Table 8.2(1/2) FEATURES OF DESIGN CHANNEL OF TRIBUTARIES OF AGNO RIVER FOR LONG TERM PLAN

River: TALRAC RIVER
Design Flood: 25-yr

Item	Unit	Returding Basin	Tarlac R.		
		AG180+0.8k - TA200	TA200 - TA227	TA227 - TA251	TA251 - TARIS Dam
Design Discharge	m3/s	-	2600	2600	1750
Distance	m	8100	13000	11800	4150
Gradient of River Bed	-	1/1850	1/1300	1/760	1/692
River Width	m	-	1700-640	1600-600	600-270
Width of Channel Bed	m	160	160	160	140
Dike Height (Ave.)	m	7.2	3.9	3.5	1.5
Water Depth	m	7.9-4.82	4.82-4.0	4.0	4.0-3.5
Low Channel Height(Ave.)	m	5.0-2.0	2.0	2.0	3.5

River: CAMILING RIVER
Design Flood: 25-yr

Item	Unit	Camiling R.					
		AG143+1.0k CA156+0.3k	CA156+0.3k - CA162	CA162 - CA167	CA167 - CA172	CA172 - CA173	CA173 - CA175
Design Discharge	m3/s	1650	1150	1150	1150	850	850
Distance	m	3550	4650	4300	4950	1300	2050
Gradient of River Bed	-	1/2000	1/2000	1/1000	1/550	1/300	Existing
River Width	m	250	180	180	180	130	130
Width of Channel Bed	m	50	40	40	40	30	Existing
Dike Height (Ave.)	m	5.0-3.2	3.1	2.8	2.0	1.0	1.0-0.0
Water Depth	m	8.2-6.9	6.9-6.7	6.7-6.3	6.3-4.8	4.8-4.4	4.4-4.2
Low Channel Height(Ave.)	m	4.7	4.7	4.7	4.5	4.5	4.0

River: BANILA RIVER
Design Flood: 25-yr

Item	Unit	Banila R.					
		AG349- AG349+3.7k	AG349+3.7k - BN381	BN381 - BN386	BN386 - BN394	BN394 - BN397	BN397 - BN401
Design Discharge	m3/s	1000	1000	650	300	300	230
Distance	m	3700	8050	4550	7600	2900	4100
Gradient of River Bed	-	1/1295	1/835	1/520	1/265	Existing	Existing
River Width	m	180	180	120	120	120	120
Width of Channel Bed	m	20	20	15	8	Existing	Existing
Dike Height (Ave.)	m	3.1	2.8	2.5	2.1	1.9	1.1
Water Depth	m	7.1	6.6	6.6-6.0	6.6-2.8	2.8-1.3	1.3
Low Channel Height (Ave.)	m	5.0	4.8	4.8	4.8-2.5	1.0	1.0

Table 8.2(2/2) FEATURES OF DESIGN CHANNEL EL OF TRIBUTARIES OF AGNO RIVER FOR LONG TERM PLAN

River: VIRAY-DIPALO RIVER
Design Flood: 25-yr

Item	Unit	Viray-Dipalo R. AG414 -VD425	VD425 -VD428	VD428 -VD430	VD430- VD430+0.6K	Viray R. VD430+0.6K -VD433	VD433 -VD434+0.5K
Design Discharge	m3/s	550	550	550	550	270	270
Distance	m	2800	3100	2000	600	2400	1450
Gradient of River Bed	-	1/375	1/300	1/250	1/127	1/127	1/75
River Width	m	380-290	320-270	320-260	300	150	150
Width of Channel Bed	m	30	30	30	30	15	15
Dike Height (Ave.)	m	1.4	1.4	1.4	1.4	0.75	0.75
Water Depth	m	3.7	3.7	3.7	3.7	2.75	2.75
Low Channel Height (Ave.)	m	3.3	3.3	3.3	3.3	2.8	2.8

River: VIRAY-DIPALO RIVER
Design Flood: 25-yr

Item	Unit	Dipalo R. VD430+0.6K -VD436	VD436 -VD437	VD437 -VD439	VD439 -VD441	VD441 -VD442
Design Discharge	m3/s	250	250	150	150	150
Distance	m	1500	700	1950	1950	1000
Gradient of River Bed	-	1/170	1/125	1/125	1/80	1/68
River Width	m	100	100	100	100	100
Width of Channel Bed	m	15	15	10	10	10
Dike Height (Ave.)	m	2.4	2.4	1.95	1.75	1.55
Water Depth	m	3.6	2.8	2.35	2.15	1.95
Low Channel Height(Ave.)	m	2.0	1.2	1.0	1.0	1.0

River: AMBAYOAN RIVER
Design Flood: 25-yr

Item	Unit	Ambayoan R. AG461- AM444+0.5K	AM444+0.5K - AM448K	AM448- AM451+0.4k
Design Discharge	m3/s	1350	1350	1350
Distance	m	1800	3550	3350
Gradient of River Bed	-	1/390	1/205	1/150
River Width	m	400	400	400
Width of Channel Bed	m	50	50	50
Dike Height(Ave.)	m	3.9	1.9	1.7
Water Depth	m	5.2	3.4	3.2
Low Channel Height(Ave.)	m	2.8	2.5	2.5

Table 8.3(1/3) FEATURES OF DESIGN CHANNEL OF ALLIED RIVERS FOR LONG TERM PLAN

River: CAYANGA-PATALAN-ANGALACAN RIVER
Design Flood: 10-yr (with Closure Dike)

Item	Unit	Cayanga R.	Patalan R.	Angalacan River			
		R.M - Bued R.	Bued R.- Aloragat R.	Aloragat R. - 21.0k	21.0k- Maraboc	Maraboc - 27.0k	27.0k - Bugayong
Design Discharge	m3/s	1500	800	400	400	280	280
Distance	m	6500	8300	6200	2800	3200	3300
Gradient of River Bed	-	1/1300	1/1100	1/650	1/460	1/460	1/230
River Width	m	500	200	150	120	100	80
Width of Channel Bed	m	40	30	25	25	20	20
Dike Height	m	1.9	2.1	0.3	0	0	0
Water Depth	m	7.4	6.1	4.5	4.1	3.8	3.2
Low Channel Height	m	6.5	5.0	5.0	5.0	5.0	4.0

Item	Unit	Angalacan River	
		Bugayong -KILLO Br.	Killo Br. -37.5k
Design Discharge	m3/s	190	190
Distance	m	2700	4500
Gradient of River Bed	-	1/190	1/140
River Width	m	60	50
Width of Channel Bed	m	15	15
Dike Height	m	0	0
Water Depth	m	3	2.4
Low Channel Height	m	4.0	3.0

River: BUED RIVER
Design Flood: 10-yr (with Closure Dike)

Item	Unit	Bued River					
		Junction -2.0 K	2.0 K - 4.0 K	4.0 K - NIA Dam	NIA Dam 11.9 K	11.9 K - 16.5 K	16.5 K 19.7
Design Discharge	m3/s	750	750	750	750	500	500
Distance	m	2000	2000	3300	4600	4600	3200
Gradient of River Bed	-	1/400	1/280	1/170	1/143	1/140	1/70
River Width	m	400	400	400	400	400	400
Width of Channel Bed	m	30	20	20	20	20	20
Dike Height	m	1.9-1.1	2.1	1.9	1.4	1.2	1.1
Water Depth	m	7.4-5.1	4.6	2.9	1.9	1.7	1.6
Low Channel Height	m	5.0	3.5	2.0	1.5	1.5	1.5

Table 8.3(2/3) FEATURES OF DESIGN CHANNEL OF ALLIED FOR LONG TERM PLAN

River: ALORAGAT RIVER
Design Flood: 10-yr (with Closure Dike)

Item	Unit	ALORAGAT RIVER			
		Junction -7.0k	7.0k- 11.5k	11.5k- 17.0k	17.0k- 19.7k
Design Discharge	m3/s	300	300	150	100
Distance	m	7000	4500	5500	2700
Gradient of River Bed	-	1/680	1/355	1/335	1/185
River Width	m	90	80	50	45
Width of Channel Bed	m	30	20	10	10
Dike Height	m	1.6-0.0	0.0	0.3	0.8
Water Depth	m	6.1-3.2	3.2	3.2	2.2
Low Channel Height	m	5.5	5.0	3.5	2.0

River: PANTO-MARUSAY-SINOCALAN-TAGUMISING RIVER
Design Flood: 10-yr (w/o Floodway)

