
 SCHEMATIC DIAGRAM OF KOK RIVER
 (EXISTING CONDITION)
 JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
 SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.
 Map & Drawing No.
 Figure W-12



THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
 SCHEMATIC DIAGRAM OF KOK RIVER
 (WITH PROJECT CONDITION)
 JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
 SANYU CONSULTANTS INC. & NEPPON KOEI CO., LTD.
 Map & Drawing No.
 Figure W-13

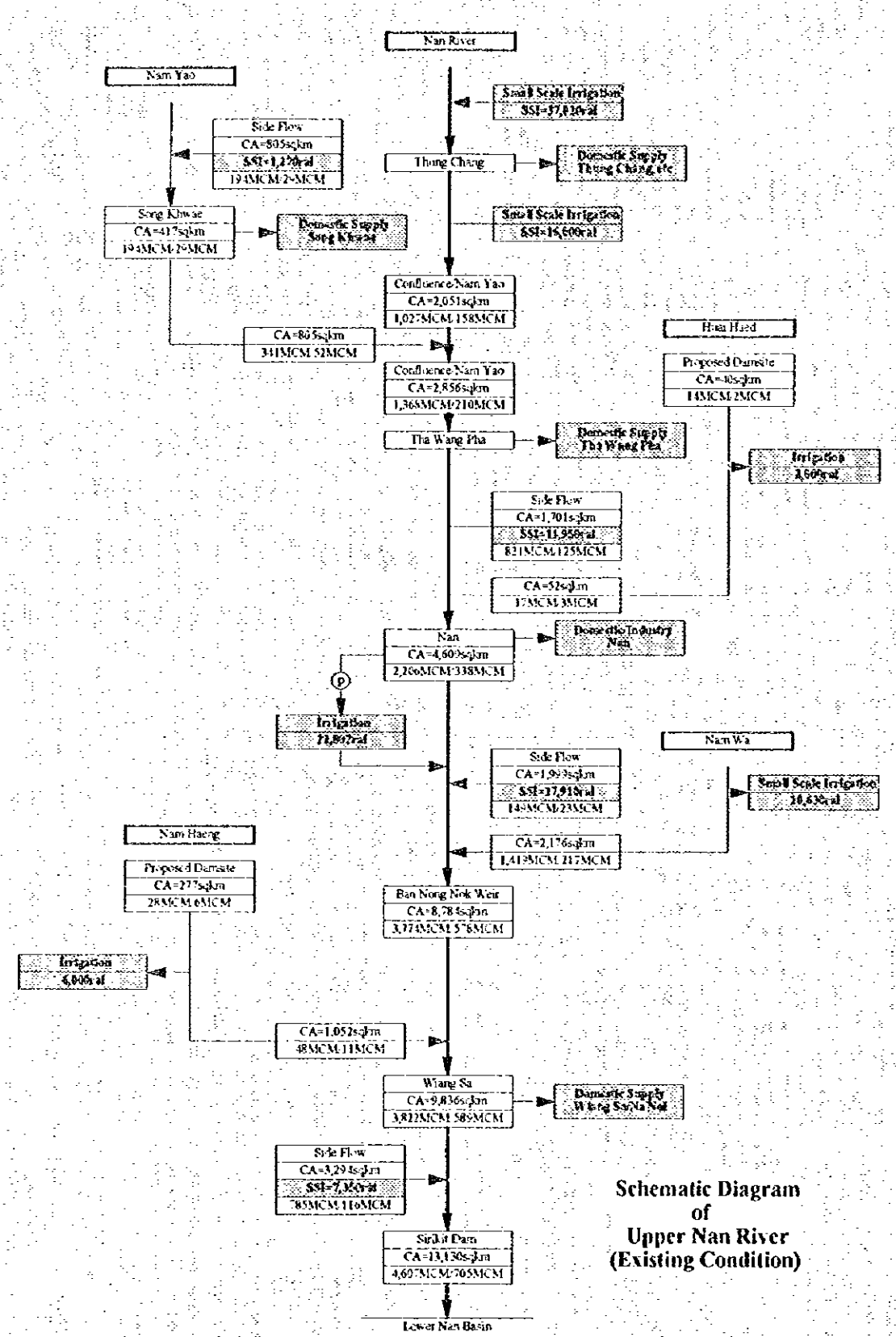


Schematic Diagram of Ing River (Existing Condition)

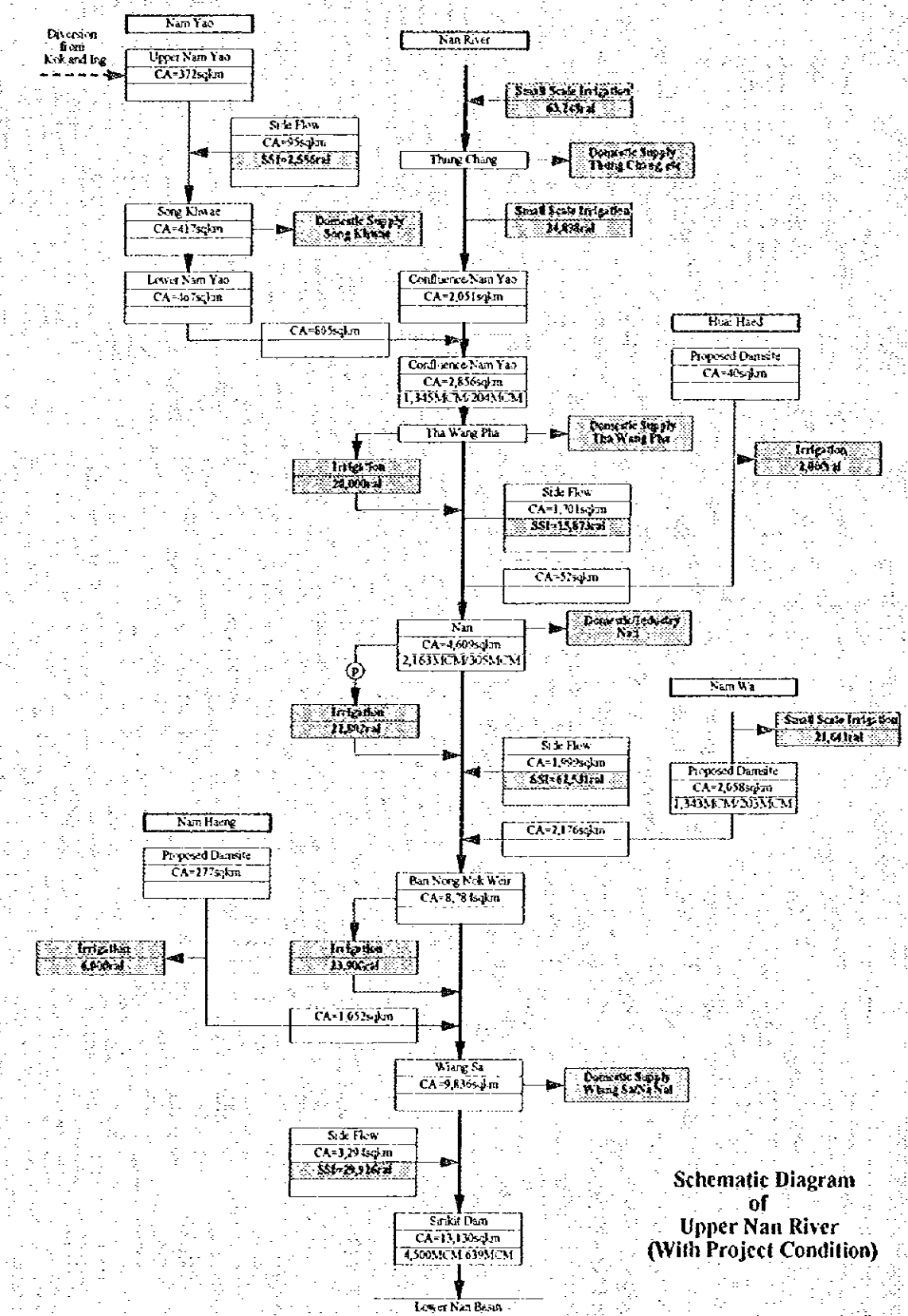


Schematic Diagram of Ing River (With Project Condition)

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
SCHEMATIC DIAGRAM OF ING RIVER (EXISTING/WITH PROJECT CONDITION)	
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)	
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	
Map & Drawing No.	Figure W- 14



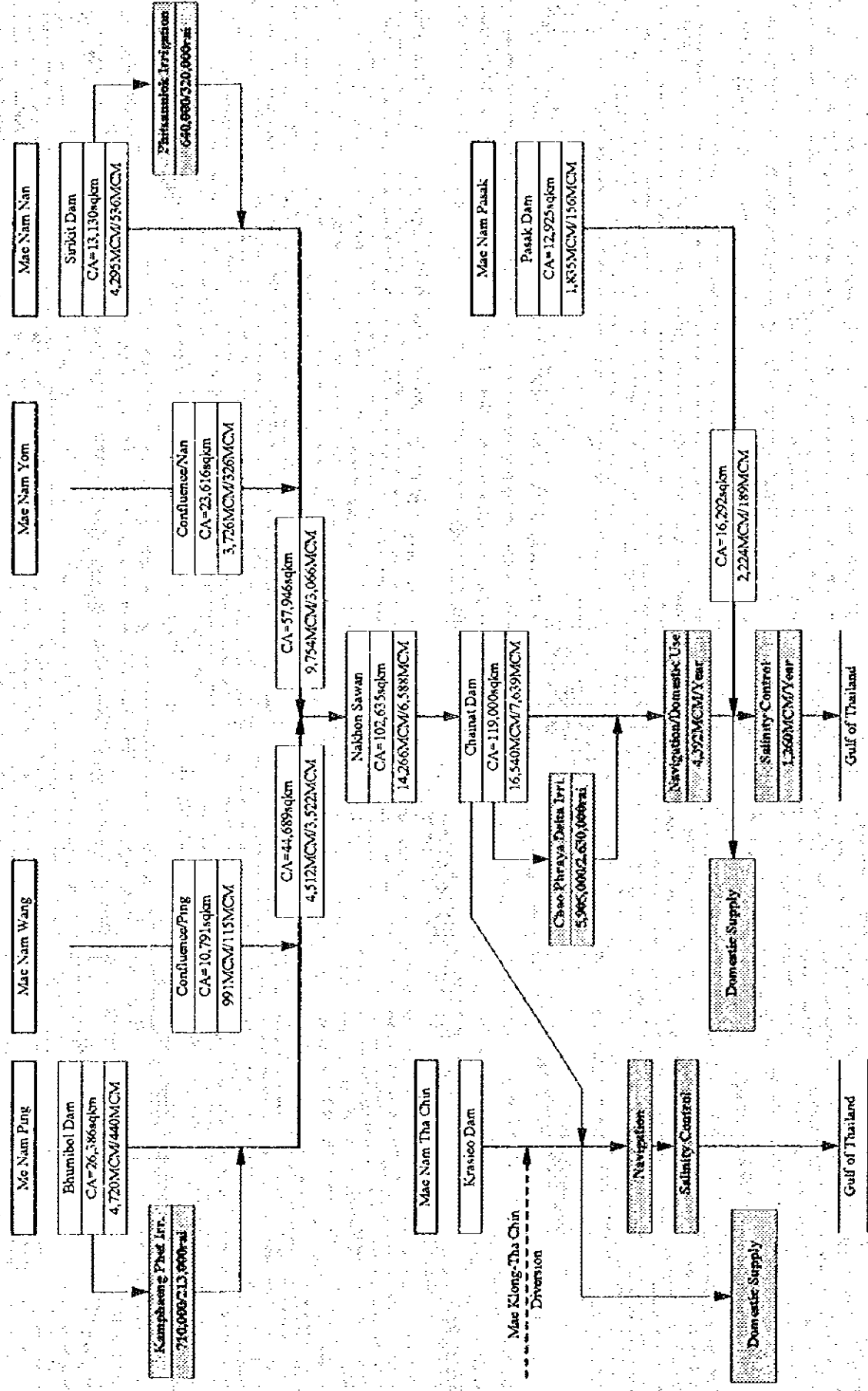
Schematic Diagram of Upper Nan River (Existing Condition)



