Table 147 FLOOD CONTROL DAMS (3/7)

Name of Dam	Design Flood (X-year Flood)	Flow Reduction Ratio at Damsite	Flood Control Storage (10^6 m^3)	Cost of Dam/1 (M$$10^6$)
Selangor				
Selangor	50	0.25	37.6	133.55
Kelang Gates	50	0.10	6.2	4.00
Batu	50	0.10	4.6	6.32
Langat	50	0.25	7.0	(Under Const.)
Semenyih	50	0.25	8.9	13.70
Gombak	50	0.10	7.8	12.50

Table 148 FLOOD CONTROL DAMS (4/7)

Name of Dam	Design Flood (X-year Flood)	Flow Reduction Ratio at Damsite	Flood Control Storage (10^6 m^3)	Cost of Dam/1 (M$$10^6$)
N. Sembilan				
Upper Muar	50	0.25	24.4	5.28
Teriang	50	0.15	9.0	8.93
Melaka				
(No dam proposed)				
Johor				
Segamat	50	0.25	16.9	16.10
Kepeh	50	0.25	18.5	17.11
Bekok	50	0.25	90.7	49.50
Semberong	50	0.35	25.5	15.6
Simpang Kiri	50	0.25	98.7	181.70
Johor	50	0.25	481.0	17.99
Semangan	50	0.25	43.3	2.48
Linggiu A	50	0.25	74.3	9.11
Ulu Sedili	50	0.25	82.3	3.15

Remarks; /1: Financial cost excl. price escalation.
Only cost to be allocated to flood control.

Table 149 FLOOD CONTROL DAMS (5/7)

Name of Dam	Design Flood (X-year Flood)	Flow Reduction Ratio at Damsite	Flood Control Storage (10^6 m^3)	Cost of Dam/1 (M\$$10^6$)
Pahang				
Jeram Lower	50	0.25	168	8.35
Telam/Jelai Kechil	100	0.25	1,740	45.6
Teris 2	50	0.50	58	37.2
Kelau 2	50	0.35	200	85.0
Telemong	50	0.30	226	122.9
Tekam	50	0.25	260	29.1
Tembeling Upper	100	0.25	2,110	36.5
Tekai Lower	100	0.85	510	17.0
Lipis	50	0.25	300	94.9
Kuantan	50	0.25	81	166.95
Kenau	50	0.25	52	16.55
Cherul	50	0.25	106	37.46

Table 150 FLOOD CONTROL DAMS (6/7)

Name of Dam	Design Flood (X-year Flood)	Flow Reduction Ratio at Damsite	Flood Control Storage (10^6 m^3)	Cost of Dam/1 (M\$$10^6$)
Trengganu				
Kemaman	50	0.25	99	29.00
Paka Upper	50	0.25	42	9.70
Loh	50	0.25	99	14.50
Kenyir	50	0.30		(existing)

Remarks; /1: Financial cost excl. price escalation.
Only cost to be allocated to flood control.

Table 151 FLOOD CONTROL DAMS (7/7)

Name of Dam	Design Flood (X-year Flood)	Flow Reduction Ratio at Damsite	Flood Control Storage (10^6 m^3)	Cost of Dam/1 (M$$10^6$)
Kelantan				
Dabong	100	0.50	1,300	32
Lebir	100	0.66	700	24

Remarks; /1: Financial cost excl. price escalation.
Only cost to be allocated to flood control.

Table 152 RIVER IMPROVEMENT PLAN (1/13)
WITH FLOOD CONTROL DAM

State:Perlis

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 1 Perlis								
Perlis/Korok								
1	Kuala Perlis	3	300	1/10000	2.72	0.29	0.18	-0.11
2	Kg.Kota Keran	3	280	1/10000	2.64	0.31	0.71	+0.40
3	Kangar	17	145	1/2000	8.70	0.82	0.87	+0.05
	Tinah Jasoh Dam	-	150	-	4.40	(0.35)	-	-
	Total ;	-	-	-	16.59		-	-

Remarks: * Stretches in other state

Table 153 RIVER IMPROVEMENT PLAN (2/13)
WITH FLOOD CONTROL DAM

State:Kedah

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 3 Kedah								
Sg.Kedah								
1	Alor Setar	15	630	1/10000	20.39	3.81	0.20	-3.61
2	Kg.K.Pai	0.5	420	1/3000	0.40	0.10	0.11	+0.01
3	K.Nerang	15	130	1/3000	7.79	1.83	1.88	+0.05
	Drian Dam	-	-	-	16.50	(1.30)		
	Aning Dam	-	-	-	28.70	(2.26)		
	Pedu Dam(Existing)				(-)			
	Total:				45.20			
Basin 5 Muda (After Muda Dam)								
Sg.Muda								
1	Kg.K.Muda	10	1160	1/10000	17.29	1.30	0.09	-1.21
2	Muda Barrage	12	1160	1/8000	19.43	1.46	1.26	-0.20
3	Kg.Pinang Tun	15	1160	1/3000	18.70	1.40	1.67	+0.27
4	Kg.Sidam Kiri	5	1110	1/3000	6.09	0.46	0.01	-0.45
5	Kg.K.Sedim	14	990	1/5000	18.75	1.41	0.26	-1.15
6	K.Kechil	40	960	1/2000	41.81	3.12	0.68	-2.44
	Muda Dam (Existing)				(Existing)			
	Total:				106.28			

Remarks: * Stretches in other state

Table 154 RIVER IMPROVEMENT PLAN (3/13)
WITH FLOOD CONTROL DAM

State:Perak

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 10 Perak (after completion of upstream dams)								
1	Bagen Datok	50	7250	1/10000	263.46	21.17	1.90	-19.27
2	Telok Ansor	10	7060	1/3000	37.71	3.06	1.98	-1.08
3	Sg.Kinta Confl	60	6660	1/3000	216.75	18.92	9.62	-9.93
4	Kubang Haji	7	5920	1/3000	23.13	2.07	0.96	-1.11
5	Nordin Bridge	40	5820	1/3000	130.52	10.01	0.91	-9.10
6	Kuala Kangsar	20	5630	1/3000	63.68	5.67	5.01	-0.66
P1	K.Sg.Plus	22	460	1/1500	15.40	1.90	0.53	-1.37
	Plus Dam				92.31	(7.29)		
	Total							
Basin 10 Perak (damage reduction by upstream dams)								
	-Temengor/ Bersia/Kenering dams	-	-	-	Cost to hydropower	Approx. 9.90	- -	
Basin 11 Bernam								
Sg.Slim								
1	River mouth	No impr	750	-	-	-		
2	Tengi diversion	8	440	1/3000	6.62	10.08	0.	0.
3	Kg.Buloh Seruas	8	410	1/3000	6.24	7.78	0.	0.
S1	Kg.K.Slim	14	230	1/1000	6.50	8.81	0.	0.
	Slim Dam				319.22	(25.21)		
	Total;							

Remarks: * Stretches in other state

Table 155 RIVER IMPROVEMENT PLAN (4/13)
WITH FLOOD CONTROL DAM

State:Selangor

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 13 Selangor								
Sg.Selangor								
1	River mouth	-	610	1/10000	-			
2	Kg.Peng Ladang	18	490	1/10000	22.20	5.14	0.08	-5.06
3	Batang Berjunta	8	490	1/2000	6.81	1.73	0.00	-1.73
4	Sg.Sembah Conf	15	380	1/2000	10.39	2.93	0.04	-2.89
5	Sg.Kerling	11	250	1/1000	5.26	1.23	0.06	-1.17
6	Rasa bridge	20	230	1/1000	9.29	2.48	0.11	-2.37
	Selangor Dam				133.55	(9.35)		
	Total ;							
Basin 15 Sg.Kelang								
1	River mouth	-	530	1/9000				
2	Kelang Town	12	530	1/9000				
3	Sg.Damansara Co	6	470	1/5000				
4	Bukit Kamuning	7	420	1/5000				
5	Puchong Drop	6	350	1/1000	3.34	0.65	0.54	-0.11
6	Petaling Jaya	14	330	1/1000	7.54	1.46	2.85	+1.39
7	Market Street	8	295	1/1000	4.07	0.49	1.36	+0.87
B1	Market Street	2	155	1/800	0.79	0.14	0.51	+0.37
B2	Sg.Gombak Confl	4	125	1/500	1.38	0.29	0.65	+0.36
G1	Sg.Batu Confl	2	70	1/100	0.16	0.02	0.55	+0.53
	Kelang Gate Dam(Existing)				4.00	(0.32)		
	Batu Dam (Under coust)				6.30	(0.49)		
	Gombak Dam				12.50	(0.99)		
	Total;				136.38	12.21		

Remarks: * Stretches in other state

Table 156 RIVER IMPROVEMENT PLAN (5/13)
WITH FLOOD CONTROL DAM

State:Selangor

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 16 Langat								
Sg.Langat								
1	River mouth	-	773	1/80000	No impro.			
2	Tg.Tonakah	11	743	1/20000	No impro.			
3	Bandar	11	723	1/20000	No impro.			
4	Tk.Dotok	13	702	1/7000	16.59	1.68	0.79	-0.89
5	Kg.Labohan Dag	8	651	1/5000	9.10	0.85	0.09	-0.76
6	Sg.Batang Labu	4	543	1/5000	4.21	0.42	0.12	-0.30
7	Dengkil	9	538	1/3000	8.48	0.84	0.06	-0.78
8	Sg.Semenyih	14	294	1/1000	7.11	0.53	0.28	-0.25
9	Kajang	20	238	1/1000	9.40	0.71	0.65	-0.06
S1	Sg.Semenyih/La	8	275	1/1000	3.96	0.38	0.02	-0.36
S2	Sg.Bernang Con	8	270	1/700	3.67	0.35	0.10	-0.25
S3	Semenyih	6	130	1/700	2.24	0.20	0.12	-0.08
	Semenyih Dam				13.70	(1.08)		
	Langat Dam (Existing)				-	-		

Remarks: * Stretches in other state

Table 157 RIVER IMPROVEMENT PLAN (6/13)
WITH FLOOD CONTROL DAM

State:Negeri Sembilan

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 21 Muar								
Sg.Muar								
1	N.S/Johor bo	23	500	1/1500	16.63	1.45	0.10	-1.35
2	Rompin	20	450	1/1500	13.89	1.04	0.00	-1.04
3	Kg.K.Jelai	7	350	1/1000	3.89	0.34	0.12	-0.22
4	Kg.K.Tembol	14	280	1/1500	7.50	0.70	0.59	-0.11
5	Kg.Telok	6	220	1/800	2.60	0.22	0.34	+0.12
6	Tg.Jboh	8	130	1/800	3.08	0.23	0.21	-0.02
	Upper Muar Dam				5.28	(0.42)		
	Total							

Remarks: * Stretches in other state

Table 158 RIVER IMPROVEMENT PLAN (7/13)
WITH FLOOD CONTROL DAM

Stat Johor

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 22 Batu Pahat								
Alt.3: With Bekok / Semberong dams and Floodway								
1	River mouth	No improv.						
2	S.Kiri Conf	No improv.						
3	Proposed Barr	6	250	1/25000	9.07	1.04	1.06	+0.02
4	Sg.Semberong	18	235	1/15000	18.93	1.92	1.61	-0.31
5	Yong Peng	16	150	1/4000	9.01	0.92	1.06	+0.14
S1	S.Bekok Conf	21	172	1/8000	14.27	1.47	1.05	-0.42
	Bekok dam	-	-	-	49.50	(3.91)		
	Semberong dam				15.60	(1.23)		
F1	Floodway	19	130		20.00	1.82		
					128.97	10.95		

Remarks: * Stretches in other state

Table 159 RIVER IMPROVEMENT PLAN (8/13)
WITH FLOOD CONTROL DAM

State:Johor

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 24 Johor								
Sg.Johor								
1	River mouth	-	-	-	-	-	-	-
2	Ladang Omar S	7	480	1/5000	6.95	1.11	0.50	-0.61
3	PUB Intake	13	420	1/3000	10.35	1.59	0.06	-1.53
4	Kg.Semangan	13	220	1/3000	7.61	1.38	1.34	-1.04
M1	Sg.Johor Confl	7	100	1/2500	3.25	0.48	0.00	-
L1	Sg.Linggiu/Joh	7	340	1/1500	4.15	0.41	0.00	-
	Johor Dam				17.99	(1.42)		
	Semangan Dam				2.48	(0.20)		
	Linggiu A Dam				9.11	(0.72)		
	Total;					5.22		
Basin 25 Sedili Besar								
Sg.Sedili Besar								
1	Kg.Sedili Besa	9	890	1/15000	16.95	1.32	0.00	-
2	Kg.Hutan Leso	25	830	1/15000	46.01	3.56	0.00	-
3	Mawai	6	720	1/10000	8.58	0.66	0.00	-
4	Sg.Dohol Conf	22	630	1/15000	36.92	2.91	0.00	-
5	Sg.Ambol Confl	6	310	1/1500	3.34	0.26	0.00	-
	Ulu Sedeli Besar Dam				3.15	(0.25)		
	Total;					8.90		
Basin 21 Muar-Lower Reaches								
Sg.Muar-Lower Reaches								
S1	K.Sg.Segamat	5	310	1/2000	2.96	1.00	0.13	-0.87
S2	Segamat	13	255	1/2000	7.37	1.45	0.24	-1.21
S3	Sg.Juasseh Con	5	70	1/500	1.50	0.39	0.00	-
S4	Segamat	9	70	1/4000	3.98	0.96	0.18	-0.78
	Segamat Dam				16.10	(1.27)		
	Kapek Dam				17.11	(1.35)		
	Total							

Remarks: * Stretches in other state

Table 160 RIVER IMPROVEMENT PLAN (9/13)
WITH FLOOD CONTROL DAM

State:Phang

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 28 Rompin								
Sg.Jeram								
1	K.Rompin	-	3950	-				
2	Kg.Pauh	12	3950	1/10000	42.42	3.27	0.00	-
3	Kg.Piranp	25	3950	1/10000	88.37	6.81	0.45	-6.36
4	Kg.Tinam	17	3550	1/8000	52.70	4.02	0.04	-3.98
5	Kg.Kong King	33	3100	1/9000	99.04	7.55	0.00	-
6	Kg.Aur	4	2600	1/3000	8.23	0.62	0.00	-
7	Sg.Jeram/Kela	1	630	1/3000	0.99	0.08	0.00	-
8	Sg.Jeram/Tep	10	430	1/5000	9.26	0.78	0.00	-
	Jeram Lower Dam				8.35	(0.66)		
	Total				268.64	24.36		

Remarks: * Stretches in other state

Table 161 RIVER IMPROVEMENT PLAN (10/13)
WITH FLOOD CONTROL DAM

State:Phang

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 30 Sg.Phang								
Alt.2: 3 multipurpose dams.								
1	River mouth	105	13600	1/4500	637.80	49.17	9.26	-39.91
2	Kg.Luhuk Peku	13	13500	1/5000	81.21	6.26	0.36	-5.90
3	Kg.K.Jengka	24	12500	1/6000	149.58	11.69	1.00	-10.19
4	Kg.K.Bela	9	12400	1/6000	55.83	4.36	0.06	-4.30
5	K.Terlang	26	12300	1/5000	153.73	12.02	1.93	-10.09
6	Temerlok	104	10300	1/5000	556.98	44.70	5.63	-39.07
7	Kg.K.Tembeling	46	2400	1/4000	97.49	7.47	0.58	-6.89
8	Kuala Lipis	19	1500	1/6000	33.12	2.66	2.32	-0.34
S1	Temerlok	72	1800	1/3000	115.37	8.63	5.60	-3.03
M1	Kg.K.Tembeling	16	3300	1/4000	39.85	3.20	0.15	-3.05
L1	Kualo Lipis	25	1100	1/3000	30.34	2.27	0.58	-1.69
	Telom/Jalei Kechir Dams				45.60	(3.60)		
	Tembeling Upper D.				36.50	(2.88)		
	Tekai Lower D.				17.00	(1.34)		
	Total ;				1836.95	165.95		

Remarks: * Stretches in other state

Table 162 RIVER IMPROVEMENT PLAN (11/13)
WITH FLOOD CONTROL DAM

State:Phang

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Alt.2: 2 dams,excluding Kuantan dam								
1	Kuantan	6	2900	1/7000	16.21	1.84	1.03	-0.81
2	Sg.Belat Conf	11	2370	1/5000	24.76	2.96	0.56	-2.40
3	Kg.Kubang Tera	7	1580	1/5000	12.04	1.54	0.05	-1.49
4	Kg.Batu Sewar	15	1340	1/3000	20.20	3.01	0.64	-2.37
5	Kg.K.Reman	16	-	-	-	-		-
6	Kg.K.Kenau	3	700	1/750	2.31	0.27	0.11	-0.16
K1	Kg.K.Kenau	5	200	1/750	2.05	0.41	0.05	-0.36
	Kenau Dam				16.55	(1.31)		
	Chereh Dam				37.46	(2.96)		
	Total ;				123.58	10.60		

Remarks: * Stretches in other state

Table 163 RIVER IMPROVEMENT PLAN (12/13)
WITH FLOOD CONTROL DAM

State:Trengganu

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 32 Kemaman								
Kemaman								
1	River mouth	3	5900	1/10000	13.68	1.20	0.81	-0.39
2	Chukai	13	4900	1/10000	52.20	4.89	0.03	-4.86
3	Kg.Binjai	8	4700	1/3000	22.53	1.92	0.49	-1.43
4	Sg.Cherul Con	13	2000	1/5000	26.00	2.64	0.18	-2.56
5	Kg.R.Panjang	7	750	1/1000	6.34	0.68	0.03	-0.65
	Kemaman Dam	-	-	-	29.00	(2.29)		
	Total;				148.24	13.13		
Basin 33 Paka								
Paka								
1	Paka	11	1700	1/5000	19.79	1.47	0.00	-
2	Kg.Ayertlitam	12	1600	1/4000	21.60	2.39	0.02	-2.37
3	Kg.K.Rasau	20	1300	1/3000	No.impro.			-
	Paka Upper Dam	-	-	-	9.70	(0.68)		
	Total ;				28.84	2.42		
Basin 34 Dungun								
Dungun								
1	Dungun	7	3300	1/3000	16.19	1.31	0.12	-1.19
2	Kg.Binjai	5	3100	1/3000	11.21	0.83	0.00	-
3	Kg.Serdang	20	3100	1/3000	44.84	3.67	0.17	-3.50
4	Kg.Jerengau	23	2700	1/3000	48.18	3.96	0.14	-3.82
5	Sg.Kermin Conf	8	2100	1/3000	14.20	1.33	0.01	-1.32
	Loh Dam	-	-	-	14.50	(1.15)		
	Total				135.61	12.16		
Basin 36 Trengganu								
	Kenyir Dam (Under const.)	-	-	-	Cost borne by tlydropower			

Remarks: * Stretches in other state

Table 164 RIVER IMPROVEMENT PLAN (13/13)
WITH FLOOD CONTROL DAM

State:Kelantan

Unit: Million M$ for cost

St'h No.	Location	Impr. Le'th (km)	Des'n Flood (cms)	Lon'l Grad.	Con' Cost	Ann'l Cost	Da'g Red'n	B-C
Basin 40 Kelantan								
Sg.Kelantan								
1	River mouth	65	13600	1/4000	381.79	32.58	37.63	5.05
2	Guillemord ba	25	12400	1/3500	134.36	9.91	3.93	-5.98
L1	Kuala Kerai	7	7000	1/4000	27.66	2.03	0.10	-1.93
	Dabong Dam	-	-	-	32.0	(2.91)		
	Lebir Dam	-	-	-	24.0	(2.18)		

Remarks: * Stretches in other state

Table 165 SELECTION OF ALTERNATIVES FOR PERLIS

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin Perlis														
1	0.24	2.7	0.60	0.39	-0.07	-	-0.11	-	+0.02	-0.79	-0.11	SD	-	SD
2	1.21	6.3	0.67	0.47	-0.39	-	+0.40	+0.59	+0.05	-1.57	-0.19	SD	SD	SD
3	1.29	9.5	2.05	1.32	+0.12	-	+0.05	-	+0.07	-2.74	-0.35	SD	SD	SD
K1	0.94	9.0	0.93	0.58	+0.18	-	-	-	+0.05	-2.21	-0.35	SC	SC	SC
C1	0.32	3.6	0.67	0.47	-0.13	-	-	-	+0.02	-1.03	-0.15	SC	-	SC
S-total	4.00	31.1	4.92	3.23	+0.87	-	+0.34	+0.59	+0.21	-8.34	-1.15			
Total for the State:														
Perlis	4.00	31.1	4.92	3.23										

Table 166 SELECTION OF ALTERNATIVES FOR KEDAH

Unit: M10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Floodway SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proofing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 3 Kedah														
1	0.38	4.1	0.61	0.21	-3.65	-	-3.61	-	+0.01	-0.98	-0.17	SC	-	NM
2	0.07	0.9	0.08	0.01	+0.06	-	+0.01	-	0	-0.21	-0.04	SC	SC	SC
3	1.46	11.1	0.67	0.32	+1.02	-	+0.05	-	+0.05	-2.49	-0.39	SC	SC	SC
P1	0.04	-	0.28	0.17	-	-	-	-	0	-0.10	-	-	-	-
S-total	1.95	16.1	1.64	0.71	-2.57	-	-3.55	-	+0.06	-3.78	-0.60			
Basin 5 Muda (w/Muda Dam)														
1	0.16	1.1	0.31	0.15	-1.54	-	-	-	+0.01	-0.24*	-0.05	SC+	-	-
	0.19*	3.3*	0.17*	0.04*	-1.53*	-	-	-	+0.01*	-0.74*	-0.14*	-	-	-
2	0.24	1.1	0.77	0.34	-0.20	-	-	-	+0.02	-0.24	-0.05	SC+	SC+	SC
	0.23*	2.0*	0.55*	0.28*	-0.48*	-	-	-	+0.02*	-0.48*	-0.08*	-	-	-
3	0.98	7.2	1.44	0.79	+0.27	-	-	-	+0.08	-1.60*	-0.31	SC+	SC+	SC
	0.26*	1.2*	0.09*	- *	-0.55*	-	-	-	+0.02*	-0.21*	-0.01*	-	-	-
4	0.01	0.1	0.17	-	-0.57	-	-	-	0	-0.03	-0.01	-	-	-
5	0.49	4.4	1.45	0.21	-1.48	-	-	-	0	-0.96	-0.19	SC	-	-
6	1.39	15.3	1.96	-	-3.04	-	-	-	+0.01	-3.33	-0.66	SC	-	-
K1	2.19	16.3	3.18	0.79	+0.21	-	-	-	+0.08	-3.54	-0.67	SC	SC	SC(*)
K2	0.78	4.4	0.66	0.45	+1.26	-	-	-	+0.06	-0.95	-0.17	SC	SC	SC
S-total	6.24	49.9	9.94	2.73	-4.09	-	-	-	+0.26	-9.57	-2.11			
	0.68*	6.5*	0.81*	0.32*	-2.56*	-	-	-	+0.05*	-1.43*	-0.23*			
Basin 8 Kerian														
1	-	-	0.32	-	-1.27	-	-	-	0	-	-	-	-	-
	- *	-	0.10*	-	-1.27*	-	-	-	0 *	- *	- *	-	-	-
2	0.20	0.9	1.04	0.03	-1.03	-	-	-	-0.01	-0.27	-0.05	-	-	-
	- *	-	0.39*	-	-1.13*	-	-	-	0 *	- *	- *	-	-	-
I1	-	-	0.39	-	-0.19	-	-	-	0 *	- *	- *	-	-	-
S-total	0.20	0.7	1.75	0.03	-2.49	-	-	-	-0.01	-0.27	-0.05			
	- *	- *	0.49*	- *	-2.40*	-	-	-	0 *	- *	- *			
Total for the State:														
KH	8.39	66.9	13.82	3.47										
PG	0.68	6.5	0.81	0.32										
PK	-	-	0.49	-										

Remarks; * : Stretches in other states (P. Pinang, Perak)
(*): Due to improvement in upper reach
+ : Joint project with other state

Table 167 SELECTION OF ALTERNATIVES FOR P. PINANG

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 5 Muda (with Muda Dam)														
1	0.16*	1.1*	0.31*	0.15*	-1.21*	-	-	-	+0.01*	-0.24*	-0.05*	SC+	-	-
	0.19	3.3	0.17	0.04	-1.52	-	-	-	+0.01	-0.74	-0.14	-	-	-
2	0.24*	1.1*	0.77*	0.34*	-0.20*	-	-	-	+0.02*	-0.24*	-0.05*	SC+	SC+	SC
	0.23	2.0	0.55	0.28	-0.48	-	-	-	+0.02	-0.48	-0.08	-	-	-
3	0.98*	7.2*	1.44*	0.79*	+0.27	-	-	-	+0.08*	-1.60*	-0.31*	SC+	SC+	SC
	0.26	1.2	0.09	-	-0.55*	-	-	-	+0.02	-0.21*	-0.01	-	-	-
4	0.01*	0.1*	0.17*	- *	-0.45*	-	-	-	0 *	-0.31*	-0.01*	-	-	-
5	0.49*	4.4*	1.45*	0.21*	-1.15*	-	-	-	0 *	-0.96*	-0.19*	(SC)	-	-
6	1.39*	15.3*	1.96*	- *	-2.44*	-	-	-	+0.01*	-3.33*	-0.66*	(SC)	-	-
K1	2.19*	16.3*	3.18*	0.79*	+0.21*	-	-	-	+0.08*	-3.54*	-0.67*	(SC)	(SC)	(SC)
K2	0.78*	4.4*	0.66*	0.45*	+1.26*	-	-	-	+0.06*	-0.95*	-0.17*	(SC)	(SC)	(SC)
S-total	0.68	6.5	0.81	0.32	-1.73	-	-	-	+0.05	-1.43	-0.23			
	6.24*	49.9*	9.94*	2.73*	-4.08*	-	-	-	+0.26*	-9.57*	-2.11*			
Basin 5 Tembus														
1	2.21	21.8	4.99	2.87	+1.49	-	-	-	+0.07	-7.23	-0.89	SC	SC	SC
Basin 6 Perai														
1	0.75	3.0	0.47	-	+0.07	-	-	-	+0.04	-0.49	-0.01	SC	SC	SC
2	0.73	5.6	1.01	0.06	+0.18	-	-	-	+0.03	-1.12	-0.14	**	**	**
S-total	1.48	8.6	1.48	0.06	+0.25	-	-	-	+0.07	-1.61	-0.15			
Basin 6 Juru														
1	-	-	0.23	-	-0.56	-	-	-	-0.01	-	-	-	-	-
2	-	-	0.34	-	-2.32	-	-	-	-0.01	-	-	-	-	-
S-total	-	-	0.57	-	-2.88	-	-	-	-0.02	-	-			
Basin 7 Pinang														
1	2.53	10.9	0.14	-	0	-	-	-	+0.16	-1.87	-0.04	SC	SC	SC
Total for the State:														
PP	6.90	47.8	7.98	3.25										
KD	6.24	49.9	9.94	2.73										

Remarks; * : Stretches in other state (Kedah)
+ : Joint project with other state
( ): Project undertaken by other state
** : To be improved under Perai Barrage Project

Table 168 SELECTION OF ALTERNATIVES FOR PERAK (1/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Floodway SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proofing NP	Selected Plan Alt. F1	Selected Plan Alt. F2	Selected Plan Alt. F3
Basin 8 Kerian														
1	-	-	0.10	-	-1.27	-	-	-	0	-	-	-	-	-
	-	-	0.32*	-	-	-	-	-	0 *	-	-	-	-	-
2	-	-	0.39	-	-1.03	-	-	-	-0.01	-	-	-	-	-
	0.20*	0.9*	1.04*	0.03*	-	-	-	-	-0.01*	-0.27*	-0.05*	-	-	-
I1	-	-	0.39	-	-0.19	-	-	-	0	-	-	-	-	-
S-total	-	-	0.88	-	-2.49	-	-	-	-0.01	-	-			
	0.20*	0.9*	1.36*	0.03*	-	-	-	-	0 *	-0.27*	-0.05*			
Basin 9 Kurau														
1	-	-	-	-	-	-	-	-	0	-	-	-	-	-
2	0.52	3.2	2.49	1.40	-0.26	-	-	-	0	-1.08	-0.13	SC	-	-
3	-	-	0.54	-	-0.34	-	-	-	-0.01	-	-	-	-	-
4	0.69	11.0	1.72	0.24	+0.02	-	-	-	0	-2.27	-0.44	SC	SC	SC
S-total	1.21	14.2	4.75	1.64	-0.58	-	-	-	-0.01	-3.35	-0.57			
Basin 9 Beruas														
1	0.46	1.8	11.28	0.8	-	-	-	-	-	-	-	-	-	-
Basin 10 Perak (after Completion of Upstream Dams)														
1	3.15	18.2	46.33	2.96	-11.95	-	-19.27	-	-0.58	-3.21	-0.80	SF	SF	SF
2	2.68	13.3	7.76	3.67	+0.09	+1.37	-1.08	-	+0.13	-1.88	-0.64	SF	SF	SF
3	12.73	179.2	37.40	5.87	-6.50	-	-9.93	-	+0.29	-40.08	-8.60	SF	SF	SF
4	1.40	18.2	1.26	0.31	-1.49	-	-1.11	-	+0.07	-4.12	-0.83	SC	-	-
5	1.35	24.4	1.52	0.20	-5.76	-	-9.10	-	+0.06	-5.66	-1.18	SC	-	-
6	7.56	72.5	3.82	0.76	-1.60	-	-0.66	-	+0.37	-16.34	-2.98	SC	-	-
7	0.12	2.4	0.23	-	-1.64	-	-	-	0	-0.56	-0.12	-	-	-
8	0.38	6.5	2.35	-	-	-	-	-	-	-	-	-	-	-
9	0.86	14.0	4.15	0.23	-2.53	-	-	-	-0.03	-3.14	-0.66	-	-	-
10	1.67	12.0	4.94	0.54	-	-	-	-	-	-	-	-	-	-
B1	0.03	-	0.68	0.05	-0.96	-	-	-	-0.01	+0.02	-	-	-	-
B2	0.32	2.2	1.68	0.38	-0.71	-	-	-	0	-0.38	-0.11	-	-	-
B3	0.23	4.6	0.47	-	-0.63	-	-	-	0	-1.07	-0.22	-	-	-
K1	0.65	6.0	15.10	0.63	-3.63	-	-	-	-0.18	-1.18	-0.29	SC	-	-
P1	0.94	7.8	1.82	0.11	-1.10	-	-1.37	-	+0.01	-1.75	-0.31	SC	-	-
S-total	34.07	381.3	129.51	15.71	-37.41	+1.37	-42.52	-	+0.13	-83.41	-17.49			
Teluk Anson Town	6.50	45.6	1.00	-	-	-	-	+0.32	-	-	-	SP	SP	SP
Basin 11 Bernam														
1*	0.00*	-	1.69*	- *	No	-	-	-	-0.05*	- *	- *	-	-	-
	0.03	-	15.70	-	impro.	-	-	-	-0.47	-	-	-	-	-
2*	-	-	0.53*	- *	No	-	0	-	-0.01*	- *	- *	-	-	-
	-	-	1.67	-	impro.	-	-	-	-0.03	-	-	-	-	-
3*	-	-	0.53*	- *	-0.57	-	0	-	-0.01*	- *	- *	-	-	-
	0.01	0.4	0.24	-	-	-	-	-	0	-0.08	-0.01	-	-	-
4*	-	-	0.66*	0.05*	-0.50	-	0	-	-0.01*	- *	- *	-	-	-
	0.01	0.4	0.81	-	-	-	-	-	-0.01	-0.08	-0.01	-	-	-
5*	0.35*	8.0*	1.21*	- *	+0.06	-	-	-	+0.03*	-2.01*	-0.36*	(SC)	-	(SC)
	0	-	0.56	-	-	-	-	-	-0.02	-	-	-	-	-
S1	0.45	3.6	0.17	-	-0.96	-	-	-	0	-	-	-	-	-
S-total	0.5	4.4	19.15	-	-1.97	-	0	-	-0.53	-0.16	-0.02			
	0.35*	8.0*	4.62*	0.05*	-	-	-	-	-0.05*	-2.01*	-0.36*			

Table 169 SELECTION OF ALTERNATIVES FOR PERAK (2/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Total for the State:														
PK	36.24+	401.7+	165.57+	18.15+										
KH	0.20	0.9	1.36	0.03										
SL	0.35	8.0	4.62	0.05										

Remarks; * : Stretches in other states
– : Incl. Teluk Anson town
(SC): Project to be undertaken by other state (Selangor)
(*) : *No improvement, water level regulation by reservoirs*
(**): Improved. No flood since 1964

Table 170 SELECTION OF ALTERNATIVES FOR SELANGOR (1/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 11 Bernam														
1	0.03*	- *	15.67*	- *	No	-	-	-	-0.47*	- *	- *	-	-	-
	-	-	1.69	-	impro.	-	-	-	-0.05	-	-	-	-	-
2	-	- *	1.67*	- *	No	-	-	-	-0.03*	- *	- *	-	-	-
	-	-	0.53	-	impro.	-	-	-	-0.01	-	-	-	-	-
3	0.01*	0.4*	0.24*	- *	-0.57	-	-	-	0 *	-0.08*	-0.01*	-	-	-
	-	-	0.53	-	-	-	-	-	-0.01	-	-	-	-	-
4	0.01*	0.4*	0.81*	- *	-0.50	-	-	-	-0.01*	-0.08*	-0.01*	-	-	-
	-	-	0.66	0.05	-	-	-	-	-0.01	-	-	-	-	-
5	0 *	- *	0.56*	- *	+0.06	-	-	-	-0.02*	- *	- *	-	-	-
	0.35	8.0	1.21	-	-	-	-	-	+0.03	-2.01	-0.36	SC	-	SC
S1	0.45*	3.6*	0.17*	- *	-0.96	-	-	-	0	- *	- *	-	-	-
S-total	0.35	8.0	4.62	0.05	-1.97	-	-	-	-0.05	-2.01	-0.36			
	0.5 *	4.4*	19.12*	- *	-	-	-	-	-0.53*	-0.16*	-0.02*			
Basin 12 Tengi														
1	0.10	3.1	6.82	0.03	-(*)	-	-	-	-0.19	-0.79	-0.15	-	-	-
Basin 13 Selangor														
1	0.41	5.7	2.13	-	Incl. in 2	-	-	-	+0.02	-1.35	-0.19	SC	-	-
2	0.13	3.0	6.31	0.05	-1.97	-	-5.06	-	-0.13	-0.72	-0.15	SC	-	-
3	-	-	0.69	-	-0.63	-	-1.73	-	-0.01	-	-	-	-	-
4	0.08	1.0	2.31	-	-0.94	-	-2.89	-	-0.04	-0.23	-0.03	-	-	-
5	0.11	1.4	1.31	-	-0.45	-	-1.17	-	-0.01	-0.32	-0.04	-	-	-
6	0.17	4.4	0.76	-	-0.12	-	-2.37	-	+0.01	-1.05	-0.19	-	-	-
S1	0.05	2.4	0.90	-	-0.27	-	-	-	-0.01	-0.57	-0.12	-	-	-
K1	0.03	1.4	1.32	-	-0.26	-	-	-	-0.03	-0.33	-0.07	-	-	-
G1	0.30	3.7	1.09	-	-0.05	-	-	-	+0.02	-0.86	-0.11	-	-	-
S-total	1.28	23.0	16.82	0.05	-4.69	-	-13.22	-	-0.18	-5.43	-0.90			
Basin 14 Buloh														
1	0.19	3.1	4.61	-	+0.10	-	-	-	-0.09	-0.75	-0.12	SC	-	SC
2	0.13	6.0	3.25	-	-0.24	-	-	-	-0.05	-1.38	-0.29	SC	-	SC
3	-	-	1.84	-	-	-	-	-	-0.03	-	-	-	-	-
4	0.29	15.8	0.97	0.12	+0.17	-	-	-	+0.03	-3.70	-0.76	SC	SC	SC
S-total	0.61	24.9	10.67	0.12	+0.03	-	-	-	-0.14	-5.83	-1.17			
Basin 15 Kelang														
1	-	-	-	-	No impro.	-	-	-	-	-	-	-	-	-
2	0.18	17.7	2.39	-	-0.96	-	-	-	-0.05	-2.89	-0.62	SC	-	SC
3	-	-	1.55	-	-	-	-	-	-0.04	-	-	-	-	-
4	0.36	23.7	6.97	-	-0.20	-	-	-	-0.09	-3.90	-0.80	SC	-	SC
5	0.59	18.1	1.93	-	-0.04	-	-0.11	-	+0.01	-3.04	-0.55	SD	-	SD
6	4.33	108.3	0.97	-	-4.53	-	+1.39	-	+0.44	-18.54	-3.06	SD	SD	SD
7	1.87	46.7	0.38	-	+0.88	-	+0.87	-	+0.19	-8.00	-1.32	SD	SD	SD
B1	0.47	11.7	0.10	-	+0.22	-	+0.37	-	+0.05	-2.00	-0.33	SD	SD	SD
B2	0.70	17.5	0.14	-	+0.32	-	+0.36	-	+0.07	-3.00	-0.50	SD	SD	SD
G1	0.53	13.1	0.11	-	+0.27	-	+0.53	-	+0.05	-2.25	-0.37	SD	SD	SD
D1	0.23	11.1	1.25	-	-0.25	-	-	-	-0.01	-1.84	-0.36	SC	-	SC
S-total	9.26	267.9	15.79	-	-3.33	-	-3.41	-	+0.62	-45.46	-7.91			