Item	Unit	PANTO R.	MARUSAY R.		SINOCALAN R.		
		R.M - Dagupan R.	Dagupan R. -4.0K	4.0k - Ingalera R.	Ingalera R. -18.0k	18.0k- 25.5k	25.5k - Mitura R.
Design Discharge	m3/s	1900	1250	1250	900	650	650
Distance	m	2500	1500	4300	9700	7500	5500
Gradient of River Bed	-	1/1750	1/1750	1/1750	1/1750	1/1450	1/1100
River Width	m	400	120	220	220	150	100
Width of Channel Bed	m	60	60	40	30	30	25
Dike Height	m	2.7	2.6	2.6	2.4	2.4	2.0
Water Depth	m	7.2	7.1	7.1	6.9	6.9	6.0
Low Channel Height	m	5.5	5.5	5.5	5.5	5.5	5.0

Item	Unit	TAGUMISING R.		
		Mitura R. -36.7k	36.7k- Sta. Maria	Sta. Maria -43.5k
Design Discharge	m3/s	160	160	120
Distance	m	5700	4700	2100
Gradient of River Bed	-	1/700	1/430	1/350
River Width	m	100	80	80
Width of Channel Bed	m	10	10	10
Dike Height	m	0	0	0
Water Depth	m	4.0	3.3	3.0
Low Channel Height	m	5.0	4.5	4.5

Table 8.3(3/3) FEATURES OF DESIGN CHANNEL OF ALLIED FOR LONG TERM PLAN

River: DAGUPAN RIVER
Design Flood: 10-yr

Item	Unit	DAGUPAN R. Junction -7.5k	SAN JUAN R. 7.5k- 12.7k	12.7k- Erang R.	ELANG R. San Juan - 27.6k
Design Discharge	m3/s	700	550	390	190
Distance	m	7500	5200	9000	5900
Gradient of River Bed	-	1/5000	1/5000	1/5000	1/5000
River Width	m	250	100	100	50
Width of Channel Bed	m	60	30	20	15
Dike Height	m	2.7	3.2	3.3	2.3
Water Depth	m	7.2	7.2	7.0	6.0
Low Channel Height	m	5.5	5.0	4.5	4.5

River: INGALERA RIVER
Design Flood: 10-yr

Item	Unit	INGALERA RIVER Junction -Malasigui	Malasigui -26.0k	26.0k- 32.0k	32.0k - San Nicolas	San Nicolas -37.5k
Design Discharge	m3/s	360	260	150	150	80
Distance	m	13300	12700	6000	4000	1500
Gradient of River Bed	-	1/3600	1/1800	1/1000	1/700	1/700
River Width	m	100	60	50	50	40
Width of Channel Bed	m	15	12	8	8	6
Dike Height	m	2.4	0.5	0.0	0.6	0.3
Water Depth	m	7.1	5.8	4.3	4.0	3.2
Low Channel Height	m	5.5	5.5	5.0	4.0	3.5

River: MITURA-MAGALONG RIVER
Design Flood: 10-yr

Item	Unit	MITURA R. Junction -5.3k	5.3k- Taboy	MAGALONG RIVER Taboy - 19.0k	19.0k - 21.0k
Design Discharge	m3/s	130	130	90	70
Distance	m	5300	8900	4800	2000
Gradient of River Bed	-	1/800	1/460	1/460	1/250
River Width	m	50	40	35	30
Width of Channel Bed	m	10	8	6	4
Dike Height	m	2.0-0.0	0.3	0.4	0.5
Water Depth	m	6.0-3.8	3.7	3.3	2.9
Low Channel Height	m	5.0	4.0	3.5	3.0

Table 8.4 (1/2) WORK QUANTITIES OF RIVER IMPLOVEMENT OF AGNO RIVER FOR LONG TERM PLAN

River : Main Agno
Study : Long Term Plan (River Improvement and Natural Retarding Basin)
Return Period : 25 - year

Work Item	Unit	Agno River Main Stream											Total of Agno River
		Lower Agno River				Poponto Stretch			Upper Agno River				
		RM-AG045	*AG045-AG122	AG122-AG282	Sub-total	Bayambang Stretch	Poponto Floodway	Sub-total	AG309-AG351	AG351-AG405	AG405-AG473	Sub-total	
(1) Excavation 1	cu.m	0	5,333,000	7,100,000	12,433,000	650,000	5,440,000	6,090,000	1,900,000	1,400,000	0	3,300,000	21,823,000
Excavation 2	cu.m	0	0	0	0	0	0	0	0	0	2,850,000	2,850,000	2,850,000
Total of (1)	cu.m	0	5,333,000	7,100,000	12,433,000	650,000	5,440,000	6,090,000	1,900,000	1,400,000	2,850,000	6,150,000	24,673,000
(2) Dredging	cu.m	5,770,000	7,257,000	0	13,027,000	0	0	0	0	0	0	0	13,027,000
(3) Embankment 1													
Left Dike	cu.m	0	0	1,440,000	1,440,000	84,300	133,700	218,000	77,700	236,000	0	313,700	1,971,700
Right Dike	cu.m	0	0	625,000	625,000	84,300	953,300	1,037,600	66,600	467,000	0	533,600	2,196,200
Embankment 2													
Left Dike	cu.m	862,000	5,950,000	0	6,812,000	0	0	0	0	0	240,000	240,000	7,052,000
Right Dike	cu.m	798,000	752,000	0	1,550,000	0	0	0	0	0	2,500,000	2,500,000	4,050,000
Total of (3)	cu.m	1,660,000	6,702,000	2,065,000	10,427,000	168,600	1,087,000	1,255,600	144,300	703,000	2,740,000	3,587,300	15,269,900
(4) Sodding	cu.m	524,000	1,440,000	756,000	2,720,000	74,200	310,500	384,700	703,500	655,500	366,000	1,725,000	4,829,700
(5) Revetment (L.W.C.)													
Type-A	sq.m	16,000	24,000	0	40,000	3,150	59,800	62,950	32,800	24,400	75,100	132,300	235,250
Type-B	sq.m	0	71,600	58,600	130,200	4,670	0	4,670	0	0	0	0	134,870
Revetment (H.W.C.)													
Type-A	sq.m	0	0	0	0	0	0	0	30,500	13,400	13,600	57,500	57,500
Type-B	sq.m	14,400	21,600	11,800	47,800	0	38,100	38,100	0	0	0	0	85,900
Total of (5)	sq.m	30,400	117,200	70,400	218,000	7,820	97,900	105,720	63,300	37,800	88,700	189,800	513,520
(6) Groin (L.W.C.)													
Type-A	pc.	59	277	124	460	0	0	0	114	84	0	198	658
Type-B	pc.	0	0	0	0	0	0	0	0	0	0	0	0
Groin (H.W.C.)													
Type-A	pc.	0	0	0	0	0	0	0	0	0	148	148	148
Type-B	pc.	0	0	0	0	0	0	0	0	0	152	152	152
Total of (6)	pc.	59	277	124	460	0	0	0	114	84	300	498	958
(7) Sluice Way													
Type-A	pc.	0	0	2	2	1	1	2	0	2	1	3	7
Type-B	pc.	0	6	2	8	0	0	0	0	0	1	1	9
Total of (7)	pc.	0	6	4	10	1	1	2	0	2	2	4	16
(8) Water Gate													
Type-A	pc.	0	0	0	0	0	0	0	0	0	0	0	0
Type-B	pc.	2	0	0	2	0	0	0	0	0	0	0	2
Total of (8)	pc.	2	0	0	2	0	0	0	0	0	0	0	2
(9) Bridge													
Newly Const.	sq.m	22,500	11,850	11,250	45,600	0	0	0	6,750	0	0	6,750	52,350
Rehabilit.	sq.m	0	0	0	0	0	0	0	0	0	0	0	0
Demolishment													
Concrete	cu.m	3,400	1,480	1,400	6,280	0	0	0	3,800	0	0	3,800	10,080
Metal	ton	510	550	0	1,060	0	0	0	1,300	0	0	1,300	2,360
(10) Fixed Weir	pc.	0	0	0	0	0	1	1	0	0	0	0	1
(11) Others	L.S	0	0	0	0	0	0	0	0	0	0	0	0

Remarks : * AG045-AG122 include Dumuloc, Sobol, Bayaoas, and Olo Rivers of other tributaries of Agno River. (File cord : WQ-AGM25)