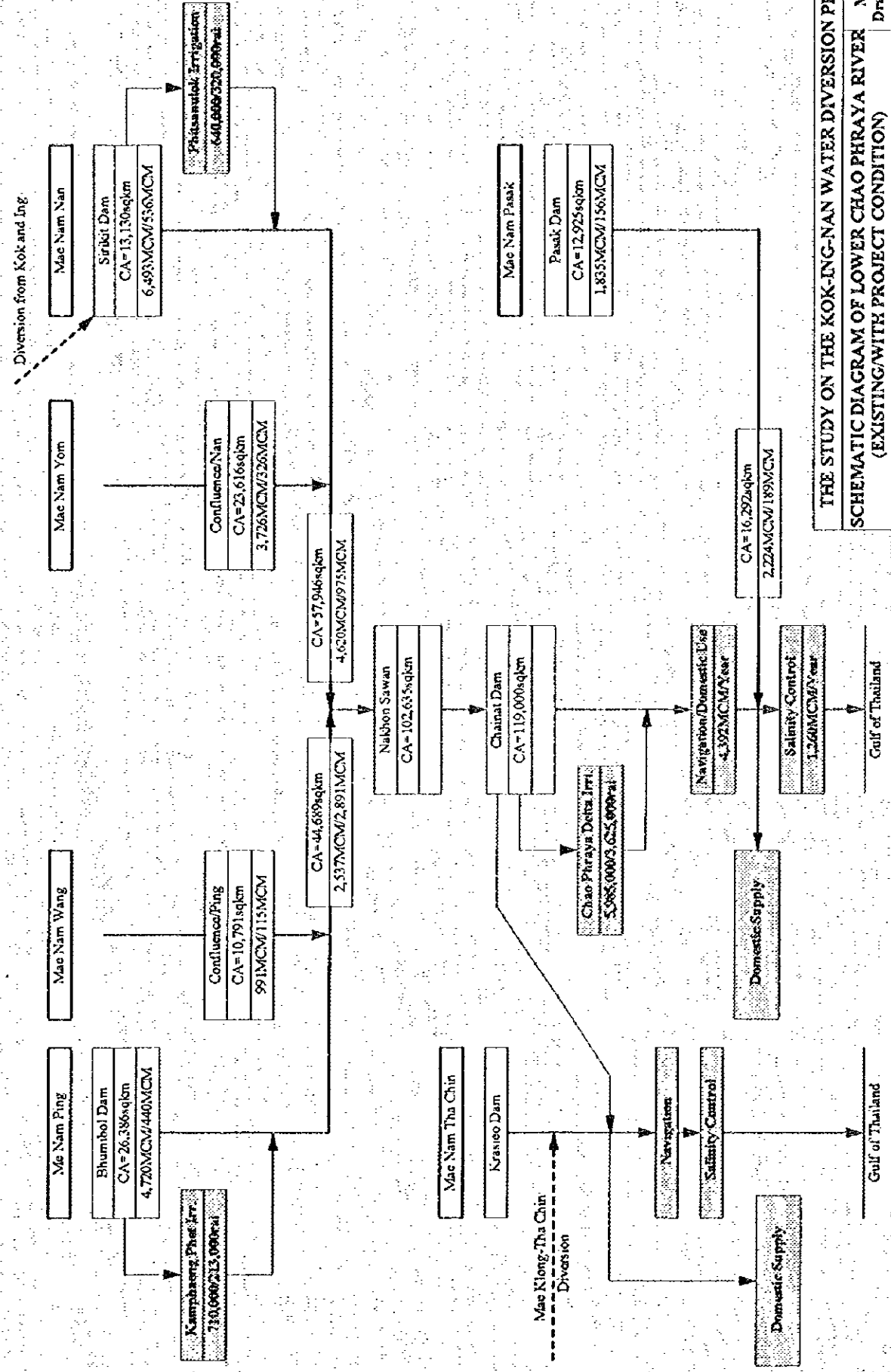
Schematic Diagram of Upper Nan River (With Project Condition)

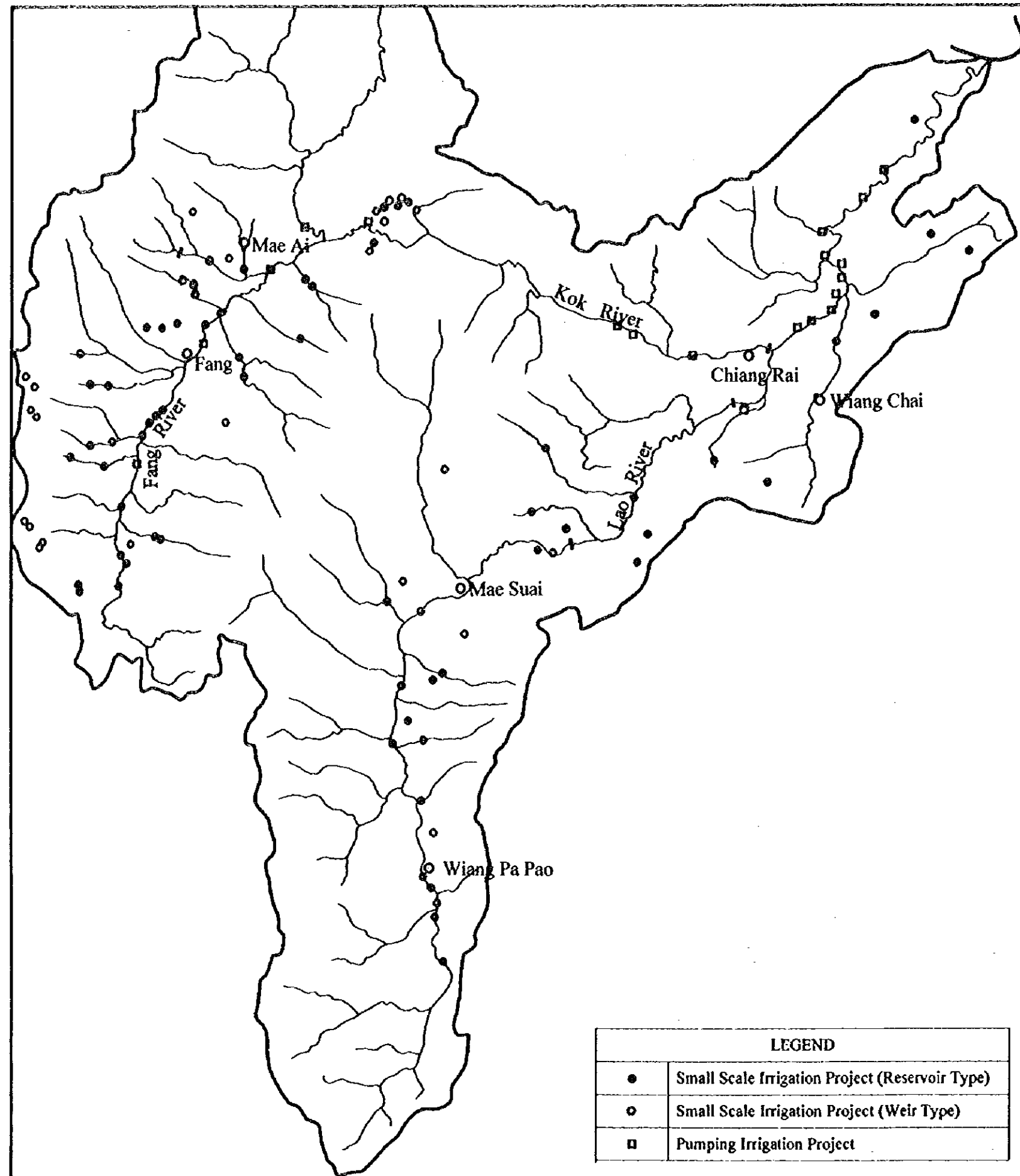
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
SCHEMATIC DIAGRAM OF UPPER NAN RIVER (EXISTING/WITH PROJECT CONDITION)	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Map & Drawing No.
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	Figure W-15

Schematic Diagram of Chao Phraya River Basin (Future Condition without Project)



Schematic Diagram of Chao Phraya River Basin (Future Condition with Project)



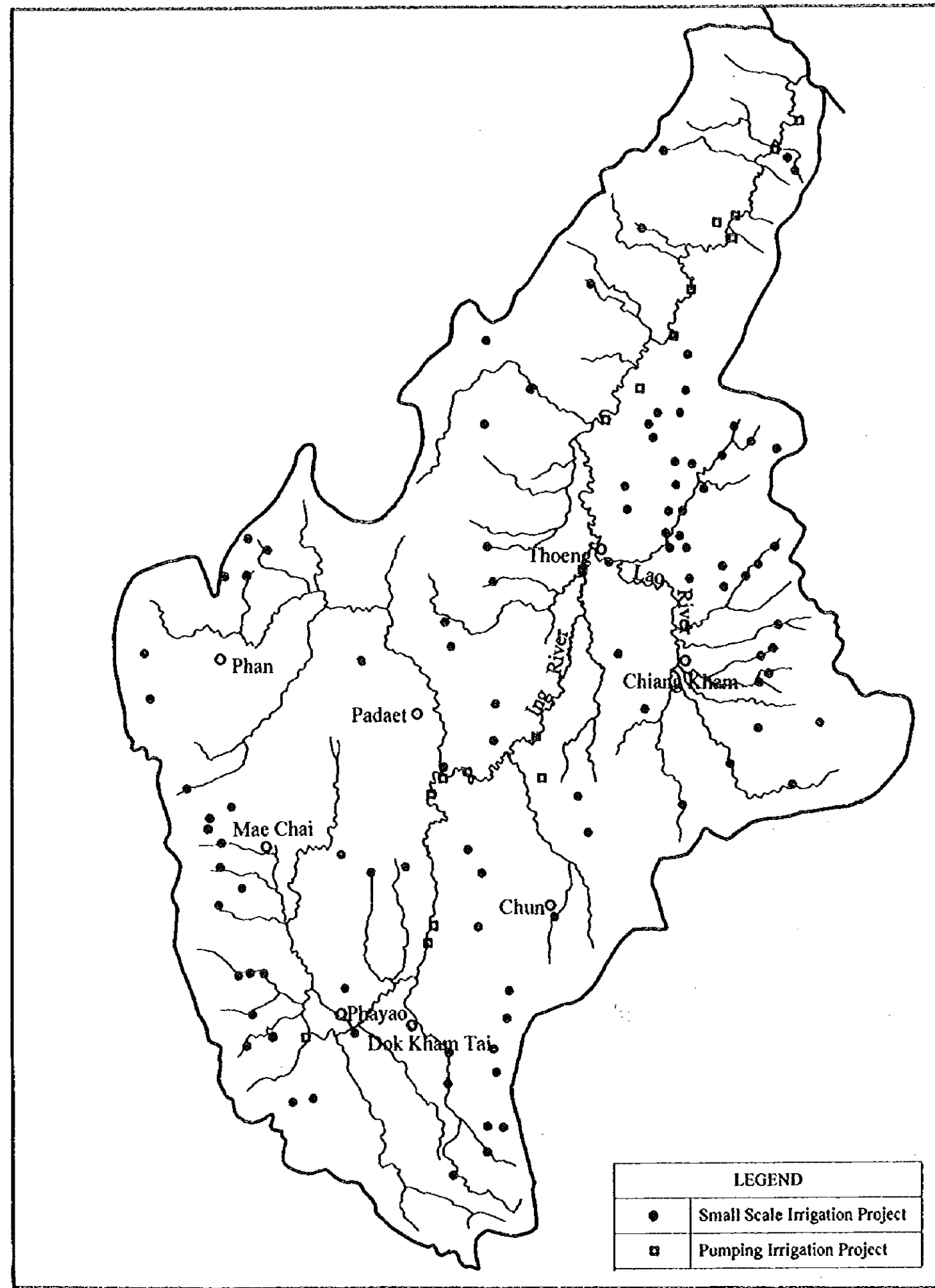


LEGEND	
●	Small Scale Irrigation Project (Reservoir Type)
○	Small Scale Irrigation Project (Weir Type)
□	Pumping Irrigation Project