Table 171 SELECTION OF ALTERNATIVES FOR SELANGOR (2/2)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 16 Sg. Langat														
1	-	-	-	-	No impro.	-	-	-	-	-	-	-	-	-
2	-	-	-	-	No impro.	-	-	-	-	-	-	-	-	-
3	-	-	-	-	No impro.	-	-	-	-	-	-	-	-	-
4	1.20	26.7	13.31	0.08	-0.19	-0.19	-0.89	-	-0.11	-6.14	-1.07	SC	SC	SC
5	0.16	8.4	28.79	0.31	-0.20	-	-0.76	-	-0.46	-1.92	-0.40	SC	-	SC
6	0.18	6.0	0.71	0.02	+0.19	-	-0.30	-	+0.01	-1.38	-0.27	SC	-	SC
7	0.11	2.8	2.33	0.12	-0.17	-	-0.78	-	-0.02	-0.64	-0.12	SC	-	SC
8	0.45	10.5	1.50	0.05	-0.76	-	-0.25	-	+0.04	-2.42	-0.43	SC	-	SC
9	0.97	30.5	1.78	0.07	-0.80	-	-0.06	-	+0.12	-7.05	-1.34	SC	SC	SC
L1	-	-	1.64	0.12	+0.13	-	-	-	-0.01	+0.01	-	SC	-	SC
L2	0.04	2.1	1.02	0.11	+0.28	-	-	-	0	-0.47	-0.10	SC	-	SC
L3	0.12*	1.7*	0.49*	0.20*	+0.30*	-	-	-	0 *	-0.40*	-0.09*	(SC)	-	(SC)
S1	0.04	2.5	0.51	0.03	+0.12	-	-0.36	-	-	-0.57	-0.12	SC	-	SC
S2	0.18	4.9	0.77	0.04	+0.20	-	-0.25	-	+0.01	-1.13	-0.21	SC	-	SC
S3	0.20	4.9	0.36	-	+0.38	-	-0.08	-	+0.02	-1.13	-0.20	SC	-	SC
B1	0.03	1.4	0.47	-	+0.33	-	-	-	-0.01	-0.33	-0.07	SC	-	SC
B2	0.30	14.1	0.99	0.64	+0.51	-	-	-	+0.08	-3.20	-0.66	SC	-	SC
P1	0.20*	3.9*	0.73*	0.04*	+0.28*	-	-	-	0 *	-0.89*	-0.18*	(SC)	-	(SC)
S-total	3.86	114.8	54.18	1.59	0.02	-0.19	-3.73	-	-0.33	-26.37	-4.99			
	0.32*	5.6*	1.22*	0.24*	0.58*	-	-	-	0 *	-1.29*	-0.27*			
Basin 17 Sepang Kechil														
1	-	-	0.16	-	No impro.	-	-	-	-	-	-	-	-	-
2	-	-	0.94	-	No impro.	-	-	-	-0.02	-	-	-	-	-
S-total	-	-	1.10	-	-	-	-	-	-0.02	-	-			
Basin 17 Sepang Basar														
1	- *	- *	0.25*	-	No	-	-	-	0 *	- *	- *	-	-	-
	-	-	0.37	-	impro.	-	-	-	-0.01	-	-	-	-	-
2	- *	- *	0.31*	-	No	-	-	-	-0.01*	- *	- *	-	-	-
	-	-	0.28	0.02	impro.	-	-	-	-	-0.01	-	-	-	-
S-total	-	-	0.65	0.02	-	-	-	-	-0.01	-0.01	-			
	- *	- *	0.56*	-	-	-	-	-	-0.01*	- *	- *			
Total for the State:														
SL	15.46	441.7	110.65	1.86										
PR	0.50	4.4	19.12	-										
NS	0.32	5.6	1.22	0.24										

Remarks; * : Stretches in other state (N. Sembilan)
( ): Project to be undertaken by other state

Table 172 SELECTION OF ALTERNATIVES FOR N. SEMBILAN (1/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 16 Langat														
L3	0.12	1.9	0.49	0.20	+0.30	-	-	-	0	-0.40	-0.09	SC	-	SC
P1	0.20	3.9	0.73	0.04	+0.28	-	-	-	0	-0.89	-0.18	SC	-	SC
S-total	0.32	5.8	1.22	0.24	+0.58	-	-	-	0	-1.29	-0.27			
Basin 17 Sepang Besar														
1*	- *	- *	0.37*	- *	No	-	-	-	-0.01*	- *	- *	-	-	-
	-	-	0.25	-	impro.	-	-	-	0	-	-	-	-	-
2*	- *	- *	0.28*	0.02*	No	-	-	-	- *	-0.01	- *	-	-	-
	-	-	0.31	-	impro.	-	-	-	-0.01	-	-	-	-	-
S-total	-	-	0.56	-	-	-	-	-	-0.01	-0.01	-			
	- *	- *	0.65*	0.02*	-	-	-	-	-0.01*	- *	- *			
Basin 17 Lukut Besar														
1	-	-	0.08	-	No impro.	-	-	-	0	-	-	-	-	-
2	-	-	0.49	-	No impro.	-	-	-	-0.01	-	-	-	-	-
3	-	-	0.35	-	No impro.	-	-	-	-0.01	-	-	-	-	-
T1	-	-	0.35	-	No impro.	-	-	-	-0.01	-	-	-	-	-
T2	-	-	0.27	-	No impro.	-	-	-	-0.01	-	-	-	-	-
S-total	-	-	1.54	-	-	-	-	-	-0.04	-	-			
Basin 17 Menvara														
1	-	-	0.10	-	No impro.	-	-	-	0	-	-	-	-	-
2	-	-	0.49	-	No impro.	-	-	-	-0.01	-	-	-	-	-
S-total	-	-	0.59	-	-	-	-	-	-0.01	-	-			
Basin 18 Linggi														
1	- *	- *	1.40*	-	No	-	-	-	-0.01	-	-	-	-	-
	-	-	0.36	-	impro.	-	-	-	-	-	-	-	-	-
2	0.12	3.6	1.06	-	-0.18	-	-	-	-0.02	-0.71	-0.15	SC	-	SC
3	0.12	3.2	2.0	0.11	-0.58	-	-	-	-0.04	-0.67	-0.13	SC	-	SC
4	0.15	4.8	0.71	-	-0.56	-	-	-	0	-0.95	-0.19	SC	-	SC
5	1.60	17.5	0.48	-	+0.83	-	-	-	+0.10	-3.51	-0.54	SC	SC	SC
6	0.26	6.3	0.47	0.12	+0.09	-	-	-	+0.01	-1.28	-0.25	SC	SC	SC
R1	0.04*	- *	0.77*	0.22*	-0.31	-	-	-	-0.01	-	-	-	-	-
	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-
R2	0.01*	- *	0.08*	0.05*	-0.11	-	-	-	0	-0.02	-	-	-	-
	0.01	-	0.13	0.05	-	-	-	-	-	-	-	-	-	-
R3	0.07	-	0.37	0.36	-0.22	-	-	-	0	-0.13	-	-	-	-
R4	0.05	-	0.28	0.28	-0.13	-	-	-	0	-0.10	-	-	-	-
P1	0.10	2.4	0.49	0.14	-0.21	-	-	-	0	-0.52	-0.10	-	-	-
P2	0.12	2.8	0.53	0.16	-0.25	-	-	-	0	-0.61	-0.11	-	-	-
S1*	0.22*	3.0*	0.73*	0.56*	-0.05*	-	-	-	0 *	-0.86*	-0.12*	(SC)	-	(SC)
S2*	0.39*	8.7*	0.53*	0.29*	+0.35*	-	-	-	+0.01*	-1.84*	-0.35*	(SC)	(SC)	(SC)
S3*	0.11*	2.1*	0.31*	0.14*	+0.09*	-	-	-	-0.01*	-0.48*	-0.09*	(SC)	-	(SC)
J1	0.18	3.8	0.46	0.33	+0.04	-	-	-	+0.01	-0.87	-0.15	SC	-	SC
J2	0.10	-	0.54	0.54	+0.05	-	-	-	0	-0.20	-	SC	-	SC
S-total	2.88	44.4	8.30	2.09	-1.54	-	-	-						
	0.77*	13.8*	3.82*	1.26*	0.39*	-	-	-						

Table 173 SELECTION OF ALTERNATIVES FOR N. SEMBILAN (2/2)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 21 Muar														
1	0.18	1.2	0.84	0.11	-1.51	-	-1.35	-	0	-0.28	-0.05	SD	-	-
2	-	-	0.49	-	-1.30	-	-1.04	-	-0.01	-	-	-	-	-
3	0.21	3.8	0.3	-	-0.26	-	-0.22	-	+0.01	-0.84	-0.17	SD	-	-
4	1.01	5.6	0.84	0.62	-0.21	-	-0.11	-	+0.05	-1.28	-0.24	SD	-	-
5	0.50	3.9	0.32	0.18	+0.03	-	+0.12	-	+0.03	-0.86	-0.16	SD	SD	SD
6	0.33	-	0.32	0.32	-0.05	-	-0.02	-	+0.01	-0.03	-	-	-	-
M1	-	-	0.24	-	-0.30	-	-	-	0	-	-	-	-	-
G1	0.16	-	1.01	0.16	-0.88	-	-	-	-0.01	-0.02	-	SC	-	-
G2	0.65	9.7	0.56	0.13	+0.05	-	-	-	+0.03	-2.15	-0.43	SC	SC	SC
G3	0.14	2.6	0.28	-	-0.04	-	-	-	+0.01	-0.57	-0.12	SC	SC	SC
J1	0.02	-	0.53	0.02	-0.92	-	-	-	-0.01	-	-	-	-	-
J2	0.03	0.4	0.22	0.01	-0.28	-	-	-	0	-0.08	-0.02	-	-	-
J3	0.24	2.3	0.22	0.12	-0.03	-	-	-	+0.01	-0.51	-0.10	-	-	-
B1	0.90	10.9	0.78	0.3	+0.31	-	-	-	+0.05	-2.43	-0.48	SC	SC	SC
B2	0.80	5.9	0.71	0.47	+0.41	-	-	-	+0.04	-1.35	-0.26	SC	SC	SC
S1	0.26	-	0.26	0.26	0	-	-	-	+0.01	-0.02	-	-	-	-
T1	0.18	-	0.17	0.17	-0.08	-	-	-	+0.01	-0.02	-	-	-	-
S-total	5.61	46.3	8.09	2.87	-5.06	-	-2.62	-	+0.24	-8.44	-1.96			
Basin 30 Pahang-Upper Reaches														
T3	0.59	4.9	2.99	0.52	-3.81	-	-	-	-0.01	-0.95	-0.20	SC	-	-
T4	-	-	-	-	-	-	-	-	0	-	-	-	-	-
T5	0.59	7.1	0.74	0.39	-1.76	-	-	-	+0.02	-1.45	-0.29	SC	-	-
E1	0.02	-	0.18	0.03	-	-	-	-	0	+0.01	-	-	-	-
E2	0.12	2.8	0.74	0.05	-	-	-	-	-0.01	-0.58	-0.12	-	-	-
S-total	1.32	14.8	4.65	0.99	-5.57	-	-	-	0	-2.97	-0.61			
Total for the State:														
NS	10.13	111.3	24.95	6.19										
ML	0.77	13.8	3.82	1.26										

Remarks; * : Stretches in other state
( ): Project to be undertaken by other state

Table 174 SELECTION OF ALTERNATIVES FOR MELAKA (1/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 18 Linggi														
1	-	-	0.36*	-	No	-	-	-	-0.01*	-	-	-	-	-
	-	-	1.40	-	impro.	-	-	-	-0.02	-	-	-	-	-
2*	0.12*	3.6*	1.06*	-	-0.18*	-	-	-	-0.02*	-0.71*	-0.15*	(SC)	-	(SC)
3*	0.12*	3.2*	2.00*	0.11*	-0.58*	-	-	-	-0.04*	-0.67*	-0.13*	(SC)	-	(SC)
4*	0.15*	4.8*	0.71*	-	-0.56*	-	-	-	0 *	-0.95*	-0.19*	(SC)	-	(SC)
5*	1.60*	17.5*	0.48*	-	+0.83*	-	-	-	-0.10*	-3.51*	-0.54*	(SC)	(SC)	(SC)
6*	0.26*	6.3*	0.47*	0.12*	+0.09*	-	-	-	0 *	-1.29*	-0.25*	(SC)	(SC)	(SC)
R1	-	-	0.42*	-	-0.31	-	-	-	-0.01*	-	-	-	-	-
	0.04	-	0.77	0.22	-	-	-	-	-0.01	-0.10	-	-	-	-
R2	0.01*	-	0.13*	0.05*	-0.11	-	-	-	0 *	-0.02*	-	-	-	-
	0.01	-	0.08	0.05	-	-	-	-	0	-0.02	-	-	-	-
R3*	0.07*	-	0.37*	0.36*	-0.22*	-	-	-	-	-0.13*	-	-	-	-
R4*	0.05*	-	0.28*	0.28*	-0.13*	-	-	-	-	-0.10*	-	-	-	-
P1*	0.10*	2.4*	0.49*	0.14*	-0.21*	-	-	-	0 *	-0.52*	-0.10*	-	-	-
P2*	0.12*	2.8*	0.53*	0.16*	-0.28*	-	-	-	0 *	-0.61*	-0.11*	-	-	-
S1	0.22	3.0	0.73	0.56	-0.05	-	-	-	0	-0.86	-0.12	SC	-	SC
S2	0.39	8.7	0.53	0.29	+0.35	-	-	-	+0.01	-1.84	-0.35	SC	SC	SC
S3	0.11	2.1	0.31	0.14	+0.09	-	-	-	-0.01	-0.48	-0.09	SC	-	SC
J1*	0.18*	3.8*	0.46*	0.33*	+0.04*	-	-	-	0 *	-0.87*	-0.15*	(SC)	-	(SC)
J2*	0.10*	-	0.54*	0.54*	+0.05*	-	-	-	0 *	-0.20*	-	(SC)	-	(SC)
S-total	0.77	13.8	3.82	1.26	-0.43	-	-	-						
	2.88*	44.4*	8.30*	2.09*	-1.15*	-	-	-						
Basin 18 Bharu														
1	0.25	5.4	1.07	0.60	-0.06	-	-	-	-0.01	-1.39	-0.22	SC	-	SC
2	0.53	11.5	0.93	0.49	+0.11	-	-	-	+0.01	-2.54	-0.46	SC	SC	SC
S-total	0.78	16.9	2.00	1.09	+0.05	-	-	-		-3.93	-0.68			
Basin 19 Seri Melaka														
1	0.44	4.3	1.25	1.02	+0.02	**	-	-	-0.01	-1.54	-0.20	SF	SF	SF
Basin 19 Melaka														
1	3.48	40.5	1.52	0.49	-0.30	+2.46	-	-	+0.18	-9.79	-1.56	SF	SF	SF
2	0.40	7.2	0.97	0.39	+0.07	**	-	-	0	-1.86	-0.32	SF	SF	SF
3	0.22	2.7	1.86	0.29	-0.43	-	-	-	-0.02	-0.78	-0.12	SC	-	SC
4	0.33	4.3	1.20	0.67	-0.64	-	-	-	-0.01	-1.34	-0.20	SC	-	SC
5	0.04	-	0.86	0.11	-0.40	-	-	-	-0.02	-0.06	-	-	-	-
T1	0.11	-	0.35	0.35	-0.27	-	-	-	0	-0.19	-	-	-	-
D1	0.15	4.7	0.19	0.05	-0.03	-	-	-	0	-1.09	-0.20	SC	-	SC
S-total	4.73	59.4	6.95	2.35	-2.00	+2.46	-	-						
Basin 19 Duyong														
1	0.03	0.8	0.30	-	-0.07	-	-	-	0	-0.19	-0.04	SC	-	SC
2	0.07	1.2	0.15	0.09	-0.10	-	-	-	0	-0.32	-0.06	SC	-	SC
3	0.01	-	0.85	0.19	-0.22	-	-	-	-0.02	-0.01	-	-	-	-
4	0.03	-	0.26	0.09	-0.11	-	-	-	-0.01	-0.05	-	-	-	-
S-total	0.14	2.0	1.56	0.37	-0.50	-	-	-						

Table 175 SELECTION OF ALTERNATIVES FOR MELAKA (2/2)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Floodway SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proofing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 20 Kesang														
1	0.06*	1.6*	0.22*	0.03*	+0.09	-	-	-	0 *	-0.40*	-0.08*	SC+	SC+	SC+
	0.15	4.7	0.86	-	-	-	-	-	-0.02	-1.11	-0.23	-	-	-
2	0.16*	-	0.75*	0.35*	+0.01	-	-	-	-0.02*	-0.24*	-	SC+	SC+	SC+
	0.47	7.5	2.74	0.21	-	-	-	-	-0.06	-1.85	-0.37	-	-	-
3	0.05*	-	0.77*	0.12*	-0.84	-	-	-	-0.01*	-0.08*	-	SC+	SC+	SC+
	0.04	1.2	2.78	-	-	-	-	-	-0.04	-0.27	-0.06	-	-	-
4	0.65	6.7	0.83	0.41	+0.49	-	-	-	0	-1.77	-0.33	SC	-	SC
5	0.42	1.6	0.47	0.35	+0.39	-	-	-	0	-0.54	-0.08	SC	-	SC
6	0.45	4.3	0.48	0.29	+0.30	-	-	-	0	-1.16	-0.21	SC	-	SC
C1	0.14*	2.5*	0.57*	0.17*	+0.05	-	-	-	0 *	-0.69*	-0.12	SC+	SC+	SC+
	0.19	2.0	0.42	0.12	-	-	-	-	0	-0.52	-0.10	-	-	-
C2	0.22	4.1	0.52	0.08	-0.22	-	-	-	0	-1.00	-0.20	-	-	-
S-total	2.59	32.1	9.10	1.46	+0.27	-	-	-						
	0.41*	4.1*	2.31*	0.67*	-	-	-	-						
Total for the State:														
ML	9.45	128.5	24.68	7.55										
NS	2.88	44.4	8.30	2.09										
JH	0.41	4.1	2.31	0.67										

Remarks; * : Stretches in other states (N. Sembilan, Johor)
+ : Improvement jointly with other state
++: Improvement by other state
**: *Included in stretch 1, Basin 19*

Table 176 SELECTION OF ALTERNATIVES FOR JOHOR (1/3)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Floodway SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proofing NP	Selected Plan Alt. F1	Selected Plan Alt. F2	Selected Plan Alt. F3
Basin 20 Kesang														
1	0.15*	4.7*	0.86*	- *	+0.09	-	-	-	-0.02*	-1.11*	-0.23*	SC+	SC+	SC+
	0.06	1.6	0.22	0.03	-	-	-	-	0	-0.40	-0.08	-	-	-
2	0.47*	7.5*	2.74*	0.21*	+0.01	-	-	-	-0.06*	-1.85*	-0.37*	SC+	SC+	SC+
	0.16	-	0.75	0.35	-	-	-	-	-0.02*	-0.24	-	-	-	-
3	0.04*	1.2*	2.78*	- *	-0.84	-	-	-	-0.04*	-0.27*	-0.06*	SC+	SC+	SC+
	0.05	-	0.77	0.12	-	-	-	-	-0.01	-0.08	-	-	-	-
4	0.65*	6.7*	0.83*	0.41*	+0.49	-	-	-	0 *	-1.77*	-0.33*	(SC)	-	(SC)
5	0.42*	1.6*	0.47*	0.35*	+0.39	-	-	-	0 *	-0.54*	-0.08*	(SC)	-	(SC)
6	0.45*	4.3*	0.48*	0.29*	+0.30	-	-	-	0 *	-1.16*	-0.21*	(SC)	-	(SC)
C1	0.19*	2.0*	0.42*	0.12*	+0.30	-	-	-	0	-0.52*	-0.10*	SC+	SC+	SC+
	0.14	2.5	0.57	0.17	-	-	-	-	0	-0.69	-0.12	-	-	-
C2	0.22*	4.1*	0.52*	0.08*	-0.22*	-	-	-	0 *	-1.00*	-0.20*	-	-	-
S-total	0.41	4.1	2.31	0.67	+0.74	-	-	-						
	2.59*	32.1*	9.10*	1.46*	-0.22*	-	-	-						
Basin 21 Muar Lower Reaches														
1	0.65	7.0	1.90	0.07	-19.36	-	-	-	+0.01	-1.54	-0.26	SC	-	-
2	0.12	0.6	1.88	-	-8.47	-	-	-	-0.04	-0.11	-0.01	SC	-	-
3	0.03	-	3.36	-	-2.66	-	-	-	-0.07	-	-	-	-	-
4	0.22	4.7	4.20	-	-1.73	-	-	-	-0.06	-1.04	-0.21	SC	-	-
5	0.53	6.7	7.28	-	-3.03	-	-	-	-0.10	-1.45	-0.26	SC	-	-
6	0.01	-	2.05	-	-1.08	-	-	-	-0.04	-	-	-	-	-
L1	-	-	0.97	-	-1.06	-	-	-	-0.02	-	-	-	-	-
L2	0.80	4.3	0.62	-	+0.42	-	-	-	+0.05	-0.87	-0.09	SC	SC	SC
S1	0.21	4.4	1.34	-	-0.19	-	-0.87	-	-0.02	-0.99	-0.20	SC	SP	SP
S2	0.46	3.2	1.24	-	-0.41	-	-1.21	+0.35	+0.01	-0.67	-0.09	SC	SP	SP
S3	0	-	0.24	-	-0.13	-	0	-	-0.01	-	-	-	-	-
S4	0.34	2.2	1.54	-	-0.20	-	-0.78	-	-0.01	-0.46	-0.06	SC	-	-
S5	0.09	1.5	2.19	-	-0.66	-	-	-	-0.04	-0.33	-0.07	-	-	-
P1	0.05	1.1	0.71	-	-0.37	-	-	-	-0.01	-0.24	-0.05	-	-	-
S-total	3.51	35.7	29.52	0.07	-38.93	-	-2.86	+0.35	-0.35	-7.70	-1.30			
Basin 22 Batu Pahat														
1	0.78	6.2	1.47	0.08	+0.48	-	-	-	+0.03	-1.36	-0.20	SD/SF	SD/SF	SD/SF
2	0.68	-	1.11	0.85	+0.45	-0.75	-	-	0	-0.32	-	SD/SF	SD/SF	SD/SF
3	0.10	-	0.39	0.12	+0.07	-	+0.02	-	-0.01	-0.04	-	SD/SF	SD/SF	SD/SF
4	1.09	4.3	3.76	0.33	-1.24	-	-0.31	-	-0.01	-1.01	-0.09	SD/SF	SD/SF	SD/SF
5	0.12	0.6	5.00	-	-1.03	-	+0.14	-	-0.08	-0.11	-0.01	SD/SF	SD/SF	SD/SF
6	0.01	-	1.24	-	-0.49	-	-	-	-0.02	-	-	-	-	-
K1	1.84	11.4	5.51	0.89	+0.53	-	-	-	-0.01	-2.81	-0.41	SC	SC	SC
K2	0.61	3.9	3.84	0.13	+0.14	-	-	-	-0.03	-0.87	-0.12	SC	SC	SC
K3	-	-	2.86	-	-	-	-	-	-0.04	-	-	-	-	-
K4	0.76	4.1	3.09	-	+0.65	-	-	-	-0.02	-0.83	-0.08	SC	SC	SC
S1	0.06	-	4.64	-	-1.27	-	-0.42	-	-0.09	-	-	SD/SF	SD/SF	SD/SF
S2	0	-	0.74	-	-0.27	-	-	-	-0.01	-	-	-	-	-
S-total	6.05	30.5	33.65	2.40	-1.98	-0.75		-	-0.29	-7.35	-0.91			
Basin 22 Senggarang/Proposed Floodway														
F1	0.09	1.1	1.32	-	-	-0.75	-	-	-0.03	-0.24	-0.05	SD/SF	SD/SF	SD/SF

Table 177 SELECTION OF ALTERNATIVES FOR JOHOR (2/3)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 23 S.W. Johor Rivers														
1	9.15	127.6	59.21	1.11	-	-	-	-	-	-	-	(Improved)		
Basin 23 Sekudai														
1	-	-	0.26	-	-	-	-	-	0	-	-	(Improved)		
2	0	-	0.48	-	-	-	-	-	-0.01	-	-	(Improved)		
3	1.64	12.6	0.32	0.03	-0.79	-	-	-	+0.09	-2.06	-0.26	SC	SC	SC
4	0.86	5.7	0.52	-	+0.34	-	-	-	+0.04	-0.92	-0.10	SC	SC	SC
S-total	2.50	18.3	1.58	0.03	-0.45	-	-	-	+0.12	-2.98	-0.36			
Basin 23 Sg. Tebrau														
1	1.36	9.0	0.24	-	-	-	-	-	+0.07	-1.47	-0.18	(Improved)		
2	-	-	0.42	-	-	-	-	-	-0.01	-	-	(Improved)		
3	0.13	2.6	0.55	0.01	+0.82	-	-	-	-0.01	-0.44	-0.08	SC	SC	SC
4	0	-	0.65	0.06	-0.26	-	-	-	-0.02	-0.05	-	-	-	-
S-total	1.49	11.6	1.86	0.07	+0.56	-	-	-	+0.03	-1.96	-0.26			
Basin 24 Johor														
1	-	-	0.14	-	-	-	-	-	0	-	-	-	-	-
2	0.80	6.8	0.95	-	-0.48	-	-0.61	+0.12	+0.04	-1.39	-0.20	SC	SP	SP
3	0.11	2.0	1.63	-	-1.19	-	-1.53	-	-0.02	-0.42	-0.08	SC	-	-
4	0.55	10.1	0.74	-	-1.00	-	-1.04	-	+0.03	-2.13	-0.41	SC	-	-
5	-	-	0.49	-	-	-	-	-	-0.01	-	-	-	-	-
6	0.01	-	2.12	0.05	-1.47	-	-	-	-0.04	-0.03	-	-	-	-
7	0.41	3.1	0.32	-	+0.09	-	-	-	+0.03	-0.64	-0.08	SC	SC	SC
T1	-	-	0.32	-	-	-	-	-	-0.01	-	-	-	-	-
T2	0.77	6.9	0.63	-	+0.02	-	-	-	+0.05	-1.43	-0.21	SC	SC	SC
E1	-	-	0.56	-	-	-	-	-	-0.01	-	-	-	-	-
M1	0	-	0.35	-	-	-	0	-	-0.01	-	-	-	-	-
L1	-	-	0.45	-	-	-	0	-	-0.01	-	-	-	-	-
P1	0.29	4.8	1.51	0.17	-0.19	-	-	-	-0.02	-1.13	-0.20	SC	-	-
S1	-	-	0.35	-	-	-	-	-	-0.01	-	-	-	-	-
S-total	2.94	33.7	10.56	0.22	-4.12	-	-3.18	+0.12	+0.01	-7.17	-1.70			
Basin 25 Sg. Sedili Kechil														
1	-	-	1.11	-	-0.37	-	-	-	-0.02	-	-	-	-	-
2	0.10	1.6	3.06	-	-1.74	-	-	-	-0.04	-0.35	-0.06	-	-	-
3	-	-	1.46	-	-0.75	-	-	-	-0.02	-	-	-	-	-
B1	0.03	0.4	1.20	-	+0.01	-	-	-	-0.02	+0.09	-0.02	-	-	-
L1	-	-	3.02	-	-0.64	-	-	-	-0.05	-	-	-	-	-
S-total	0.13	2.0	9.85	-	-3.49	-	-	-	-0.15	-0.26	-0.08			
Basin 25 Sg. Sedili Besar														
1	-	-	0.32	-	-1.60	-	0	-	-0.01	-	-	-	-	-
2	-	-	6.26	-	-4.30	-	0	-	-0.10	-	-	-	-	-
3	-	-	1.22	-	-0.73	-	0	-	-0.02	-	-	-	-	-
4	-	-	3.70	-	-3.41	-	0	-	-0.06	-	-	-	-	-
5	-	-	1.10	-	-0.38	-	0	-	-0.02	-	-	-	-	-
6	-	-	0.76	-	-0.32	-	-	-	-0.01	-	-	-	-	-
K1	-	-	2.41	-	-0.41	-	-	-	-0.04	-	-	-	-	-
M1	-	-	1.54	-	-0.35	-	-	-	-0.03	-	-	-	-	-
D1	-	-	1.19	-	-0.51	-	-	-	-0.02	-	-	-	-	-
A1	-	-	1.07	-	-0.68	-	-	-	-0.02	-	-	-	-	-
S-total	-	-	19.57	-	-12.69	-	-	-		-	-			

Table 178 SELECTION OF ALTERNATIVES FOR JOHOR (3/3)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 26 Sg. Jamaluang														
1	-	-	1.45	0.05	-0.46	-	-	-	-0.02	-0.02	-	-	-	-
2	-	-	0.99	-	-0.40	-	-	-	-0.02	-	-	-	-	-
S-total	-	-	2.44	0.05	-0.86	-	-	-	-0.04	-0.02	-			
Basin 26 Sg. Mersing														
1	1.62	23.1	0.87	-	+0.01	-	-	-	+0.08	-3.69	-0.68	SC	SC	SC
2	-	-	1.50	-	-0.45	-	-	-	-0.02	-	-	-	-	-
M1	-	-	1.85	-	-0.30	-	-	-	-0.03	-	-	-	-	-
S-total	1.62	23.1	4.22	-	+0.74	-	-	-	+0.03	-3.69	-0.68			
Basin 26 Sg. Tenglu														
1	0.18	3.2	0.61	-	+0.34	-	-	-	0	-0.51	+0.10	SC	-	SC
Basin 26 Sg. Mawar														
1	-	-	1.09	0.06	-	-	-	-	-0.06	-0.03	-	-	-	-
Basin 26 Sg. Sisek														
2	-	-	1.36	-	-	-	-	-	-0.02	-	-	-	-	-
Basin 26 Sg. Teriang Kechil														
1	-	-	1.02	-	-	-	-	-	-0.02	-	-	-	-	-
Basin 26 Sg. Teriang Besar														
2	0	-	1.01	-	-	-	-	-	-0.02	-	-	-	-	-
Basin 27 Sg. Endau														
1	0.67	12.4	0.81	-	+0.66	-	-	-	+0.04	-2.60	+0.50	SC	-	SC
2	0.08*	0.8*	17.79*	- *	-9.42	-	-	-0.34	+0.26*	+0.16*	-0.03*	-	-	-
	1.13	4.5	12.00	0.42	-8.89	-	-	-	+0.16	-1.03	-0.16	-	-	-
3	-	4.0	0.38	-	-	-	-	-	-0.01	-	-	-	-	-
4	-	-	1.33	-	-	-	-	-	-0.02	-	-	-	-	-
5	-	-	4.35	-	-	-	-	-	-0.07	-	-	-	-	-
6	-	-	4.01	-	-	-	-	-	-0.06	-	-	-	-	-
7	0	-	2.75	-	-	-	-	-	-0.05	-	-	-	-	-
8	-	-	0.27	-	-	-	-	-	-0.01	-	-	-	-	-
A1	0.89*	- *	9.03*	0.47*	-	-	-	-	-0.10*	+0.07*	- *	-	-	-
	-	-	-	-	-	-	-	-	0	-	-	-	-	-
E1	-	-	5.48	-	-	-	-	-	-0.08	-	-	-	-	-
L1	-	-	5.34	-	-	-	-	-	-0.08	-	-	-	-	-
G1	-	-	4.64	-	-	-	-	-	-0.07	-	-	-	-	-
K1	0.24	-	1.17	0.11	-	-	-	-	-0.02	-0.05	-	-	-	-
K2	0.72	3.1	4.13	-	-0.18	-	-	-	-0.02	-0.55	+0.03	SC	-	SC
M1	-	-	2.15	-	-	-	-	-	-0.03	-	-	-	-	-
P1	0	-	1.19	-	-	-	-	-	-0.02	-	-	-	-	-
M1	0	-	0.81	-	-	-	-	-	-0.02	-	-	-	-	-
M2	3.08	18.2	0.76	-	+0.63	-	-	-	+0.22	-3.43	+0.36	SC	SC	SC
S-total	5.84	37.7	51.57	0.53	-17.20	-	-	-0.34	-0.46	-7.66	+1.05			
	0.97*	0.8*	26.82*	0.47*	-	-	-	-	+0.16*	+0.23*	-0.03*			
Total for the State:														
JH	33.91	328.6	232.75	5.21										
ML	2.59	32.1	9.10	1.46										
PH	0.97	0.80	26.82	0.47										

Remarks; * Stretches in other state

Table 179 SELECTION OF ALTERNATIVES FOR PAHANG (1/2)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 27 Sg. Endau														
2	1.13*	4.0*	12.00*	0.42*	-8.80	-	-	-	-0.16*	-1.03*	-0.16*	-	-	-
	0.08	0.8	17.79	-	-	-	-	-	+0.76	-0.16	-0.03	-	-	-
A1	- *	- *	- *	- *	-	-	-	-	0 *	- *	- *	-	-	-
	0.89	-	9.03	0.47	-	-	-	-	-0.10	-0.07	-	-	-	-
S-total	0.97	0.8	26.82	0.47	-8.80	-	-	-	-0.36	-0.23	-0.03			
	1.13*	4.0*	12.00*	0.42*	-	-	-	-	-0.16*	-1.03*	-0.16*			
Basin 28 Sg. Pontian														
1	-	-	-	-	-	-	-	-	0	-	-	-	-	-
2	1.17	1.5	7.11	0.57	-0.22	-	-	-	-0.04	-0.34	-0.04	-	-	-
3	-	-	2.49	-	-	-	-	-	-0.04	-	-	-	-	-
4	-	-	5.80	-	-	-	-	-	-0.09	-	-	-	-	-
S-total	1.17	1.5	15.40	0.57	-0.22	-	-	-	-0.17	-0.34	-0.04			
Basin 28 Sg. Rompin														
1	-	-	-	-	-	-	-	-	0	-	-	-	-	-
2	-	-	11.56	-	-3.57	-	0	-	-0.18	-	-	-	-	-
3	0.98	3.1	25.30	-	-7.09	-	-6.36	-	-0.32	-0.49	-0.02	-	-	-
4	0.08	0.7	12.52	-	-4.52	-	-3.98	-	-0.19	-0.12	-0.02	-	-	-
5	-	-	12.39	-	-	-	0	-	-0.19	-	-	-	-	-
6	-	-	0.40	-	-	-	0	-	-0.01	-	-	-	-	-
7	-	-	0.51	-	-	-	0	-	-0.01	-	-	-	-	-
8	-	-	1.10	-	-	-	0	-	-0.02	-	-	-	-	-
S1	-	-	1.82	-	-	-	-	-	-0.03	-	-	-	-	-
A1	-	-	3.07	-	-	-	-	-	-0.05	-	-	-	-	-
K1	0.01	-	4.28	-	-3.48	-	-	-	-0.07	-	-	-	-	-
K2	0.01	-	1.96	-	-0.89	-	-	-	-0.04	-	-	-	-	-
K3	0	-	0.83	-	-	-	-	-	-0.02	-	-	-	-	-
K4	0	-	1.20	-	-	-	-	-	-0.02	-	-	-	-	-
K5	0.01	-	1.09	-	-1.15	-	-	-	-0.02	-	-	-	-	-
T1	-	-	1.17	-	-	-	-	-	-0.02	-	-	-	-	-
S-total	1.09	3.8	79.20	-	-20.40	-	-10.34	-	-1.19	-0.61	-0.04			
Basin 29 Sg. Bebar														
1	0.30	1.5	4.71	0.10	-1.59	-	-	-	-0.04	-0.46	+0.09	-	-	-
2	0.68	-	49.10	0.50	-4.52	-	-	-	-0.71	-0.02	-	-	-	-
3	-	-	5.50	-	-	-	-	-	-0.08	-	-	-	-	-
4	-	-	19.68	-	-	-	-	-	-0.30	-	-	-	-	-
M1	-	-	13.73	-	-	-	-	-	-0.21	-	-	-	-	-
S1	-	-	5.11	-	-	-	-	-	-0.08	-	-	-	-	-
S-total	0.98	1.5	97.83	0.60	-6.11	-	-	-	-1.42	-0.48	+0.09			
Basin 29 Sg. Merchong														
1	-	-	16.74	-	-	-	-	-	-0.26	-	-	-	-	-
2	-	-	29.56	-	-	-	-	-	-0.45	-	-	-	-	-
3	-	-	4.62	-	-	-	-	-	-0.07	-0.26	-	-	-	-
S-total	-	-	50.92	-	-	-	-	-	-2.56	-0.26	-			