Table 8.4 (2/2) WORK QUANTITIES OF RIVER IMPLOVEMENT OF AGNO RIVER FOR LONG TERM PLAN

River : Tarlac/other tributaries
Study : Long Term Plan (River Improvement and Natural Retarding Basin)
Return Period : 25 - year

Work Item	Unit	Tarlac River			Tributaries of Agno River				
		AG180-TA200 (Confluence)	TA200-TA265	Total of Tarlac River	Camiling River	Banila River	Viray-Dipalo River	Ambayaoan River	Total of Tributaries
(1) Excavation 1	cu.m	2,600,000	1,700,000	4,300,000	414,000	478,000	185,000	0	1,077,000
Excavation 2	cu.m	0	0	0	0	38,000	0	85,000	123,000
Total of (1)	cu.m	2,600,000	1,700,000	4,300,000	414,000	516,000	185,000	85,000	1,200,000
(2) Dredging	cu.m	0	0	0	0	0	0	0	0
(3) Embankment 1									
Left Dike	cu.m	558,000	315,500	873,500	467,600	623,500	42,000	134,200	1,267,300
Right Dike	cu.m	0	481,600	481,600	424,400	680,900	60,200	140,400	1,305,900
Embankment 2									
Left Dike	cu.m	0	0	0	0	7,800	0	0	7,800
Right Dike	cu.m	0	0	0	0	0	0	0	0
Total of (3)	cu.m	558,000	797,100	1,355,100	892,000	1,312,200	102,200	274,600	2,581,000
(4) Sodding	cu.m	437,800	979,800	1,417,600	441,400	739,000	119,200	152,400	1,452,000
(5) Revetment (L.W.C.)									
Type-A	sq.m	18,400	58,300	76,700	48,100	67,000	39,700	15,900	170,700
Type-B	sq.m	12,100	0	12,100	0	0	0	3,500	3,500
Revetment (H.W.C.)									
Type-A	sq.m	0	6,800	6,800	10,500	0	200	3,800	14,500
Type-B	sq.m	0	0	0	0	0	0	0	0
Total of (5)	sq.m	30,500	65,100	95,600	58,600	67,000	39,900	23,200	188,700
(6) Groin (L.W.C.)									
Type-A	pc.	0	244	244	276	420	286	88	1,070
Type-B	pc.	0	0	0	0	0	0	0	0
Groin (H.W.C.)									
Type-A	pc.	0	0	0	0	0	0	0	0
Type-B	pc.	0	0	0	0	0	0	0	0
Total of (6)	pc.	0	244	244	276	420	286	88	1,070
(7) Sluice Way									
Type-A	pc.	0	2	2	1	14	4	4	23
Type-B	pc.	0	0	0	3	0	0	0	3
Total of (7)	pc.	0	2	2	4	14	4	4	26
(8) Water Gate									
Type-A	pc.	0	0	0	0	0	0	0	0
Type-B	pc.	0	0	0	0	0	0	0	0
Total of (8)	pc.	0	0	0	0	0	0	0	0
(9) Bridge									
Newly Const.	sq.m	0	13,500	13,500	2,300	8,600	6,200	3,000	20,100
Rehabilit.	sq.m	0	0	0	0	0	0	0	0
Demolishment									
Concrete	cu.m	0	2,500	2,500	1,100	2,300	600	200	4,200
Metal	ton	0	0	0	0	0	0	0	0
(10) Fixed Weir	pc.	0	0	0	0	0	0	0	0
(11) Others	L.S	0	0	0	0	1	0	0	1

(File cord : WQ/TAL25)

Table 8.5 WORK QUANTITIES OF RIVER IMPLOVEMENT OF ALLIED RIVER FOR LONG TERM PLAN

River : Allied River
Study : Long Term Plan (River Improvement with Bued Closure Dike/without Binalonan Floodway)
Return Period : 10 - year

Work Item	Unit	Allied River										Total of Allied River
		Panto - Sinocalan River						Cayanga - Patalan River				
		*Panto-Sinocalan R.	Dagupan River	Ingalera River	Macalong River	Binalonan Floodway	Sub-total	**Cayanga-Patalan R.	Bued River	Aloragat River	Sub-total	
(1) Excavation 1	cu.m	1,925,000	702,000	1,395,000	194,000	0	4,216,000	1,254,000	183,800	216,000	1,653,800	5,869,800
Excavation 2	cu.m	0	0	0	0	0	0	0	188,000	0	188,000	188,000
Total of (1)	cu.m	1,925,000	702,000	1,395,000	194,000	0	4,216,000	1,254,000	371,800	216,000	1,841,800	6,057,800
(2) Dredging	cu.m	38,000	0	0	0	0	38,000	260,000	0	0	260,000	298,000
(3) Embankment 1												
Left Dike	cu.m	618,400	967,900	384,000	35,500	0	2,005,800	288,700	33,000	0	321,700	2,327,500
Right Dike	cu.m	618,400	967,900	384,000	35,500	0	2,005,800	288,700	33,000	0	321,700	2,327,500
Embankment 2												
Left Dike	cu.m	0	0	0	0	0	0	0	23,700	0	23,700	23,700
Right Dike	cu.m	0	0	0	0	0	0	0	51,100	0	51,100	51,100
Total of (3)	cu.m	1,236,800	1,935,800	768,000	71,000	0	4,011,600	577,400	140,800	0	718,200	4,729,800
(4) Sodding	cu.m	628,000	995,000	520,000	64,000	0	2,207,000	231,100	97,200	0	328,300	2,535,300
(5) Revetment (L.W.C.)												
Type-A	sq.m	73,000	30,400	18,900	20,900	0	143,200	75,200	39,700	40,800	155,700	298,900
Type-B	sq.m	38,000	40,300	124,200	0	0	202,500	30,300	0	0	30,300	232,800
Revetment (H.W.C.)												
Type-A	sq.m	27,200	0	0	0	0	27,200	5,800	1,500	0	7,300	34,500
Type-B	sq.m	0	0	0	0	0	0	0	0	0	0	0
Total of (5)	sq.m	138,200	70,700	143,100	20,900	0	372,900	111,300	41,200	40,800	193,300	566,200
(6) Groin (L.W.C.)												
Type-A	pc.	556	100	242	54	0	952	542	281	272	1,095	2,047
Type-B	pc.	0	0	0	0	0	0	0	0	0	0	0
Groin (H.W.C.)												
Type-A	pc.	0	0	0	0	0	0	0	0	0	0	0
Type-B	pc.	0	0	0	0	0	0	0	0	0	0	0
Total of (6)	pc.	556	100	242	54	0	952	542	281	272	1,095	2,047
(7) Sluice Way												
Type-A	pc.	16	4	8	8	0	36	10	6	0	16	52
Type-B	pc.	0	3	0	0	0	3	0	0	0	0	3
Total of (7)	pc.	16	7	8	8	0	39	10	6	0	16	55
(8) Water Gate												
Type-A	pc.	0	0	0	0	0	0	0	0	0	0	0
Type-B	pc.	0	0	0	0	0	0	0	0	0	0	0
Total of (8)	pc.	0	0	0	0	0	0	0	0	0	0	0
(9) Bridge												
Newly Const.	sq.m	8,000	0	3,900	38	0	11,938	1,210	3,000	263	4,473	16,411
Rehabilit.	sq.m	338	3,905	0	193	0	4,436	2,678	0	0	2,678	7,114
Demolishment												
Concrete	cu.m	4,590	1,200	1,700	470	0	7,960	1,700	300	200	2,200	10,160
Metal	ton	0	0	0	0	0	0	0	0	0	0	0
(10) Fixed Weir	pc.	0	0	0	0	0	0	0	0	0	0	0
(11) Others	L.S	0	0	0	0	0	0	0	1	0	1	1

Remarks: * Panto-Sinocalan River Consists of Panto, Marusay, Sinocalan, Tagumising and Tuboy Rivers. (File cord : MQ-ALE10)
** Cayanga-Patalan River consists of Cayanga, Patalan and Angalacan Rivers.