No	Project	Area (rai)
Small Scale Irrigation Project		
1	Huai Tab Chang Res	1,400
2	Thung Khlong Weir	1,700
3	Hin Weir	5,000
4	Huai Yan Weir	1,000
5	Huai Yan Res	2,000
6	Ruang Weir	2,000
7	Mae Sak Res	1,200
8	Huai Chom Phi Res	1,000
9	Mae Chai Weir	100
10	Huai Ton Yang Res	1,000
11	Huai Nen Res	5,900
12	Huai Chae Res	800
13	Huai Tao Pun Res	500
14	Huai Pa Sang Weir	1,500
15	Ban Pang Weir	6,000
16	Huai Nong Tu Res	450
17	Huai Nok Khao Weir	1,500
18	Huai Dae Res	1,000
19	Huai Hang Weir	1,000
20	Rong Sak Res	1,500
21	Huai Pha Miang Res	300
22	Huai Ton Tun Res	100
23	Huai Kaew Res	1,700
24	Huai Yang Kham Res	600
25	Huai Pa Sak Weir	1,600
26	Rong Chang Res	1,300
27	Huai Pang Duang Res	4,500
28	Rong Pha Res	4,000
29	Huai Chom Phi Res	200
30	Mae Yen Res	1,800
31	Pa Fack Weir	1,000
32	Huai Kek Weir	2,500
33	Huai Krung Weir	500
34	Ton Kuang Weir	1,000
35	Huai Jan Weir	1,600
36	Huai Mae Chedi Weir	1,000
37	Huai Pha Tan Res	2,500
38	Pha Tan Weir	200
39	Huai Daa Weir	500
40	Huai Yang Res	1,550
41	Doi View Res	2,000
42	Huai Chang Phuak Res	200
43	Huai Yang Res	2,600
44	Huai Hom Res	1,000
45	Fong Duang Res	500
46	Mae Kaew Res	3,000

No	Project	Area (rai)
47	Mae Eon Res	2,500
48	Mae Sun Weir	1,000
49	Wang Khan Weir	5,600
50	Huai Luang Res	3,200
51	Nan Ngaw Res	500
52	Tung Hong Res	3,000
53	Huai Bang Duang Res	4,200
54	Rong Rew Res	800
55	Huai Khrai Res	1,300
56	Huai Pong Weir	600
57	Ton Khuang Weir	1,600
58	Pa Hat Weir	500
59	Huai Chiang Khan Res	3,200
60	Huai Cham Tong Res	1,000
61	Huai Dee Moe Res	1,500
62	Huai Yang Hom Res	1,700
63	Huai Ta Res	1,000
64	Ba Dan Weir	200
65	Huai Miang Res	1,300
66	Huai Maang Chum Res	500
67	Huai Yack Sai Res	800
68	Mae Raw Res	1,200
69	Huai Wai Res	3,600
70	Huai Bong Res	1,700
71	Mae Tam Klang Weir	7,000
72	Mae Tak Weir	2,500
73	Rong Auam Res	3,000
74	Rong Lan Res	5,000
75	Huai Na Ban	200
76	Pua Weir	1,500
77	Huai Fai Res	3,000
78	Huai Cham Tong Res	100
79	Huai Pha Lut	600
80	San Pa Loei Res	450
81	Nan Sa	1,000
82	Kaew	3,000
83	Wean Khong	1,000
84	Huai Sa Res	2,600
85	Nan Ton Res	1,500
	Small Scale Total	146,250
Small Scale (King's) Project		
1	Huai Pa Sak Res	1,600
2	Huai San To Res	5,000
3	Mae Kaew Weir	1,700
4	Huai Ton Yang Res	3,200
5	Huai Ban Res	23,000
6	Doi Ngaw Res	2,000

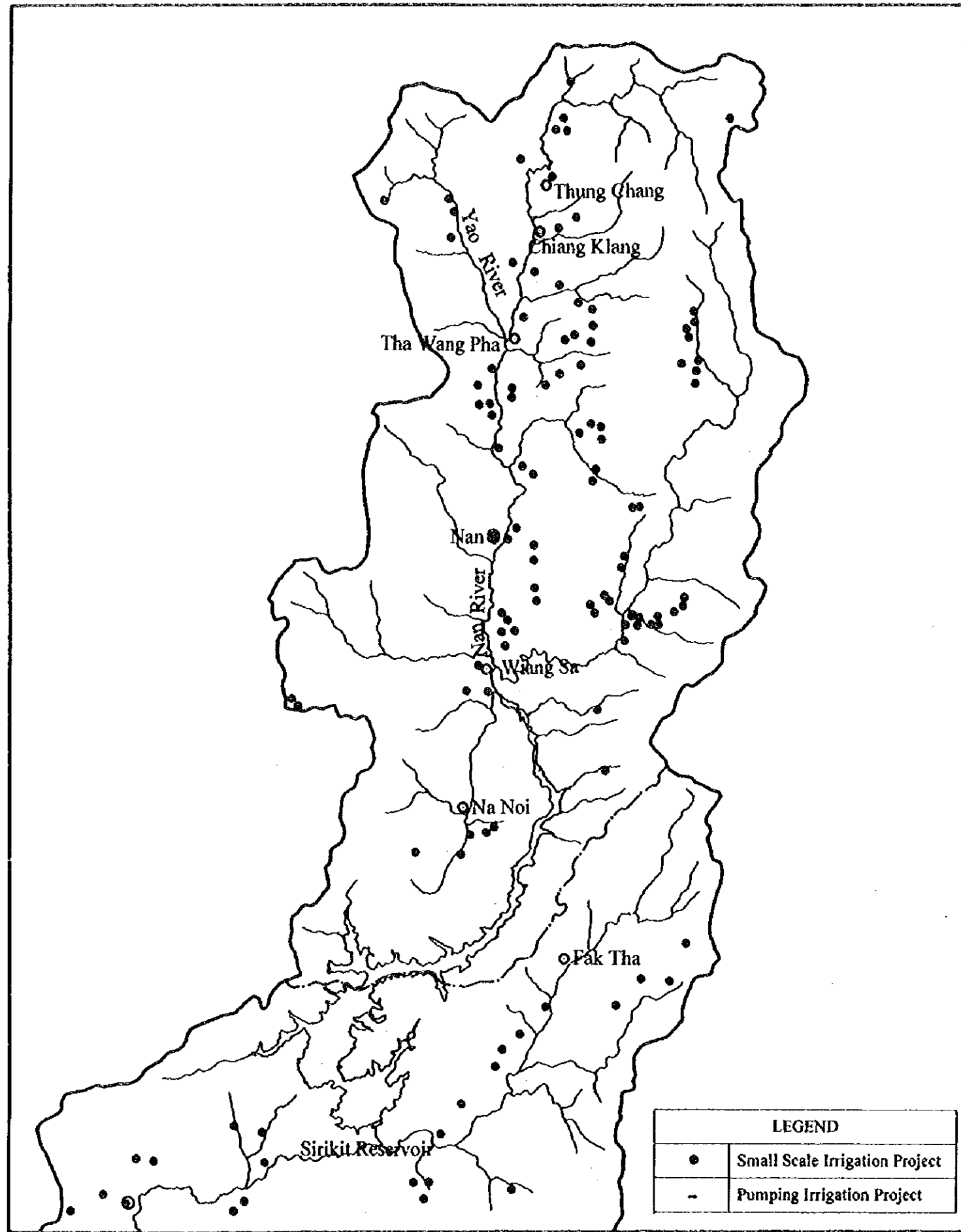
No	Project	Area (rai)
7	Huai Phan Res	5,000
8	Huai Khang Weir	500
9	Huai Khok Weir	2,500
10	Huai Pa Tan Res	2,100
11	Huai Daa Weir	500
12	Huai Mae Chedi Weir	1,000
13	Huai Mae Chedi Weir	1,000
14	Huai Laeng Weir	100
15	Huai Tong Res	1,300
16	Huai Tong Weir	1,500
17	Huai Kho Res	8,000
18	Huai Ta Khuan Res	12,000
	Small Scale (King) Total	71,400
Pumping Irrigation Project		
1	Wiang Wai	2,370
2	Rong Rew	1,990
3	Luang	1,670
4	Sri Don Chai	3,690
5	Nan Phrae	1,030
6	San Tab Tong	2,540
7	Boon Ruang	1,680
8	Khrubg Tai	1,500
9	Boon Ruang (2)	1,500
10	Rong Maek	1,830
11	Fhuang Phayom	1,530
12	Mae Sai Lao	1,250
13	Sri Miang Chum	1,300
14	Huai Dok Khem	1,500
15	Lo	1,200
16	Wang Khon Duang	1,500
17	Dun Bon	1,800
	Pumping Project Total	29,280
National Security Project		
1	Huai Ban Res	1,000
2	Tab Tao Res	800
3	Ban Lao Weir	2,500
4	Huai Pong Weir	600
5	Huai Sai Kat Weir	500
6	Nan Ngaw Weir	1,000
7	Nan Ngaw Res	500
8	Rm Pho Thai Weir	Domes
9	Ban Khun Huai Khok	Domes
10	Ban Huai Hia	Domes
11	Ban Kew	Domes
12	Ban Rat Phak Dee	300
	National Security Total	7,200