Table 180 SELECTION OF ALTERNATIVES FOR PAHANG (2/2)

Unit: N10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy	Benefit-Cost: Structural Measure: Channel Improv. SC	Bypass Flood-way SF	Dam + Channel Improv. SD	Polder SP	Non-structural Measure: Restrict of Devel. NM	Land Use Change NR	Flood Proof-ing NP	Selected Plan: Alt. F1	Alt. F2	Alt. F3
Basin 30 Sg. Pahang														
1	10.90	58.2	103.78	3.42	-40.68	-	-39.91	+0.79	-0.63	-11.73	-1.62	SD	SP	SP
2	0.41	3.1	8.50	0.49	-6.04	-	-5.90	-	-0.11	-0.70	-0.13	SD	-	-
3	2.34	20.9	15.09	1.62	-8.11	-	-10.19	-	-0.02	-4.38	-0.80	SD	-	-
4	0.11	1.0	3.71	0.06	-4.97	-	-4.30	-	-0.05	-0.22	-0.04	SD	-	-
5	3.00	25.9	17.78	1.09	-16.67	-	-10.09	+0.02	-0.04	-5.28	-0.96	SD	SP	SP
6	8.77	89.1	46.35	1.66	-61.67	-	-39.07	-	+0.01	-17.88	-3.41	SD	-	-
7	1.11	11.1	9.01	0.25	-10.05	-	-6.89	-	-0.05	-2.22	-0.42	SD	-	-
8	3.86	22.7	3.15	-	-4.88	-	-0.34	+0.56	+0.30	-4.37	-0.62	SD	SP	SP
J1	0.88	9.7	9.68	0.47	-	-	-	-	-0.09	-2.01	-0.40	SC	-	-
B1	0.10	0.2	35.96	0.12	-2.80	-	-	-	-0.60	-0.07	-0.01	-	-	-
E1	0.02*	- *	0.18*	0.03*	-	-	-	-	0 *	-0.01*	- *	-	-	-
E2	0.12*	2.8*	0.74*	0.05*	-	-	-	-	-0.01*	-0.58*	-0.12*	-	-	-
T1	4.10	15.2	19.57	0.32	-15.72	-	-	-	-0.04	-2.90	-0.26	SC	-	-
T2	0.66	4.8	2.35	0.19	-1.11	-	-	-	+0.02	-0.97	-0.16	-	-	-
T3	0.59*	4.9*	2.99*	0.52*	-3.81	-	-	-	-0.01*	-0.95*	-0.20*	-	-	-
T5	0.59*	7.1*	0.74*	0.39*	-1.76	-	-	-	+0.02*	-1.45*	-0.29*	-	-	-
S1	9.25	42.9	19.24	1.24	-35.20	-	-3.03	+1.08	+0.49	-8.34	-0.99	SC	SP	SP
S2	3.54	13.7	2.11	-	-7.65	-	-	-	+0.27	-2.56	-0.22	SC	-	-
M1	0.27	2.8	8.90	0.16	-4.73	-	-3.05	-	-0.12	-0.59	-0.12	SD	-	-
L1	1.16	6.2	3.34	0.08	-4.18	-	-1.69	-	+0.04	-1.20	-0.17	-	-	-
(1-8 & M1)	(Included in above)			-	-	+3.71	-	-	-	-	-	-	Dam	Dam
Whole Malaysia	(Included in above)			-	-	-	-	-	-	-33.01	-	-	NR	NR
S-total	50.46	327.5	308.52	11.17	-230.03	+3.71	-124.46	+2.45	-0.62	-65.42	-10.33			
	1.32*	14.8*	4.65*	0.99*	-	-	-	-	0 *	-2.97*	-0.61*			
Basin 31 Sg. Kuantan														
1	2.02	8.8	0.62	-	-0.43	-	-0.81	-	+0.09	-1.00	-0.09	SC	SC	SC
2	1.10	8.1	1.59	0.03	-1.65	-	-2.40	Included in B1	+0.03	-0.92	-0.14	SC	SP	SP
3	0.12	1.5	1.28	-	-1.09	-	-1.49	-	-0.01	-0.17	-0.03	SC	-	-
4	1.45	8.7	0.22	-	-1.69	-	-2.37	-	+0.07	-0.98	-0.13	SC	-	-
5	-	-	1.16	-	-1.71	-	-	-	-0.02	-	-	-	-	-
6	0.21	2.7	0.25	-	-0.31	-	-0.16	-	+0.01	-0.30	-0.06	SC	-	-
B1	2.70	20.3	12.58	0.08	-2.09	-	-	+0.02	-0.06	-2.30	-0.36	SC	SP	SP
B2	0.15	1.3	1.10	0.13	-0.91	-	-	-	-0.01	-0.16	-0.03	-	-	-
P1	0.09	1.1	0.95	-	-0.35	-	-	-	-0.01	-0.13	-0.03	-	-	-
R1	0.04	-	1.67	0.08	-0.38	-	-	-	-0.03	-0.01	-	-	-	-
M1	0.29	3.6	1.39	-	-0.21	-	-	-	-0.01	-0.41	-0.08	-	-	-
K1	0.13	1.7	0.11	-	-0.21	-	-0.36	-	+0.01	-0.19	-0.04	-	-	-
S-total	8.30	57.8	22.92	0.32	-11.03	-	-7.59	+0.02	+0.06	-4.01	-0.99			
Total for the State:														
PH	62.97	392.9	601.61	13.13										
NS	1.32	14.8	4.65	0.99										
JH	1.13	4.0	12.00	0.42										

Remarks; Figures in ( ) show population and area protected by polder
* Stretches in other states (N. Sembilan)

Table 181 SELECTION OF ALTERNATIVES FOR TRENGGANU (1/2)

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 32 Kemaman														
1	0.06	1.0	0.81	-	-0.92	-	-0.39	-	+0.01	-0.21	-0.04	SC	-	-
2	1.30 [1.10]	12.4 [14.0]	3.07 [2.00]	0.10	+0.03	-	-4.86	+0.12	+0.04	(-2.67)	(-0.49)	SC	SP	SP
3	0.03	-	2.95	0.22	-5.67	-	-1.43	-	-0.04	+0.01	-	-	-	-
4	0.79	5.6	1.73	0.14	-2.44	-	-2.56	-	+0.03	(-1.18)	(-0.20)	SC	-	-
5	0.34	4.6	1.40	0.21	-1.80	-	-0.65	-	0	(-1.00)	(-0.20)	SC	-	-
C1	0.14	1.9	9.82	0.11	-1.76	-	-	-	-0.14	-0.42	-0.08	-	-	-
H1	0.01	-	5.33	-	0	-	-	-	-0.09	-	-	-	-	-
T1	0.12	1.8	1.34	-	-0.34	-	-	-	-0.02	-0.40	-0.08	-	-	-
S-total	2.79	27.3	26.45	0.78	-12.90	-	-9.89	+0.12	-0.23					
Basin 32 Kemasik														
1	0.05	0.5	1.09	0.08	-0.39	-	-	-	-0.01	-0.01	0	-	-	-
Basin 32 Kerteh														
1	-	-	0.12	-	-	-	-	-	0	-	-	-	-	-
2	0.05	0.5	3.97	0.05	-0.97	-	-	-	-0.06	(-0.11)	-0.01	-	-	-
3	-	-	1.15	-	-	-	-	-	-0.02	-	-	-	-	-
C1	0.06	0.7	0.69	-	-0.30	-	-	-	-0.01	(-0.14)	-0.02	-	-	-
S-total	0.11	1.20	5.93	0.05	-1.27	-	-	-	-0.09		-0.03			
Basin 33 Paka														
1	-	-	1.47	-	-	-	-	-	-0.02	-	-	-	-	-
2	0.03	0.2	2.42	0.08	-1.89	-	-2.37	-	-0.03	(-1.33)	-0.02	SC	-	-
3	-	-	0.81	-	-	-	-	-	-0.01	-	-	-	-	-
S-total	0.03	0.2	4.70	0.08	-1.89	-	-2.37	-	-0.06		-0.02			
Basin 34 Dungun														
1	0.21	1.6	4.16	0.52	-1.45	-	-1.19	-	-0.05	-0.28	(-0.06)	SC	-	-
2	-	-	0.21	-	-	-	-	-	0	-	-	-	-	-
3	0.34	3.5	6.96	0.45	-4.27	-	-3.50	-	-0.09	-0.64	(-0.13)	SC	-	-
4	0.28	3.4	5.13	0.22	-4.59	-	-3.82	-	-0.06	-0.63	-0.13	SC	-	-
5	0.01	-	0.41	0.06	-1.37	-	-1.32	-	-0.01	-	-	-	-	-
6	0.13	1.6	0.98	0.08	-2.31	-	-	-	-0.01	-0.29	-0.06	-	-	-
T1	0	-	2.42	-	-	-	-	-	-0.05	-	-	-	-	-
K1	-	-	0.58	-	-	-	-	-	-0.01	-	-	-	-	-
J1	0.01	-	0.78	0.03	-1.00	-	-	-	-0.01	-	-	-	-	-
L1	-	-	0.40	-	-	-	-	-	-0.01	-	-	-	-	-
S-total	0.98	10.1	22.03	1.36	-14.99	-	-9.83	-	-0.30					
Basin 35 Merchang														
1	-	-	0.86	-	-	-	-	-	0	-	-	-	-	-
2	-	-	10.56	-	-	-	-	-	0	-	-	-	-	-
S-total	-	-	11.42	-	-	-	-	-	0	-	-			
Basin 35 Marang														
1	0.16	1.4	1.27	0.20	-2.59	-	-	-	0	-0.35	-0.06	-	-	-
2	0.02	-	1.55	0.11	-1.60	-	-	-	-0.02	-0.02	-	-	-	-
3	0.20	0.8	1.73	-	-0.97	-	-	-	-0.01	-0.16	-0.01	-	-	-
A1	0.07	0.6	2.67	0.13	-0.56	-	-	-	-0.04	-0.15	-0.02	-	-	-
S-total	0.45	2.8	7.22	0.44	-5.72	-	-	-	-0.07					

Table 182 SELECTION OF ALTERNATIVES FOR TRENGGANU (2/2)

Unit: M$10^6

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 36 Ibai														
T1	1.54	25.3	2.04	-	-0.51	-	-	-	+0.03	(-3.86)	-0.81	SC	SC	NM
T2	0.78	9.1	1.53	0.18	-0.29	-	-	-	+0.01	(-1.39)	-0.27	SC	-	NM
S-total	2.32	34.4	3.57	0.18	-0.80	-	-	-	+0.04		-1.08			
Basin 36 Trengganu														
1	3.15	31.2	2.51	0.72	+1.07	-	-	-	+0.18	(-4.82)	(-0.82)	SC	SC	SC
2	0.49	9.8	1.19	0.50	-12.27	-	-	-	+0.02	(-1.56)	(-0.32)	SC	-	NM
3	0.19	2.9	1.53	0.51	-3.40	-	-	-	-0.01	-0.45	(-0.10)	SC	-	NM
4	0.33	6.3	2.16	0.42	-7.91	-	-	-0.28	-0.01	(-0.99)	(-0.20)	SC	-	NM
	[0.18]	[3.3]	[0.36]											
N1	0.99	17.4	4.42	2.27	-3.93	-	-	-	+0.04	(-2.72)	(-0.56)	SC	SC	NM
N2	0.01	-	2.21	-	-3.23	-	-	-	-0.04	-	-	-	-	NM
N3	0.46	9.6	5.91	0.05	-1.99	-	-	-	-0.09	(-1.53)	-0.31	SC	-	NM
T1	0.36	7.1	2.64	0.40	-1.45	-	-	-	-0.02	(-1.11)	(-0.23)	SC	-	NM
T2	0.72	15.1	1.37	0.41	-1.41	-	-	-	+0.03	(-2.39)	(-0.49)	SC	-	NM
B1	0.50	4.7	2.80	0.75	-1.61	-	-	+0.14	0	-0.70	-0.13	SC	SP	SP
	[0.36]	[3.3]	[0.86]											
B2	0.34	6.4	2.18	0.53	-0.88	-	-	-	0	(-1.01)	(-0.21)	SC	-	NM
S-total	7.54	110.5	28.92	6.56	-37.01	-	-	-0.14	+0.10	-	-			
Basin 37 Merang														
1	0.04	0.6	4.53	-	-	-	-	-	-0.06	-0.15	-0.03	-	-	-
2	-	-	5.63	-	-	-	-	-	-0.09	-	-	-	-	-
S-total	0.04	0.6	10.18	-	-	-	-	-	-0.15	-0.15	-0.03			
Basin 37 Setiu														
1	-	-	-	-	-	-	-	-	0	-	-	-	-	-
2	0.05	0.8	4.74	-	-1.15	-	-	-	-0.07	-0.26	-0.05	-	-	-
3	0.19	2.2	0.60	0.28	-0.85	-	-	-	+0.01	(-0.65)	(-0.14)	SC	SC	-
4	0.09	0.7	1.10	0.22	-0.39	-	-	-	-0.01	(-0.21)	(-0.04)	SC	-	-
G1	0.06	0.4	2.05	0.19	-0.48	-	-	-	-0.02	-0.12	-0.03	-	-	-
K1	0.05	0.2	0.98	0.21	-0.14	-	-	-	-0.01	-0.06	-0.01	SC	-	-
T1	0.06	0.1	0.87	0.24	-0.17	-	-	-	-0.01	-0.04	-0.01	SC	-	-
C1	0.07	0.6	9.42	0.18	-2.03	-	-	-	-0.14	-0.16	-0.04	-	-	-
U1	0.09	0.1	5.39	0.41	-0.59	-	-	-	-0.07	-0.03	-0.01	-	-	-
S-total	0.66	5.1	25.15	1.73	-5.80	-	-	-	-0.32					
Basin 38 Keluang Besar														
1	0.31	4.3	2.08	0.24	-0.30	-	-	-	0	(-1.28)	(-0.26)	SC	-	SC
2	0.04	0.2	0.81	0.17	-0.70	-	-	-	-0.01	-0.06	-0.01	-	-	-
3	0.19	1.4	1.41	0.71	-0.06	-	-	-	+0.01	(-0.40)	-0.09	SC	-	SC
K1	1.12	11.6	5.09	2.62	+0.41	-	-	-	+0.06	(-3.42)	(-0.71)	SC	SC	SC
L1	0.06	0.8	0.85	0.01	-5.66	-	-	-	-0.01	-0.26	-0.05	-	-	-
S-total	1.72	18.3	10.24	3.75	-6.31	-	-	-	+0.05					
Basin 38 Besut														
1	3.13	30.2	8.93	3.03	-0.96	-	-	-	+0.15	(-9.02)	(-1.74)	SC	SC	SC
2	1.14	13.1	4.44	2.13	+1.54	-	-	-	+0.05	(-3.92)	(-0.81)	SC	SC	SC
3	0.31	1.5	1.83	0.14	-0.56	-	-	-	-0.01	-0.42	-0.06	SC	-	SC
4	0.03	0.4	1.17	-	-1.33	-	-	-	-0.02	-0.11	-0.02	-	-	-
S-total	4.61	45.2	16.37	5.30	-1.31	-	-	-	+0.17					
Total for the State:														
	21.30	256.2	173.27	20.31	-	-	-	-	-	-	-			

Remarks; 1. Notwithstanding the calculated values, ( ) shows plans not practical from social viewpoint
2. Figures in [ ] show damage data for area bunded by polder

Table 183 SELECTION OF ALTERNATIVES FOR KELANTAN

Unit: M$10⁶

Stretch	Average Annual Damage	Population (10^3)	Flood Area Total (10^3 ha)	Flood Area Paddy (10^3 ha)	Benefit-Cost: Structural Measure: Channel Improv. SC	Structural Measure: Bypass Flood-way SF	Structural Measure: Dam + Channel Improv. SD	Structural Measure: Polder SP	Non-structural Measure: Restrict of Devel. NM	Non-structural Measure: Land Use Change NR	Non-structural Measure: Flood Proof-ing NP	Selected Plan: Alt. F1	Selected Plan: Alt. F2	Selected Plan: Alt. F3
Basin 39 Peng Datu														
1	10.71	87.3	8.94	2.54	No impro.	-	-	-	+0.23	-19.69	-3.61	(SD)	(SD)	(SD)
2	3.90	29.1	5.48	3.00	No impro.	-	-	-	+0.08	-6.95	-1.20	(SD)	(SD)	(SD)
S-total	14.61	116.4	14.42	5.54	No impro.	-	-	-	+0.31	-26.64	-4.81			
Basin 39 Kemasin														
1	1.20	13.2	3.00	1.63	-0.74	-	-	-	+0.01	-3.20	-0.61	-	-	-
2	1.24	13.2	7.81	1.89	-0.77	-	-	-	-0.08	-3.23	-0.61	-	-	-
3	1.15	12.8	2.20	1.50	-0.70	-	-	-	+0.03	-3.10	-0.59	-	-	-
4	1.00	12.1	1.65	0.81	-0.26	-	-	-	0	-3.31	-0.61	-	-	-
5	1.30	13.3	4.49	2.10	No impro.	-	-	-	-	-	-	-	-	-
S-total	5.89	64.6	19.15	7.93	-5.07	+0.71(*)	-	-	-0.02	-15.66	-2.98	SF(*)		SF(*
Basin 39 Semerak														
1	1.97	14.2	9.81	3.50	-5.08	-	-	-	-0.06	-3.74	-0.62	-	-	-
2	2.61	20.5 [8.9]	6.72 [3.32]	3.17	-2.57	-	-	+0.24	+0.02	-5.10	-0.89	-	-	-
3	1.12	13.3	2.22	1.32	+0.13	-	-	-	+0.02	-3.18	-0.61	-	-	-
G1	0.35	3.7	0.93	0.64	-0.01	-	-	-	-	-0.93	-0.17	-	-	-
R1	1.50	19.0	2.53	1.16	+0.71	-	-	-	+0.02	-4.42	-0.87	-	-	-
J1	0.48	5.0	1.58	0.90	+0.21	-	-	-	-	-1.27	-0.23	-	-	-
T	0.95	9.0	2.80	2.23	-0.17	-	-	-	+0.02	-2.39	-0.41	-	-	-
S-total	8.98	84.7	26.59	12.92	-6.75	-0.69(*)	-	+0.24	+0.02	-21.03	-3.80	SF(*)		SF(*
Basin 40 Sg. Kelantan														
1	46.44	388.3 [77.7]	76.74 [2.51]	32.42	-29.39	-	+5.05	+3.75	+0.36	-76.12	-13.62	SD	SD	SD
2	3.39	38.7 [19.3]	6.08 [0.91]	0.58	-26.22	-	-5.98	+0.82	+0.07	-7.02	-1.20	SP	SP	SP
L1	0.20	2.7	1.03	0.04	-2.59	-	-1.93	-	-0.02	-0.51	-0.10	-	-	-
P1	0.83	7.3	2.15	0.53	-3.65	-	-	-	0	-1.42	-0.26	-	-	-
S-total	53.98	437.0	86.00	33.57	-22.95	-	-2.86		+0.41	-85.07	-15.18			
Basin 41 Sg. Golok														
1	1.81	19.8	5.91	2.89	+0.20	-	-	-	+0.01	-5.44	-1.03	SC	-	S
2	0.60	5.5	2.70	1.01	-2.42	-	-	-	-0.01	-1.53	-0.28	SC	-	-
3	0.54	5.6	1.76	1.03	-1.39	-	-	-	0	-1.58	-0.29	SC	-	-
4	0.24	2.0	2.32	0.63	-2.42	-	-	-	-0.03	-0.61	-0.10	SC	-	-
5	0.49	5.9	2.27	0.38	-1.04	-	-	-	-0.03	-1.52	-0.30	SC	-	-
L1	1.09	11.4	11.69	1.77	-0.31	-	-	-	-0.14	-3.14	-0.59	SC	-	-
S-total	4.77	50.2	26.65	7.71	-2.50	-	-	-	-0.21	-13.82	-2.59			
Total for the State:														
	88.23	752.9	172.81	67.67	-5.00									

Remarks; 1. Figures in [ ] shows damageability/population in area bunded by polder
2. (*) : Improvement of two basins (Kemasin/Semerak) as one system
3. (SD): Improvement under plan for Basin 40 - Stretch 1

Table 184 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN PERLIS/KEDAH/P. PINANG

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M$$10^6$)
PERLIS									
	ALTERNATIVE F1								
1	Perlis	46	1	-	-	-	31	5	26
	ALTERNATIVE F2								
1	Perlis	34	1	-	-	-	25	4	22
	ALTERNATIVE F3								
1	Perlis	46	1	-	-	-	31	5	26
KEDAH									
	ALTERNATIVE F1								
3	Kedah	31	-	-	-	-	16	1	32
5	Muda	121	-	-	-	-	50	10	108
	Total	152	-	-	-	-	66	11	140
	ALTERNATIVE F2								
5	Muda	59	-	-	-	-	29	6	41
	ALTERNATIVE F3								
3	Kedah	16	-	-	-	4	12	1	10
5	Muda	59	-	-	-	-	29	6	41
	Total	75	-	-	-	4	41	7	51
P. PINANG									
	ALTERNATIVE F1								
5	Muda	19	-	-	-	-	28	6	19
6	Perai	4	-	-	-	-	3	0	4
7	Pinang	2	-	-	-	-	11	0	30
	Total	25	-	-	-	-	42	6	53
	ALTERNATIVE F2								
5	Muda	17	-	-	-	-	25	6	19
6	Perai	4	-	-	-	-	3	0	4
7	Pinang	2	-	-	-	-	11	0	30
	Total	23	-	-	-	-	39	6	53
	ALTERNATIVE F3								
5	Muda	17	-	-	-	-	25	6	19
6	Perai	4	-	-	-	-	3	0	4
7	Pinang	2	-	-	-	-	11	0	30
	Total	23	-	-	-	-	39	6	53

Remarks;
R.I. : River improvement,
F.W. : Floodway,
Pold.: Polder,
N.S. : Non-structural measure, in person
P.P.: Population protected (the year 2000)
F.A.: Flood area relieved
C.C.: Construction cost

Table 185 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN PERAK

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M\$$10^6$)
	ALTERNATIVE F1								
9	Kurau	23	-	-	-	-	14	4	22
10	Perak	38	-	50	1	-	340	75	584
	Total	61	-	50	1	-	354	79	606
	ALTERNATIVE F2								
9	Kurau	13	-	-	-	-	3	2	18
10	Perak	-	-	50	1	-	256	93	315
	Total	13	-	50	1	-	259	95	333
	ALTERNATIVE F3								
9	Kurau	13	-	-	-	-	3	2	18
10	Perak	-	-	50	1	-	256	93	315
	Total	13	-	50	1	-	259	95	333

Remarks;
R.I. : River improvement,
F.W. : Floodway,
Pold.: Polder,
N.S. : Non-structural measure, in person
P.P.: Population protected (the year 2000)
F.A.: Flood area relieved
C.C.: Construction cost

Table 186 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN SELANGOR

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M$$10^6$)
	ALTERNATIVE F1								
11	Bernam	11	-	-	-	-	8	2	5
13	Selangor	18	-	-	-	-	9	8	24
14	Buloh	24	-	-	-	-	25	9	13
15	Kelang	73	2	-	-	-	268	14	143
16	Langat	109	-	-	-	-	115	54	84
	Total	235	2	-	-	-	425	87	269
	ALTERNATIVE F2								
15	Kelang	36	2	-	-	-	216	4	136
	ALTERNATIVE F3								
11	Bernam	11	-	-	-	-	8	2	5
14	Buloh	24	-	-	-	-	25	9	13
15	Kelang	73	2	-	-	-	268	14	143
16	Langat	109	-	-	-	-	115	54	84
	Total	217	2	-	-	-	416	79	245

Remarks;
- R.I. : River improvement,
- F.W. : Floodway,
- Pold. : Polder,
- N.S. : Non-structural measure, in person
- P.P. : Population protected (the year 2000)
- F.A. : Flood area relieved
- C.C. : Construction cost

Table 187 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN N. SEMBILAN/MELAKA/JOHOR (1/2)

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M$$10^6$)
N. SEMBILAN									
	ALTERNATIVE F1								
16	Langat	19	-	-	-	-	6	1	7
18	Linggi	71	-	-	-	-	39	6	33
21	Muar	103	1	-	-	-	44	6	58
30	Pahang	24	-	-	-	-	12	1	18
	Total	217	1	-	-	-	101	14	116
	ALTERNATIVE F2								
18	Linggi	15	-	-	-	-	24	1	5
21	Muar	53	1	-	-	-	39	3	27
	Total	68	1	-	-	-	63	4	32
	ALTERNATIVE F3								
16	Langat	19	-	-	-	-	6	1	7
18	Linggi	71	-	-	-	-	39	6	33
21	Muar	53	1	-	-	-	39	3	27
	Total	143	1	-	-	-	84	10	67
MELAKA									
	ALTERNATIVE F1								
18	Linggi	32	-	-	-	-	31	4	12
19	Melaka	32	-	5	-	-	66	7	30
20	Kesang	49	-	-	-	-	28	9	30
	Total	113	-	5	-	-	125	20	72
	ALTERNATIVE F2								
18	Linggi	26	-	-	-	-	29	3	10
19	Melaka	-	-	5	-	-	52	4	9
20	Kesang	19	-	-	-	-	15	7	20
	Total	45	-	5	-	-	96	14	39
	ALTERNATIVE F3								
18	Linggi	32	-	-	-	-	31	4	12
19	Melaka	32	-	5	-	-	66	7	30
20	Kesang	49	-	-	-	-	28	9	30
	Total	113	-	5	-	-	125	20	72

Remarks;
- R.I. : River improvement,
- F.W. : Floodway,
- Pold.: Polder,
- N.S. : Non-structural measure, in person
- P.P.: Population protected (the year 2000)
- F.A.: Flood area relieved
- C.C.: Construction cost

Table 188 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN N. SEMBILAN/MELAKA/JOHOR (2/2)

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M$$10^6$)
JOHOR									
	ALTERNATIVE F1								
20	Kesang	19	-	-	-	-	4	2	7
21	Muar	163	-	-	-	-	33	20	424
22	Batu Pahat	109	1	19	-	-	32	29	166
23	Pontian Kechil	30	-	-	-	-	21	1	18
24	Johor	58	-	-	-	-	34	6	61
26	Mersing	9	-	-	-	-	26	1	8
27	Endau	37	-	-	-	-	34	6	20
	Total	425	1	19	-	-	184	65	704
	ALTERNATIVE F2								
20	Kesang	19	-	-	-	-	4	2	7
21	Muar	-	-	-	1	-	6	0	4
22	Batu Pahat	93	1	19	-	-	28	26	156
23	Pontian Kechil	25	-	-	-	-	18	1	15
24	Johor	-	-	-	1	-	5	0	8
26	Mersing	6	-	-	-	-	23	1	7
27	Endau	11	-	-	-	-	18	1	6
	Total	154	1	19	2	-	102	31	203
	ALTERNATIVE F3								
20	Kesang	19	-	-	-	-	4	2	7
21	Muar	-	-	-	1	-	6	-	4
22	Batu Pahat	109	1	19	-	-	32	29	166
23	Pontian Kechil	30	-	-	-	-	21	1	18
24	Johor	-	-	-	1	-	5	0	8
26	Mersing	9	-	-	-	-	26	1	8
27	Endau	37	-	-	-	-	34	6	20
	Total	204	1	19	2	-	132	40	232

Remarks;
- R.I. : River improvement,
- F.W. : Floodway,
- Pold.: Polder,
- N.S. : Non-structural measure, in person
- P.P.: Population protected (the year 2000)
- F.A.: Flood area relieved
- C.C.: Construction cost

Table 189 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN PAHANG

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3 ha)	C.C. (M$$10^6$)
	ALTERNATIVE F1								
30	Pahang	523	3	-	-	-	316	267	1,914
31	Kuantan	56	-	-	-	-	50	17	106
	Total	579	3	-	-	-	366	284	2,020
	ALTERNATIVE F2								
30	Pahang	-	3	-	4	10	63	3	412
31	Kuantan	6	-	-	1	-	27	2	34
	Total	6	3	-	5	10	90	5	446
	ALTERNATIVE F3								
30	Pahang	-	3	-	4	112	63	3	412
31	Kuantan	6	-	-	1	-	27	2	34
	Total	6	3	-	5	112	90	5	446

Remarks;
- R.I. : River improvement,
- F.W. : Floodway,
- Pold.: Polder,
- N.S. : Non-structural measure, in person
- P.P.: Population protected (the year 2000)
- F.A.: Flood area relieved
- C.C.: Construction cost

Table 190 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN TRENGGANU

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M\$$10^6$)
	ALTERNATIVE F1								
32	Kemaman	36	-	-	-	-	24	7	72
33	Paka	12	-	-	-	-	-	2	20
34	Dungun	50	-	-	-	-	9	16	113
36	Trengganu	162	-	-	-	-	145	30	276
37	Setiu	24	-	-	-	-	3	4	16
38	Besut	66	-	-	-	-	62	24	98
	Total	350	-	-	-	-	243	83	595
	ALTERNATIVE F2								
32	Kemaman	-	-	-	1	-	14	2	10
36	Trengganu	29	-	-	1	-	77	10	79
37	Setiu	9	-	-	-	-	2	1	8
38	Besut	33	-	-	-	-	55	18	58
	Total	71	-	-	2	-	148	31	155
	ALTERNATIVE F3								
32	Kemaman	-	-	-	1	-	14	2	10
36	Trengganu	5	-	-	1	34	35	3	33
38	Besut	66	-	-	-	-	62	24	98
	Total	71	-	-	2	34	111	29	141

Remarks;
- R.I. : River improvement,
- F.W. : Floodway,
- Pold.: Polder,
- N.S. : Non-structural measure, in person
- P.P.: Population protected (the year 2000)
- F.A.: Flood area relieved
- C.C.: Construction cost

Table 191 OUTLINE OF FLOOD MITIGATION PROGRAM BY ALTERNATIVE IN KELANTAN

Basin No.	Basin Name	R.I. (km)	Dam (nos)	F.W. (km)	Pold. (nos)	N.S. (10^3)	P.P. (10^3)	F.A. (10^3ha)	C.C. (M$10^6)
	ALTERNATIVE F1								
39	Kemasin	-	-	16	-	-	266	60	102
40	Kelantan	65	2	-	1	-	408	78	378
41	Golok	73	-	-	-	-	50	27	73
	Total	138	2	16	1	-	724	165	553
	ALTERNATIVE F2								
39	Kemasin	-	-	-	-	-	116	14	-
40	Kelantan	65	2	-	1	-	406	78	378
	Total	65	2	-	1	-	522	92	378
	ALTERNATIVE F3								
39	Kemasin	-	-	16	-	-	266	60	102
40	Kelantan	65	2	-	1	-	408	78	378
41	Golok	10	-	-	-	-	20	6	17
	Total	75	2	16	1	-	694	144	497

Remarks; R.I. : River improvement, P.P.: Population protected (the year 2000)
F.W. : Floodway, F.A.: Flood area relieved
Pold.: Polder, C.C.: Construction cost
N.S. : Non-structural measure, in person

Table 192 RECOMMENDED PLAN FOR FLOOD FORECASTING AND WARNING SYSTEM

Basin No.	River Basin	People Rel'ved by F/F (10^3)	Construction Cost (M$$10^6$)	Construction Period
1	Perlis	9.0	0.9	5MP
5	Muda	10.2	1.2	5MP
7	Pinang	5.5	0.8	5MP
10	Perak/1	162.9	0.7	4MP
13	Selangor	4.4	0.5	5MP
15	Kelang	113.2	1.5	4MP
16	Langat	20.6	0.5	5MP
18	Linggi	14.6	0.9	5MP
19	Melaka	25.2	1.1	5MP
21	Muar	14.2	1.8	5MP
23	Sekudai	9.2	1.0	4MP
	Tebrau	5.8	0.5	4MP
24	Johor	4.4	0.8	4MP
30	Pahang/1	99.1	1.0	5MP
31	Kuantan	8.5	0.5	5MP
32	Kemaman	6.7	0.5	4MP
34	Dungun	2.6	0.6	4MP
36	Trengganu/1	20.5	0.4	4MP
38	Besut/1	15.1	0.2	4MP
39	Kemasin/Semarak	7.1	0.3	4MP
40	Kelantan/1	213.5	0.7	4MP
41	Golok	12.7	0.2	4MP
Total		785.0	16.6	
207	Tawau	8.5	2.4	6MP
210	Segama	3.5	4.1	7MP
211	Kinabatangan	4.3	4.2	4MP
217	Bongan	12.7	3.0	5MP
218	Kadamaian	6.5	2.2	6MP
221	Papar	14.2	2.1	5MP
224	Padas	3.0	5.4	7MP
Total		52.7	23.4	
229	Limbang	2.6	3.6	7MP
230	Baram	6.0	9.8	5MP
231	Miri	14.0	2.3	6MP
233	Niah	5.0	2.6	7MP
236	Kemena	11.1	4.1	6MP
237	Tatau	2.7	3.8	7MP
241	Rajang	16.6	19.9	6MP
245	Sadong	5.0	2.7	4MP
246	Sarawak	22.9	3.4	5MP
Total		85.9	52.2	

Remarks; /1: Additional flood forecasting stations be recommended.