Table 8.6 PROJECT FINANCIAL COST OF AGNO RIVER FOR LONG TERM PLAN

(Unit: 1,000 Pesos)

River	F.C.	L.C.	Total
I. Agno River			
1. Lower Agno River			
(1) RM-AG045	955,609	679,183	1,634,792
(2) AG045-AG122	1,958,053	963,113	2,921,166
(3) AG122-AG282	979,063	519,039	1,498,102
Sub-total of 1	3,892,725	2,161,335	6,054,060
2. Poponto Stretch			
(1) Bayambang Stretch	76,139	53,450	129,589
(2) Poponto Floodway	685,298	312,500	997,798
Sub-total of 2	761,437	365,950	1,127,387
3. Upper Agno River			
(1) AG309-AG351	299,418	225,551	524,969
(2) AG351-AG405	222,559	155,322	377,881
(3) AG405-AG473	871,344	429,655	1,300,999
Sub-total of 3	1,393,321	810,528	2,203,849
Total of I	6,047,483	3,337,813	9,385,296
II. Tarlac River			
(1) AG180-TA200	456,111	184,589	640,700
(2) TA200-TA265	446,532	333,839	780,371
Total of II	902,643	518,428	1,421,071
III. Agno River Tributary			
(1) Camiling River	225,737	161,015	386,752
(2) Banila River	459,202	314,534	773,736
(3) Viray-Dipalo River	150,801	149,433	300,234
(4) Ambayoan River	101,274	78,013	179,287
Total of III	937,014	702,995	1,640,009
GRAND TOTAL (I+II+III)	7,887,140	4,559,236	12,446,376

(CF-LG25A)

Table 8.7 PROJECT FINANCIAL COST OF ALLIED RIVER FOR LONG TERM PLAN

(Unit: 1,000 Pesos)

River	F.C.	L.C.	Total
I. Panto-Sinocalan River			
(1) Panto-Sinocalan River	539,589	376,417	916,006
(2) Dagupan River	379,441	207,483	586,924
(3) Ingalera River	334,582	219,499	554,081
(4) Macalong River	57,757	45,235	102,992
(5) Binalonan Floodway	0	0	0
Sub-Total I.	1,311,369	848,634	2,160,003
II. Cayanga-Patalan River			
(1) Cayanga-Patalan River	338,684	262,748	601,432
(2) Bued River	214,179	161,985	376,164
(3) Aloragat River	61,882	86,802	148,684
Sub-Total I.	614,745	511,535	1,126,280
Total of I. and II.	1,926,114	1,360,169	3,286,283

(CF-LG25B)

Table 9.1 (1/2) FEATURES OF DESIGN CHANNEL OF AGNO RIVER FOR FRAMEWORK PLAN

River:Agno River
Design Flood: 100-yr

Item	Unit	Agno R.			
		RM - AG45	AG45 - AG65	AG65 - AG109	AG109 - AG177
Design Discharge	m3/s	13800	13800	13800	12700
Distance	m	6850	9050	15150	10500
Gradient of Channel Bed	-	1/6500	1/6500	1/3500	1/2000
River width	m	400-300	1500	1500	1500
Width of Channel Bed	m	100	300	240	200
Dike Height (Ave.)	m	4.9	5.5	6.6	6.0
Water Depth	m	8.73-9.75	9.75-11.1	11.1	11.1-9.74
Low Channel Depth (Ave.)	m	6.5	6.5	6.5	6.5

Item	Unit	Agno R	Retarding 1>	Floodway	Bayanbang 2>
		AG177 - AG181	AG181 - AG314	AG314 - AG320(b)	AG282(b)- AG307
Design Discharge	m3/s	11200	-	8200	1000
Distance	m	2200	7100	3800	9640
Gradient of Channel Bed	-	1/2000	1/1600	1/1600	1/1850
River width	m	1500	-	1200	250-1300
Width of Channel Bed	m	200	180	180	80-100
Dike Height (Ave.)	m	5.6	6.7	5.3	3.3
Water Depth	m	9.74-9.56	9.56-7.80	7.8	8.5-4.1
Low Channel Depth (Ave.)	m	6.0	4.0	4.0	5.0

1>:Retarding Basin stretch 2>:Bayanbang Stretchc of Agno R.

Item	Unit	Agno R.			
		AG320(b)- AG351	AG351 - AG367	AG367 - AG414	AG414 - AG453
Design Discharge	m3/s	9200	8200	8200	8200
Distance	m	15930	8170	8150	5330
Gradient of Channel Bed	-	1/1600	1/1300	1/665	1/440
River width	m	900-1900	1250-3000	3000-2000	2000-1200
Width of Channel Bed	m	180	180	180	150
Dike Height (Ave.)	m	5.3	4.6	3.9	3.4
Water Depth	m	7.8	7.8-5.4	5.4	4.9
Low Channel Depth (Ave.)	m	4.0	3.5	3.0	3.0

Table 9.1 (2/2) FEATURES OF DESIGN CHANNEL OF AGNO RIVER FOR FRAMEWORK PLAN

River:Agno River
Design Flood: 100-yr

Item	Unit	Agno R.			
		AG367 - AG460	AG460 - AG464	AG464 - AG469	AG469 - AG474
Design Discharge	m3/s	6400	6400	6400	6400
Distance	m	3120	1990	2420	2800
Gradient of Channel Bed	-	1/280	1/230	1/230	1/230
River width	m	1500-3000	3000-2200	2200-1100	1100-300
Width of Channel Bed	m	150	150	150	150
Dike Height (Ave.)	m	2.5	2.5	3.1	3.4
Water Depth	m	4.0	4.0	4.0-6.3	6.3-7.5
Low Channel Depth (Ave.)	m	3.0	3.0	3.5	5.0

Table 9.2 (1/2) FEATURES OF DESIGN CHANNEL OF AGNO RIVER FOR LONG TERM PLAN

River:Agno River
Design Flood: 25-yr

Item	Unit	Agno R.			
		RM - AG45	AG45 - AG65	AG65 - AG109	AG109 - AG177
Design Discharge	m3/s	10100	10100	10100	9300
Distance	m	6850	9050	15150	10500
Gradient of Channel Bed	-	1/6500	1/6500	1/3500	1/2000
River width	m	1500	(1500)	(1500)	(1500)
Width of Channel Bed	m	360-250	240	200	200
Dike Height (Ave.)	m	4.2	4.8	5.4	4.8
Water Depth	m	8.2-9.2	9.2-10.4	10.4	10.4-9.1
Low Channel Depth (Ave.)	m	6.5	6.5	6.5	6.5

Item	Unit	Agno R	Retarding 1>	Floodway	Bayanbang 2>
		AG177 - AG181	AG181 - AG314	AG314 - AG320(b)	AG282(b)- AG307
Design Discharge	m3/s	8400	-	5200	600
Distance	m	2200	7100	3800	9640
Gradient of Channel Bed	-	1/2000	1/1600	1/1600	1/1850
River width	m	(1500)	-	1200	250-1300
Width of Channel Bed	m	200	180	180	80-100
Dike Height (Ave.)	m	4.4	4.7	4.2	2.3
Water Depth	m	9.1-8.7	8.7-6.7	6.7	7.8-3.8
Low Channel Depth (Ave.)	m	6.0	4.0	4.0	5.0

1>:Retarding Basin stretch 2>:Bayanbang Stretchc of Agno R.

Item	Unit	Agno R.			
		AG320(b)- AG351	AG351 - AG367	AG367 - AG414	AG414 - AG453
Design Discharge	m3/s	5800	5100	5100	5100
Distance	m	15930	8170	8150	5330
Gradient of Channel Bed	-	1/1600	1/1300	1/665	1/440
River width	m	900-1900	1250-3000	3000-2000	2000-1200
Width of Channel Bed	m	180	180	180	150
Dike Height (Ave.)	m	4.2	3.7	3.2	2.9
Water Depth	m	6.7	6.7-4.7	4.7	4.4
Low Channel Depth (Ave.)	m	4.0	3.5	3.0	3.0

Table 9.2 (2/2) FEATURES OF DESIGN CHANNEL OF AGNO RIVER FOR LONG TERM PLAN

River:Agno River
Design Flood: 25-yr

Item	Unit	Agno R.			
		AG367 - AG460	AG460 - AG464	AG464 - AG469	AG469 - AG474
Design Discharge	m3/s	3800	3800	3800	3800
Distance	m	3120	1990	2420	2800
Gradient of Channel Bed	-	1/280	1/230	1/230	1/230
River width	m	1500-3000	3000-2200	2200-1100	1100-300
Width of Channel Bed	m	150	150	150	150
Dike Height (Ave.)	m	1.8	1.8	2.2	2.0
Water Depth	m	3.6	3.6	3.6-5.4	5.4-6.3
Low Channel Depth (Ave.)	m	3.0	3.0	3.5	5.0