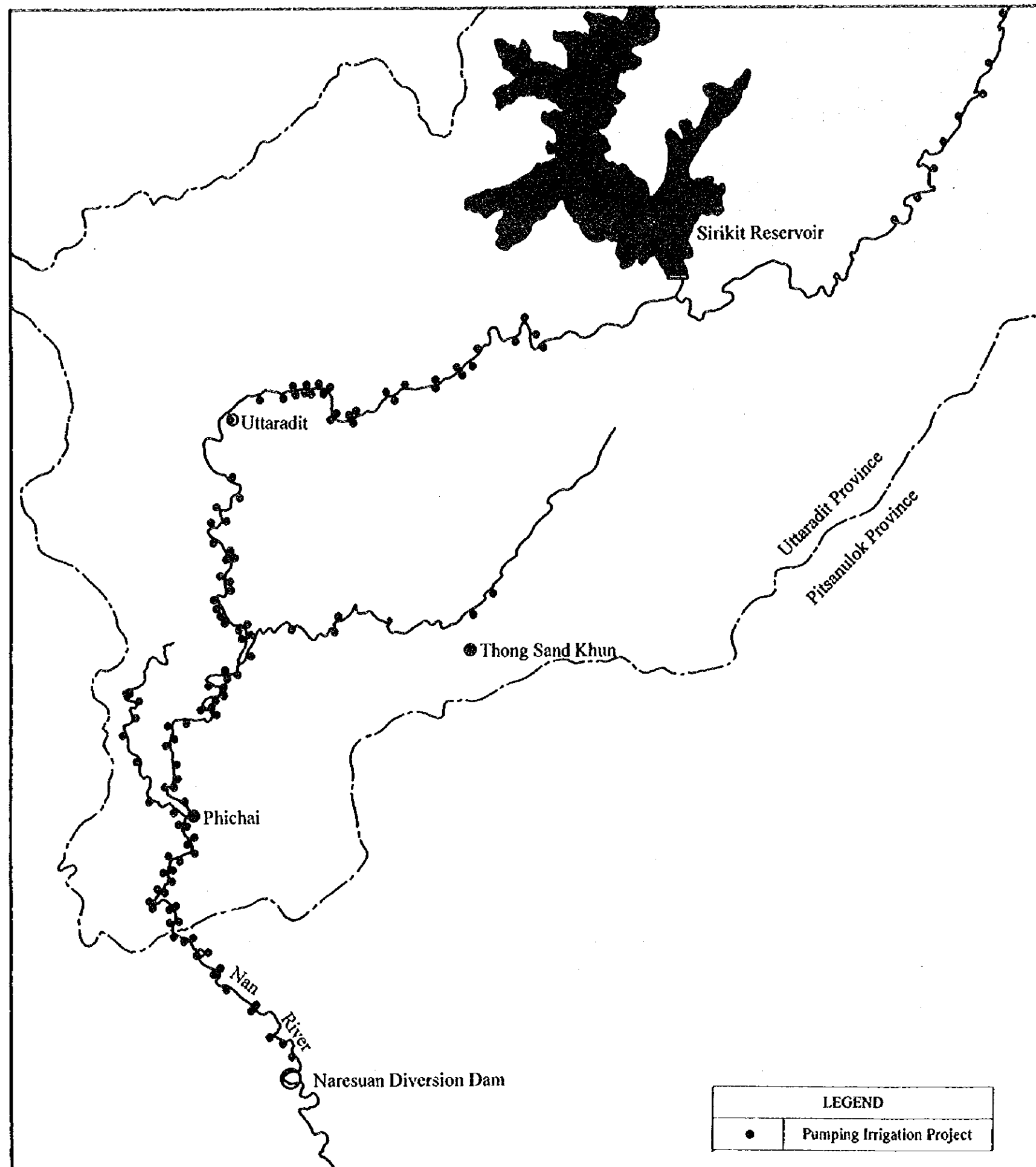
No	Project	Area (rai)
Small Scale Irrigation Project		
1	Huai Tab Chang Res.	1,400
2	Thung Khlong Weir	1,700
3	Itin Weir	5,000
4	Huai Yian Weir	1,000
5	Huai Yian Res.	2,000
6	Ruang Weir	2,000
7	Mae Sak Res.	1,200
8	Huai Chom Phi Res.	1,000
9	Mae Chai Weir	100
10	Huai Ton Yang Res.	1,000
11	Huai Nan Res.	5,900
12	Huai Chae Res.	800
13	Huai Tao Pun Res.	500
14	Huai Pa Sang Weir	1,500
15	Ban Pang Weir	6,000
16	Huai Nong Tu Res.	450
17	Huai Nok Khao Weir	1,500
18	Huai Dae Res.	1,000
19	Huai Hang Weir	1,000
20	Rong Sak Res.	1,500
21	Huai Pha Miang Res.	300
22	Huai Ton Tum Res.	100
23	Huai Kaew Res.	1,700
24	Huai Yang Khan Res.	600
25	Huai Pa Sak Weir	1,000
26	Rong Chang Res.	1,300
27	Huai Pang Daeng Res.	4,500
28	Rong Pha Res.	4,000
29	Huai Chom Phu Res.	200
30	Mae Yen Res.	1,800
31	Pa Fack Weir	1,000
32	Huai Kok Weir	2,500
33	Huai Krung Weir	500
34	Ton Kuang Weir	1,000
35	Huai Jan Weir	1,000
36	Huai Mae Chedi Weir	1,000
37	Huai Pha Tan Res.	2,500
38	Pha Tan Weir	200
39	Huai Dua Weir	500
40	Huai Yang Res.	1,550
41	Doi View Res.	2,000
42	Huai Chang Phuak Res.	200
43	Huai Yang Res.	2,000
44	Huai Hom Res.	1,000
45	Pong Daeng Res.	500
46	Mae Kaew Res.	3,000

No	Project	Area (rai)
47	Mae Bon Res.	2,500
48	Mae Sun Weir	1,000
49	Wang Khian Weir	5,600
50	Huai Luang Res.	3,200
51	Nam Ngaw Res.	500
52	Tung Hong Res.	3,000
53	Huai Bang Daeng Res.	4,200
54	Rong Rew Res.	800
55	Huai Khrai Res.	1,300
56	Huai Pong Weir	600
57	Ton Khuang Weir	1,000
58	Pa Hat Weir	500
59	Huai Chiang Khian Res.	3,200
60	Huai Cham Tong Res.	1,000
61	Huai Dee Mee Res.	1,500
62	Huai Yang Hom Res.	1,700
63	Huai Ta Res.	1,000
64	Ba Dan Weir	200
65	Huai Kiang Res.	1,300
66	Huai Muang Chum Res.	500
67	Huai Yaek Sai Res.	800
68	Mae Raw Res.	1,200
69	Huai Wai Res.	3,600
70	Huai Bong Res.	1,700
71	Mae Tan Klang Weir	7,000
72	Mae Tak Weir	2,500
73	Rong Avam Res.	3,000
74	Rong Lan Res.	5,000
75	Huai Na Ban	200
76	Pua Weir	1,500
77	Huai Fai Res.	3,000
78	Huai Cham Tong Res.	100
79	Huai Pha Lat	600
80	San Pu Loei Res.	450
81	Nam Sa	1,000
82	Kaew	3,000
83	Wean Khong	1,000
84	Huai Sa Res.	2,000
85	Nam Ton Res.	1,500
Small Scale Total		146,250
Small Scale (King's) Project		
1	Huai Pa Sak Res.	1,000
2	Huai San To Res.	5,000
3	Mae Kaew Weir	1,700
4	Huai Ton Yang Res.	3,200
5	Huai Ban Res.	23,000
6	Doi Ngew Res.	2,600

No	Project	Area (rai)
7	Huai Phan Res.	5,000
8	Huai Khrang Weir	500
9	Huai Khok Weir	2,500
10	Huai Pa Tan Res.	2,100
11	Huai Dua Weir	500
12	Huai Mae Chedi Weir	1,000
13	Huai Mae Chedi Weir	1,000
14	Huai Laeng Weir	100
15	Huai Tong Res.	1,300
16	Huai Tong Weir	1,500
17	Huai Kho Res.	8,000
18	Huai Ta Khuang Res.	12,000
Small Scale (King) Total		71,400
Pumping Irrigation Project		
1	Wiang Wai	2,370
2	Rong Rew	1,990
3	Luang	1,670
4	Sri Don Chai	3,690
5	Nam Phrae	1,030
6	San Tab Tong	2,540
7	Boon Ruang	1,080
8	Khrubg Tai	1,500
9	Boon Ruang (2)	1,500
10	Rong Maek	1,830
11	Phuang Phayom	1,530
12	Mae Sai Lao	1,250
13	Sri Miang Cham	1,300
14	Huai Dek Khem	1,500
15	Lo	1,200
16	Wang Khon Daeng	1,500
17	Dan Bon	1,800
Pumping Project Total		29,280
National Security Project		
1	Huai Ban Res.	1,000
2	Tab Tao Res.	800
3	Ban Lao Weir	2,500
4	Huai Pong Weir	600
5	Huai Sai Kat Weir	500
6	Nam Ngaw Weir	1,000
7	Nam Ngaw Res.	500
8	Rm Pho Thai Weir	Domes
9	Ban Khun Huai Khok	Domes
10	Ban Huai Hia	Domes
11	Ban Kew	Domes
12	Ban Rat Phak Dee	300
National Security Total		7,200