Table 193 PUBLIC DEVELOPMENT EXPENDITURE FOR ALT. F1

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	25.99	0.00	0.00	25.99
3	Kedah	0.00	0.00	0.00	31.94	31.94
5	Muda *	0.04	26.51	45.58	55.15	127.28
6	Perai	0.00	0.00	0.00	3.56	3.56
7	P.Pinang	0.00	15.00	15.00	0.00	30.00
9	Kurau	0.00	22.40	0.00	0.00	22.40
10	Perak	0.00	132.50	212.50	238.50	583.50
11	Bernam	0.00	0.00	0.00	5.41	5.41
13	Selangor	0.00	0.00	0.00	23.64	23.64
14	Buloh	0.00	0.00	12.87	0.00	12.87
15	Kalang	26.40	38.72	38.72	38.71	142.55
16	Langat *	0.00	28.12	28.12	34.84	91.08
18	Linggi *	0.31	37.72	7.21	0.00	45.24
19	Melaka	0.26	10.88	5.78	13.37	30.29
20	Kesang *	1.80	1.70	16.43	16.43	36.36
21	Muar *	0.00	120.00	189.52	172.46	481.98
22	Batu Pahat	40.00	35.00	55.00	36.26	166.26
23	Pontian Kechil	1.50	16.54	0.00	0.00	18.04
24	Johor	0.00	0.00	30.00	31.49	61.49
26	Mersing	0.00	0.00	0.00	8.25	8.25
27	Endau	0.00	0.00	5.61	14.85	20.46
30	Pahang *	5.39	462.69	695.60	767.92	1931.60
31	Kuantan	0.00	0.00	36.19	69.31	105.50
32	Kemaman	0.00	0.00	36.15	36.15	72.30
33	Paka	0.00	0.00	0.00	20.35	20.35
34	Dungun	0.00	0.00	45.00	67.64	112.64
36	Trengganu	0.00	83.27	96.20	96.21	275.68
37	Setiu	1.50	14.97	0.00	0.00	16.47
38	Besut	0.00	61.34	36.26	0.00	97.60
39	Kemasin	0.00	51.13	51.14	0.00	102.27
40	Kelantan	16.70	33.50	112.00	215.30	377.50
41	Golok	6.70	33.30	33.30	0.00	73.30
	Total	100.60	1251.28	1804.18	1997.74	5153.80

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 194 ANNUAL RECURRENT EXPENDITURE FOR ALT. F1

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	0.00	2.60	2.60	5.20
3	Kedah	0.00	0.00	0.00	0.00	0.00
5	Muda *	0.00	0.30	2.95	7.50	10.75
6	Perai	0.00	0.00	0.00	0.00	0.00
7	P.Pinang	0.00	0.00	1.50	3.00	4.50
9	Kurau	0.00	0.00	2.25	2.25	4.50
10	Perak	0.00	0.00	13.25	34.50	47.75
11	Bernam	0.00	0.00	0.00	0.00	0.00
13	Selangor	0.00	0.00	0.00	0.00	0.00
14	Buloh	0.00	0.00	0.00	1.30	1.30
15	Kalang	2.50	5.15	9.00	12.90	29.55
16	Langat *	0.00	0.00	2.80	5.60	8.40
18	Linggi *	0.00	0.05	3.85	4.55	8.45
19	Melaka	0.00	0.05	1.10	1.70	2.85
20	Kesang *	0.00	0.20	0.35	2.00	2.55
21	Muar *	0.00	0.00	12.00	31.30	43.30
22	Batu Pahat	0.00	4.00	7.50	12.50	24.00
23	Pontian Kechil	0.00	0.15	1.80	1.80	3.75
24	Johor	0.00	0.00	0.00	3.00	3.00
26	Mersing	0.00	0.00	0.00	0.00	0.00
27	Endau	0.00	0.00	0.00	0.55	0.55
30	Pahang *	0.00	0.55	43.00	112.55	156.10
31	Kuantan	0.00	0.00	0.00	3.60	3.60
32	Kemaman	0.00	0.00	0.00	3.60	3.60
33	Paka	0.00	0.00	0.00	0.00	0.00
34	Dungun	0.00	0.00	0.00	4.50	4.50
36	Trengganu	0.00	0.00	8.35	17.95	26.30
37	Setiu	0.00	0.15	1.65	1.65	3.45
38	Besut	0.00	0.00	6.15	9.75	15.90
39	Kemasin	0.00	0.00	5.15	10.35	15.50
40	Kelantan	0.00	1.65	2.25	12.00	15.90
41	Golok	0.00	0.65	4.00	7.35	12.00
	Total	2.50	12.90	131.50	310.35	457.25

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 195 PUBLIC DEVELOPMENT EXPENDITURE FOR ALT. F2

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	21.99	0.00	0.00	21.99
3	Kedah	0.00	0.00	0.00	0.00	0.00
5	Muda *	0.04	26.51	14.94	18.75	60.24
6	Perai	0.00	0.00	0.00	3.56	3.56
7	P.Pinang	0.00	15.00	15.00	0.00	30.00
9	Kurau	0.00	18.02	0.00	0.00	18.02
10	Perak	0.00	32.50	132.50	150.00	315.00
14	Buloh	0.00	0.00	0.00	0.00	0.00
15	Kalang	22.80	59.08	54.60	0.00	136.48
16	Langat *	0.00	0.00	0.00	0.00	0.00
18	Linggi *	4.76	5.29	0.00	5.50	10.26
19	Melaka	0.00	0.00	8.50	0.00	8.50
20	Kesang *	1.80	1.70	11.38	11.38	26.26
21	Muar *	0.00	0.00	14.26	16.09	30.35
22	Batu Pahat	40.00	35.00	55.00	25.92	155.92
23	Pontian Kechil	1.50	13.73	0.00	0.00	15.23
24	Johor	0.00	0.00	0.00	8.00	8.00
26	Mersing	0.00	0.00	0.00	6.60	6.60
27	Endau	0.00	0.00	5.61	0.00	5.61
30	Pahang *	5.39	127.05	146.47	133.20	412.11
31	Kuantan	0.00	0.00	0.00	34.06	34.06
32	Kemaman	0.00	9.75	0.00	0.00	9.75
36	Trengganu	0.00	0.00	20.79	58.08	78.87
37	Setiu	1.50	6.17	0.00	0.00	7.67
38	Besut	0.00	24.71	32.96	0.00	57.67
40	Kelantan	16.70	33.50	112.00	215.30	377.50
	Total	94.49	420.50	624.01	686.44	1825.44

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 196 ANNUAL RECURRENT EXPENDITURE FOR ALT. F2

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	0.00	2.20	2.20	4.40
5	Muda *	0.00	0.05	2.70	4.20	6.95
6	Perai	0.00	0.00	0.00	0.00	0.00
7	P.Pinang	0.00	0.00	1.50	3.00	4.50
9	Kurau	0.00	0.00	1.80	1..80	3.60
10	Perak	0.00	0.00	3.25	16.50	19.75
14	Buloh	0.00	0.00	0.00	0.00	0.00
15	Kalang	0.00	0.55	6.68	11.94	19.17
18	Linggi *	0.00	0.48	1.01	1.01	2.50
19	Melaka	0.00	0.00	0.00	0.85	0.85
20	Kesang *	0.00	0.18	0.35	1.49	2.02
21	Muar *	0.00	0.00	0.00	1.03	1.03
22	Batu Pahat	0.00	4.00	7.50	12.50	24.00
23	Pontian Kechil	0.00	0.15	1.52	1.52	3.19
24	Johor	0.00	0.00	0.00	0.00	0.00
26	Mersing	0.00	0.00	0.00	0.00	0.00
27	Endau	0.00	0.00	0.00	0.56	0.56
30	Pahang *	0.00	11.15	14.40	19.85	45.40
31	Kuantan	0.00	0.00	0.00	0.00	0.00
32	Kemaman	0.00	0.00	0.98	0.98	1.96
36	Trengganu	0.00	0.00	0.00	2.08	2.08
37	Setiu	0.00	0.15	0.76	0.76	1.67
38	Besut	0.00	0.00	2.47	5.77	8.24
40	Kelantan	0.00	1.67	2.27	11.07	15.01
	Total	0.00	18.38	49.39	99.11	166.88

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 197 PUBLIC DEVELOPMENT EXPENDITURE FOR ALT. F3

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	25.99	0.00	0.00	25.99
3	Kedah	0.00	0.12	0.00	9.94	10.06
5	Muda *	0.04	26.51	14.94	18.75	60.24
6	Perai	0.00	0.00	0.00	3.56	3.56
7	P.Pinang	0.00	0.00	15.00	15.00	30.00
9	Kurau	0.00	18.02	0.00	0.00	18.02
10	Perak	0.00	32.50	132.50	150.00	315.00
11	Bernam	0.00	0.00	0.00	5.41	5.41
14	Buloh	0.00	0.00	12.87	0.00	12.87
15	Kalang	26.40	38.72	38.72	38.71	142.55
16	Langat *	0.00	28.12	28.12	34.84	91.08
18	Linggi *	0.31	37.72	7.21	0.00	45.24
19	Melaka	0.26	10.88	5.78	13.37	30.29
20	Kesang *	1.80	1.70	16.43	16.43	36.36
21	Muar *	0.00	0.00	14.26	16.09	30.35
22	Batu Pahat	40.00	35.00	55.00	36.26	166.26
23	Pontian Kechil	1.50	16.54	0.00	0.00	18.04
24	Johor	0.00	0.00	0.00	8.00	8.00
26	Mersing	0.00	0.00	0.00	8.25	8.25
27	Endau	0.00	0.00	5.61	14.85	20.46
30	Pahang *	5.39	127.05	146.47	133.20	412.11
31	Kuantan	0.00	0.00	0.00	34.06	34.06
32	Kemaman	0.00	9.75	0.00	0.00	9.75
36	Trengganu	0.00	12.49	0.00	20.79	33.28
38	Besut	0.00	61.34	36.26	0.00	97.60
39	Kemasin	0.00	51.13	51.14	0.00	102.27
40	Kelantan	16.70	33.50	112.00	215.30	377.50
41	Golok	6.70	9.91	0.00	0.00	16.61
	Total	99.10	576.99	692.31	792.81	2161.21

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 198 ANNUAL RECURRENT EXPENDITURE FOR ALT. F3

Unit: Mil. M Dollars

B'n No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	0.00	0.00	2.60	2.60	5.20
3	Kedah	0.00	0.05	0.05	0.05	0.15
5	Muda *	0.00	0.05	2.70	4.20	6.95
6	Perai	0.00	0.00	0.00	0.00	0.00
7	P.Pinang	0.00	0.00	0.00	1.50	1.50
9	Kurau	0.00	0.00	1.80	1.80	3.60
10	Perak	0.00	0.00	3.25	16.50	19.75
11	Bernam	0.00	0.00	0.00	0.00	0.00
14	Buloh	0.00	0.00	0.00	1.30	1.30
15	Kalang	2.50	5.15	9.00	12.90	29.55
16	Langat *	0.00	0.00	2.80	5.60	8.40
18	Linggi *	0.00	0.05	3.85	4.55	8.45
19	Melaka	0.00	0.05	1.10	1.70	2.85
20	Kesang *	0.00	0.20	0.35	2.00	2.55
21	Muar *	0.00	0.00	0.00	1.03	1.03
22	Batu Pahat	0.00	4.00	7.50	12.50	24.00
23	Pontian Kechil	0.00	0.15	1.80	1.80	3.75
24	Johor	0.00	0.00	0.00	0.00	0.00
26	Mersing	0.00	0.00	0.00	0.00	0.00
27	Endau	0.00	0.00	0.00	0.55	0.55
30	Pahang *	0.00	11.15	14.40	19.85	45.40
31	Kuantan	0.00	0.00	0.00	0.00	0.00
32	Kemaman	0.00	0.00	1.00	1.00	2.00
36	Trengganu	0.00	0.45	0.45	0.45	1.35
38	Besut	0.00	0.00	6.15	9.75	15.90
39	Kemasin	0.00	0.00	5.15	10.35	15.50
40	Kelantan	0.00	1.65	2.25	12.00	15.90
41	Golok	0.00	0.65	1.65	1.65	3.95
	Total	2.50	23.60	67.85	125.63	219.58

Remarks: Population,GRP growth followed Case 1 (High growth).
Basin marked * are inter-state river basin.

Table 199 BUDGET SCHEDULED FOR 4MP PERIOD (FOR MAJOR PROJECTS)

Unit: M10^6

State	Project (River)	Disbursed up to TMP	Budget /1 for 4MP
Perlis	-	-	-
Kedah	-	-	-
P. Pinang	Tembus	0.62	0.04
Perak	-	-	-
Selangor	Kelang (Kuala Lumpur)	-	26.40 /2
N. Sembilan	-	-	-
Melaka	Bharu	-	0.31
	Duyong	-	0.26
Johor	Kesang	1.00	1.80
	Batu Pahat	-	1.00 /3
	Sekudai	-	1.12
	Tebrau	-	0.38
Pahang	Pekan Polder	2.04	5.11
	Mentekab Polder	0.05	0.28
Trengganu	Setiu	0.06	1.50
Kelantan	Pasir Mas Bund	-	10.00
	Pasir Pekan Bund	-	6.70
	Golok Bund	-	6.70
Total		3.77	61.60 /3

Remarks; /1: Excluding budgets for minor projects (See Table 13), flood forecasting system (M$2.09 x 10^6 - Peninsular only), coastal dredging (M$47.68 x 10^6), Machap dam (M$3.0 x 10^6)

/2: Out of total budget M$75 x 10^6 which includes cost for Batu dam, M$26.40 x 10^6 allocated to flood control

/3: On top of M$1.0 x 10^6, an additional budget M$39 x 10^6 is proposed in this study to include the flood control cost of Bekok and Semberang dams which are to be implemented in 4MP period (Ref. Sectoral Report - Water Resources Planning)

Source; Ref. 44

Table 200 PROCUREMENT OF DREDGERS

Unit: M$10^6

State	No. of River Needing Estuary Dredging	No. of Dredgers /1 to be Allotted	Procurement Cost /2	Annual Operating Cost
Perlis	-	-	-	-
Kedah	2	0.10 /3	1.0	0.1
P. Pinang	3	0.25 /3	2.5	0.2
Perak	1	0.15 /3	1.5	0.10
Selangor	2	0.25 /3	2.5	0.2
N. Sembilan	-	-	-	-
Melaka	1	0.25 /3	2.5	0.2
Johor	4	1	10	0.7
Pahang	6	2	20	1.4
Trengganu	11	3	30	2.1
Kelantan	6	2	20	1.4
Total	36	9 /3	90	6.4

Remarks; /1: Tentative allocation of 9 units of 14-inch class dredger

/2: M$10 x 10^6/dredger

/3: Expressed in number equivalent to 14-inch class dredger. Alternatively, procurement of small dredgers or Contract dredging rather than Departmental dredging recommendable for these states.

Table 201 GOVERNMENT PERSONNEL REQUIREMENT

Unit: person

	Engineer	Tech. Assist.	Techni-cian	Others	Adm. Staff	Consult.
Structural Measures						
Government staff during construction						
Annual constr. cost less than M$2.5 x 10^6	2	3	4	10	1	1
2.5 - 5	3	4	10	12	1	2
5 - 10	5	6	15	14	2	3
10 - 15	7	8	20	18	2	4
15 - 20	10	10	30	20	3	6
20 - 30	15	15	35	25	4	8
30 - 50	20	20	40	30	6	10
50 - 75	25	25	50	40	7	12
75 - 100	30	30	60	45	8	15
Operation and maintenance staff						
Part of staff during construction to be remained as O&M staff	5%	10%	10%	10%	10%	0

Table 202 OPERATING CREW OF DREDGING FLEET

Unit: person

Trade	Engineer	Tech. Assist.	Techni-cian	Various	Con-sultant	Total
For one fleet (14-inch class)	1	1	1	15	-	18

Table 203 MAN-POWER REQUIREMENT

Unit: Person

State: Perlis

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	0	5	0	0
	T.Assis'	0	8	0	0
	Techni'n	0	15	0	0
	Others	0	14	0	0
	Total G. staff	0	42	0	0
	Consultants	0	3	0	0
O&M	Engineer	0	0	1	1
	T.Assis'	0	0	2	2
	Techni'n	0	0	2	2
	Others	0	0	2	2
	Total G. staff	0	0	7	7
Alt. F2					
Constr.	Engineer	0	3	0	0
	T.Assis'	0	5	0	0
	Techni'n	0	10	0	0
	Others	0	12	0	0
	Total G. staff	0	30	0	0
	Consultants	0	2	0	0
O&M	Engineer	0	0	1	1
	T.Assis'	0	0	2	2
	Techni'n	0	0	1	1
	Others	0	0	2	2
	Total G. staff	0	0	6	6
Alt. F3					
Constr.	Engineer	0	5	0	0
	T.Assis'	0	8	0	0
	Techni'n	0	15	0	0
	Others	0	14	0	0
	Total G. staff	0	42	0	0
	Consultants	0	3	0	0
O&M	Engineer	0	0	1	1
	T.Assis'	0	0	2	2
	Techni'n	0	0	2	2
	Others	0	0	2	2
	Total G. staff	0	0	7	7

Table 204 MAN-POWER REQUIREMENT

Unit: Person

State: Kedah

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	0	5	5	10
	T.Assis'	0	8	8	16
	Techni'n	0	15	15	30
	Others	0	14	14	28
	Total G. staff	0	42	42	84
	Consultants	0	3	3	6
O&M	Engineer	0	0	1	2
	T.Assis'	0	0	2	4
	Techni'n	0	0	2	4
	Others	0	0	2	4
	Total G. staff	0	0	7	14
Alt. F2					
Constr.	Engineer	0	5	3	0
	T.Assis'	0	8	5	0
	Techni'n	0	15	10	0
	Others	0	14	12	0
	Total G. staff	0	42	30	0
	Consultants	0	3	2	0
O&M	Engineer	0	0	1	2
	T.Assis'	0	0	2	4
	Techni'n	0	0	2	3
	Others	0	0	2	4
	Total G. staff	0	0	7	13
Alt. F3					
Constr.	Engineer	0	7	3	2
	T.Assis'	0	12	5	4
	Techni'n	0	19	10	4
	Others	0	24	12	10
	Total G. staff	0	62	30	20
	Consultants	0	4	2	1
O&M	Engineer	0	0	2	3
	T.Assis'	0	0	4	6
	Techni'n	0	0	3	4
	Others	0	0	3	5
	Total G. staff	0	0	12	18

Table 205 MAN-POWER REQUIREMENT

Unit: Person

State: Pulau Pinang

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	2	3	3	5
	T.Assis'	4	5	5	4
	Techni'n	4	10	10	4
	Others	10	12	12	10
	Total G. staff	20	30	30	23
	Consultants	1	2	2	3
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	4	6
	Techni'n	0	1	2	3
	Others	0	1	3	5
	Total G. staff	0	5	11	17
Alt. F2					
Constr.	Engineer	2	3	3	5
	T.Assis'	4	5	5	9
	Techni'n	4	10	10	14
	Others	10	12	12	22
	Total G. staff	20	30	30	50
	Consultants	1	2	2	3
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	4	6
	Techni'n	0	1	2	3
	Others	0	1	3	5
	Total G. staff	0	5	11	17
Alt. F3					
Constr.	Engineer	2	0	3	8
	T.Assis'	4	0	5	14
	Techni'n	4	0	10	24
	Others	10	0	12	34
	Total G. staff	20	0	30	80
	Consultants	1	0	2	5
O&M	Engineer	0	1	1	2
	T.Assis'	0	2	2	4
	Techni'n	0	1	1	2
	Others	0	1	1	3
	Total G. staff	0	5	5	11

Table 206 MAN-POWER REQUIREMENT

Unit: Person

State: Perak

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	0	18	20	20
	T.Assis'	0	24	26	26
	Techni'n	0	45	40	40
	Others	0	37	30	30
	Total G. staff	0	124	116	116
	Consultants	0	10	10	10
O&M	Engineer	0	0	2	3
	T.Assis'	0	0	5	8
	Techni'n	0	0	5	9
	Others	0	0	5	8
	Total G. staff	0	0	17	28
Alt. F2					
Constr.	Engineer	0	8	15	20
	T.Assis'	0	13	19	26
	Techni'n	0	25	35	40
	Others	0	26	25	30
	Total G. staff	0	72	94	116
	Consultants	0	5	8	10
O&M	Engineer	0	0	2	3
	T.Assis'	0	0	4	7
	Techni'n	0	0	3	7
	Others	0	0	4	7
	Total G. staff	0	0	13	24
Alt. F3					
Constr.	Engineer	0	7	15	20
	T.Assis'	0	12	19	26
	Techni'n	0	19	35	40
	Others	0	24	25	30
	Total G. staff	0	62	94	116
	Consultants	0	4	8	10
O&M	Engineer	0	0	2	3
	T.Assis'	0	0	4	7
	Techni'n	0	0	3	7
	Others	0	0	3	6
	Total G. staff	0	0	12	23

Table 207 MAN-POWER REQUIREMENT

Unit: Person

State: Selangor

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	5	10	13	15
	T.Assis'	8	16	21	25
	Techni'n	15	30	40	44
	Others	14	28	40	50
	Total G. staff	42	84	114	134
	Consultants	3	6	8	7
O&M	Engineer	0	1	3	6
	T.Assis'	0	2	6	12
	Techni'n	0	2	6	11
	Others	0	2	6	12
	Total G. staff	0	7	21	41
Alt. F2					
Constr.	Engineer	3	7	7	0
	T.Assis'	5	10	10	0
	Others	10	20	20	0
	Techni'n	12	18	18	0
	Total G. staff	30	55	55	0
	Consultants	2	4	4	0
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	4	6
	Techni'n	0	1	3	5
	Others	0	2	4	6
	Total G. staff	0	6	13	20
Alt. F3					
Constr.	Engineer	5	10	13	12
	T.Assis'	8	16	21	20
	Techni'n	15	30	40	34
	Others	14	28	40	38
	Total G. staff	42	84	114	104
	Consultants	3	6	8	7
O&M	Engineer	0	1	3	6
	T.Assis'	0	2	6	12
	Techni'n	0	2	6	11
	Others	0	2	6	12
	Total G. staff	0	7	21	41

Table 208 MAN-POWER REQUIREMENT

Unit: Person

State: Melaka

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	4	4	7	6
	T.Assis'	8	8	13	10
	Techni'n	8	8	18	20
	Others	20	20	32	24
	Total G. staff	40	40	70	60
	Consultants	2	2	4	4
O&M	Engineer	0	2	4	7
	T.Assis'	0	4	8	14
	Techni'n	0	2	4	7
	Others	0	2	4	8
	Total G. staff	0	10	20	36
Alt. F2					
Constr.	Engineer	2	0	4	4
	T.Assis'	4	0	8	8
	Techni'n	4	0	8	8
	Others	10	0	20	20
	Total G. staff	20	0	40	40
	Consultants	1	0	2	2
O&M	Engineer	0	1	1	3
	T.Assis'	0	2	2	6
	Techni'n	0	1	1	3
	Others	0	1	1	3
	Total G. staff	0	5	5	15
Alt. F3					
Constr.	Engineer	4	4	7	6
	T.Assis'	8	8	13	10
	Techni'n	8	8	18	20
	Others	20	20	32	24
	Total G. staff	40	40	70	60
	Consultants	2	2	4	4
O&M	Engineer	0	2	4	7
	T.Assis'	0	4	8	14
	Techni'n	0	2	4	7
	Others	0	2	4	8
	Total G. staff	0	10	20	36

Table 209 MAN-POWER REQUIREMENT

Unit: Person

State: Negri Sembilan

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	0	5	5	8
	T.Assis'	0	8	8	14
	Techni'n	0	15	15	24
	Others	0	14	14	34
	Total G. staff	0	42	42	80
	Consultants	0	3	3	5
O&M	Engineer	0	0	1	2
	T.Assis'	0	0	2	4
	Techni'n	0	0	2	4
	Others	0	0	2	4
	Total G. staff	0	0	7	14
Alt. F2					
Constr.	Engineer	0	2	3	2
	T.Assis'	0	4	5	4
	Techni'n	0	4	10	4
	Others	0	10	12	10
	Total G. staff	0	20	30	20
	Consultants	0	1	2	1
O&M	Engineer	0	0	1	2
	T.Assis'	0	0	2	4
	Techni'n	0	0	1	2
	Others	0	0	1	2
	Total G. staff	0	0	5	10
Alt. F3					
Constr.	Engineer	0	5	2	4
	T.Assis'	0	8	4	8
	Techni'n	0	15	4	8
	Others	0	14	10	20
	Total G. staff	0	42	20	40
	Consultants	0	3	1	2
O&M	Engineer	0	0	1	2
	T.Assis'	0	0	2	4
	Techni'n	0	0	2	3
	Others	0	0	2	3
	Total G. staff	0	0	7	12

Table 210 MAN-POWER REQUIREMENT

Unit: Person

State: Johor

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	9	25	36	35
	T.Assis'	16	36	52	51
	Techni'n	23	64	83	84
	Others	34	61	82	80
	Total G. staff	82	186	253	250
	Consultants	5	14	19	19
O&M	Engineer	0	3	7	12
	T.Assis'	0	6	15	26
	Techni'n	0	4	12	22
	Others	0	4	12	21
	Total G. staff	0	17	46	81
Alt. F2					
Constr.	Engineer	9	10	9	11
	T.Assis'	16	17	14	20
	Techni'n	23	29	24	27
	Others	34	36	28	44
	Total G. staff	82	92	75	102
	Consultants	5	6	5	6
O&M	Engineer	0	3	6	9
	T.Assis'	0	6	12	18
	Techni'n	0	4	8	12
	Others	0	4	9	13
	Total G. staff	0	17	35	52
Alt. F3					
Constr.	Engineer	9	10	11	15
	T.Assis'	16	17	18	26
	Techni'n	23	29	28	43
	Others	34	36	38	58
	Total G. staff	82	92	95	142
	Consultants	5	6	6	9
O&M	Engineer	0	3	6	9
	T.Assis'	0	6	12	18
	Techni'n	0	4	8	12
	Others	0	4	9	13
	Total G. staff	0	17	35	52

Table 211 MAN-POWER REQUIREMENT

Unit: Person

State: Pahang

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	2	30	35	37
	T.Assis'	4	38	46	48
	Techni'n	4	60	75	80
	Others	10	45	59	63
	Total G. staff	20	173	215	228
	Consultants	1	15	18	19
O&M	Engineer	0	1	3	6
	T.Assis'	0	2	6	12
	Techni'n	0	1	7	15
	Others	0	1	6	13
	Total G. staff	0	5	22	46
Alt. F2					
Constr.	Engineer	2	15	15	20
	T.Assis'	4	19	19	27
	Techni'n	4	35	35	50
	Others	10	25	25	39
	Total G. staff	20	94	94	136
	Consultants	1	8	8	11
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	5	8
	Techni'n	0	1	5	9
	Others	0	1	4	7
	Total G. staff	0	5	16	27
Alt. F3					
Constr.	Engineer	2	15	15	20
	T.Assis'	4	19	19	27
	Techni'n	4	35	35	50
	Others	10	25	25	39
	Total G. staff	20	94	94	136
	Consultants	1	8	8	11
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	5	8
	Techni'n	0	1	5	9
	Others	0	1	4	7
	Total G. staff	0	5	16	27

Table 212 MAN-POWER REQUIREMENT

Unit: Person

State: Trengganu

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	2	20	25	25
	T.Assis'	4	28	37	36
	Techni'n	4	60	75	75
	Others	10	50	62	64
	Total G. staff	20	158	199	200
	Consultants	1	12	15	15
O&M	Engineer	0	1	4	8
	T.Assis'	0	2	8	16
	Techni'n	0	1	7	16
	Others	0	1	7	15
	Total G. staff	0	5	26	55
Alt. F2					
Constr.	Engineer	2	7	8	7
	T.Assis'	4	13	13	10
	Techni'n	4	18	25	20
	Others	10	32	26	18
	Total G. staff	20	70	72	55
	Consultants	1	4	5	4
O&M	Engineer	0	1	4	6
	T.Assis'	0	2	8	12
	Techni'n	0	1	4	7
	Others	0	1	5	9
	Total G. staff	0	5	21	34
Alt. F3					
Constr.	Engineer	0	11	5	3
	T.Assis'	0	18	8	5
	Techni'n	0	28	15	10
	Others	0	38	14	12
	Total G. staff	0	95	42	30
	Consultants	0	6	3	2
O&M	Engineer	0	0	3	4
	T.Assis'	0	0	6	8
	Techni'n	0	0	4	6
	Others	0	0	4	6
	Total G. staff	0	0	17	24

Table 213 MAN-POWER REQUIREMENT

Unit: Person

State: Kelantan

		4MP	5MP	6MP	7MP
Alt. F1					
Constr.	Engineer	5	17	27	20
	T.Assis'	9	26	37	26
	Techni'n	14	50	70	40
	Others	22	46	57	30
	Total G. staff	50	139	191	116
	Consultants	3	10	15	10
O&M	Engineer	0	2	5	8
	T.Assis'	0	4	10	17
	Techni'n	0	2	8	16
	Others	0	3	9	16
	Total G. staff	0	11	32	57
Alt. F2					
Constr.	Engineer	3	3	15	20
	T.Assis'	5	5	19	26
	Techni'n	10	10	35	40
	Others	12	12	25	30
	Total G. staff	30	30	94	116
	Consultants	2	2	8	10
O&M	Engineer	0	1	2	3
	T.Assis'	0	2	4	7
	Techni'n	0	1	2	6
	Others	0	2	4	7
	Total G. staff	0	6	12	23
Alt. F3					
Constr.	Engineer	5	14	22	20
	T.Assis'	9	22	29	26
	Techni'n	14	39	55	40
	Others	22	42	43	30
	Total G. staff	50	117	149	116
	Consultants	3	8	12	10
O&M	Engineer	0	2	5	7
	T.Assis'	0	4	10	15
	Techni'n	0	2	7	13
	Others	0	3	8	13
	Total G. staff	0	11	30	48

Table 214 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN PERLIS

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	($M\$10^6$)	1.7	1.5	1.7
1.2 Economic Cost				
Flood mitigation work	($M\$10^6$)	1.0	0.9	1.1
1.3 EIRR	(%)	11.9	11.0	10.8
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	46	34	46
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	31	25	31
Population served by proposed flood warning system in 2000	(10^3)	9	9	9
Area relieved from flood hazards	(10^3 ha)	5	4	5
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	0	0	0

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 215 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN KEDAH

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	($M\$10^6$)	2.6	1.5	2.1
1.2 Economic Cost				
Flood mitigation work	($M\$10^6$)	3.8	1.6	1.8
1.3 EIRR	(%)	5.8	7.7	9.2
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	152	59	75
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	66	29	41
Population served by proposed flood warning system in 2000	(10^3)	10	10	10
Area relieved from flood hazards	(10^3 ha)	11	6	7
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)			

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 216 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN P. PINANG

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	2.6	2.6	2.4
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	1.5	1.5	1.2
1.3 EIRR	(%)	16.4	17.1	26.1
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	25	23	23
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	42	39	39
Population served by proposed flood warning system in 2000	(10^3)	6	6	6
Area relieved from flood hazards	(10^3 ha)	6	6	6
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	4	3	3

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 217 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN PERAK

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	10.9	9.7	9.7
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	17.4	8.9	8.9
1.3 EIRR	(%)	5.1	8.5	8.5
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	61	13	13
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	354	259	259
Population served by proposed flood warning system in 2000	(10^3)	163	163	163
Area relieved from flood hazards	(10^3 ha)	79	95	95
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	27	4	4

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 218 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN SELANGOR

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	4.2	3.2	4.2
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	9.0	5.3	8.5
1.3 EIRR	(%)	3.8	5.0	4.1
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	235	36	217
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	425	216	416
Population served by proposed flood warning system in 2000	(10^3)	138	138	138
Area relieved from flood hazards	(10^3 ha)	87	3	79
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	9	2	8

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 21.9 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN MELAKA

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	2.3	2.1	2.9
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	2.0	1.1	2.0
1.3 EIRR	(%)	8.9	12.7	11.0
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	113	45	117
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	125	96	125
Population served by proposed flood warning system in 2000	(10^3)	25	25	25
Area relieved from flood hazards	(10^3 ha)	20	14	20
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	1	1	1

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 220 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN N. SEMBILAN

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	3.4	1.9	2.2
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	3.4	0.9	2.2
1.3 EIRR	(%)	7.9	15.2	7.9
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	217	68	93
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	101	57	84
Population served by proposed flood warning system in 2000	(10^3)	17	17	17
Area relieved from flood hazards	(10^3 ha)	14	4	10
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	2	1	1

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 221 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN JOHOR

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	7.0	5.1	5.7
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	22.0	7.6	8.2
1.3 EIRR	(%)	2.0	5.8	6.1
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	425	154	204
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	184	102	132
Population served by proposed flood warning system in 2000	(10^3)	31	31	31
Area relieved from flood hazards	(10^3 ha)	65	31	40
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	4	3	4

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 222 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN PAHANG

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	($M\$10^6$)	12.1	9.1	9.1
1.2 Economic Cost				
Flood mitigation work	($M\$10^6$)	57.0	13.3	13.3
1.3 EIRR	(%)	0.3	5.0	5.0
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	579	6	6
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	366	90	90
Population served by proposed flood warning system in 2000	(10^3)	108	108	108
Area relieved from flood hazards	(10^3 ha)	284	5	5
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	47	3	3

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 223 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN TRENGGANU

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	7.3	4.8	5.1
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	17.4	4.5	5.0
1.3 EIRR	(%)	2.6	8.4	8.1
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	350	71	71
2.2 Adverse Effect		-	-	-
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	243	148	111
Population served by proposed flood warning system in 2000	(10^3)	45	45	45
Area relieved from flood hazards	(10^3 ha)	83	31	29
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	27	6	6

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 224 BENEFICIAL AND ADVERSE EFFECTS OF FLOOD MITIGATION ALTERNATIVES IN KELANTAN

Item		Alternative F1	F2	F3
1. National Economic Development				
1.1 Economic Benefit				
Damage reduction/1	(M$10^6)	34.7	24.7	31.7
1.2 Economic Cost				
Flood mitigation work	(M$10^6)	16.2	9.3	14.2
1.3 EIRR	(%)	14.6	16.2	14.1
2. Environmental Quality				
2.1 Beneficial Effect				
Length of improved river stretch	(km)	138	65	75
2.2 Adverse Effect				
3. Social Well-Being				
3.1 Beneficial Effect				
Number of protected people by proposed facilities in 2000	(10^3)	724	522	694
Population served by proposed flood warning system in 2000	(10^3)	233	233	233
Area relieved from flood hazards	(10^3 ha)	165	92	144
3.2 Adverse Effect				
Number of people to be removed for construction of facilities	(10^3)	45	26	26

Remarks; /1: High growth rates of per capita GDP and population are applied for annual average damage estimate at 2000 condition.