FIGURES

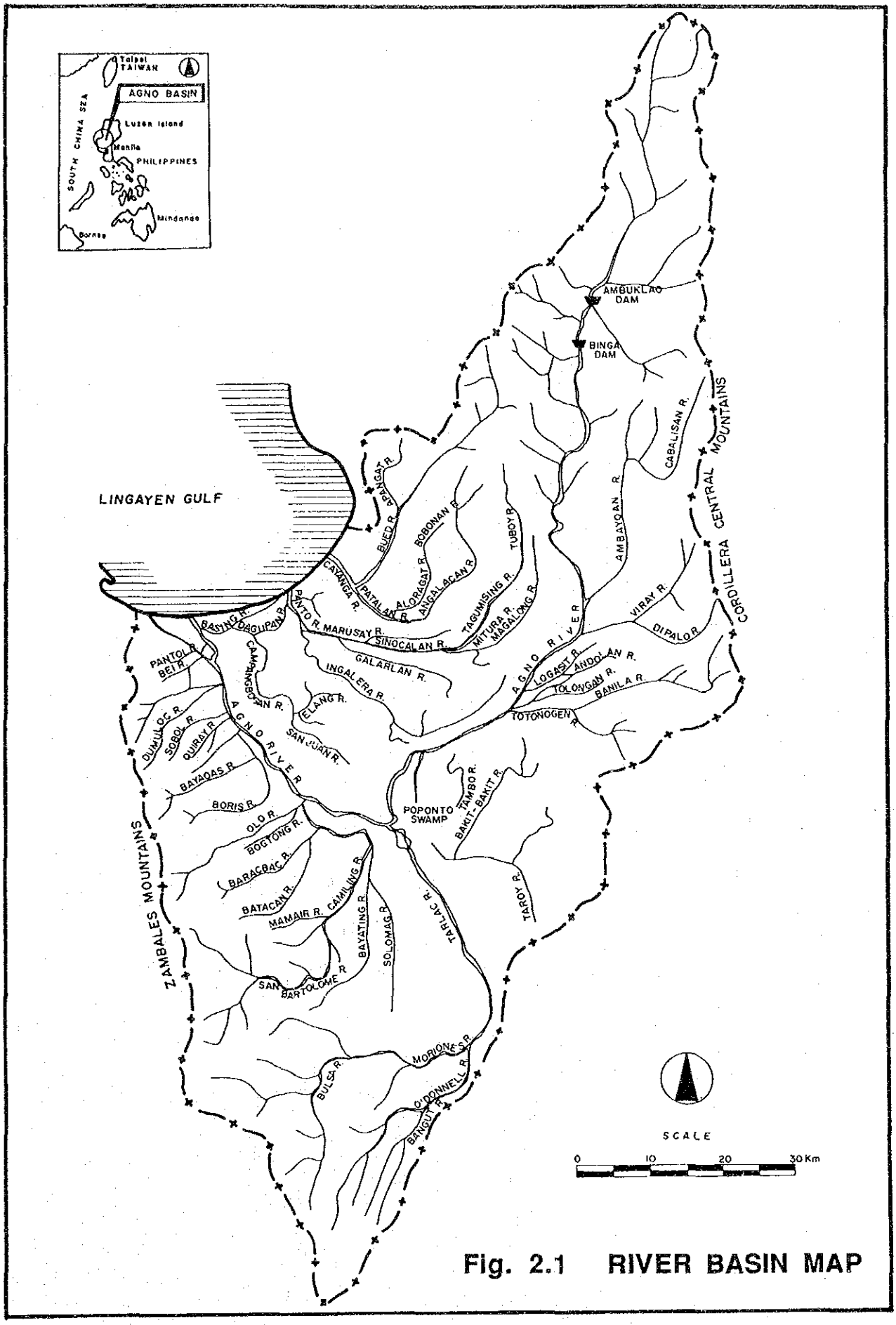
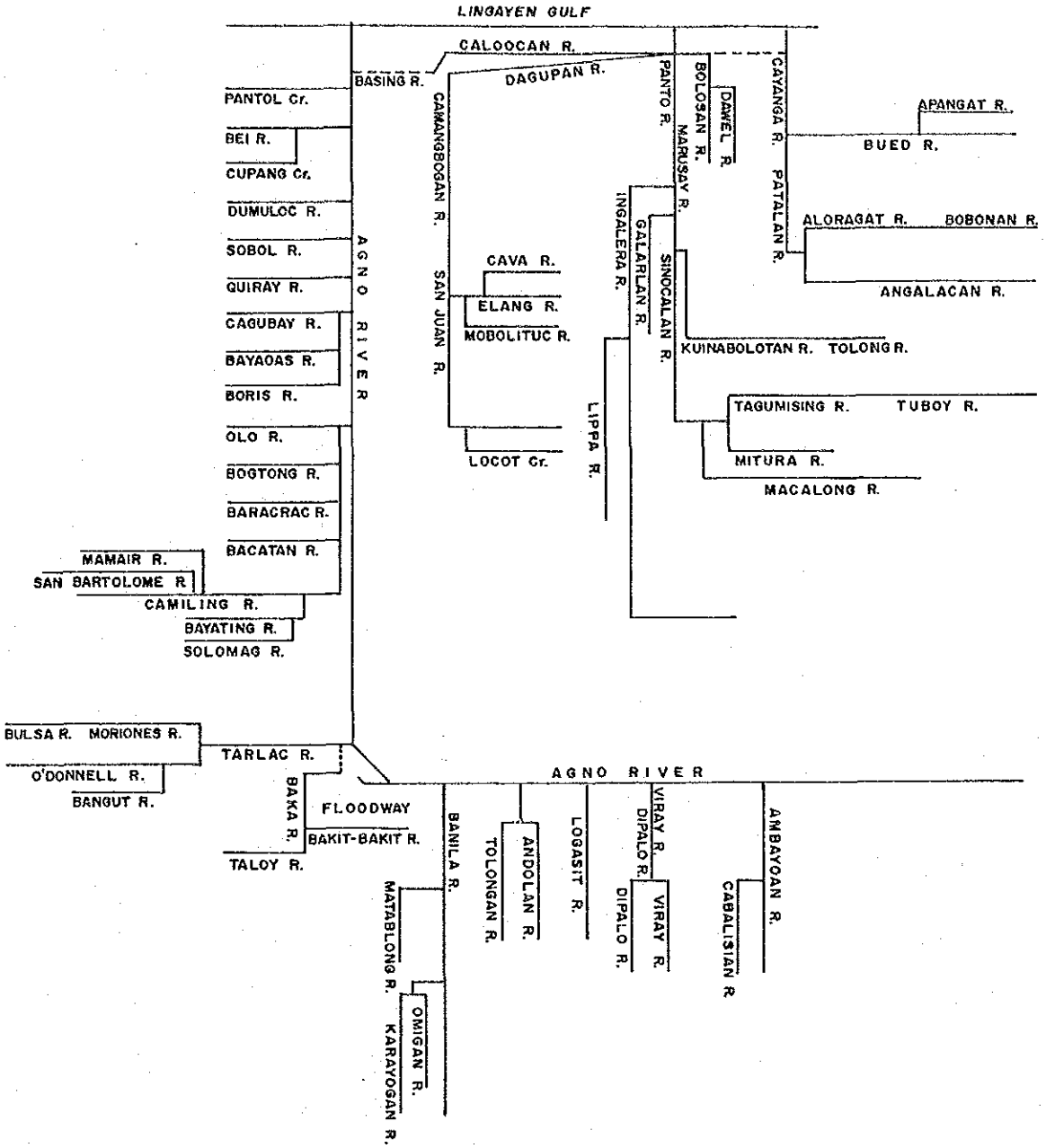


Fig. 2.1 RIVER BASIN MAP



AGNO RIVER BASIN

River	Basin Area(km²)	River Length(km)
AGNO RIVER		
Rivermouth	5,907	221.00
Floodway Site	2,477	165.00
AMBAYOAN RIVER	367	62.20
VIRAY-DIPALO RIVER	135	21.20
BANILA RIVER	309	39.00
TARLAC RIVER	1,896	93.00
CAMILING RIVER	604	64.00