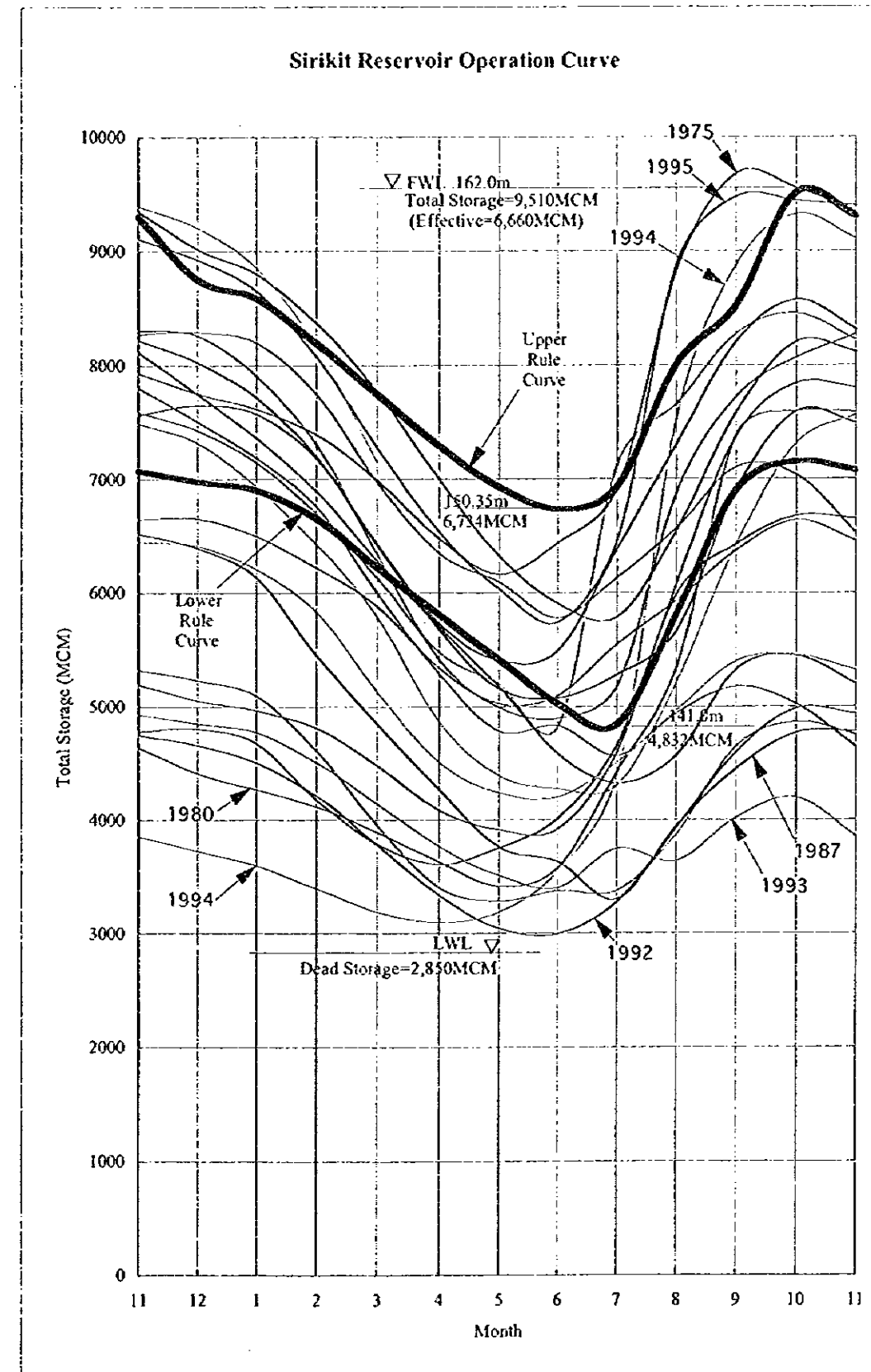
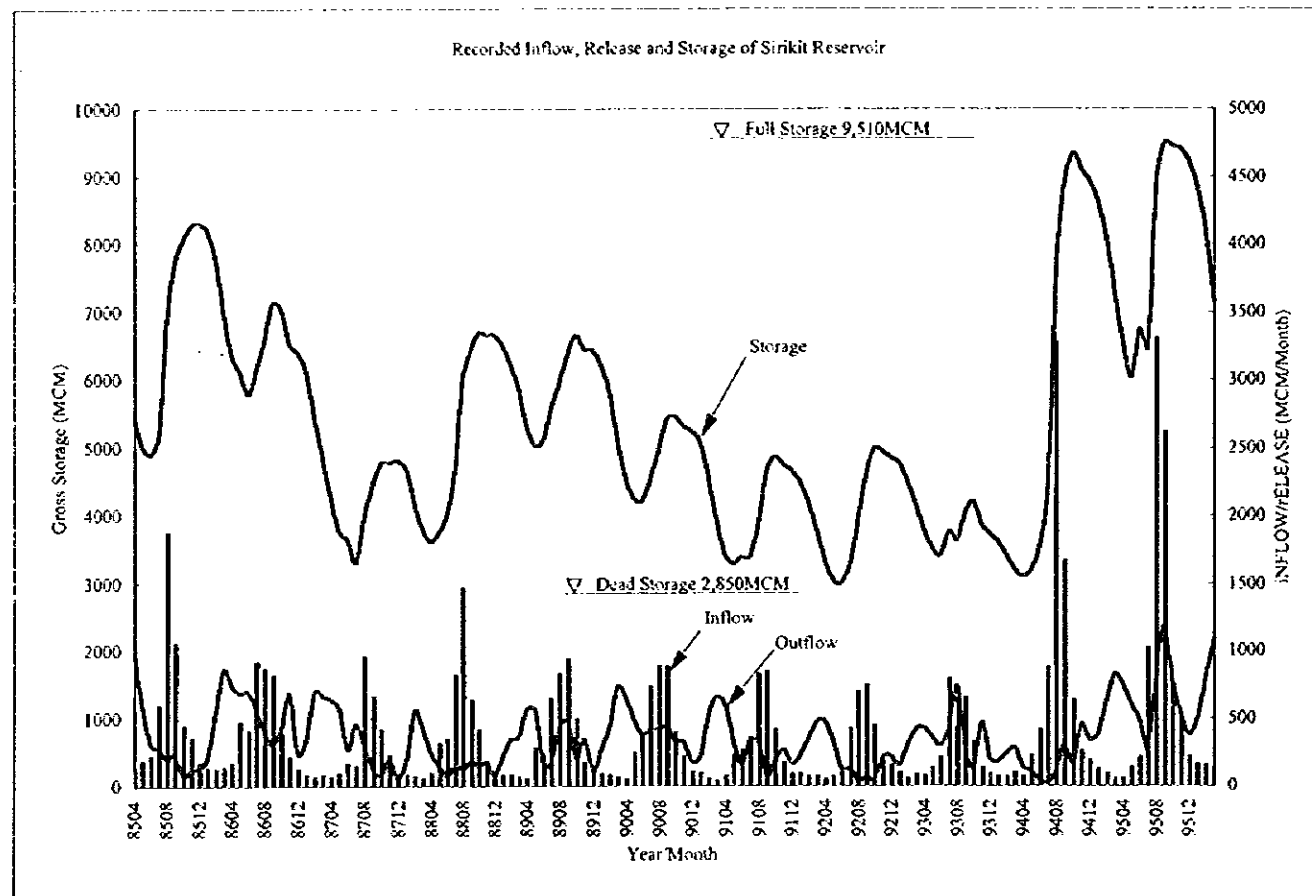
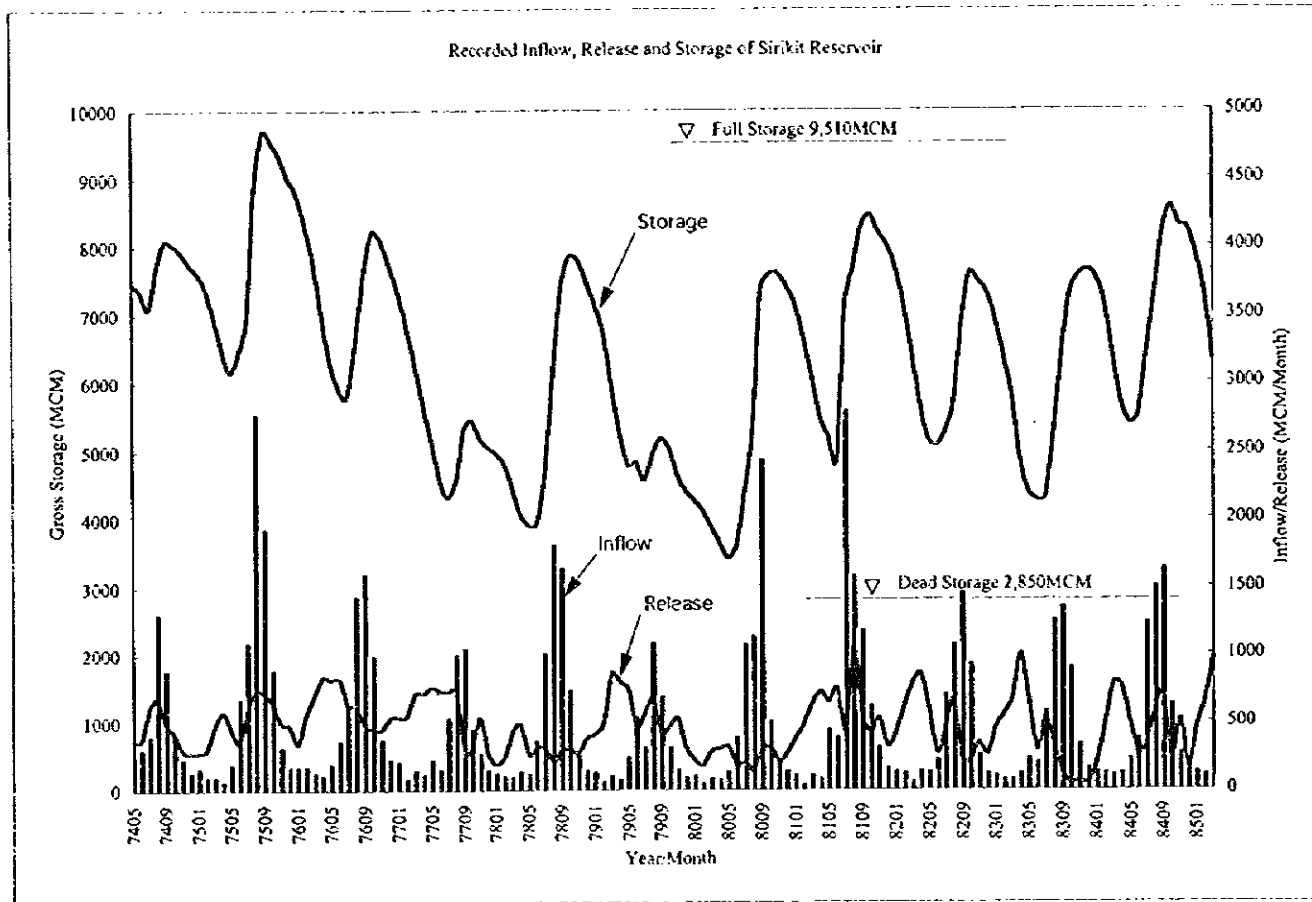
Small Scale Irrigation Project		
Changwat/Amphoe	Nos	Area (rai)
Changwat Nan		
A. Muang	14	13,850
A. Wiang Sa	12	10,050
A. Na Noi	5	6,000
A. Pua	12	7,520
A. Chiang Klang	15	15,020
A. Tha Wang Pha	8	1,850
A. Thung Chang	9	6,500
A. Mae Charim	30	9,700
KA Na Mun	1	100
KA Santisuk	7	8,800
KA Bo Klua	10	1,630
Sub-Total	123	81,020
Changwat Uttaradit		
KA Thong San Khan	2	2,000
A. Tron	1	1,000
A. Tha Pla	4	1,660
A. Nam Pat	7	6,800
A. Ban Khok	7	3,600
A. Phi Chai	2	9,500
A. Fak Tha	5	3,800
A. Muang	4	3,300
A. Lablao	2	800
Sub-Total	34	32,460
Changwat Pitsanulok		
A. Muang	3	4,800
A. Wang Thong	12	17,727
A. Phrom Phiram	2	5,700
A. Ban Kra Thum	4	21,000
A. Wat Bot	4	3,150
A. Nakhon Thai	13	21,450
A. Chat Trakan	10	8,900
A. Noen Maprang	5	6,500
Sub-Total	53	89,227
Changwat Phichit		
A. Muang	2	8,000
A. Wang Sai Phun	5	23,000
A. Taphan Hin	5	20,000
A. Tap Khlo	10	48,500
A. Bang Mun Nak	6	24,200
Sub-Total	28	123,700
Changwat Nakhon Sawan		
A. Nong Bua	1	8,000
A. Banphot Phisai	3	14,000
A. Chum Sang	2	8,000
A. Kao Liao	2	10,500
Sub-Total	8	40,500
Changwat Phetchabun		
A. Chon Daen	4	17,700
KA Wang Pong	3	9,000
KA Khao Kho	11	3,750
Sub-Total	18	30,450
Total	264	397,357