Table 225 RECOMMENDED FLOOD MITIGATION PROGRAM
CHANNEL IMPROVEMENT

Unit: km

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	-	34	-	-	34
2	P. Langkawi	-	-	-	-	-
3	Kedah	-	-	-	-	-
4	Merbok	-	-	-	-	-
5	Muda	3	45	13.5	13.5	75
6	Perai	-	-	-	4	4
7	P. Pinang	-	1	1	-	2
8	Kurian	-	-	-	-	-
9	Kurau	-	13	-	-	13
10-13	Perak+	-	-	-	-	-
14	Buloh	-	-	-	-	-
15	Kelang	-	20	16	-	36
16	Langat	-	-	-	-	-
17	Sepang	-	-	-	-	-
18	Linggi	12	15	-	14	41
19	Melaka	-	-	-	-	-
20	Kesang	1.5	6	19	11.5	38
21	Muar	-	-	20	33	53
22	Batu Pahat	-	24	37	32	93
23	Pontian Kechil	15	10	-	-	25
24	Johor	-	-	-	-	-
25	Sedili Besar	-	-	-	-	-
26	Mersing	-	-	-	6	6
27	Endau	-	-	11	-	11
28-30	Rompin+	-	-	-	-	-
31	Kuantan	-	-	-	6	6
32-35	Kemaman+	-	-	-	-	-
36	Trengganu	-	-	5	24	29
37	Setiu	-	9	-	-	9
38	Besut	-	-	33	-	33
39	Kemasin	-	-	-	-	-
40	Kelantan	5	-	20	40	65
41	Golok	-	-	-	-	-
	Total	36.5	177.0	175.5	184	573

Table 226 RECOMMENDED FLOOD MITIGATION PROGRAM
FLOODWAYS

Unit: km

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1 - 9	Perlis+	-	-	-	-	-
10	Perak	-	-	20	30	50
11 - 18	Bernam+	-	-	-	-	-
19	Melaka	-	-	5	-	5
20 - 21	Kesang+	-	-	-	-	-
22	Batu Pahat	-	-	19	-	19
23 - 38	Pontian Kechil+	-	-	-	-	-
39	Kemasin	-	-	-	-	-
40 - 41	Kelantan+	-	-	-	-	-
	Total	-	-	44	30	74

Table 227 RECOMMENDED FLOOD MITIGATION PROGRAM
DAMS

Unit: Numbers

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	-	1	-	-	1
2 - 14	P. Langkawi+	-	-	-	-	-
15	Kelang	2	-	-	-	2
16 - 20	Langat+	-	-	-	-	-
21	Muar	-	-	1	-	1
22	Batu Pahat	1	-	-	-	1
23 - 29	Pontian Kechil+	-	-	-	-	-
30	Pahang	-	2	1	-	3
31 - 39	Kuantan+	-	-	-	-	-
40	Kelantan	-	1	1	-	2
41	Golok	-	-	-	-	-
	Total	3	4	3	-	10

Table 228 RECOMMENDED FLOOD MITIGATION PROGRAM
POLDERS

Unit: Numbers

Basin No.	Basin No.	4MP	5MP	6MP	7MP	Total
1 - 9	Perlis+	-	-	-	-	-
10	Perak	-	-	1	-	1
11 - 20	Bernam+	-	-	-	-	-
21	Muar	-	-	-	1	1
22 - 23	Batu Pahat+	-	-	-	-	-
24	Johor	-	-	-	1	1
25 - 29	Sedili Besar+	-	-	-	-	-
30	Pahang	-	1	1	2	4
31	Kuantan	-	-	-	1	1
32	Kemaman	-	1	-	-	1
33 - 35	Paka+	-	-	-	-	-
36	Trengganu	-	-	1	-	1
37 - 39	Setiu+	-	-	-	-	-
40	Kelantan	-	1	-	-	1
41	Golok	-	-	-	-	-
	Total	-	3	3	5	11

Table 229 RECOMMENDED FLOOD MITIGATION PROGRAM
NON-STRUCTURAL MEASURES
(RESETTLEMENT PLAN)

Unit: 10^3 person

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1 - 29	Perlis+	-	-	-	-	-
30	Pahang	-	10	-	-	10
31 - 41	Kuantan+	-	-	-	-	-
	Total	-	10	-	-	10

Table 230 RECOMMENDED FLOOD MITIGATION PROGRAM
PEOPLE PROTECTED

Unit: 10^3 persons

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	-	25	-	-	25
2	P. Langkawi	-	-	-	-	-
3	Kedah	-	-	-	-	-
4	Merbok	-	-	-	-	-
5	Muda	22	21	8	3	54
6	Perai	-	-	-	3	3
7	P. Pinang	-	6	6	-	12
8	Kurian	-	-	-	-	-
9	Kurau	-	3	-	-	3
10	Perak	-	23	107	126	256
11	Bernam	-	-	-	-	-
12	Tengi	-	-	-	-	-
13	Selangor	-	-	-	-	-
14	Buloh	-	-	-	-	-
15	Kelang	-	126	89	-	215
16	Langat	-	-	-	-	-
17	Sepang	-	-	-	-	-
18	Linggi	17	24	-	12	53
19	Melaka	-	-	52	-	52
20	Kesang	2	-	15	3	20
21	Muar	-	-	10	35	45
22	Batu Pahat	-	5	8	15	28
23	Pontian Kechil	13	6	-	-	19
24	Johor	-	-	-	5	5
25	Sedili Besar	-	-	-	-	-
26	Mersing	-	-	-	23	23
27	Endau	-	-	18	-	18
28	Rompin	-	-	-	-	-
29	Bebar	-	-	-	-	-
30	Pahang	9	26	-	28	63
31	Kuantan	-	-	-	27	27
32	Kemaman	-	14	-	-	14
33	Paka	-	-	-	-	-
34	Dungun	-	-	-	-	-
35	Marang	-	-	-	-	-
36	Trengganu	-	-	35	43	78
37	Setiu	-	2	-	-	2
38	Besut	-	-	55	-	55
39	Kemasin	-	50	66	-	116
40	Kelantan	21	19	99	267	406
41	Golok	-	-	-	-	-
	Total	84	350	568	590	1,592

Table 231 RECOMMENDED FLOOD MITIGATION PROGRAM
AREA PROTECTED

Unit: km^2

Basin No.	Basin Name	4MP	5MP	6MP	7MP	Total
1	Perlis	-	37	-	-	37
2	P. Langkawi	-	-	-	-	-
3	Kedah	-	-	-	-	-
4	Merbok	-	-	-	-	-
5	Muda	50	38	33	-	121
6	Perai	-	-	-	5	5
7	P. Pinang	-	1	1	-	2
8	Kurian	-	-	-	-	-
9	Kurau	-	25	-	-	25
10	Perak	-	5	371	549	925
11	Bernam	-	-	-	-	-
12	Tengi	-	-	-	-	-
13	Selangor	-	-	-	-	-
14	Buloh	-	-	-	-	-
15	Kelang	-	29	7	-	36
16	Langat	-	-	-	-	-
17	Sepang	-	-	-	-	-
18	Linggi	20	10	-	13	43
19	Melaka	-	-	37	-	37
20	Kesang	2	8	49	32	91
21	Muar	-	-	12	26	38
22	Batu Pahat	-	42	124	94	260
23	Pontian Kechil	3	5	-	-	8
24	Johor	-	-	-	1	1
25	Sedili Besar	-	-	-	-	-
26	Mersing	-	-	-	9	9
27	Endau	-	-	8	-	8
28	Rompin	-	-	-	-	-
29	Bebar	-	-	-	-	-
30	Pahang	3	17	-	9	29
31	Kuantan	-	-	-	22	22
32	Kemaman	-	20	-	-	20
33	Paka	-	-	-	-	-
34	Dungun	-	-	-	-	-
35	Marang	-	-	-	-	-
36	Trengganu	-	-	32	65	97
37	Setiu	-	6	-	-	6
38	Besut	-	-	185	-	185
39	Kemasin	-	62	82	-	144
40	Kelantan	41	9	197	530	777
41	Golok	-	-	-	-	-
	Total	119	314	1,138	1,355	2,926

FIGURES

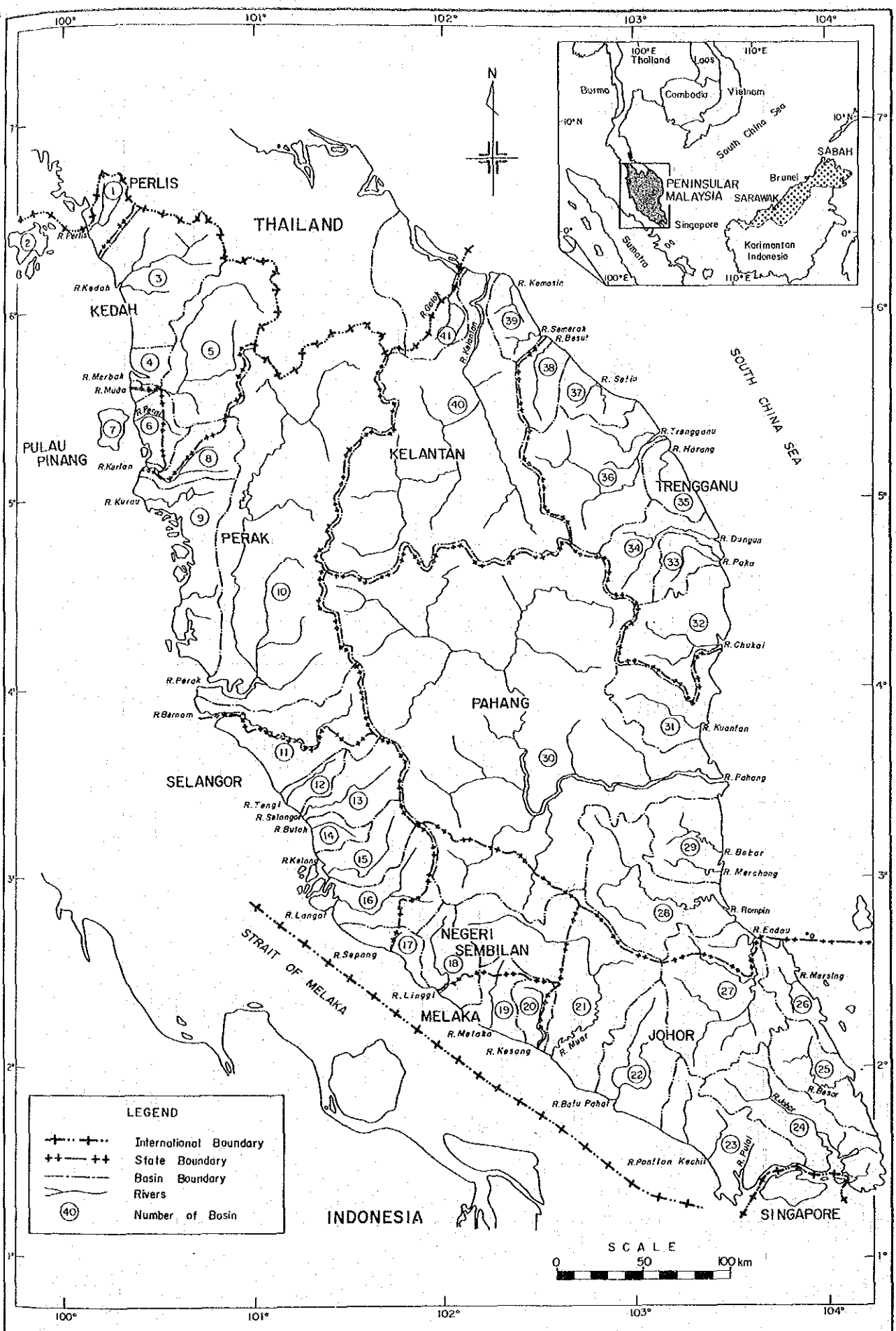

Fig. 1 Basin Division

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NATIONAL WATER RESOURCES STUDY MALAYSIA
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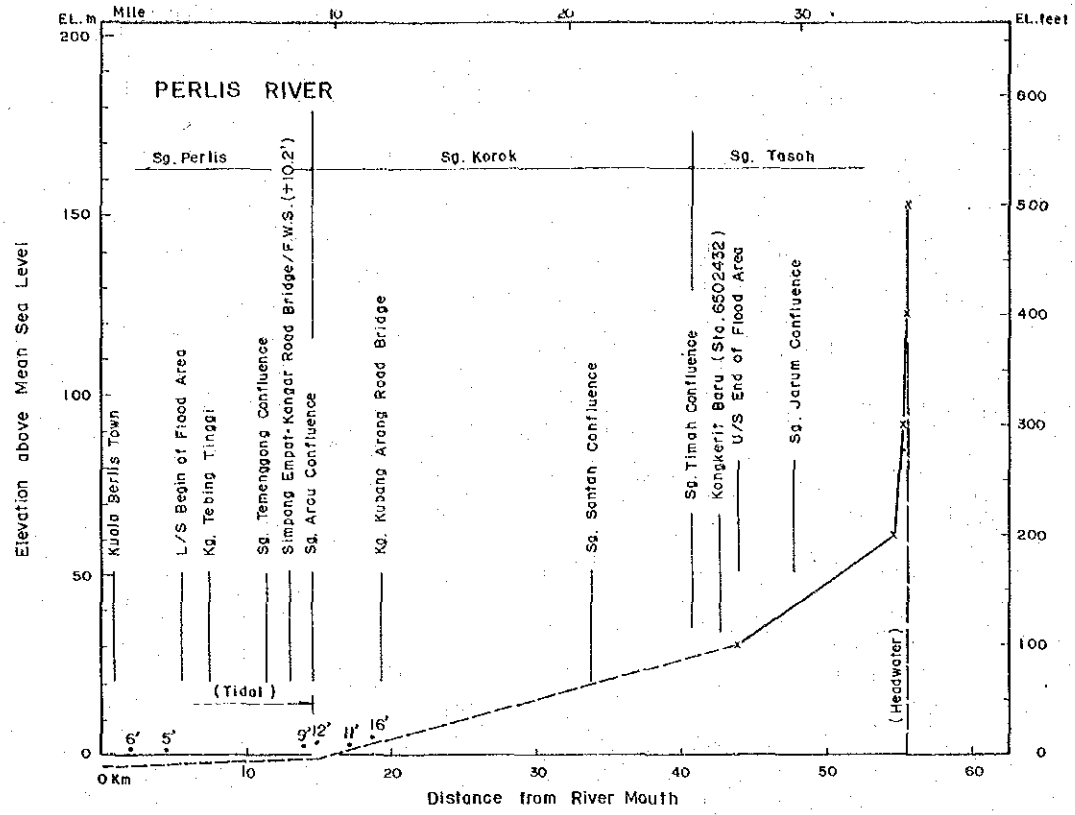

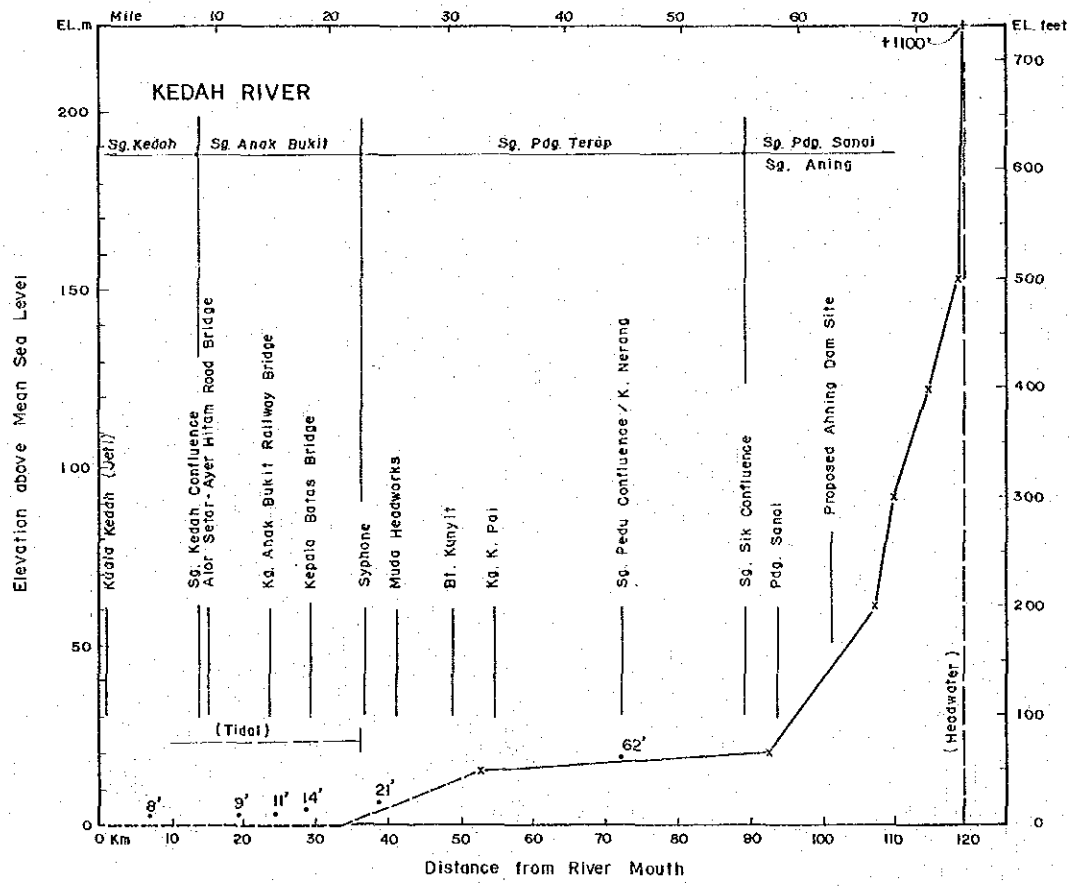

——— Estimated
•9' River bank level (feet)

Fig. 2 River Profile (1/18)
— Perlis River
— Kedah River

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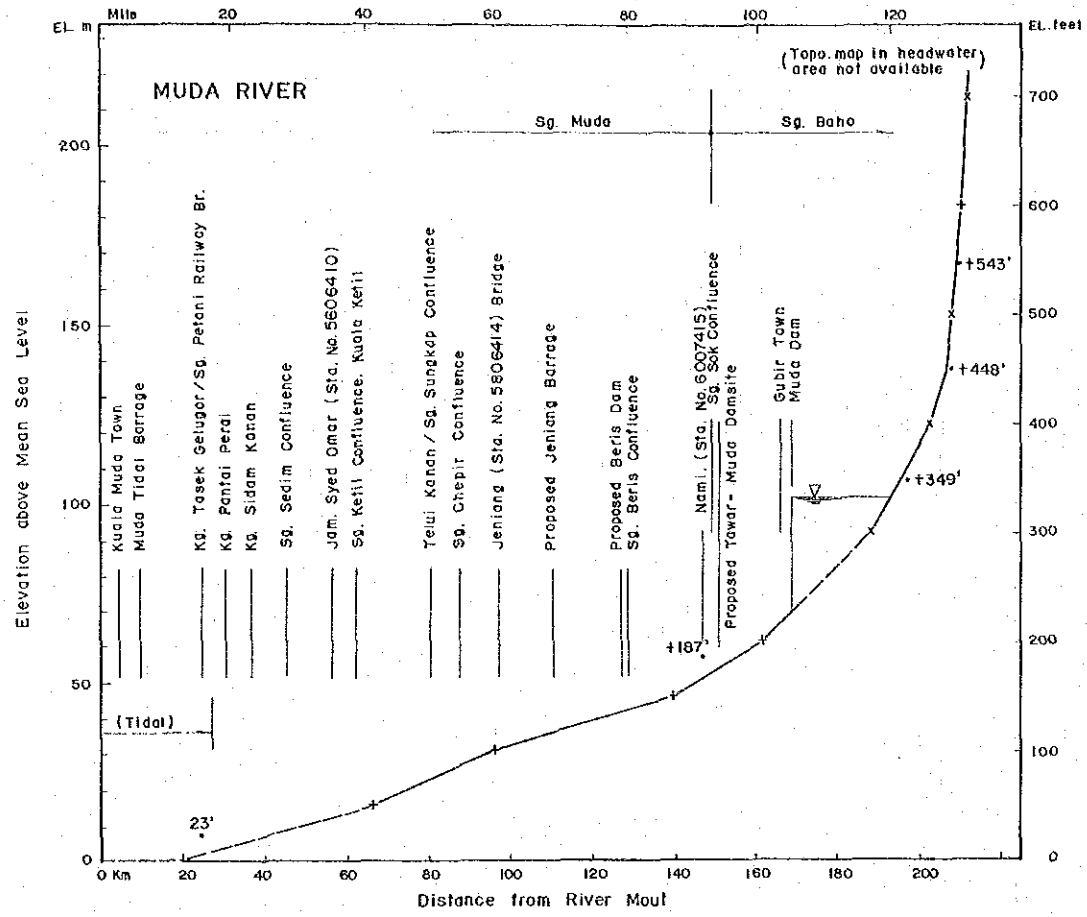

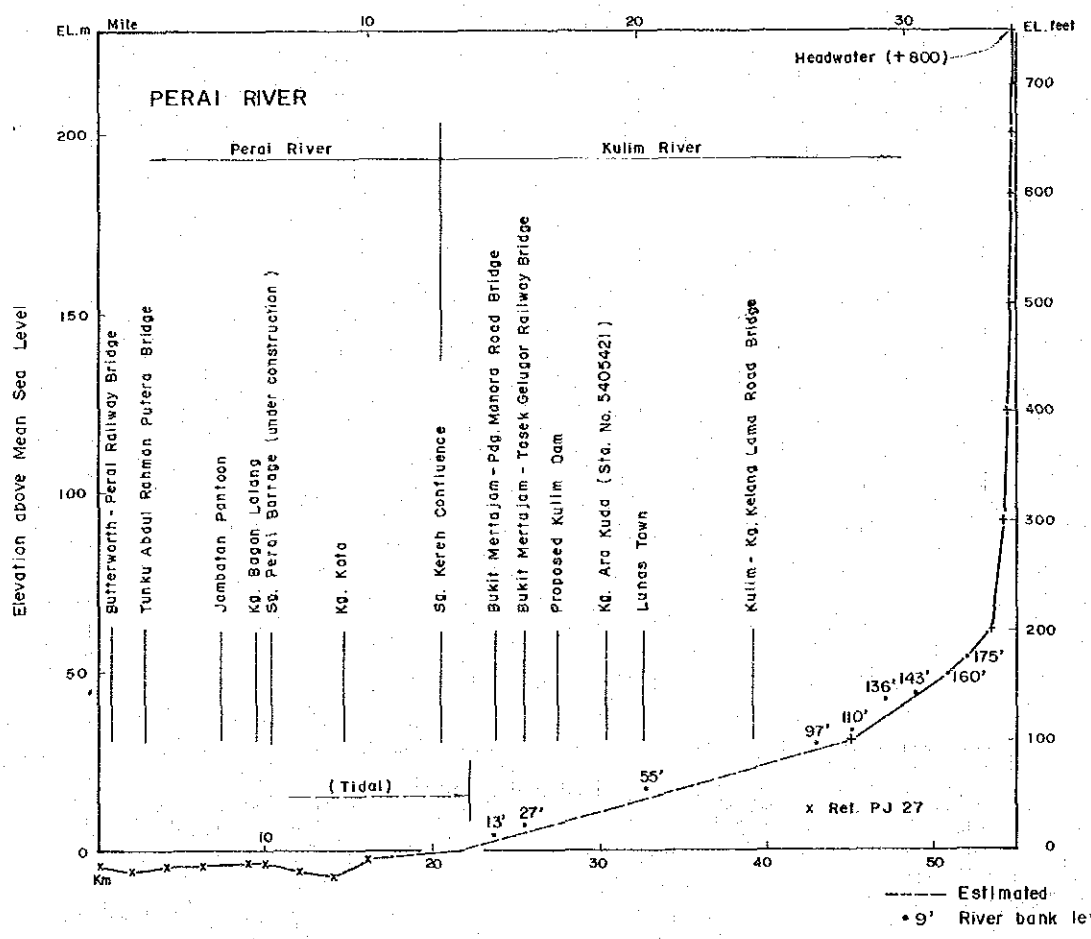

Fig. 3 River Profile (2/18)
— Muda River
— Perai River

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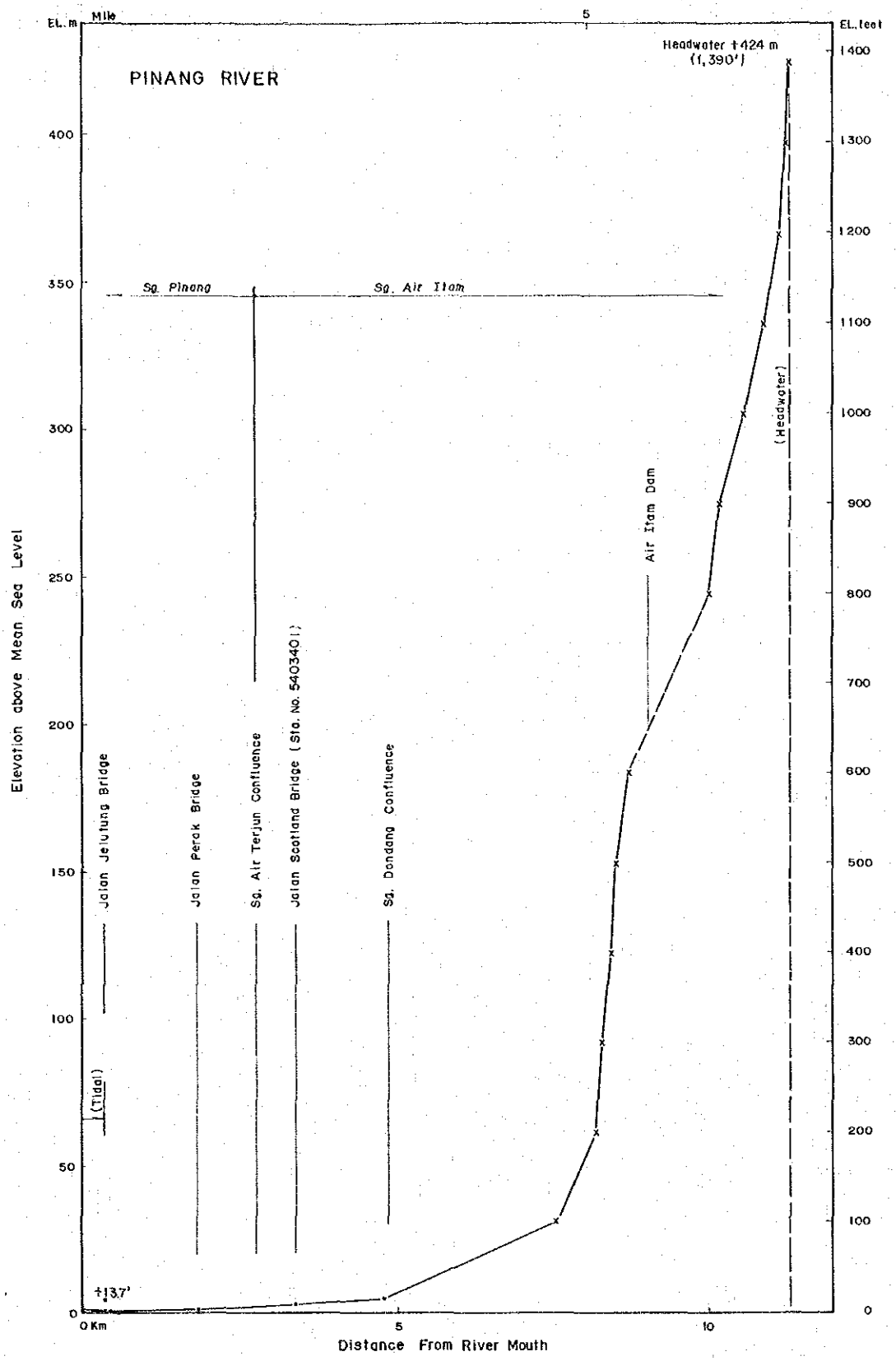
JAPAN INTERNATIONAL COOPERATION AGENCY



---- Estimated
• 9' River bank level (feet)

Fig. 4 River Profile (3/18)
— Pinang River

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JAPAN INTERNATIONAL COOPERATION AGENCY

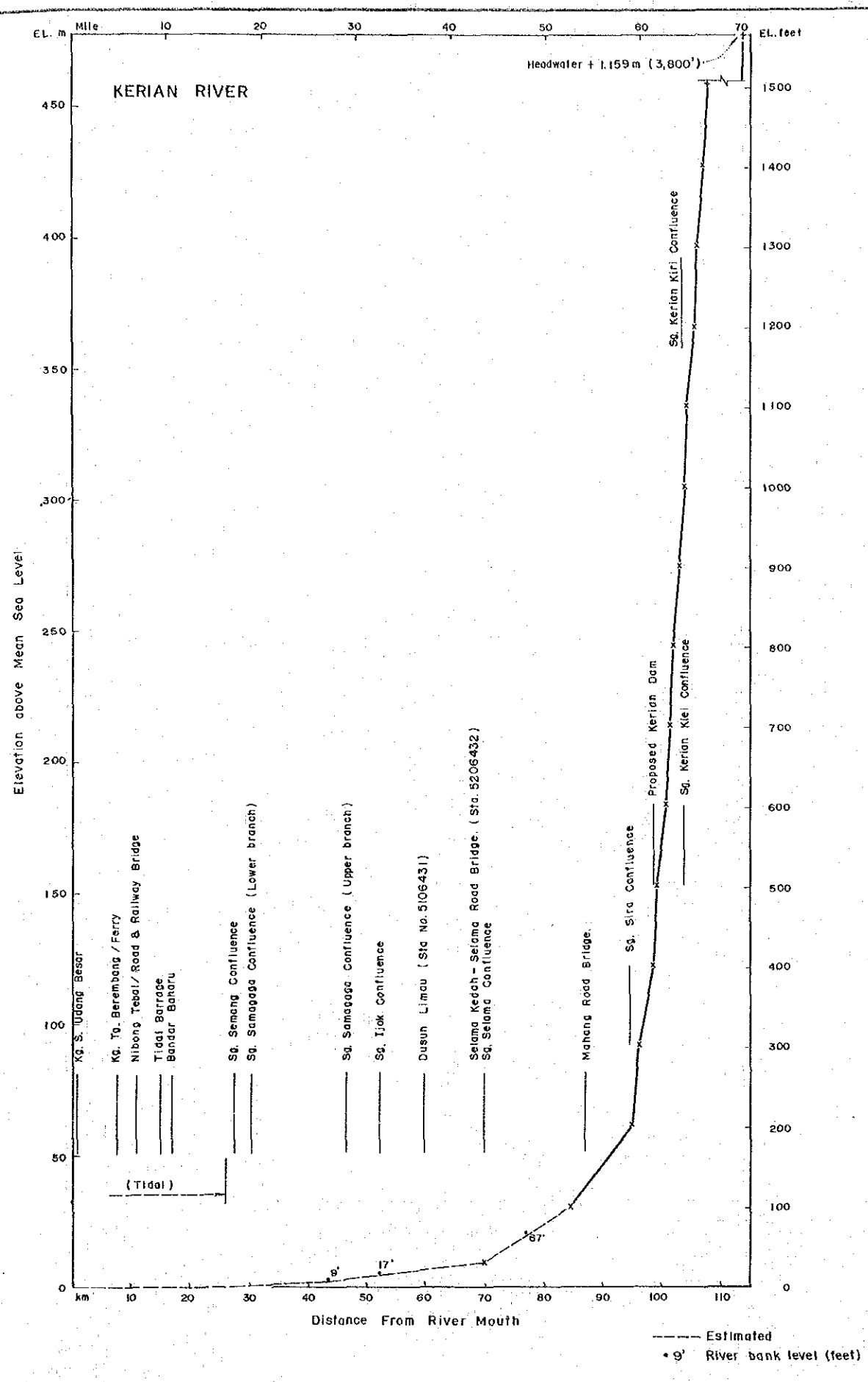

Fig. 5 River Profile (4/18)
— Kerian River

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JAPAN INTERNATIONAL COOPERATION AGENCY

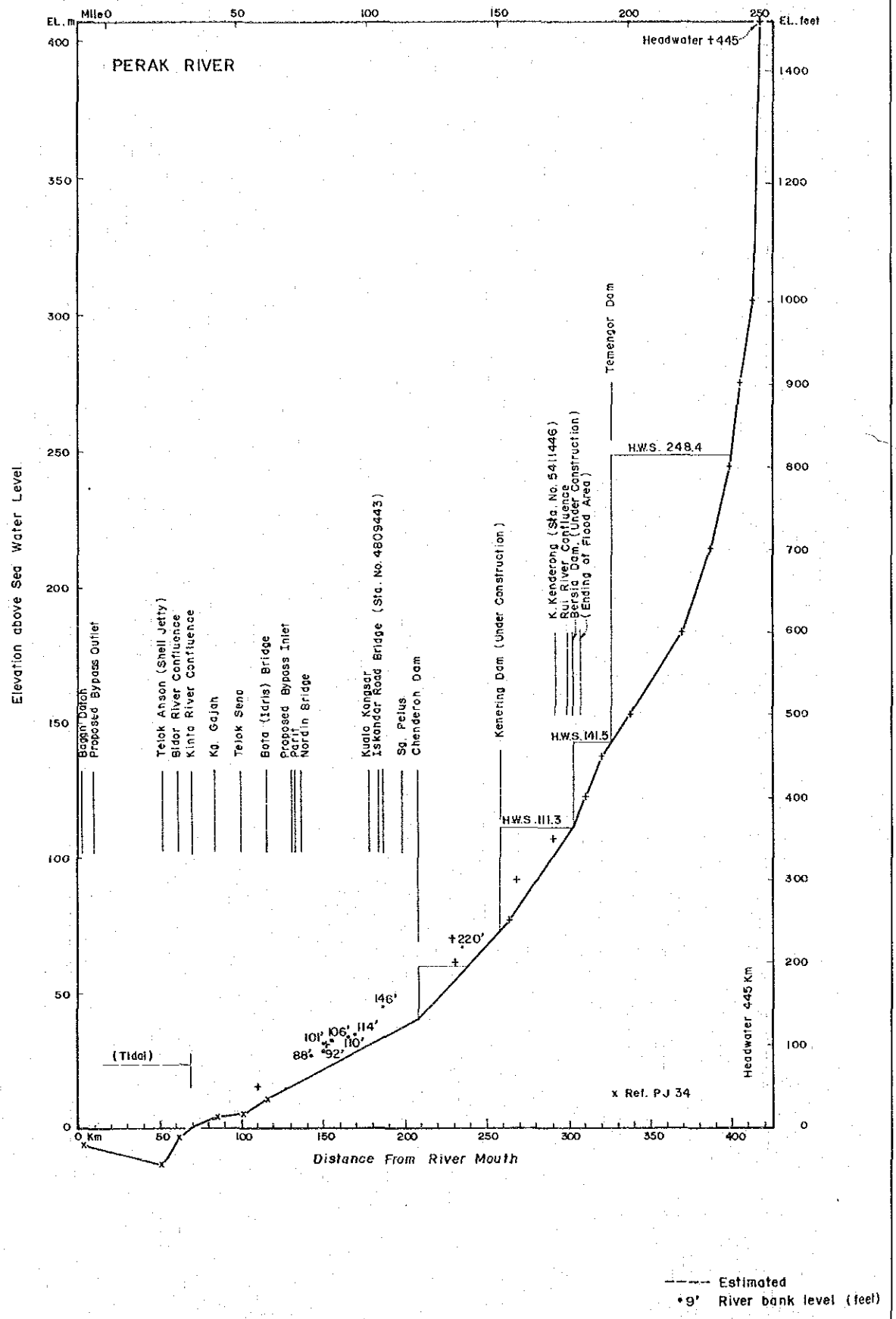

Fig. 6 River Profile (5/18)
— Perak River

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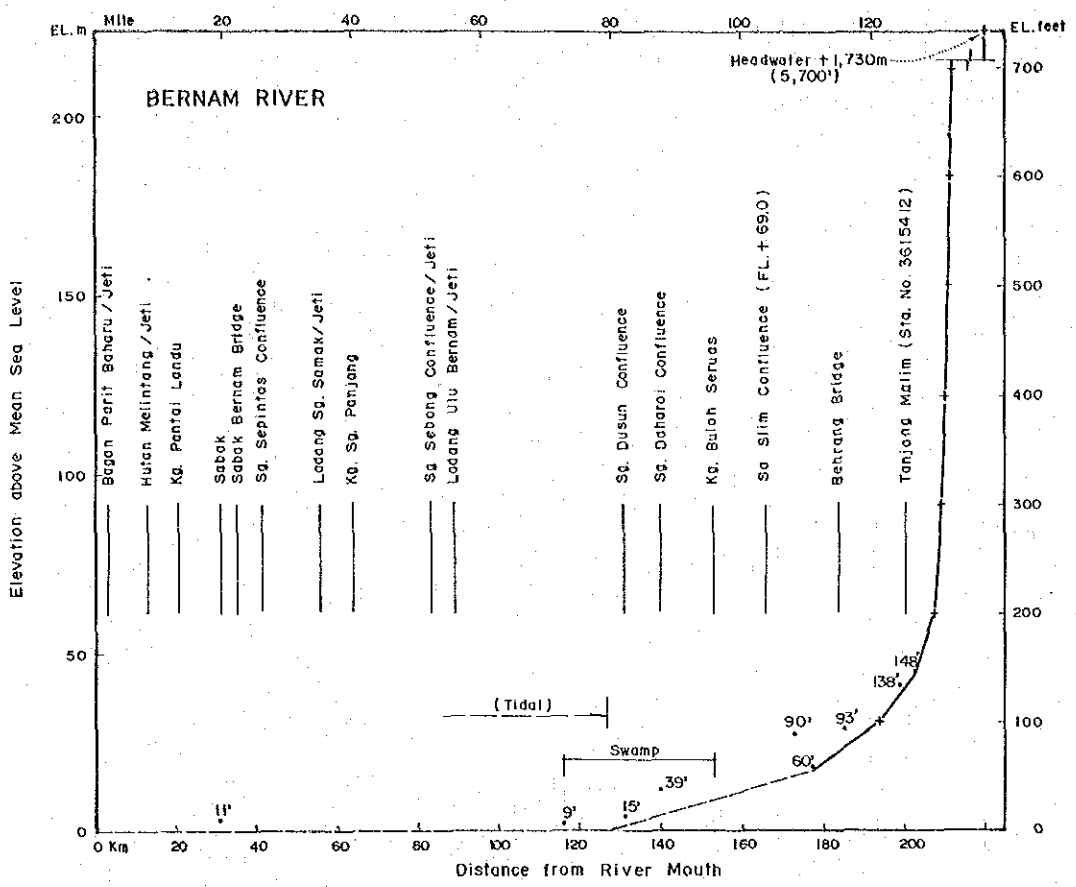
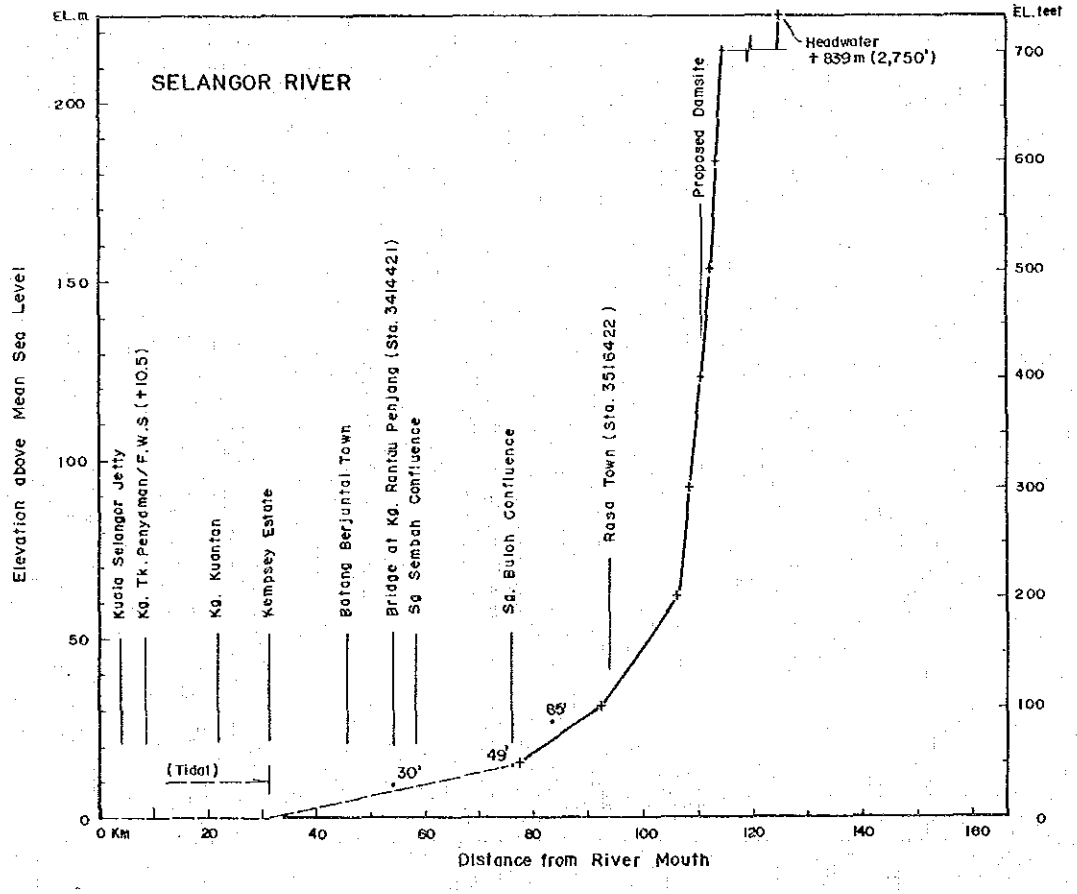
JAPAN INTERNATIONAL COOPERATION AGENCY