ALLIED RIVER BASIN

River	Basin Area(km²)	River Length(km)
CAYANGA-PATALAN R.		
(whole)	618	61.00
Angalacan R.	144	25.50
Aloragat R.	116	31.00
Bued R.	286	54.00
PANTO-SINOCALAN R.		
(whole)	1,115	75.50
Tagumising R.	182	44.50
Mitura-Macalong R.	141	31.00
Ingalera R.	197	32.50
Dagupan R.	273	32.00

Fig. 2.2 RIVER SYSTEM DIAGRAM

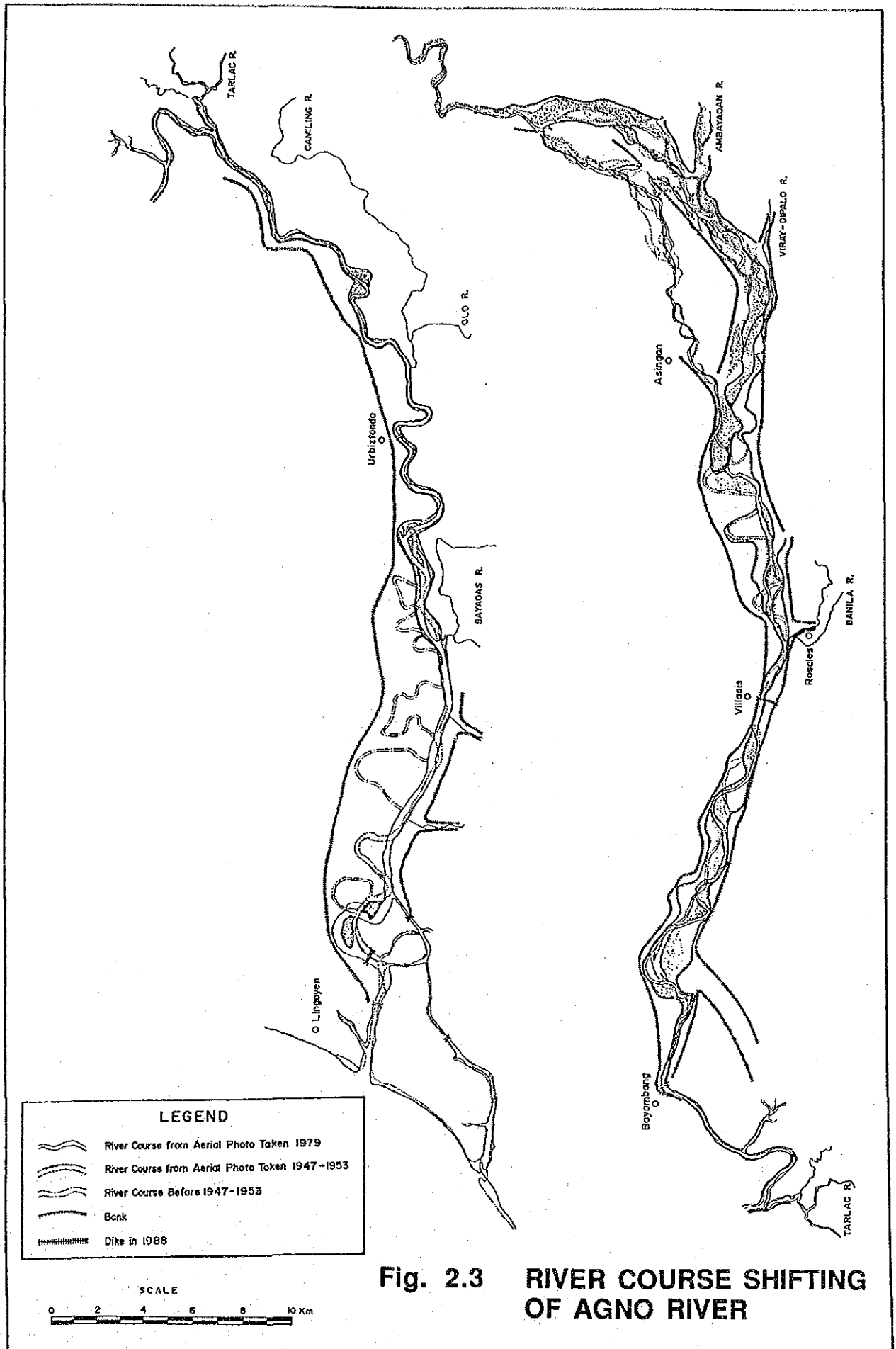


Fig. 2.3 RIVER COURSE SHIFTING OF AGNO RIVER