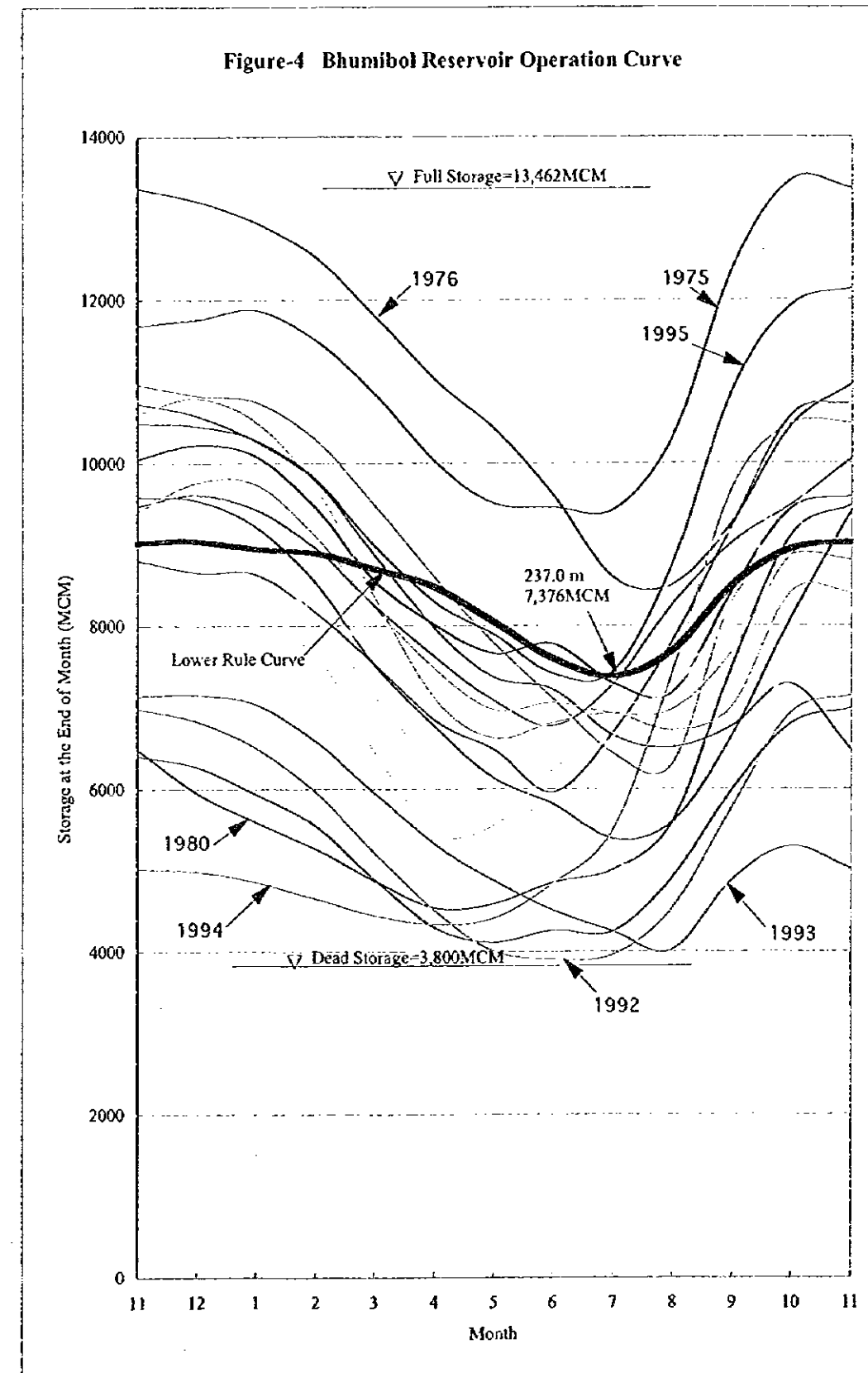
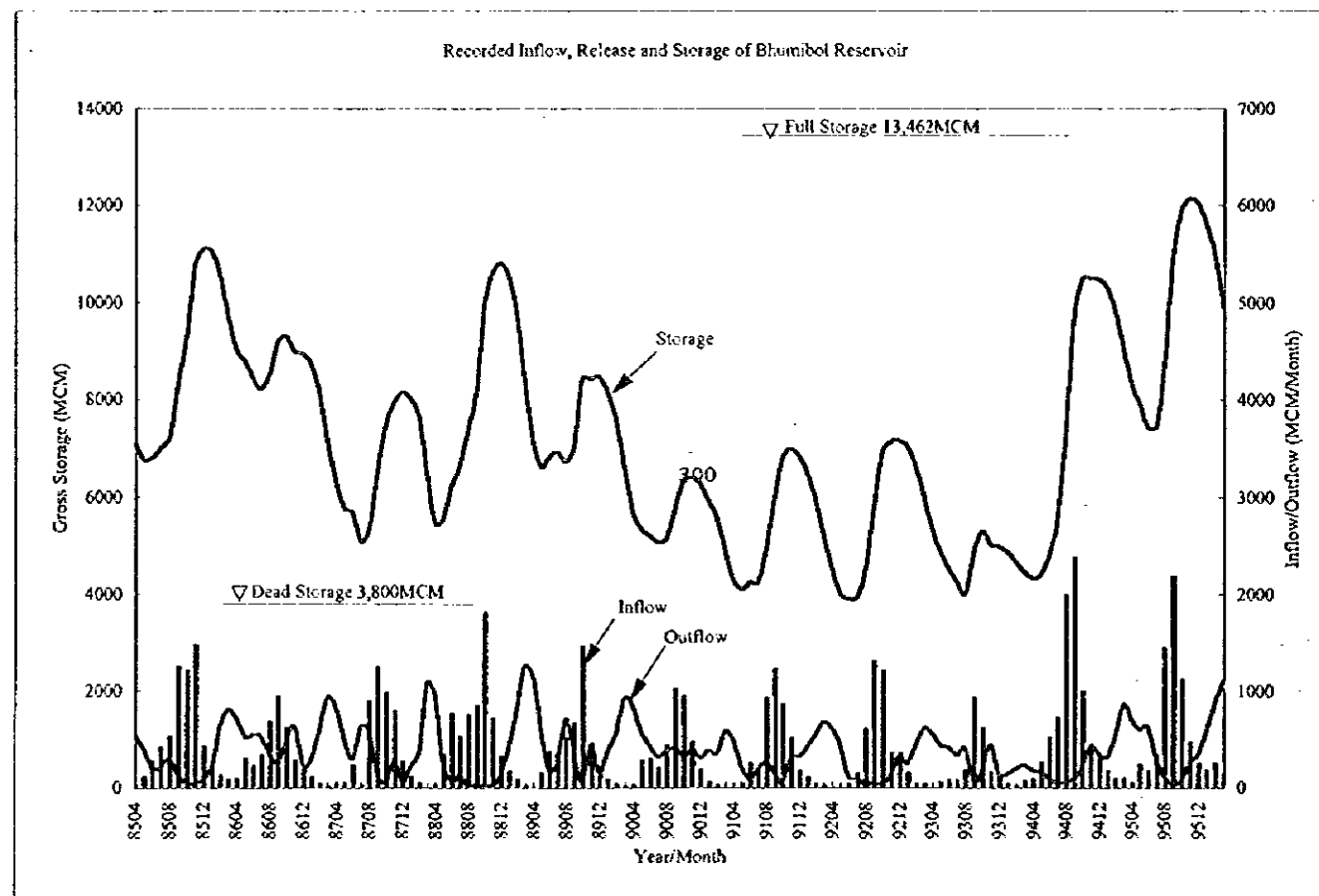
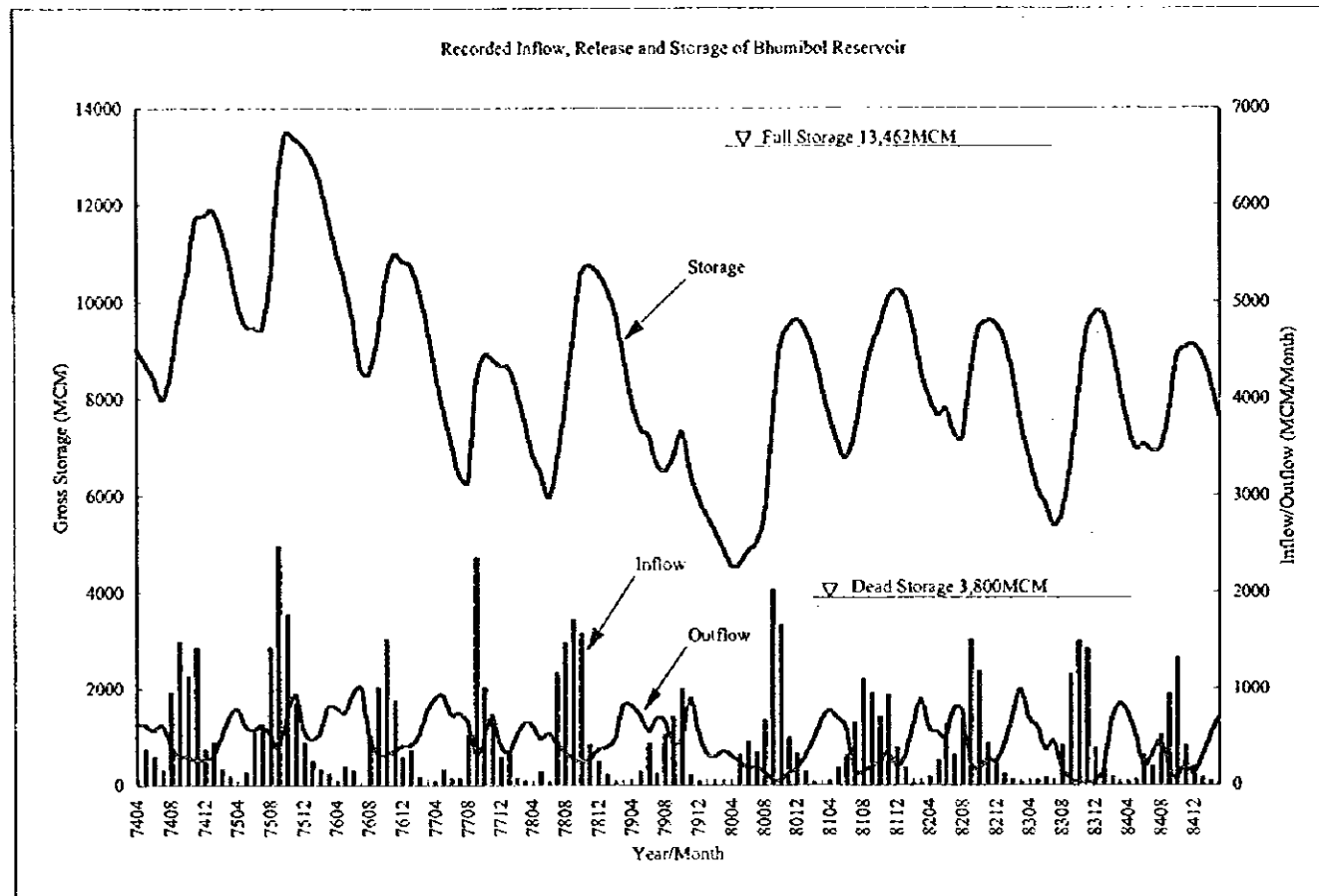
Pumping Irrigation Project		
Changwat/Amphoe	Nos	Area (rai)
Changwat Nan		
A. Muang	12	15,970
A. Wiang Sa	16	22,110
A. Na Noi	-	-
A. Pua	2	2,780
A. Chiang Klang	3	3,400
A. Tha Wang Pha	6	7,955
A. Thung Chang	-	-
A. Mae Charim	-	-
KA. Na Mun	-	-
KA. Santisuk	-	-
KA. Bo Klua	-	-
Sub-Total	39	52,215
Changwat Uttaradit		
KA. Thong San Khan	-	-
A. Tron	17	42,305
A. Tha Pla	2	1,800
A. Nan Pat	2	1,900
A. Ban Khok	-	-
A. Phi Chai	37	75,325
A. Fak Tha	3	4,330
A. Muang	26	43,715
A. Lablue	-	-
Sub-Total	87	169,875
Changwat Pitsanulok		
A. Muang	7	12,640
A. Wang Thong	8	14,930
A. Phrom Phiram	20	38,515
A. Ban Kra Thum	6	12,125
A. Wat Bot	7	12,810
A. Nakhon Thai	2	1,925
A. Chat Trakan	1	1,930
A. Noen Maprang	1	1,500
Sub-Total	52	96,375
Changwat Phichit		
A. Muang	5	9,355
A. Wang Sai Phun	-	-
A. Taphan Hin	2	2,400
A. Tap Khlo	-	-
A. Bang Mun Nak	2	3,760
Sub-Total	9	15,515
Changwat Nakhon Sawan		
A. Nong Bua	-	-
A. Banphot Phisai	-	-
A. Chum Sang	8	13,245
A. Kao Liao	-	-
Sub-Total	8	13,245
Changwat Phetchabun		
A. Chon Doen	-	-
KA. Wang Pong	-	-
KA. Khao Kho	-	-
Sub-Total	-	-
Total	195	347,225

LEGEND	
●	Pumping Irrigation Project

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
EXISTING PUMPING IRRIGATION PROJECTS IN LOWER NAN RIVER BASIN	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)	Figure W-20
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

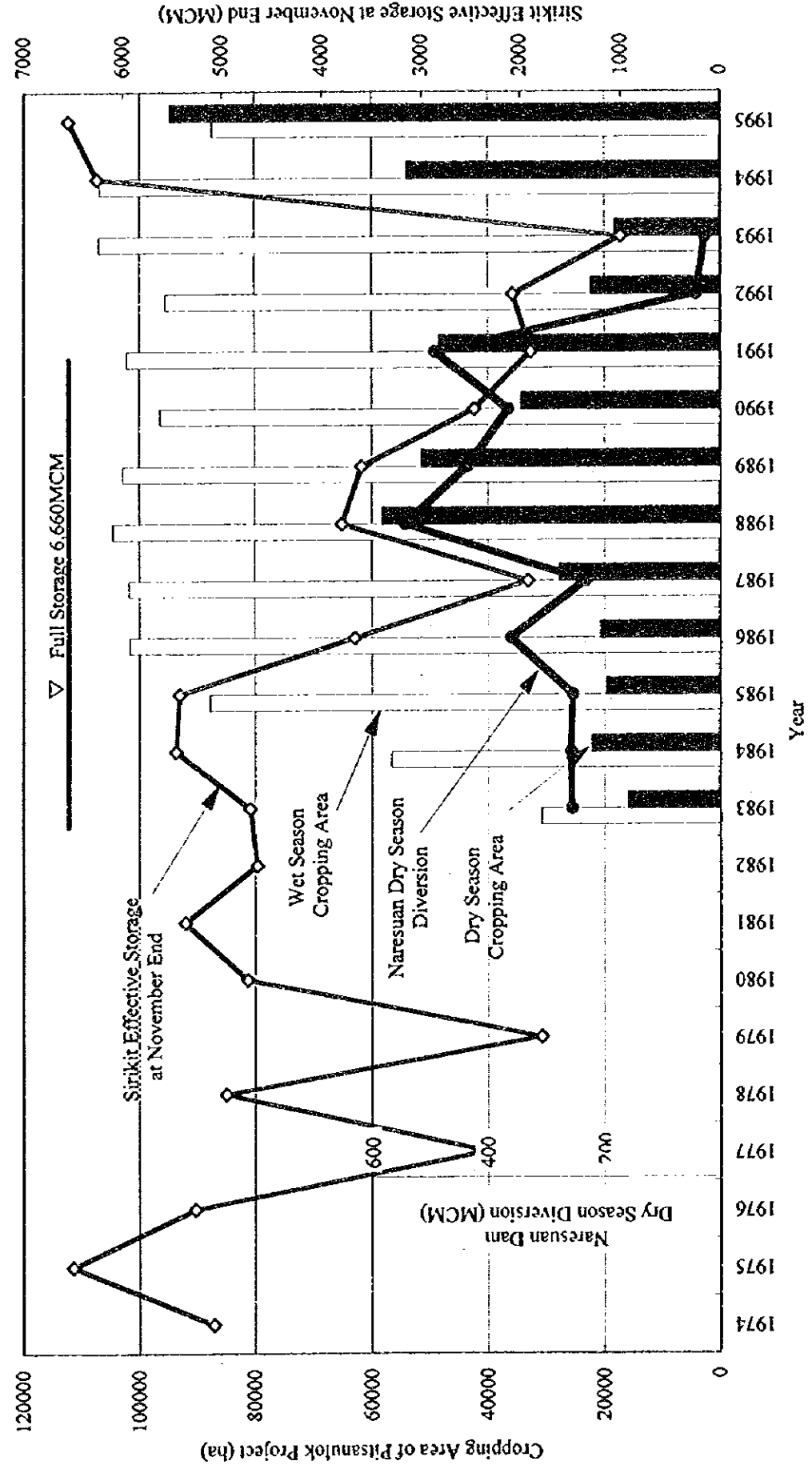


THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
Current Status of Operation at Sirikit Reservoir	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)	
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	
Figure W-21	