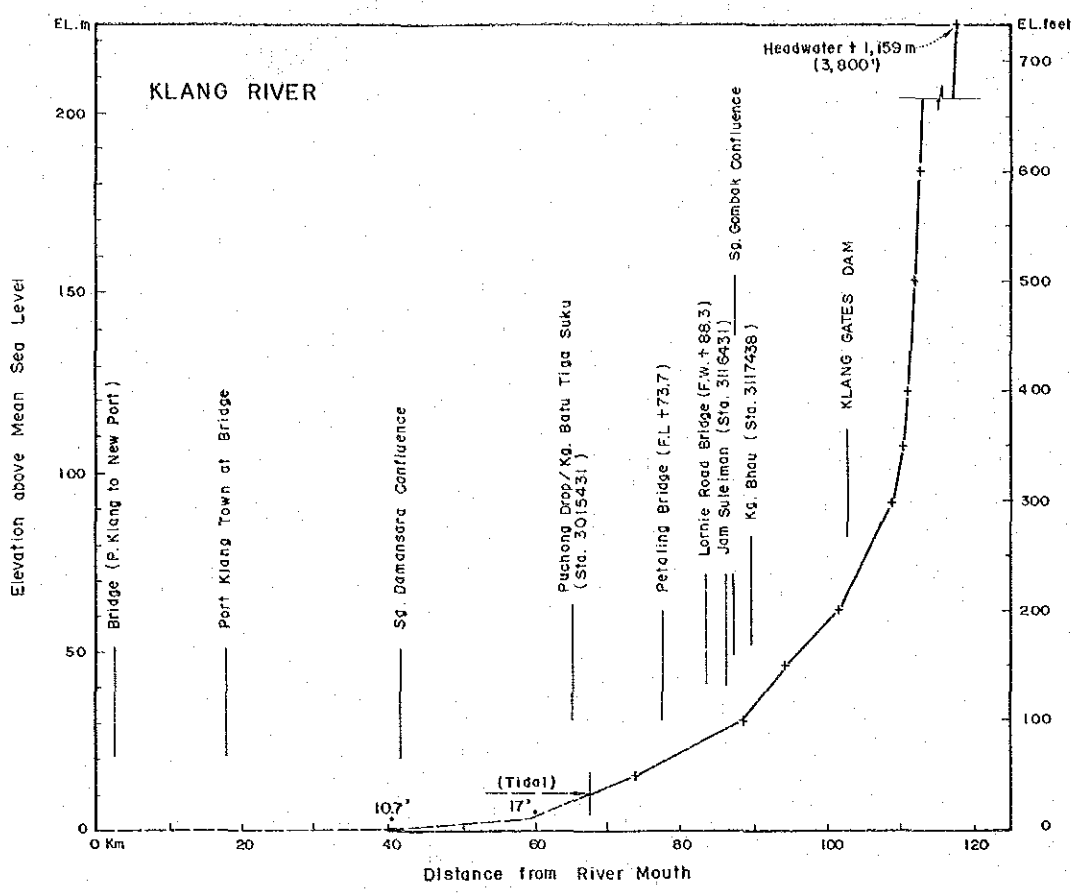




------ Estimated
•9' River bank level (feet)

Fig. 7 River Profile (6/18)
— Bernam River
— Selangor River

GOVERNMENT OF MALAYSIA
NATIONAL WATER RESOURCES STUDY MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY



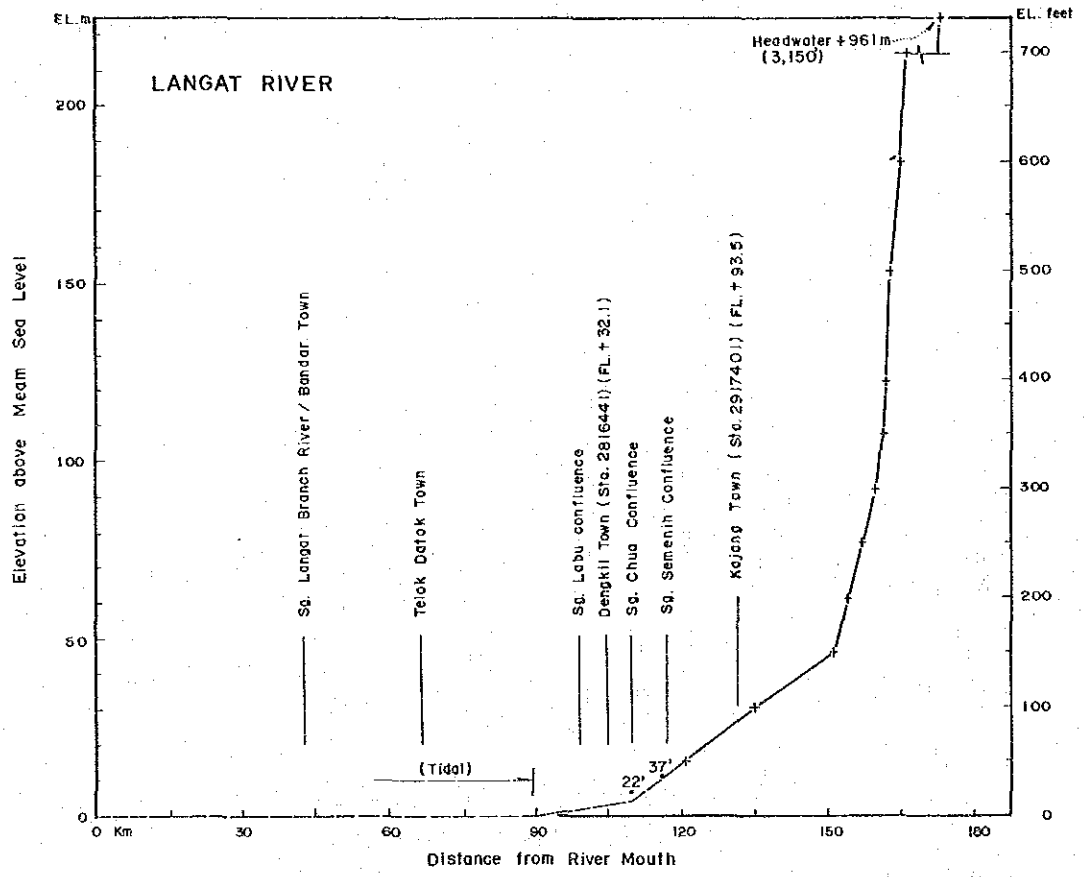


Fig. 8 River Profile (7/18)
— Klang River
— Langat River

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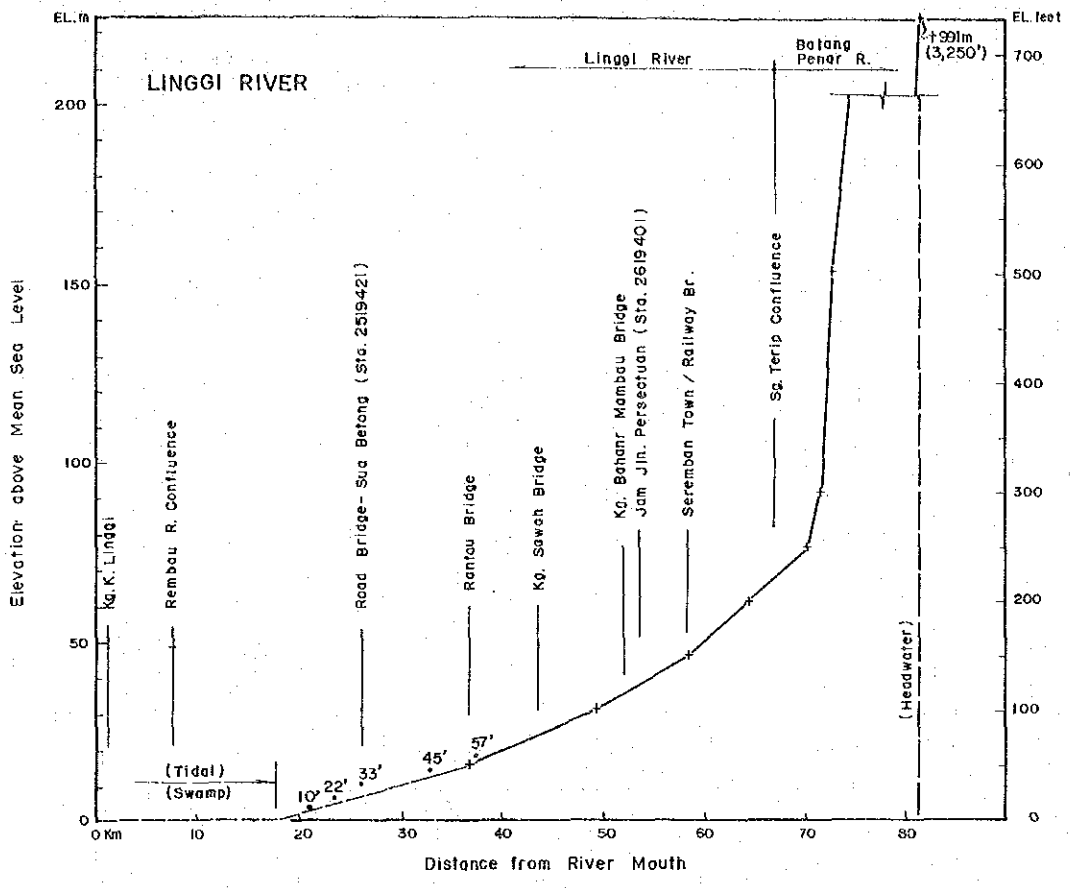
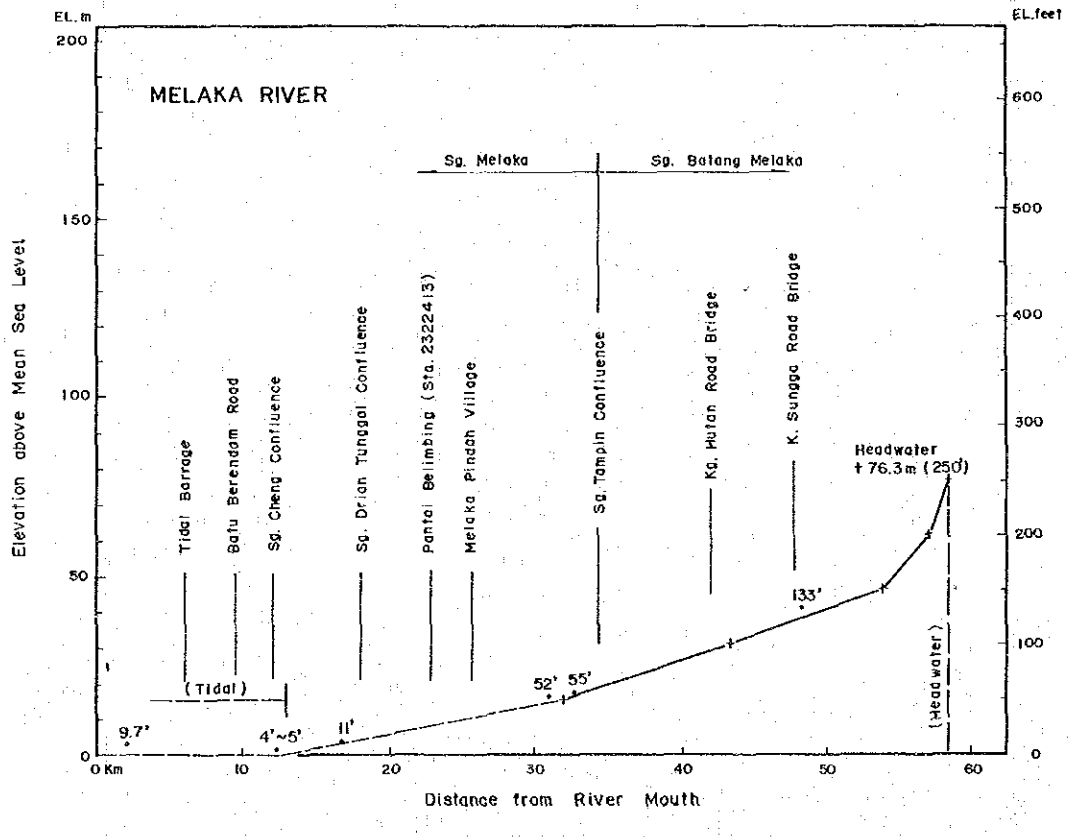
JAPAN INTERNATIONAL COOPERATION AGENCY





—— Estimated
•9' River bank level (feet)

Fig. 9 River Profile (8/18)
— Linggi River
— Melaka River

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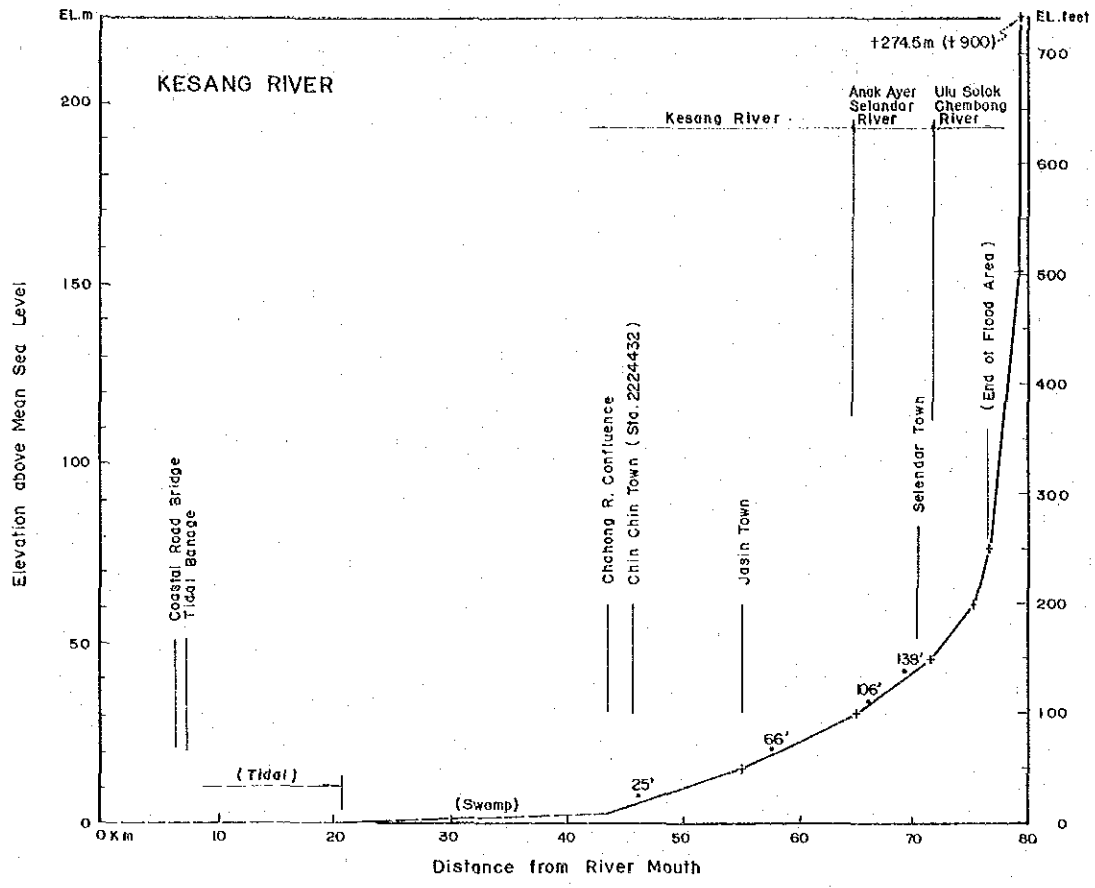
NATIONAL WATER RESOURCES STUDY MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY



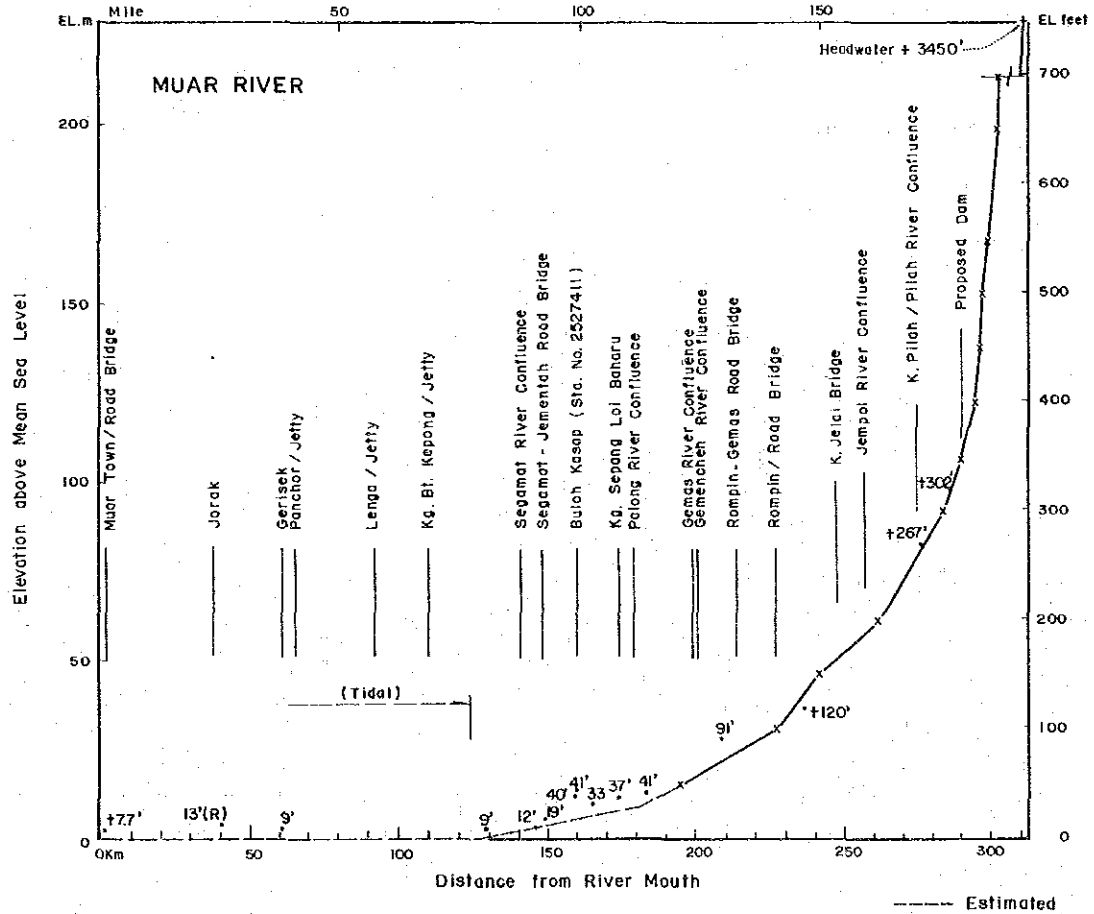


Fig. 10 River Profile (9/18)
— Kesang River
— Muar River

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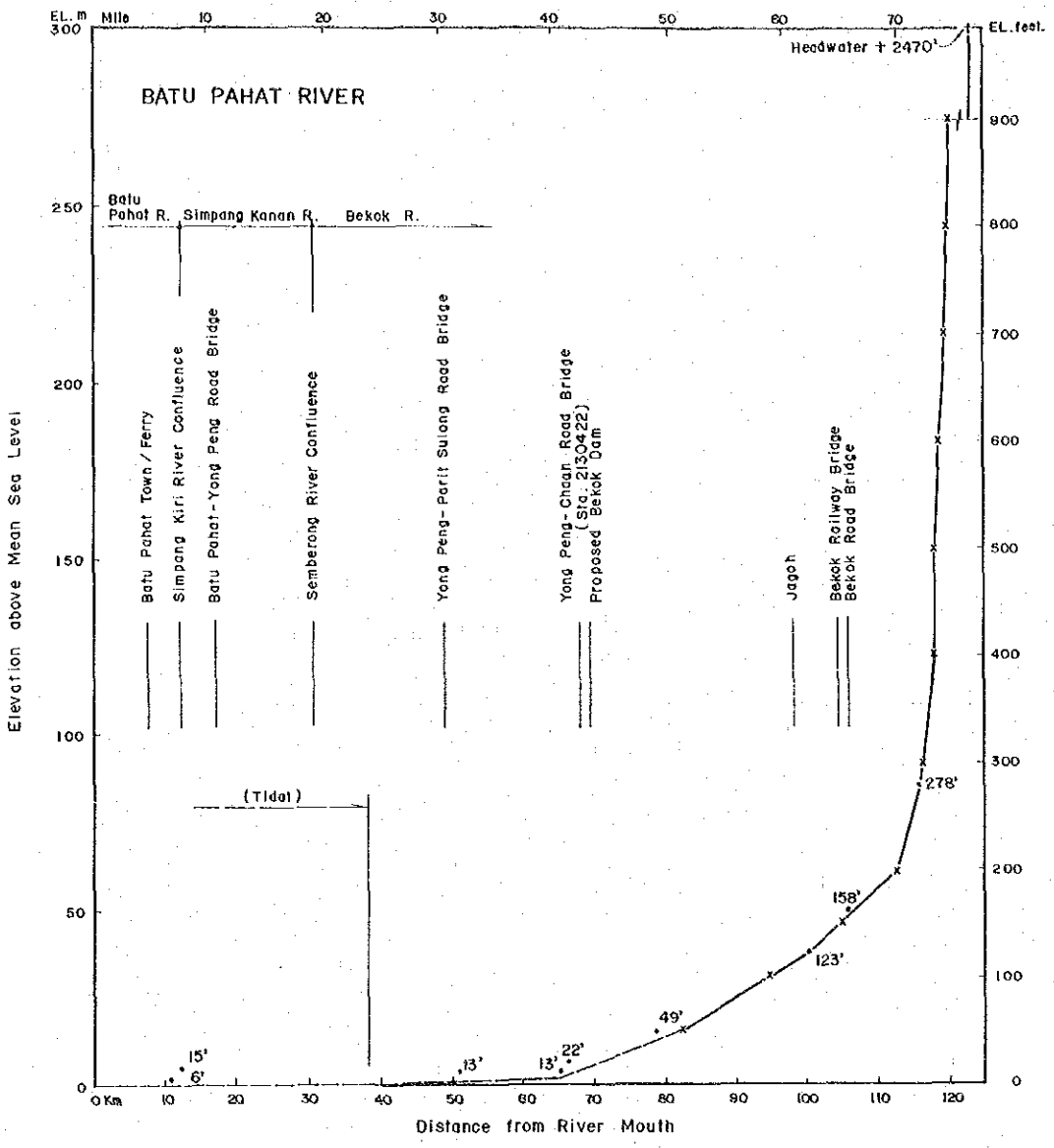
JAPAN INTERNATIONAL COOPERATION AGENCY



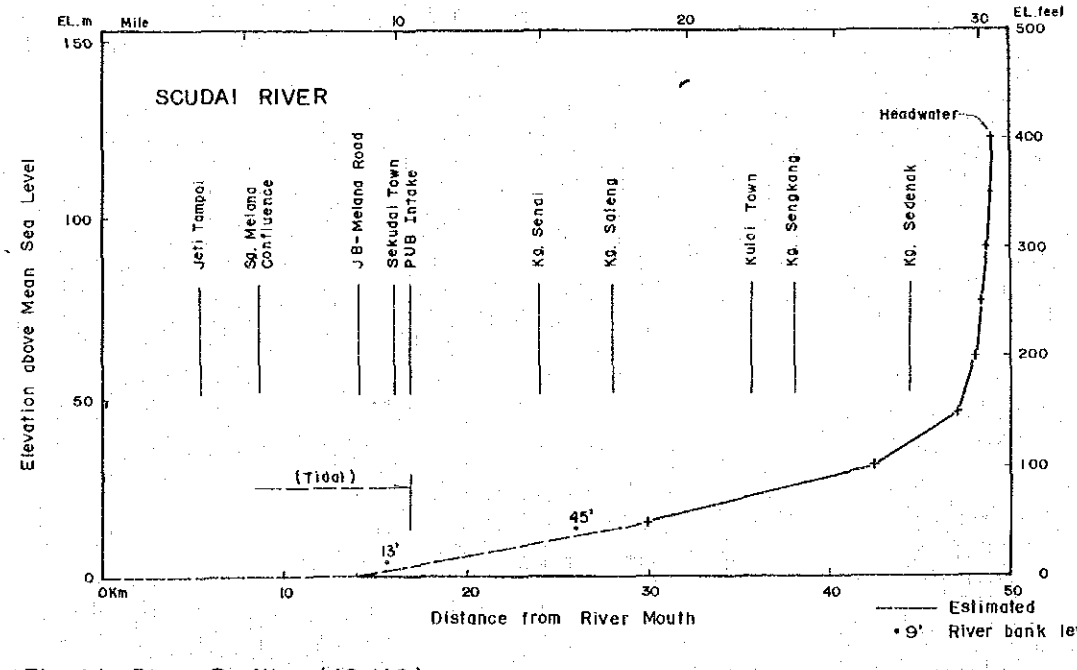


Fig. 11 River Profile (10/18)
— Batu Pahat River
— Sekudai River

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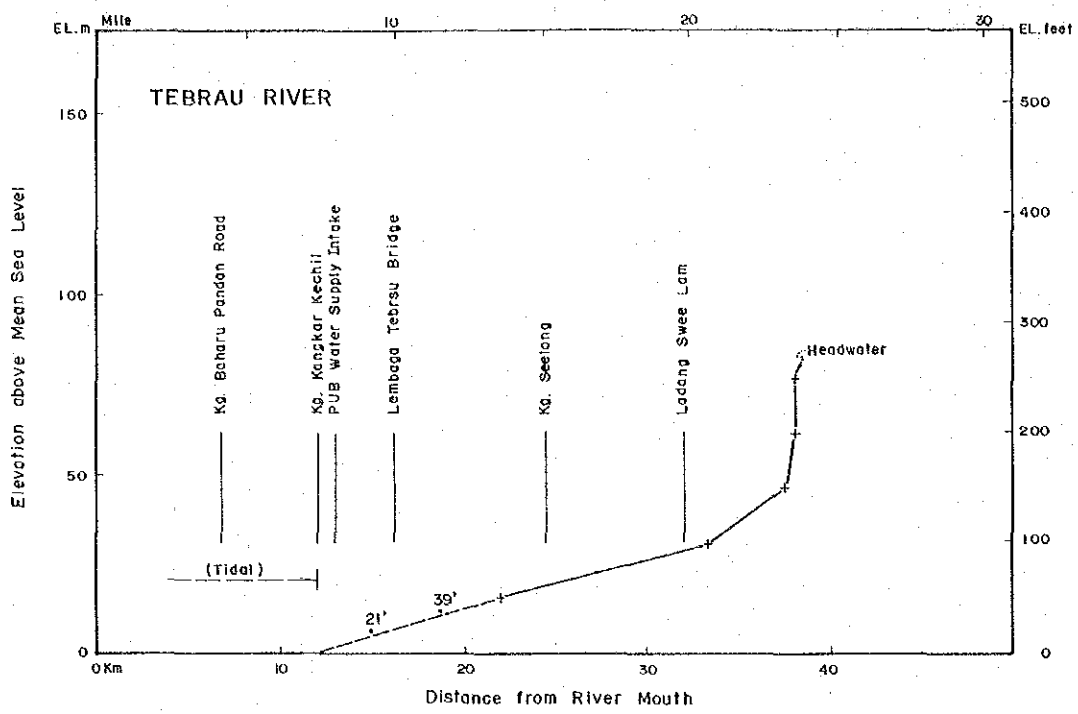

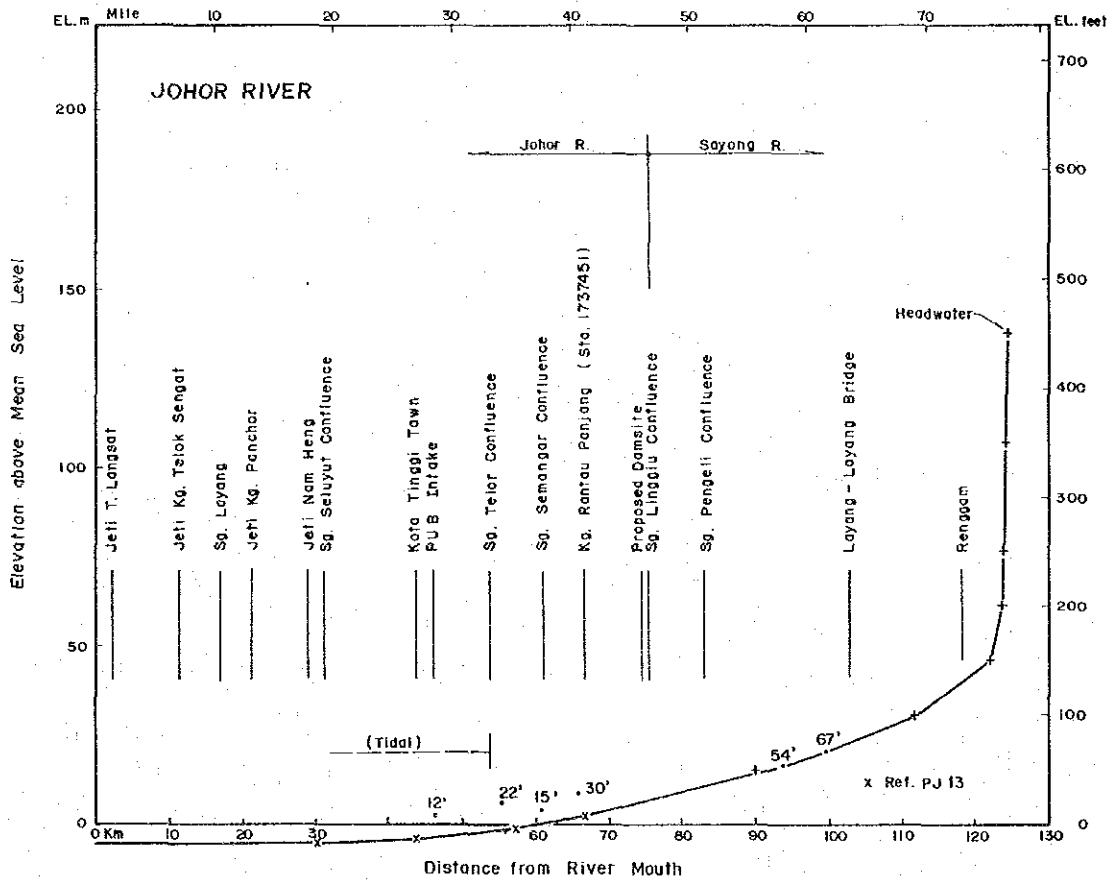

—— Estimated
•9' River bank level (feet)