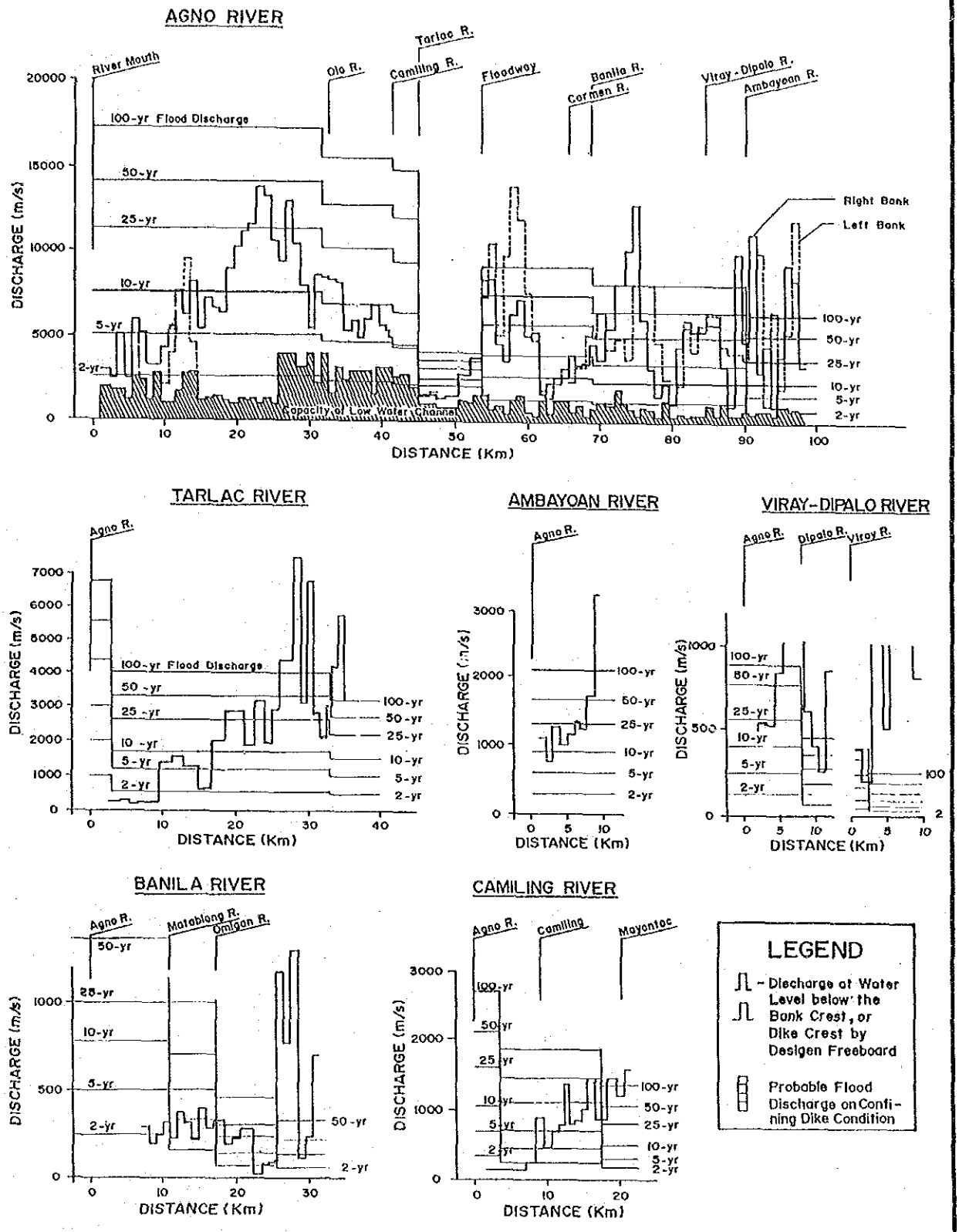


Fig. 2.4 (1/3) EXISTING CARRYING CAPACITY OF AGNO RIVER

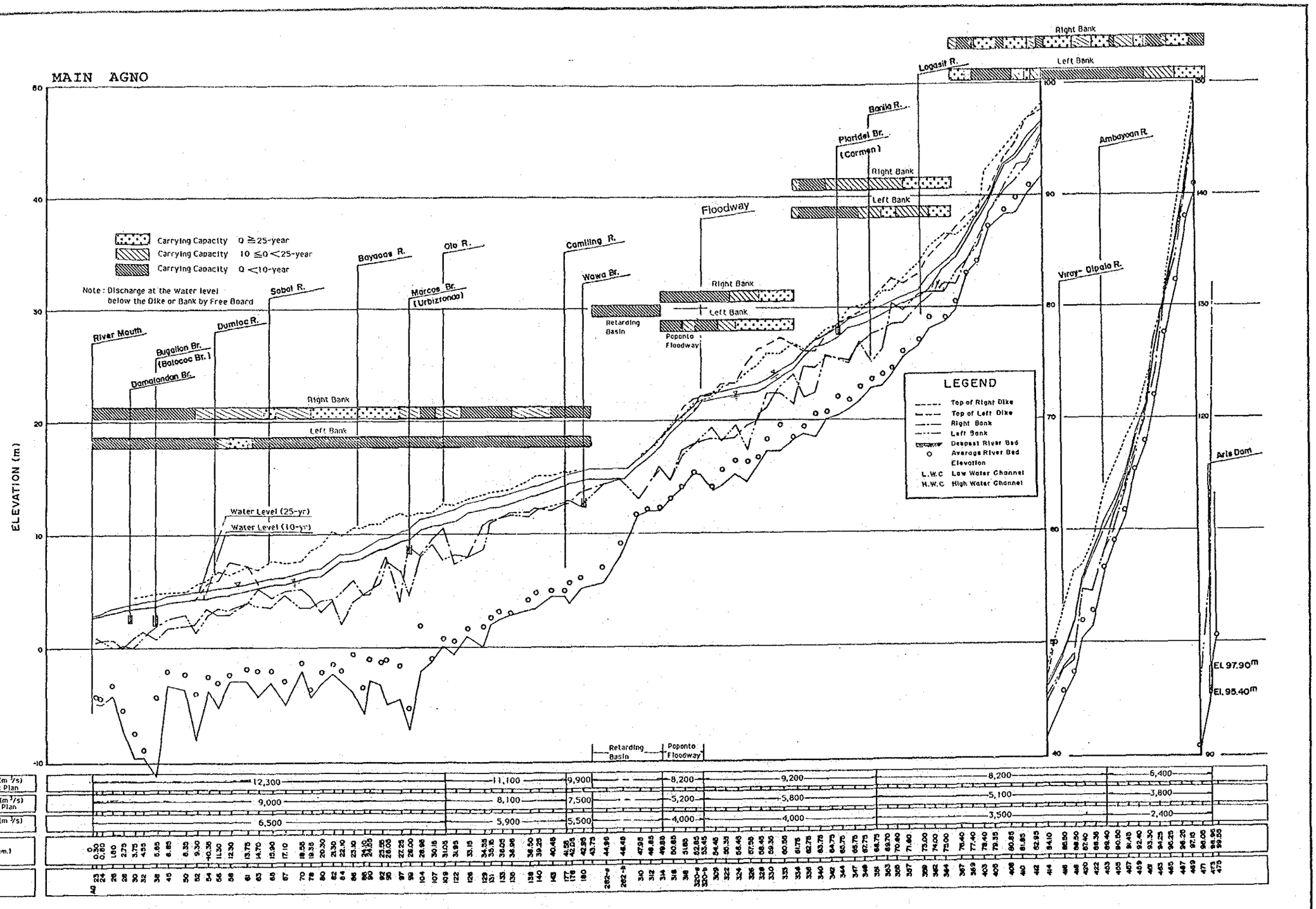


Fig. 2.4 (2/3) EXISTING CARRYING CAPACITY OF AGNO RIVER

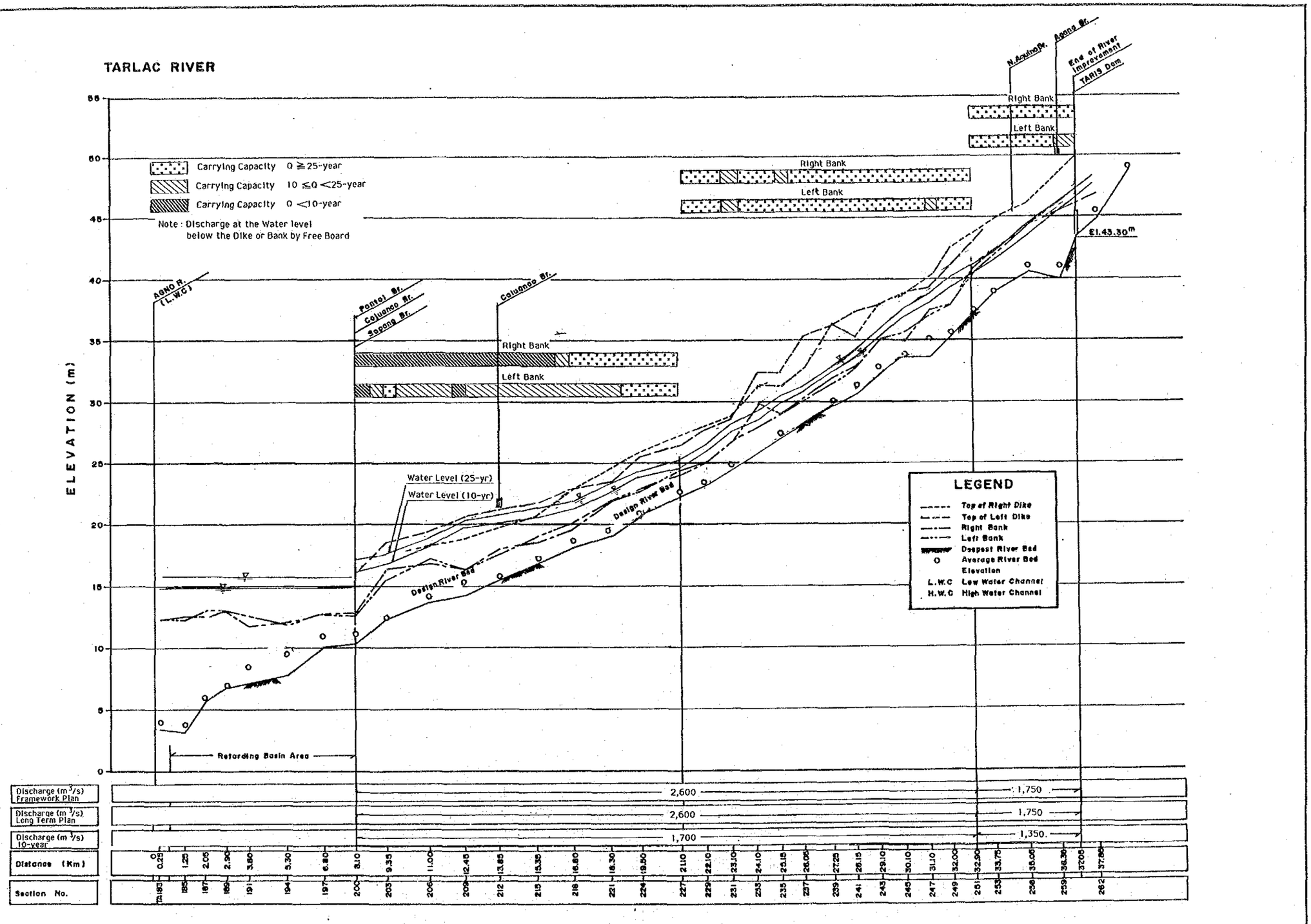
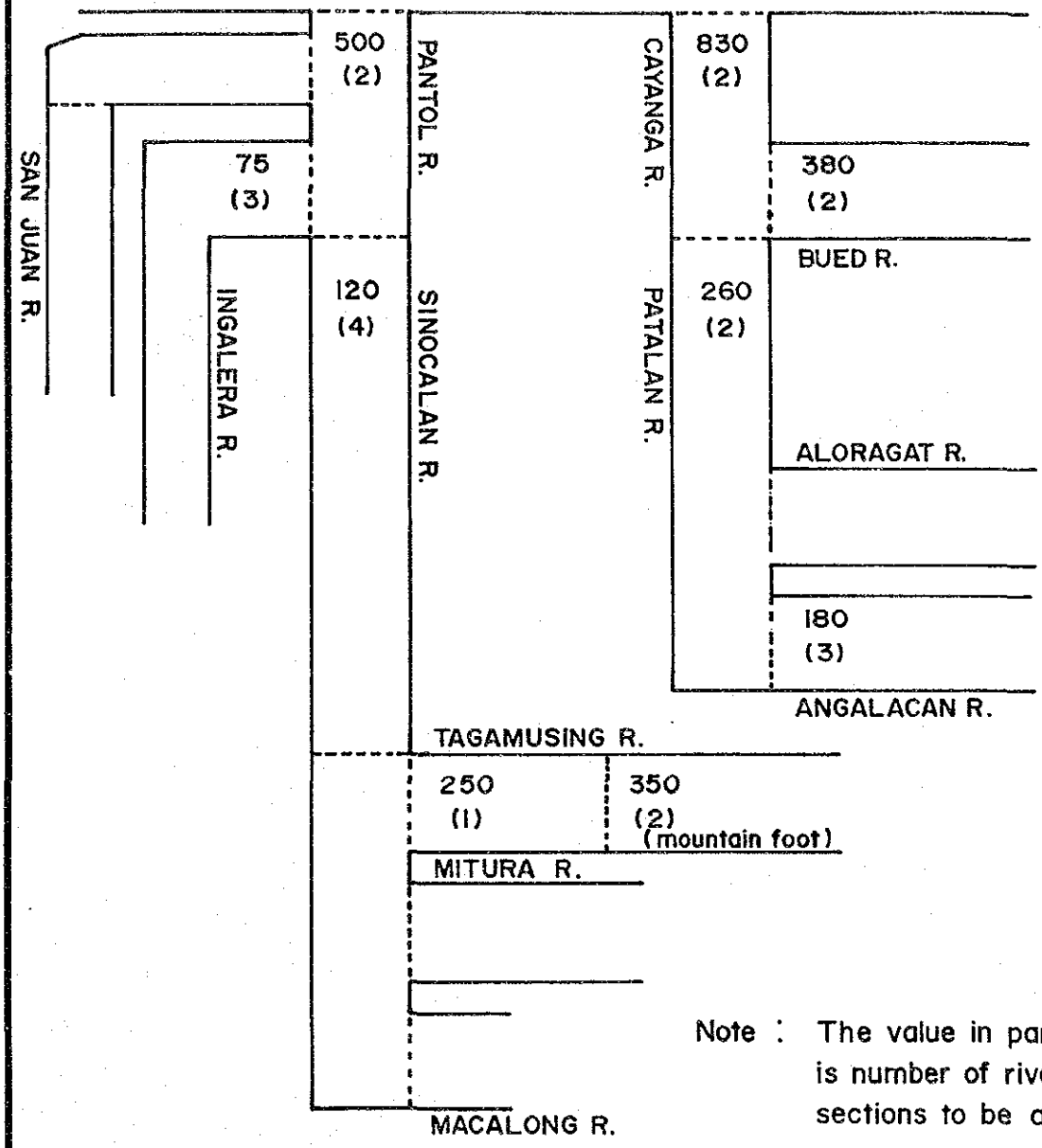
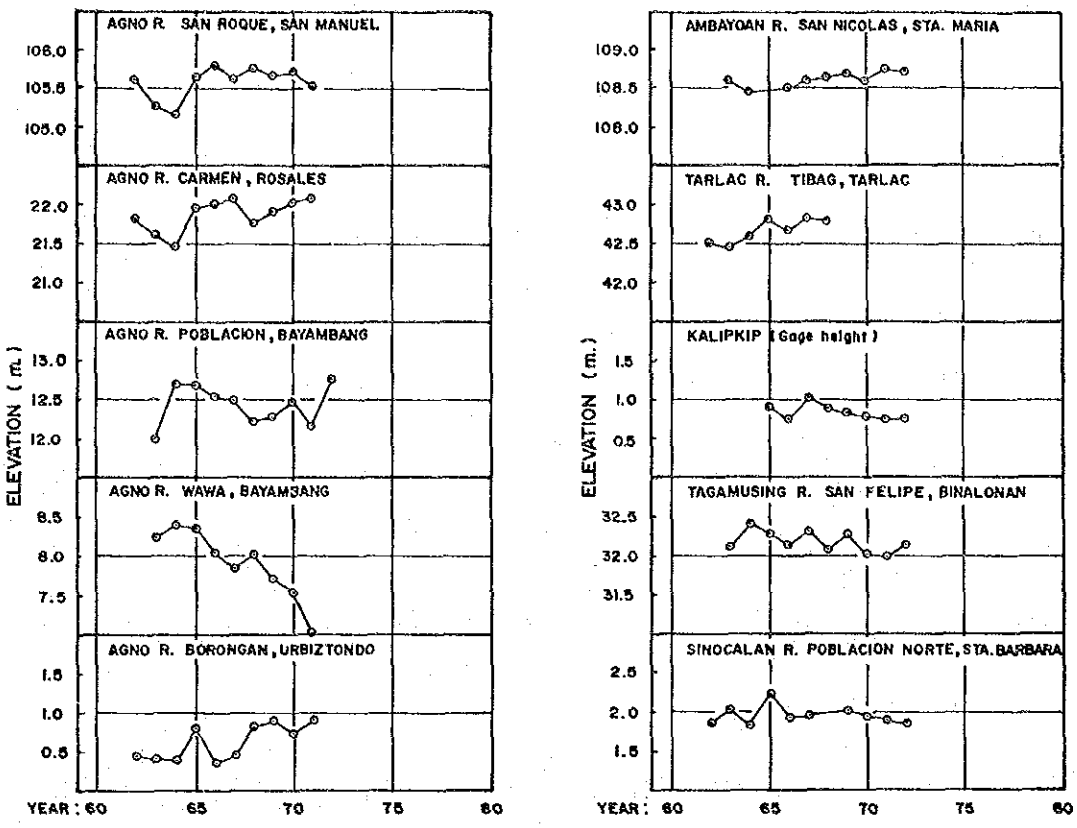


Fig. 2.4 (3/3) EXISTING CARRYING CAPACITY OF AGNO RIVER