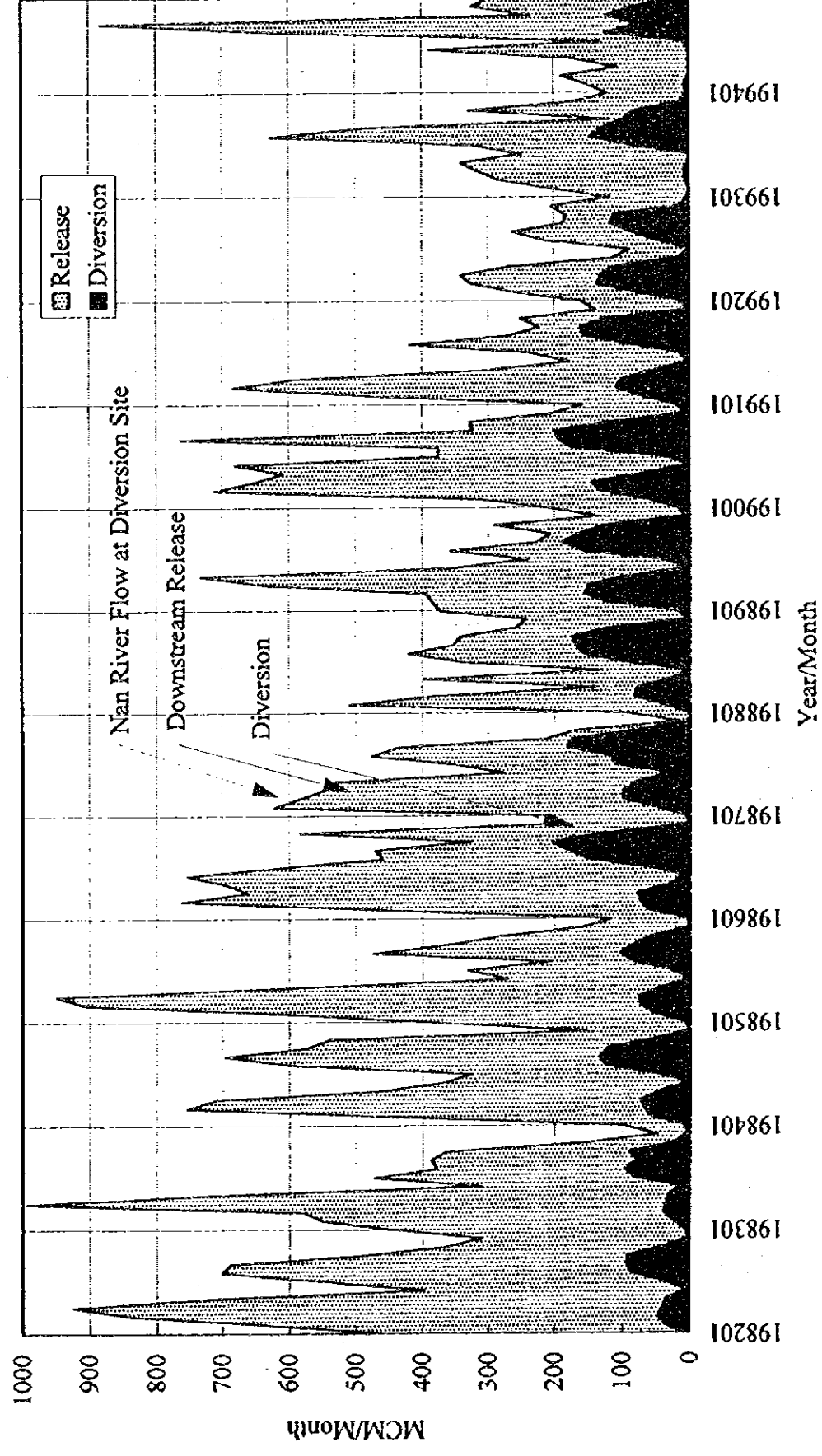


THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
Current Status of Operation at Bhumbol Reservoir	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure W-22
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

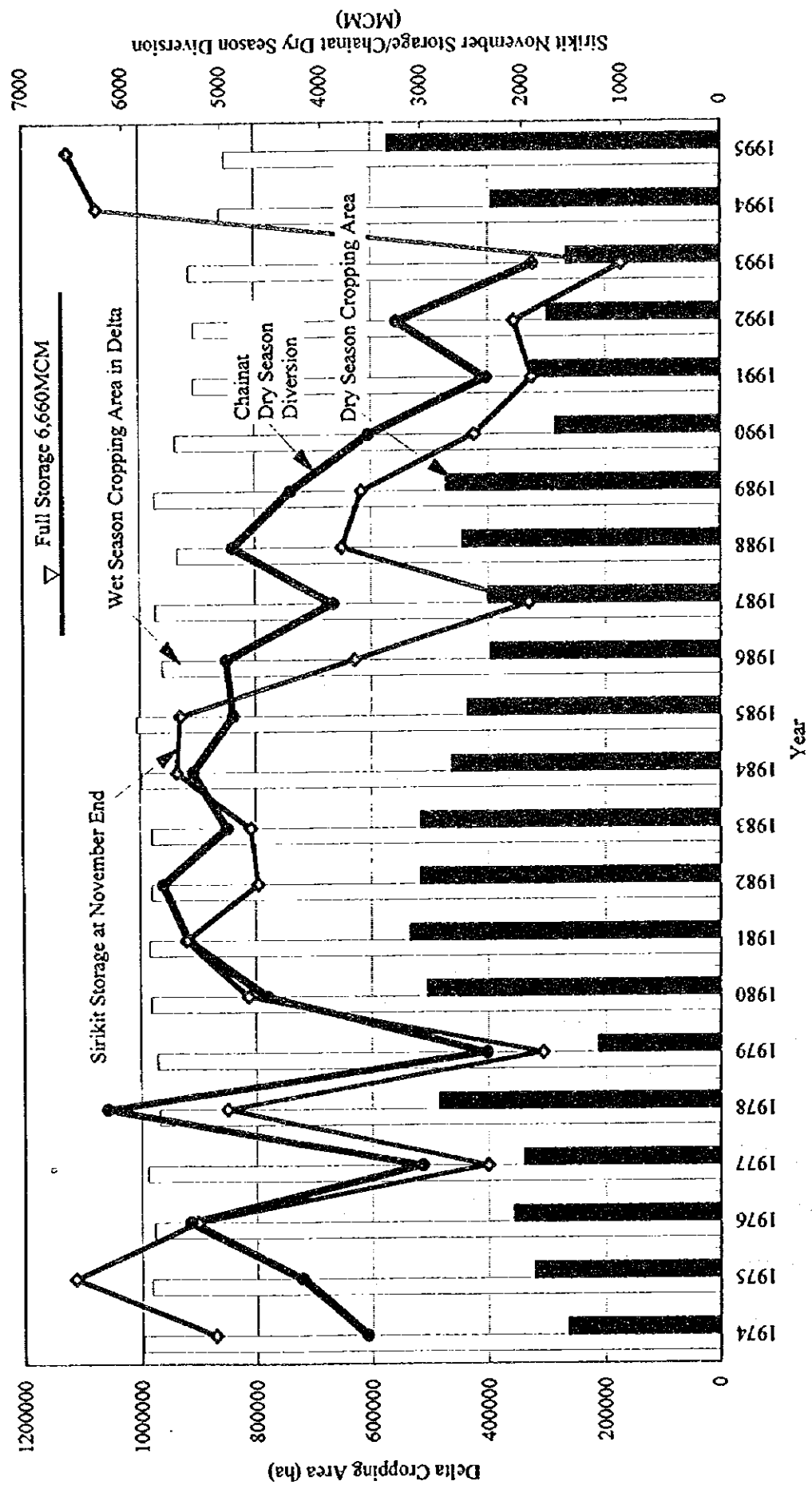
Cropping Area of Pitsanulok Project vs Naresuan Diversion/Sirikit Storage



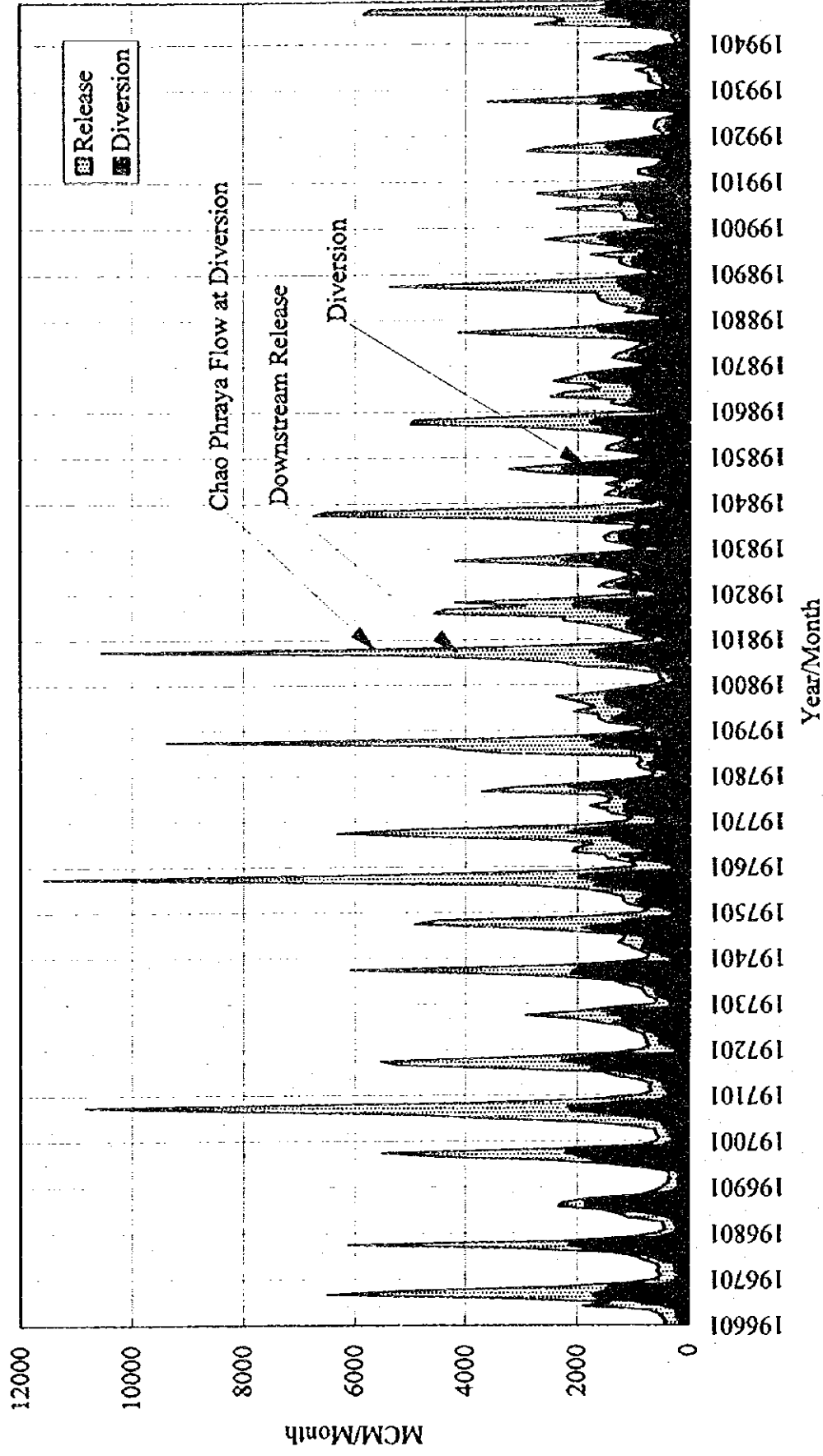
Narasuan Barrage Operation



Cropping Area of Delta vs Chao Phraya Diversion/Sirikit Storage



Chao Phraya Diversion Dam Operation



(1) Water Balance of Sub-Basins in the Upper Chao Phraya Basin

Basin	Item	5	10	15	20	25	30
Nan	Present	3.0	9.1	12.1			
	Future	4.5	7.6				
Yom	Present	0.9	3.0	3.9			
	Future	2.2	1.7				
Wang & Ping	Present	3.1	9.0	12.1			
	Future	5.3	6.8				
Sakae Krung	Present	1.2	1.3				
	Future	1.2	1.3	2.5			