Fig. 12 River Profile (11/18)
— Tebrau River
— Johor River

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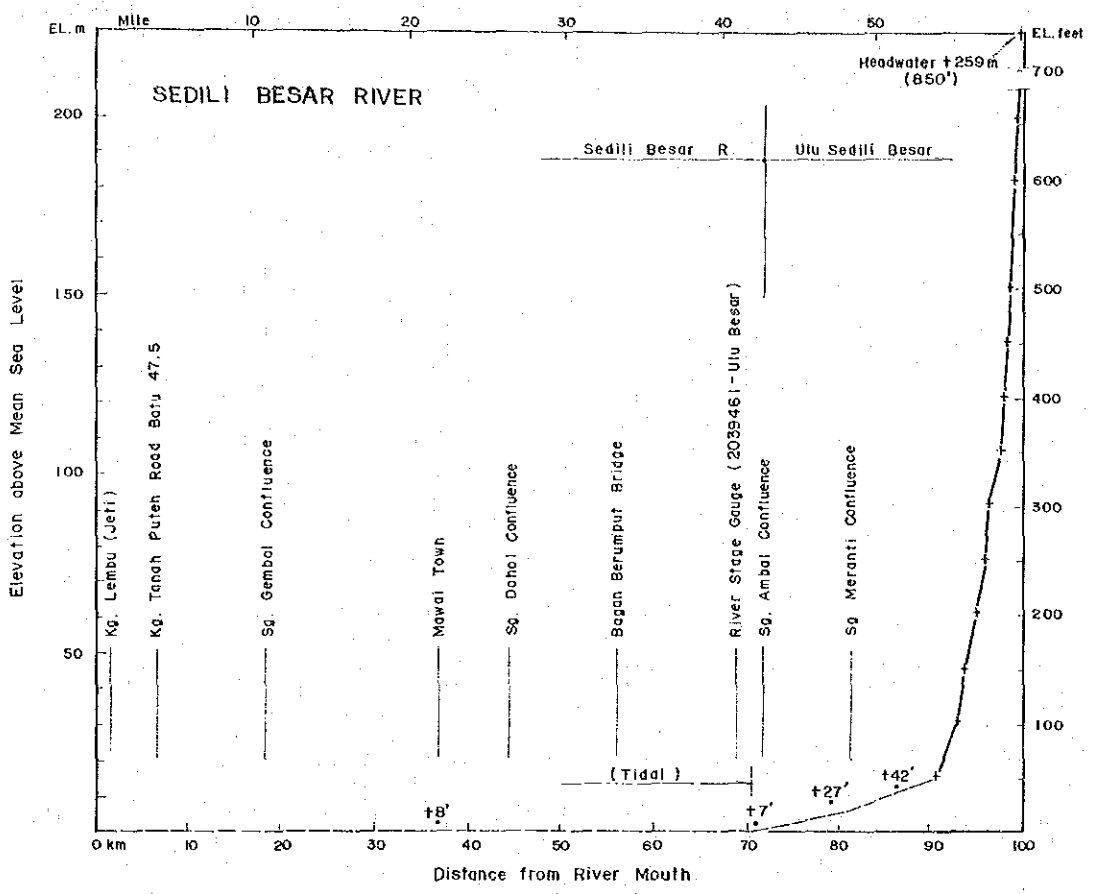
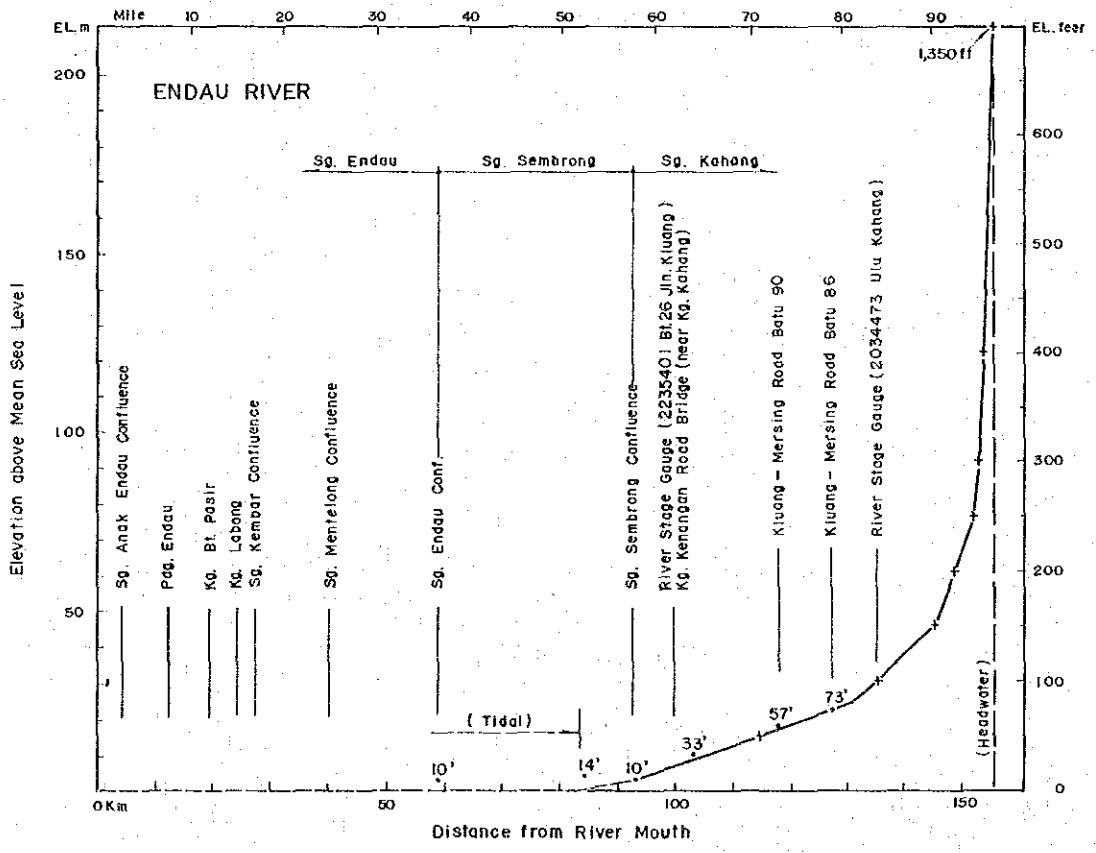
JAPAN INTERNATIONAL COOPERATION AGENCY





------ Estimated
•9' River bank level (feet)

Fig. 13 River Profile (12/18)
— Sedili Besar River
— Endau River

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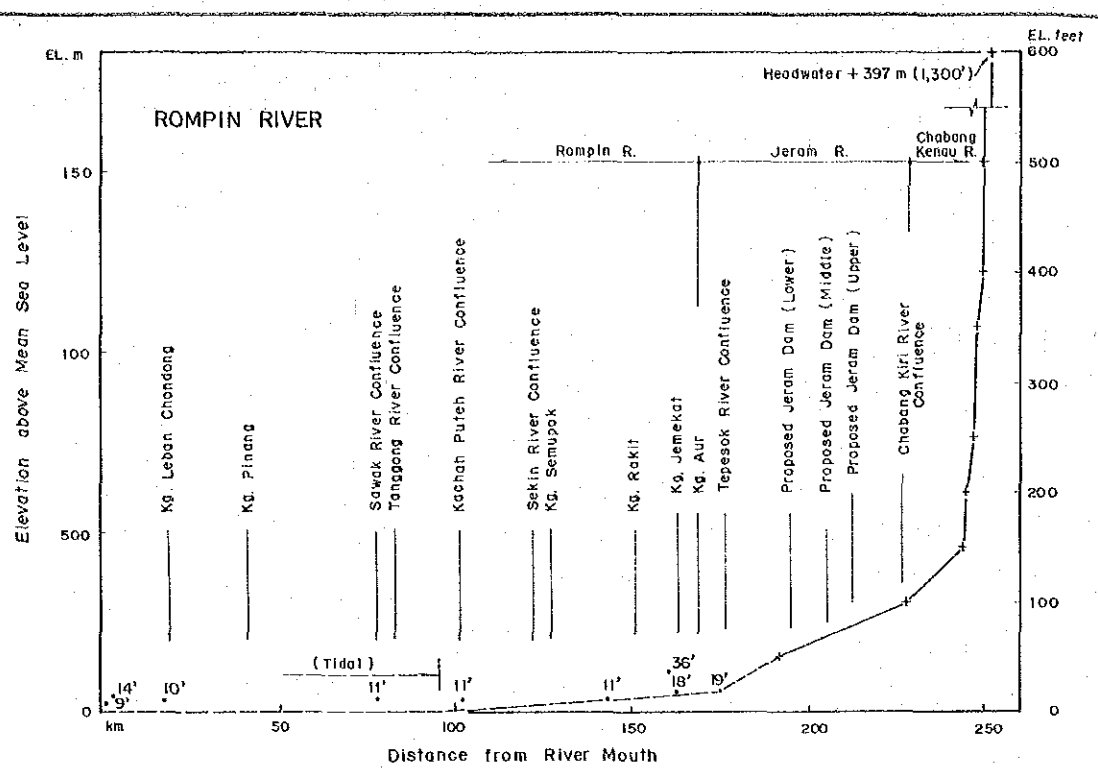
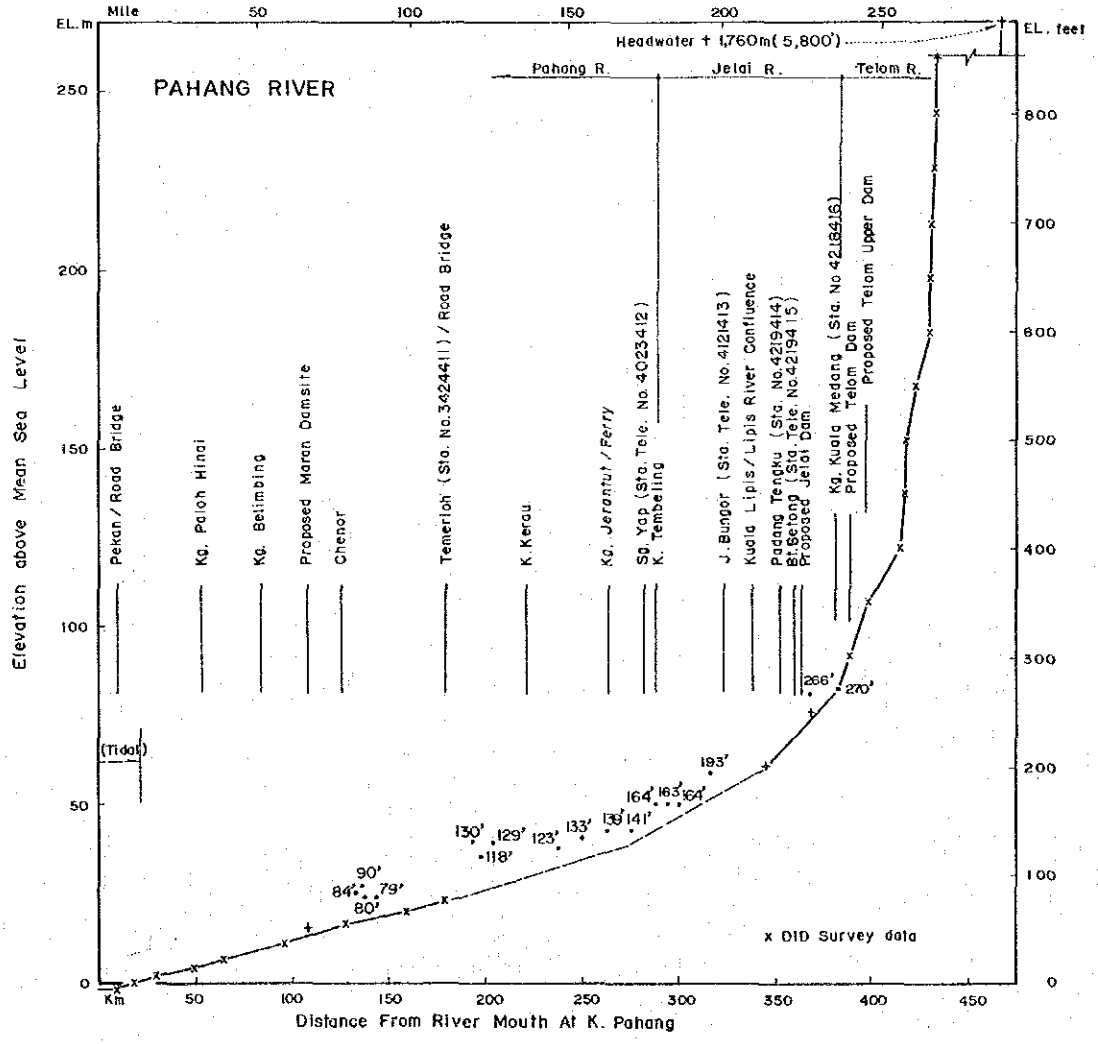




------ Estimated

• 9' River bank level (feet)

Fig. 14 River Profile (13/18)

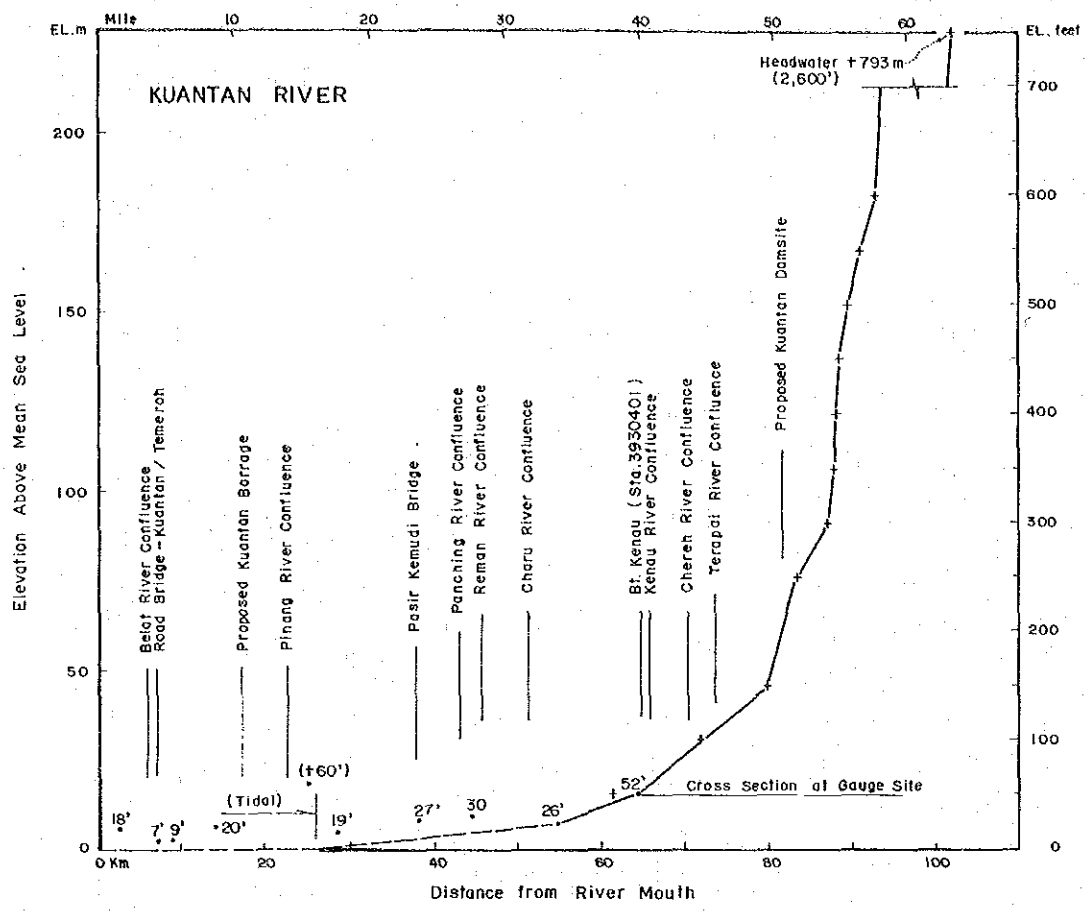
— Rompin River

— Pahang River

GOVERNMENT OF MALAYSIA

NATIONAL WATER RESOURCES STUDY MALAYSIA

JAPAN INTERNATIONAL COOPERATION AGENCY



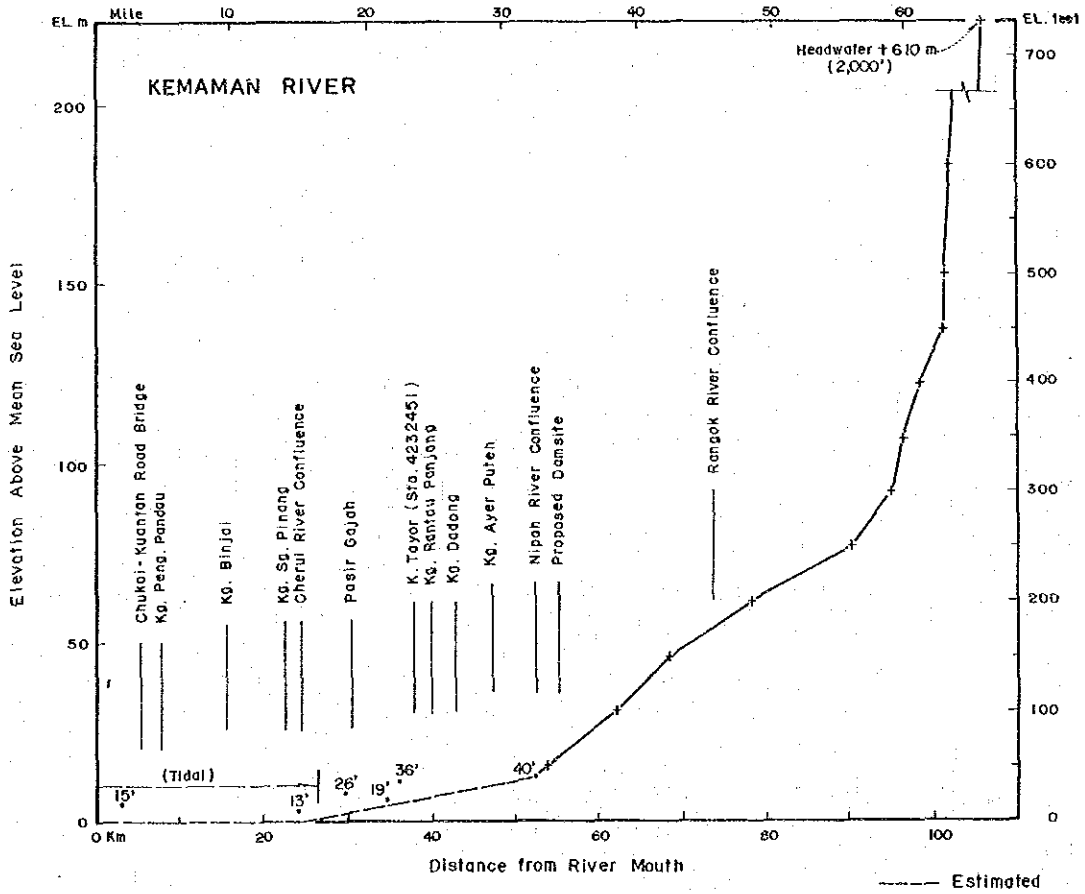


Fig. 15 River Profile (14/18)
— Kuantan River
— Kemaman River

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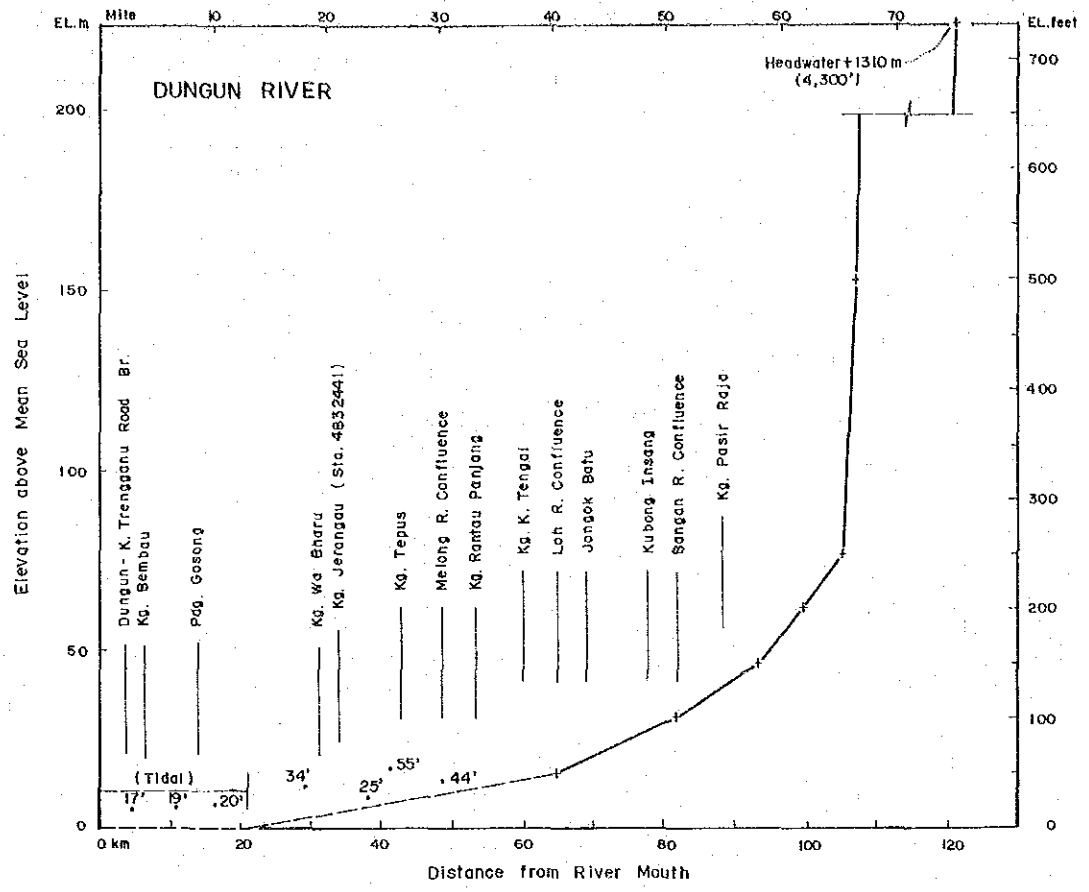

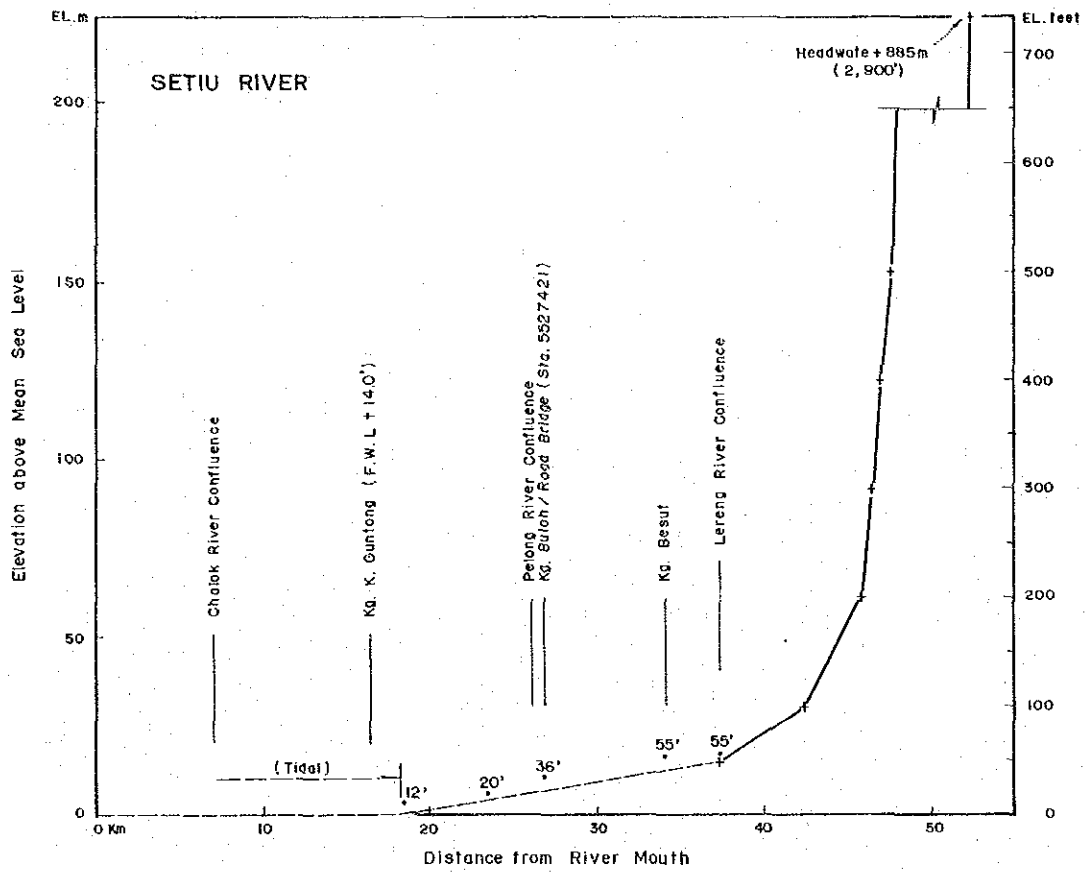

Fig. 16 River Profile (15/18)
— Dungun River
— Setiu River

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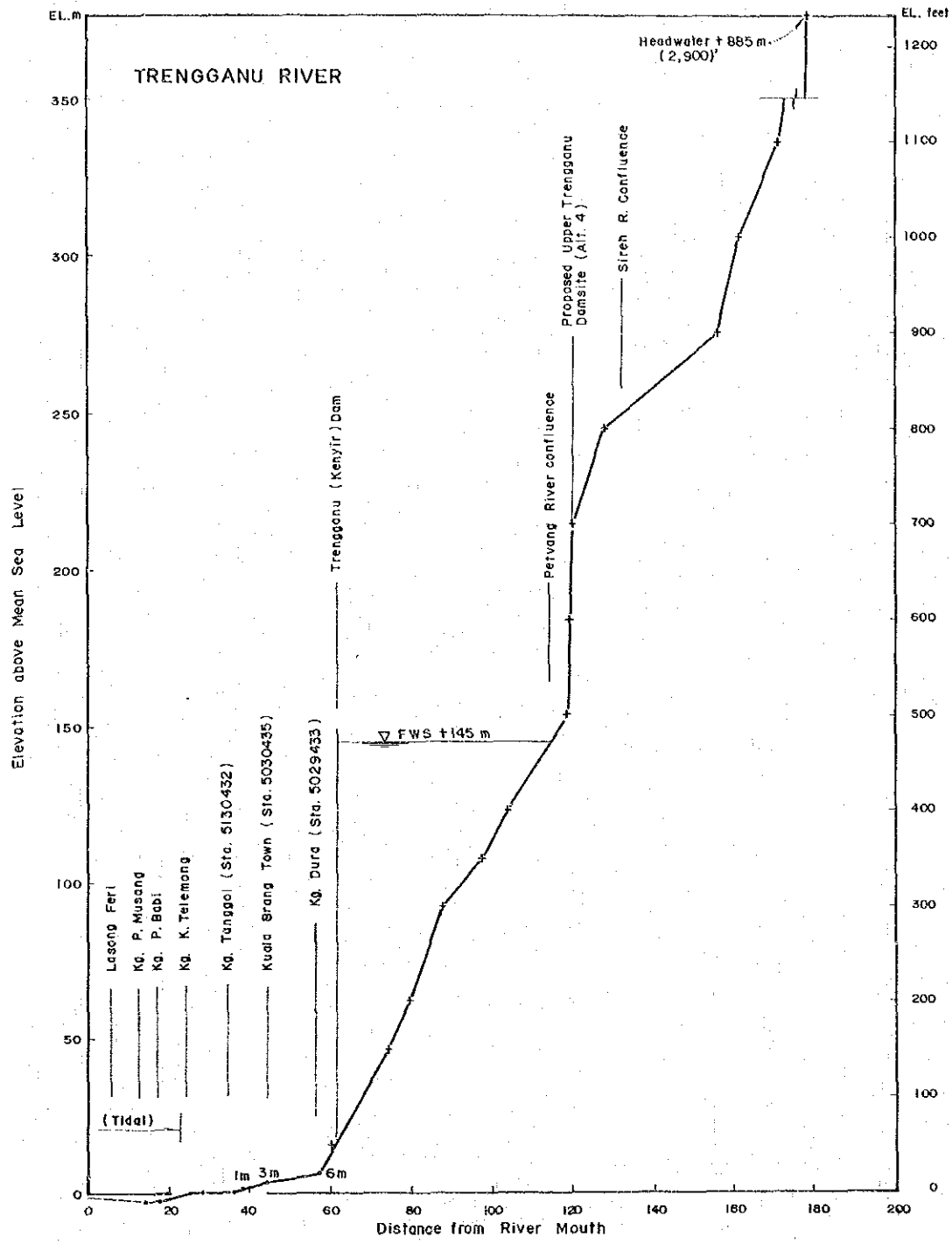
JAPAN INTERNATIONAL COOPERATION AGENCY



——— Estimated
•9' River bank level (feet)

Fig. 17 River Profile (16/18)
— Trengganu River

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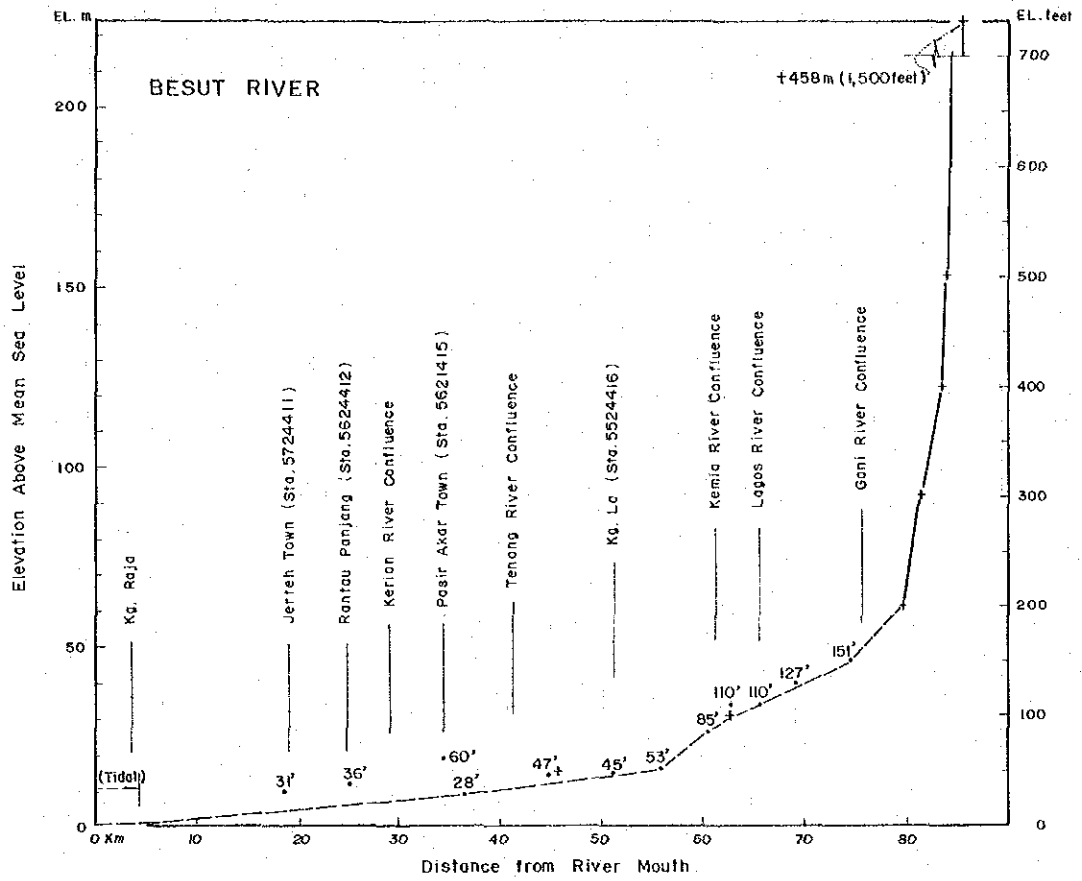

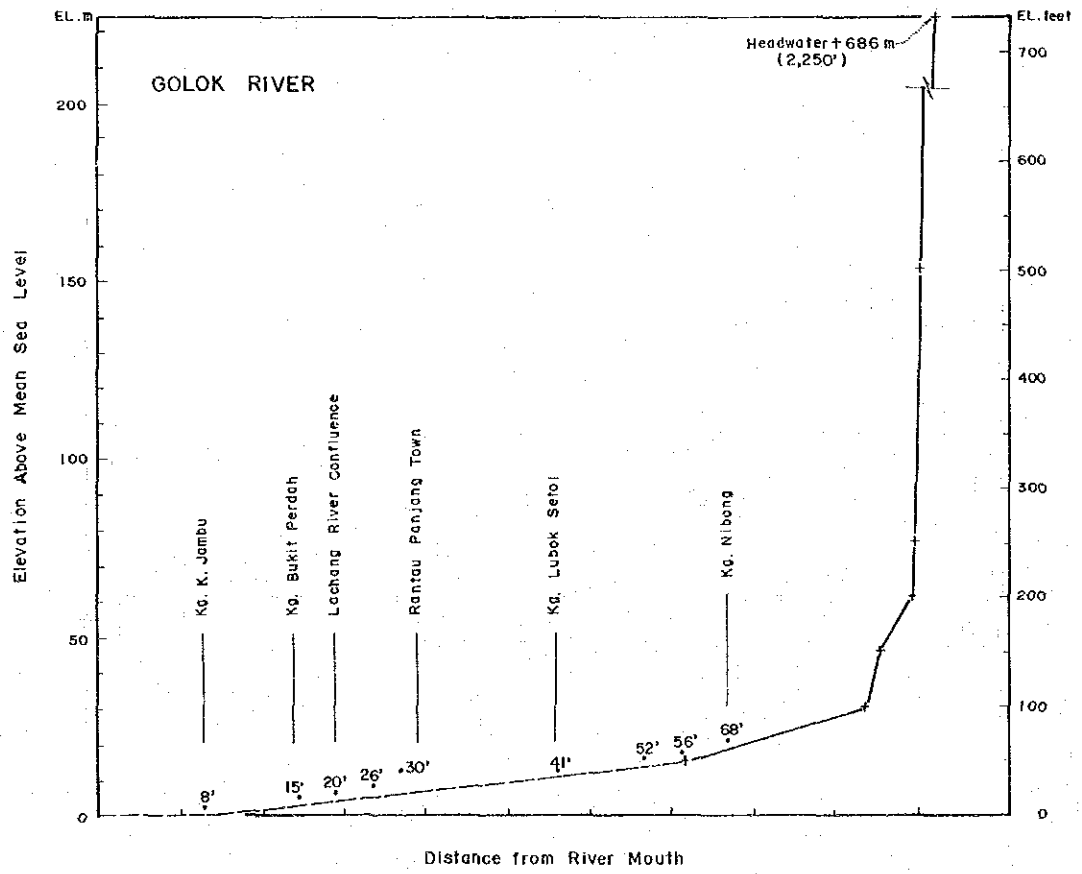

---- Estimated

•9' River bank level (feet)

Fig. 18 River Profile (17/18)

— Besut River

— Golok River

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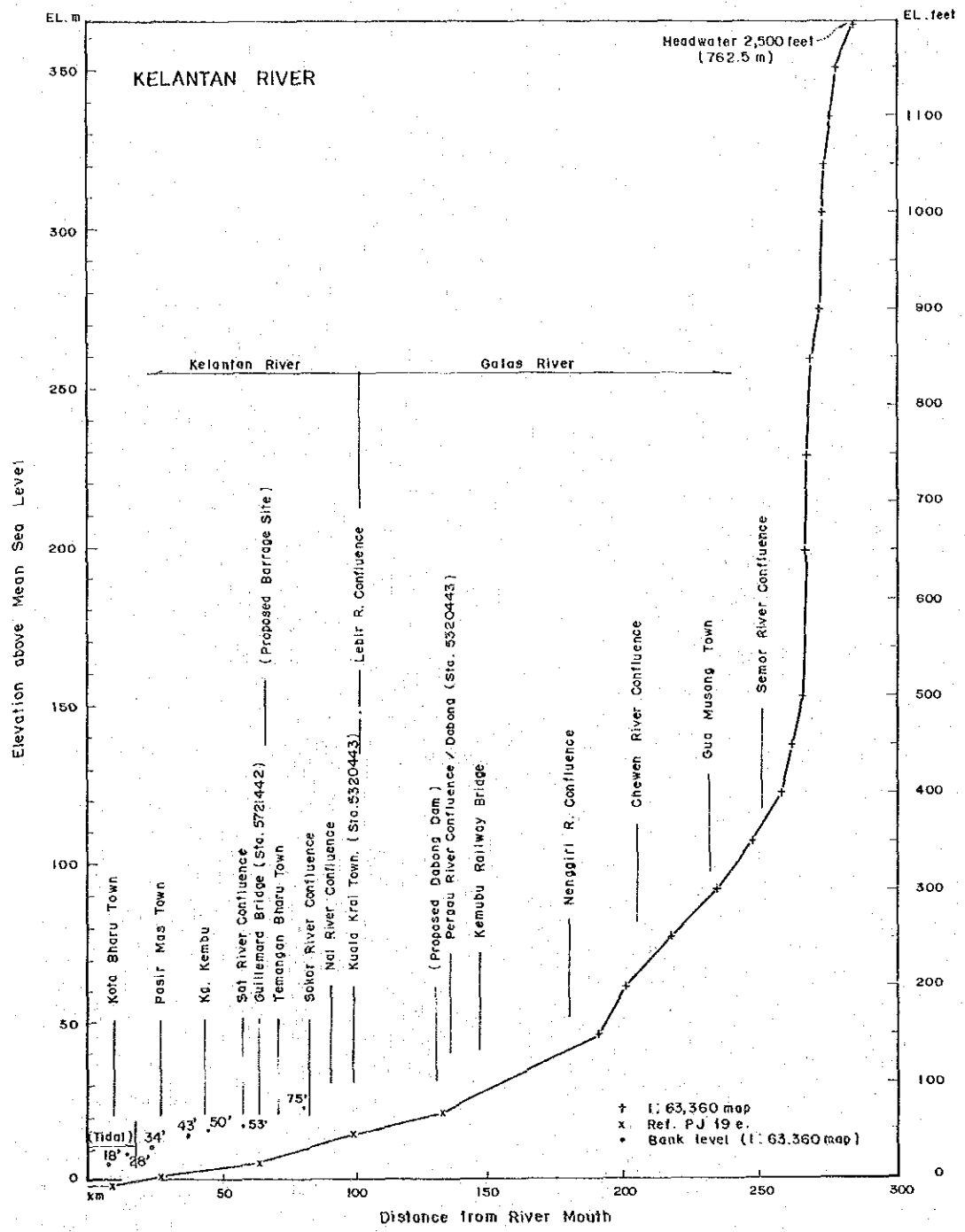

Fig. 19 River Profile (18/18)
— Kelantan River

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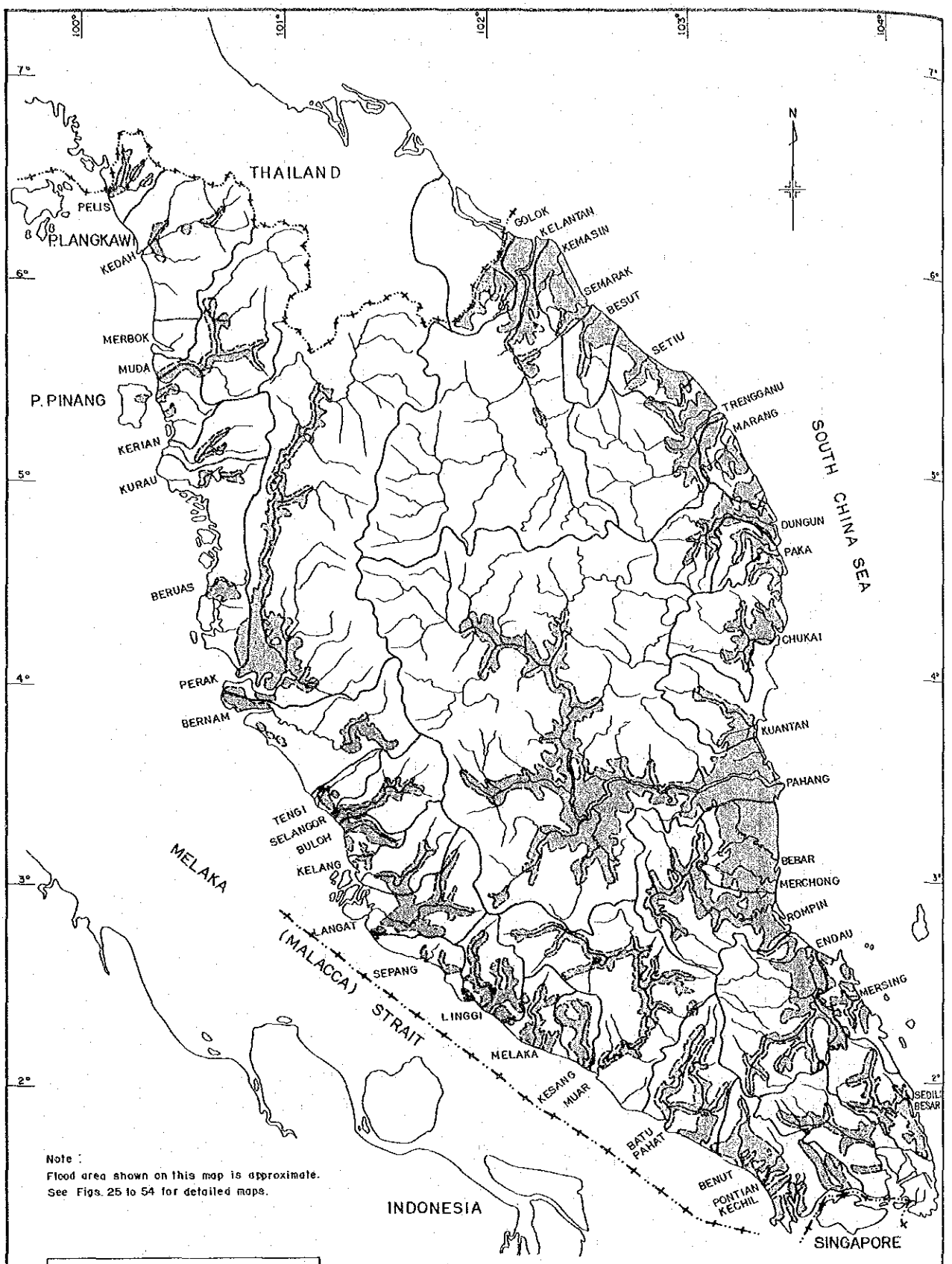
JAPAN INTERNATIONAL COOPERATION AGENCY



Note :
Flood area shown on this map is approximate.
See Figs. 25 to 54 for detailed maps.

LEGEND
- International Boundary
- Basin Boundary
- River
- Flood Area

Fig. 20 Flood Vulnerable Area in Peninsular Malaysia (General Flood Map)

SCALE
10 0 10 20 30 40 50 60 70 80

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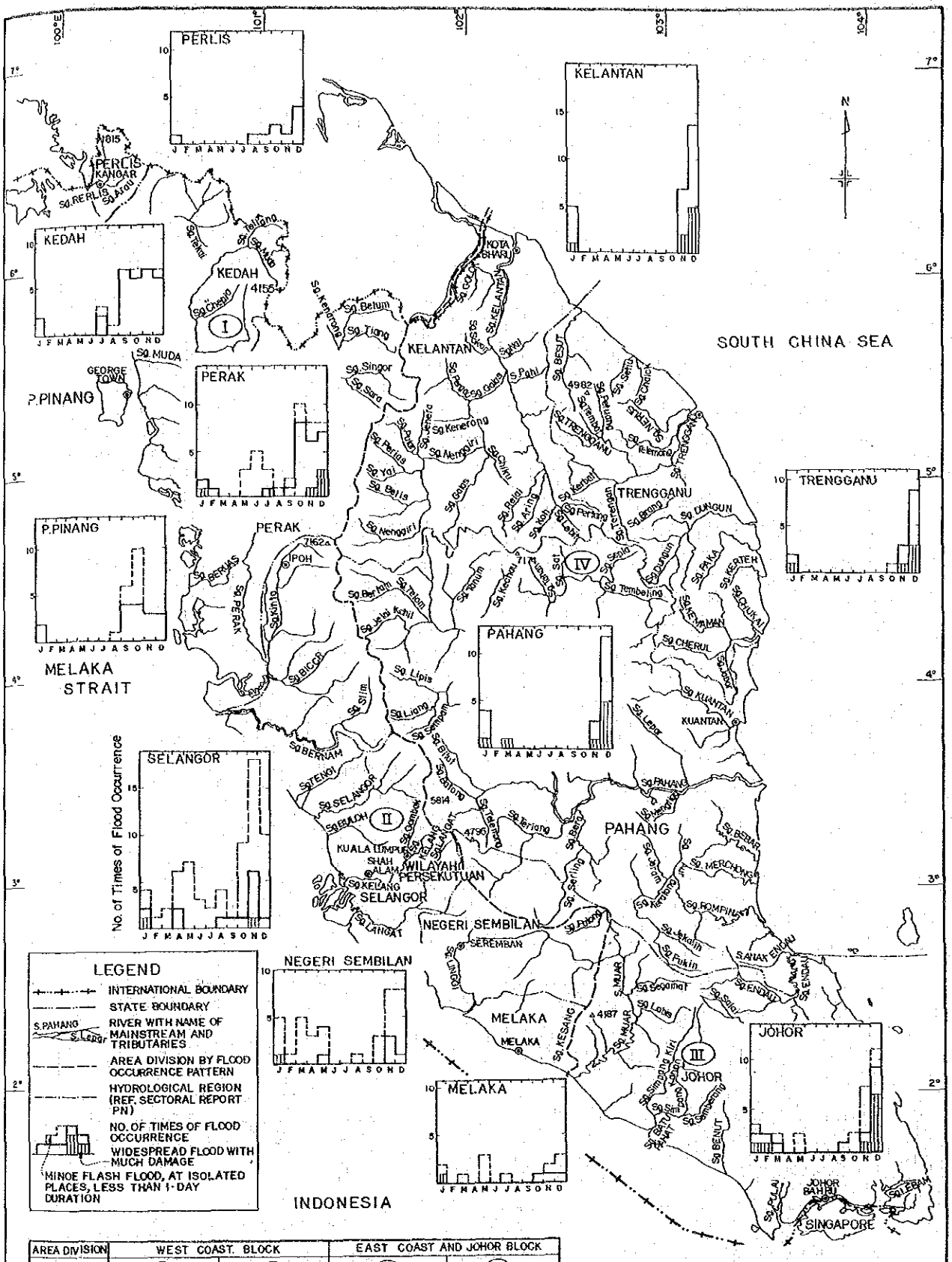

AREA DIVISION	WEST COAST BLOCK		EAST COAST AND JOHOR BLOCK	
HYDROLOGICAL RESION	(I)	(II)	(III)	(IV)
AREA	Perlis, Kedah, Pulau Pinang, North Perak	Selangor, Negeri Sembilan, Melaka	Johor	Kelantan, Trengganu, Pahang
FLOOD SEASON	Sept.- Dec.	Mostotten in Nov. but flash floods throughout the year	Major flood in Nov.-Dec (Similar to IV) But flash flood often in western part (Similar to II)	Concentrately in Nov.-Jan Period
OTHERS	Flooding in Sg. Kinta erratic (similar to II)	Rare chances of flood occurrence since 1972		

Source of flood event record : Ref. PJ 11.

Fig. 21 Seasonal Distribution of Flood Occurrence

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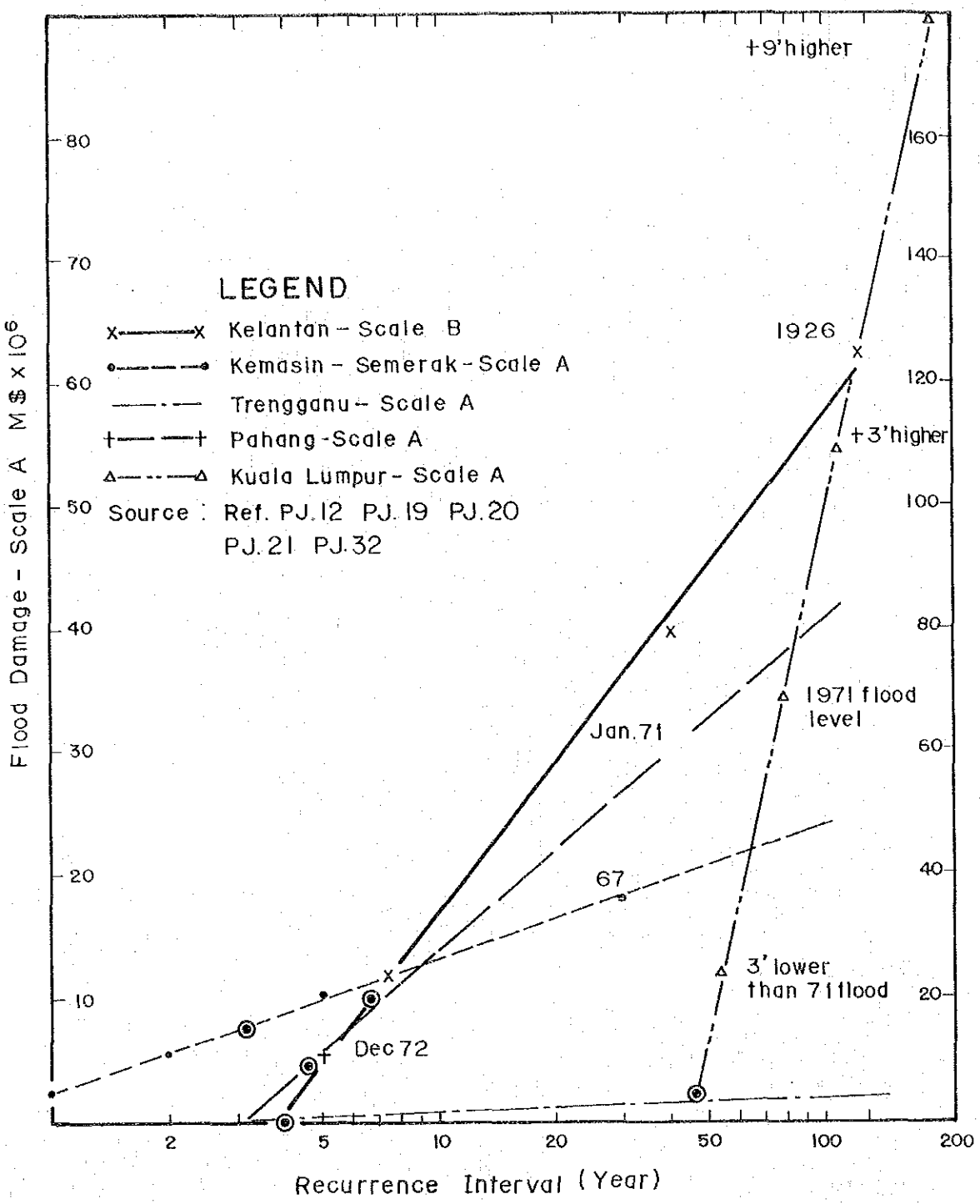

Fig. 22 Damage Frequency Curves for Floods in Several River Basins - Records in Previous Studies

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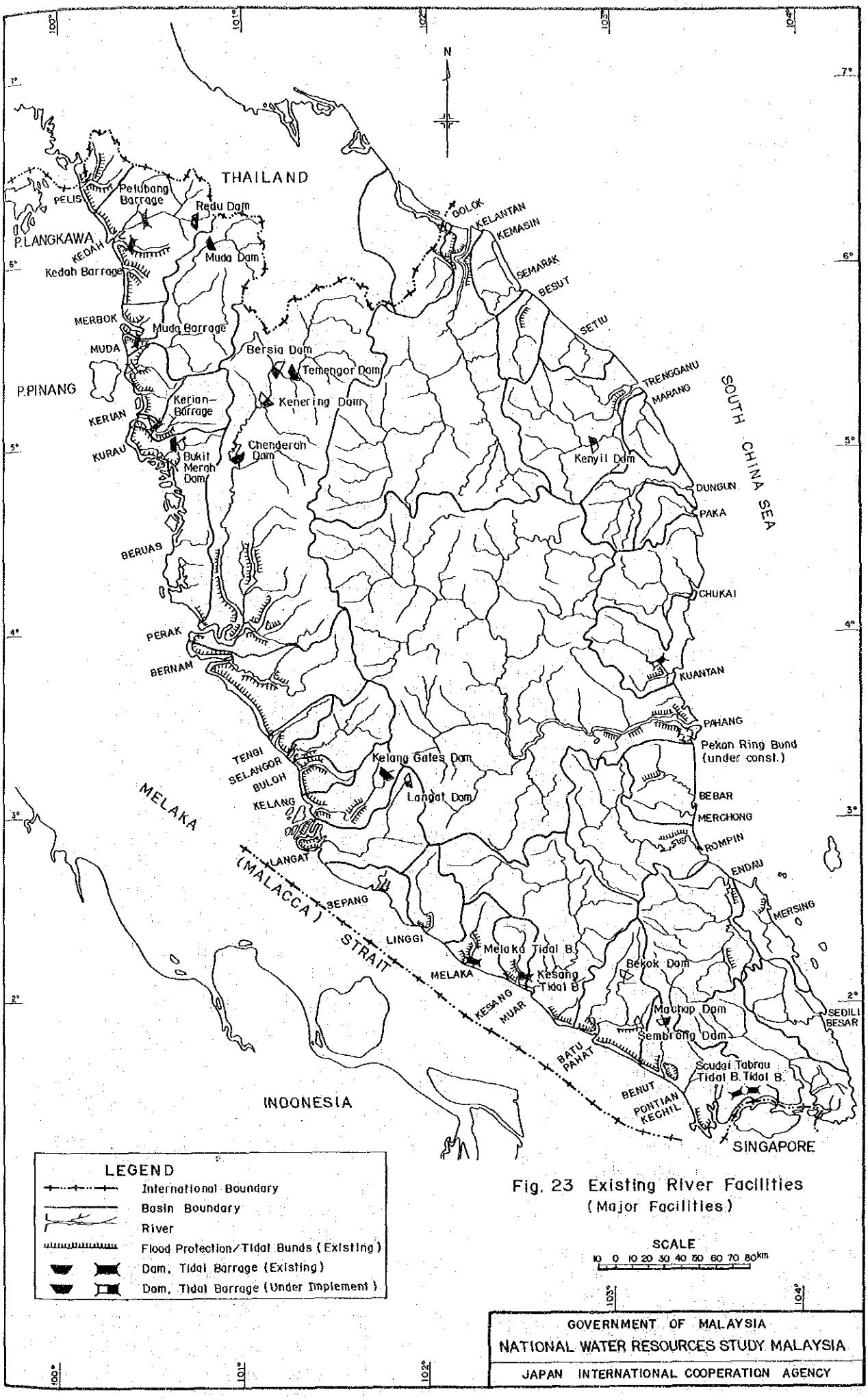

Fig. 23 Existing River Facilities
(Major Facilities)

Fig. 24 Existing Flood Warning Set – up

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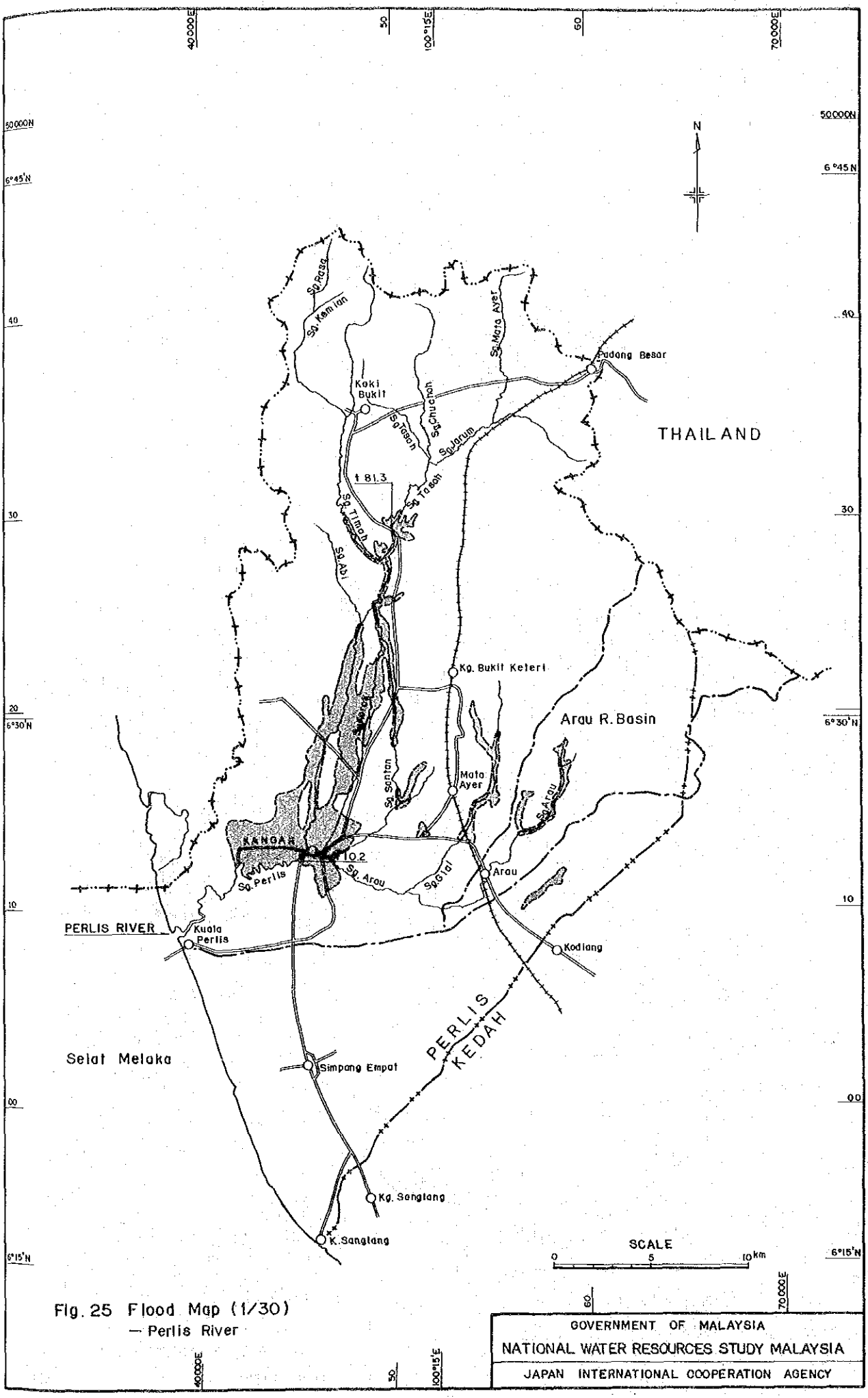

Fig. 25 Flood Map (1/30)
— Perlis River

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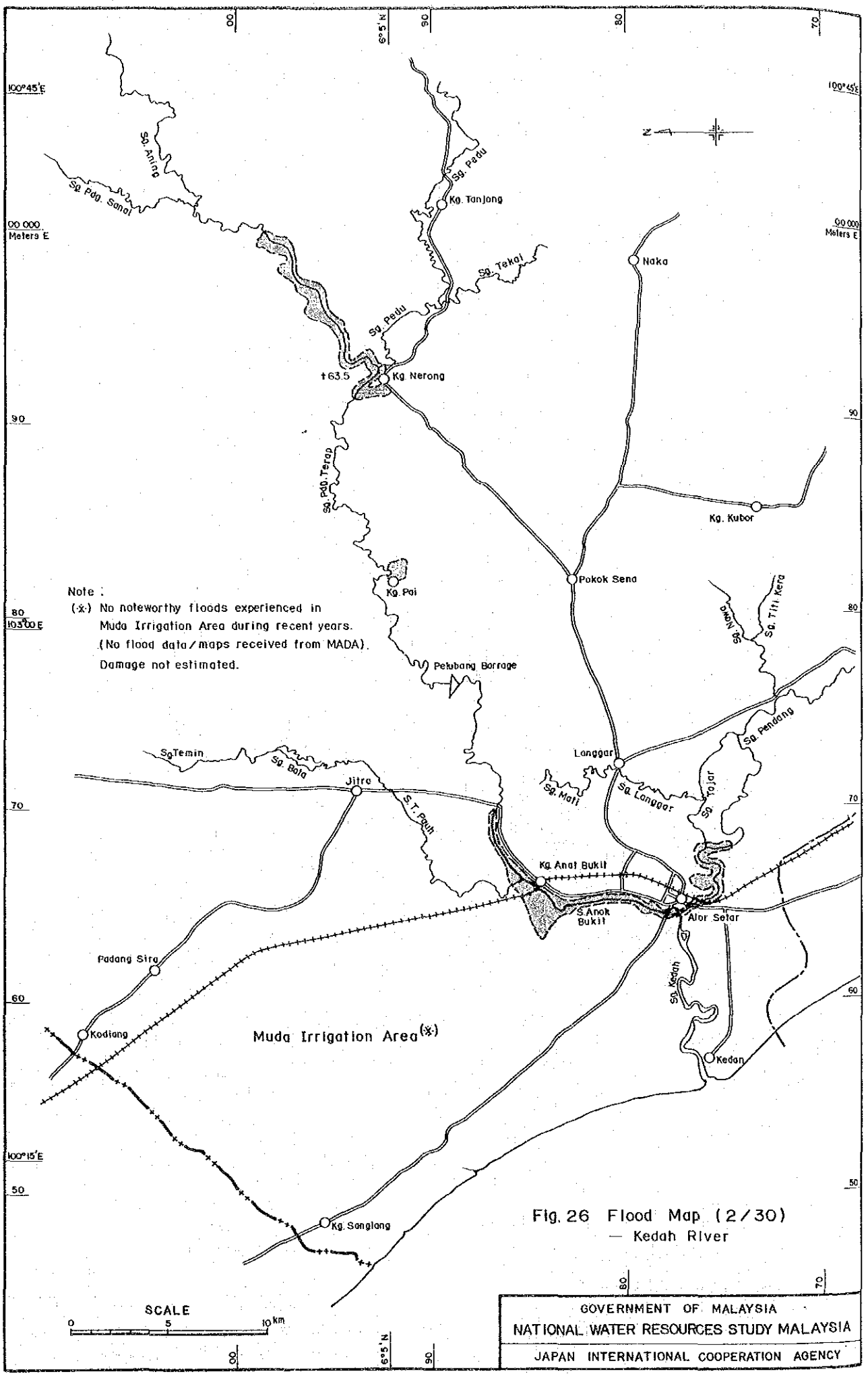

Fig. 26 Flood Map (2/30)
— Kedah River

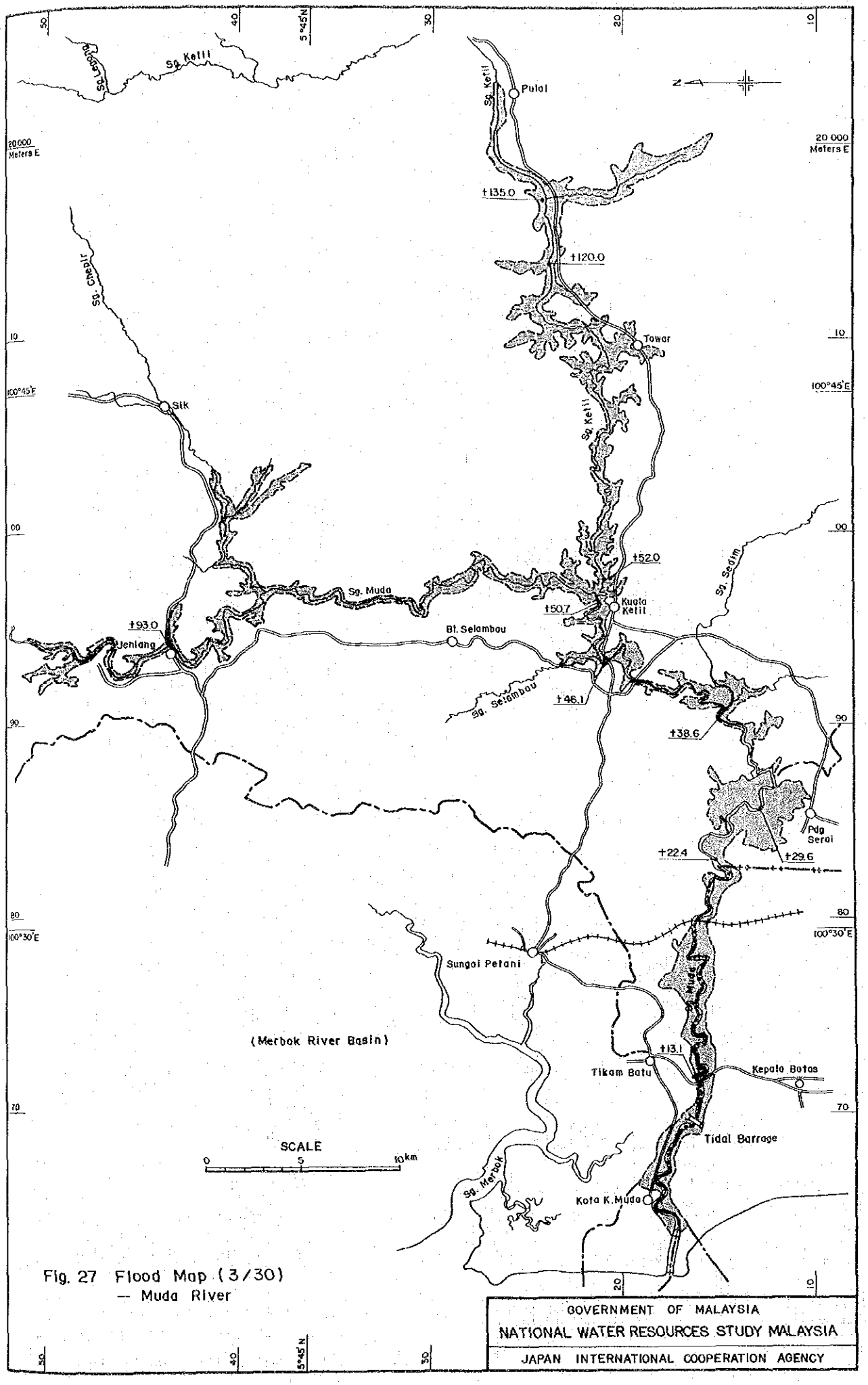

Fig. 27 Flood Map (3/30)
— Muda River

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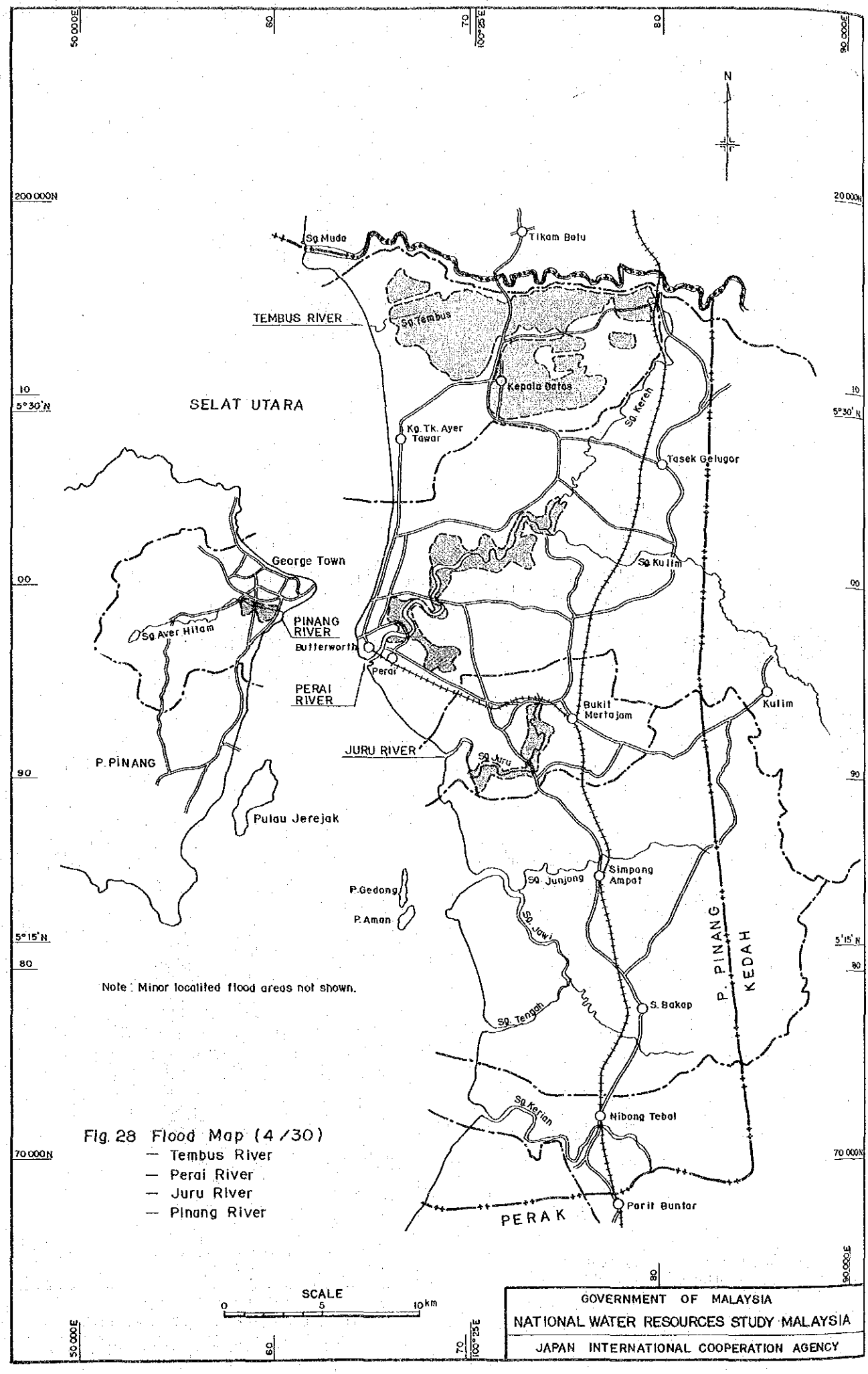

Fig. 28 Flood Map (4/30)
— Tembus River
— Perai River
— Juru River
— Pinang River

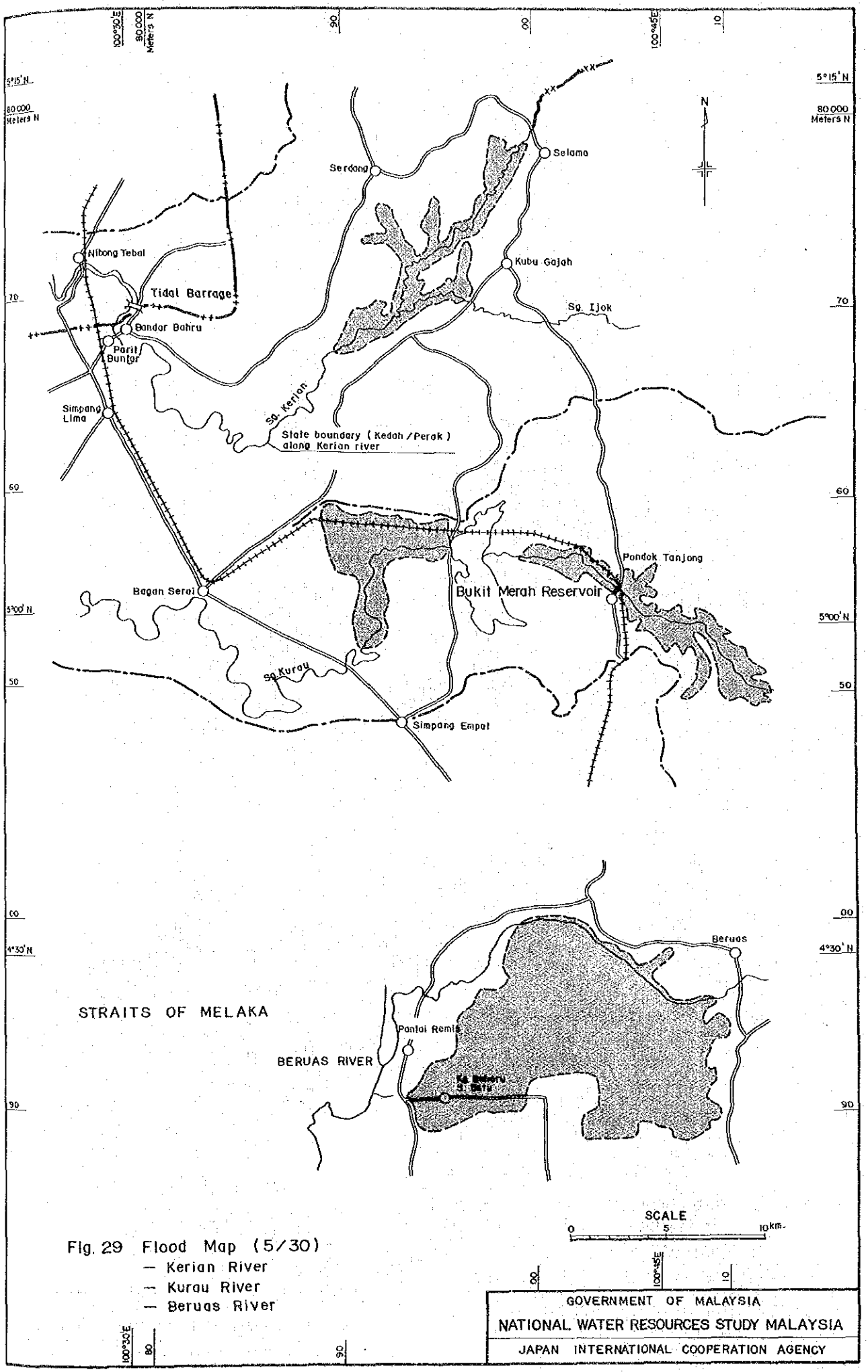

Fig. 29 Flood Map (5/30)
— Kerian River
— Kurau River
— Beruas River