(Unit: 1,000MCM)

(2) Water Balance of the Upper Chao Phraya Basin

Basin	Item	5	10	15	20	25	30
Upper Basin Total	Present	8.1	22.5	30.6			
	Future	13.2	17.4				

(Unit: 1,000MCM)

(3) Water Balance of the Lower Chao Phraya Basin

Basin	Item	5	10	15	20	25	30
Pasak	Present	0.9	3.0	3.9			
	Future	1.3	2.6				
Delta	Present	16.2	6.3	22.5			
	Future	18.9	1.5	17.4			
Pasak & Delta	Present	17.2	9.2	26.4			
	Future	20.1	1.2	21.3			

(Unit: 1,000MCM)

Average Annual Volume of Water Resources
 Water Demand
 Surplus Water
 Water Deficit

1. Water Demand, Water Sources and Water Balance in Chao Phraya Basin

(1) Upper Basins		(Unit: 1,000MCM)						
Item		0	5	10	15	20	25	30
Potential Water Resources					30.6			
Water Demand	Present		7.8	0.3	8.1			Using Rate 26%
	Future		12.8	0.4	13.2			Using Rate 43%
Surplus Water	Present				22.5			
	Future				17.4			
(2) Lower Basins		(Unit: 1,000MCM)						
Item		0	5	10	15	20	25	30
Potential Water Resources	Present				26.4			
	Future				21.3			
Water Demand	Present		12.6	4.6	17.2			Using Rate 65%
	Future		14.6	5.5	20.1			Using Rate 94%
Surplus Water	Present		9.2					
	Future	1.2						

Domestic/Industrial Demand
 Irrigation Demand

2. Incremental Volume of Dry Season Water at Sirikit Reservoir (Unit: 1,000MCM)

Item		0	1	2	3	4	5	6	7
Reservoir Inflow	Present				5.1				
	Future				7.1			Diverted	
Reservoir Outflow	Present		Wet Season = 2.1		Dry Season = 2.7		Loss 0.3		
	Future		Wet = 1.7		Dry = 5.1				0.3

Inflow
 Wet Season Outflow
 Dry Season Outflow
 Losses

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

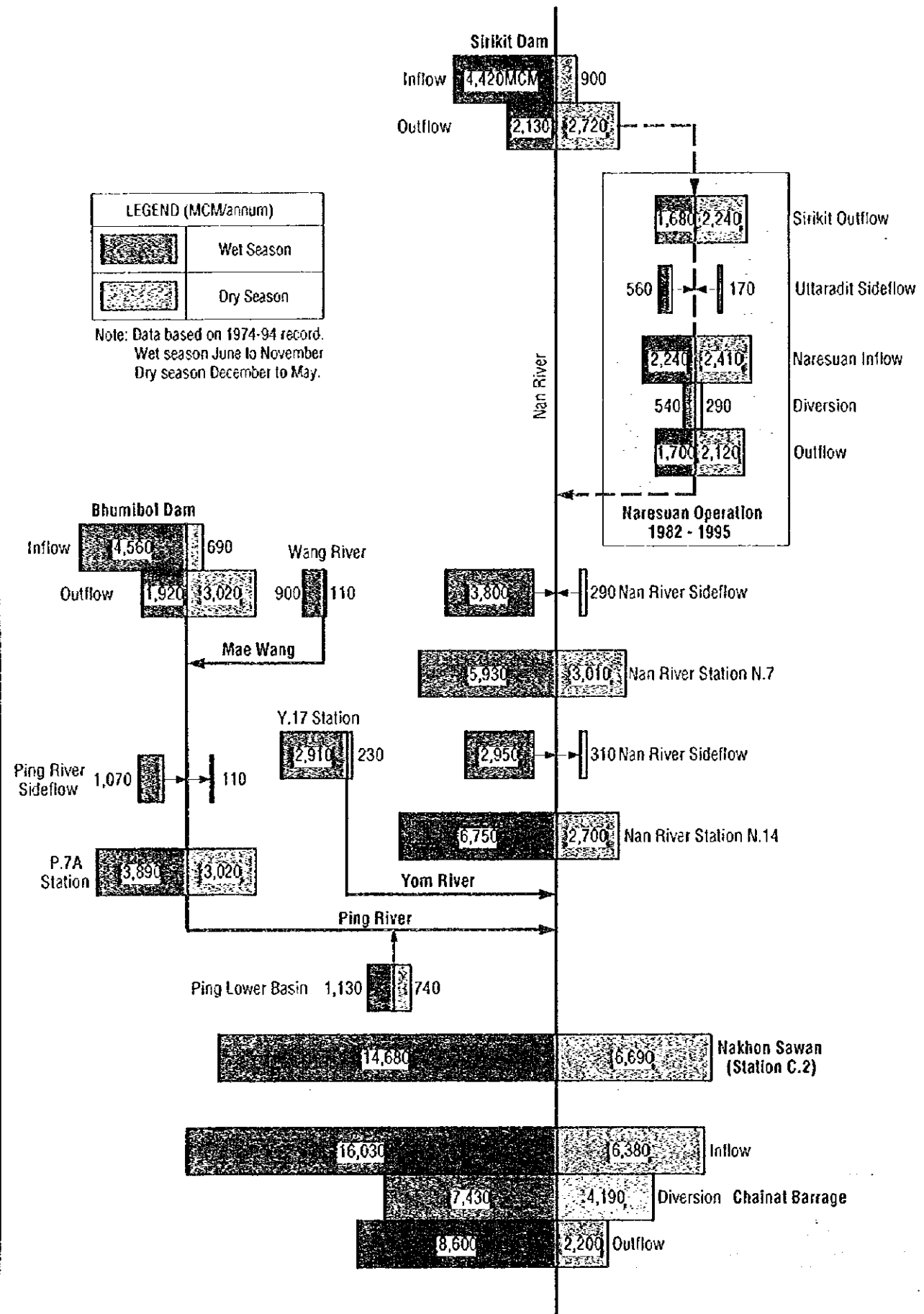
WATER BALANCE OF CHAO PHRAYA BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
 SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Map & Drawing No.

Figure W-25

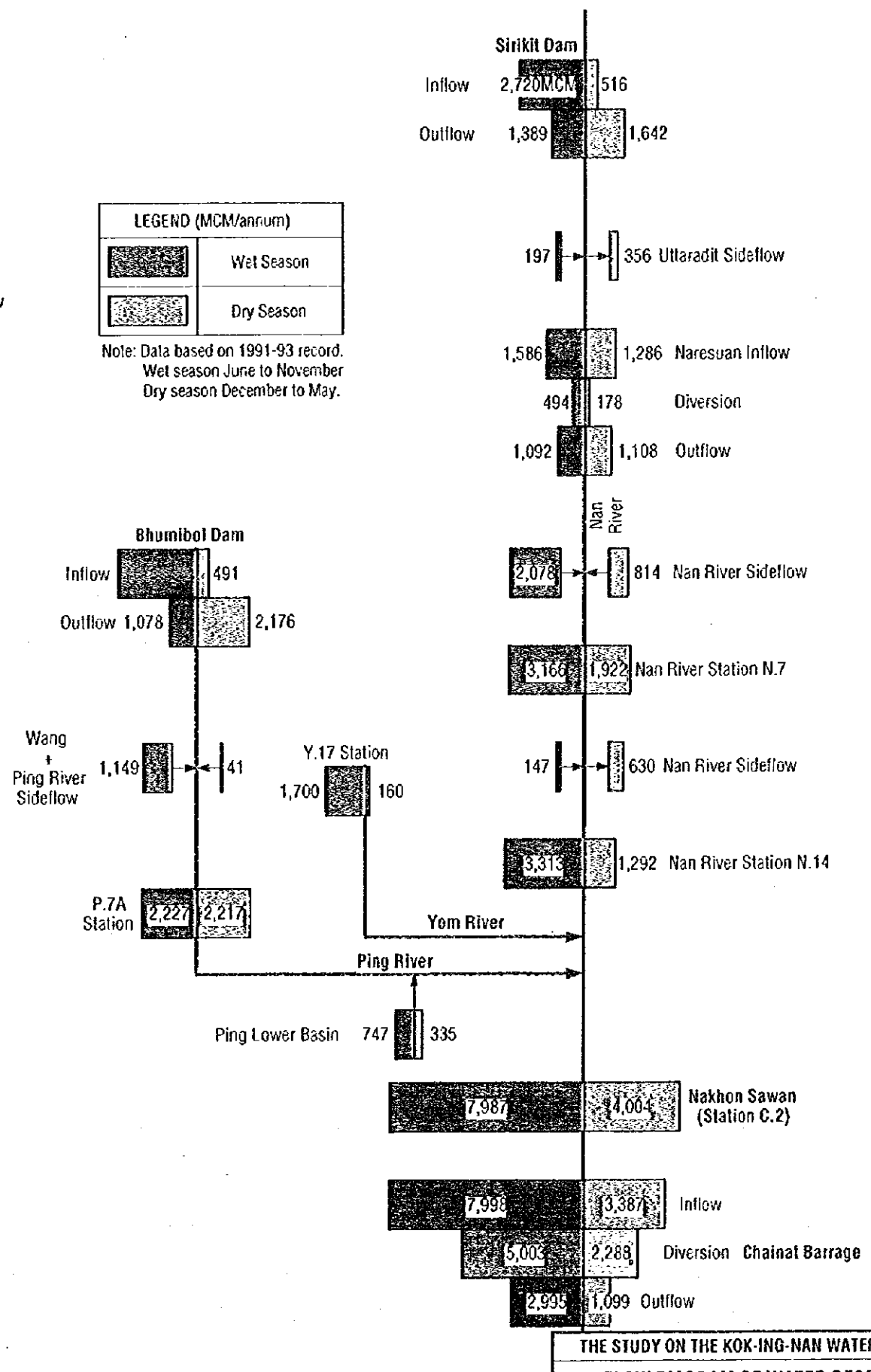
Flow Diagram of Water Resources in Chao Phraya Basin (Average)



LEGEND (MCM/annum)	
	Wet Season
	Dry Season

Note: Data based on 1974-94 record.
Wet season June to November
Dry season December to May.

Flow Diagram of Water Resources in Chao Phraya Basin (Dry Years)



LEGEND (MCM/annum)	
	Wet Season
	Dry Season

Note: Data based on 1991-93 record.
Wet season June to November
Dry season December to May.