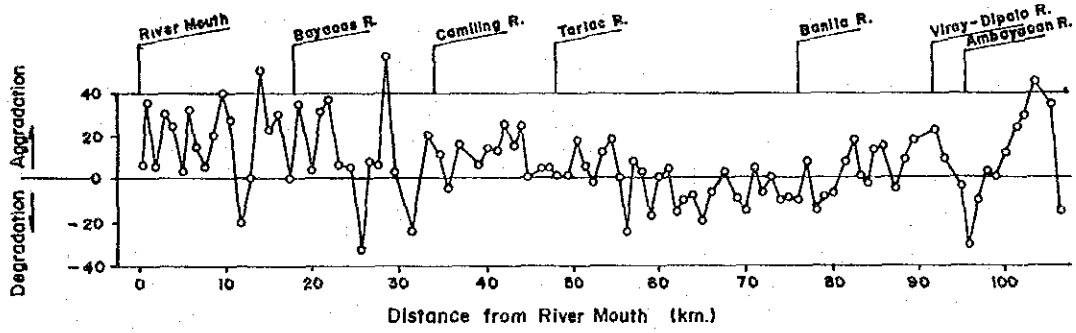
Note : The value in parenthesis is number of river cross sections to be applied.

Fig. 2.5 MINIMUM CARRYING CAPACITY OF EXISTING ALLIED RIVER

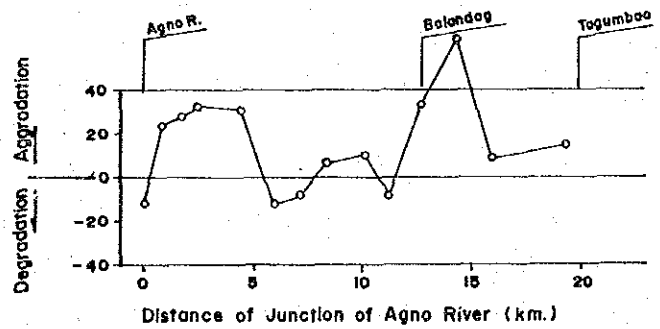


Note: Annual Lowest Waterbed at Water Gaging Stations

MAIN AGNO RIVER



TARLAC RIVER



Note: Transportation of Deepest River Bed Elevation in Dec. 1981 to May 1989

Fig. 2.6 RIVER BED FLUCTUATION

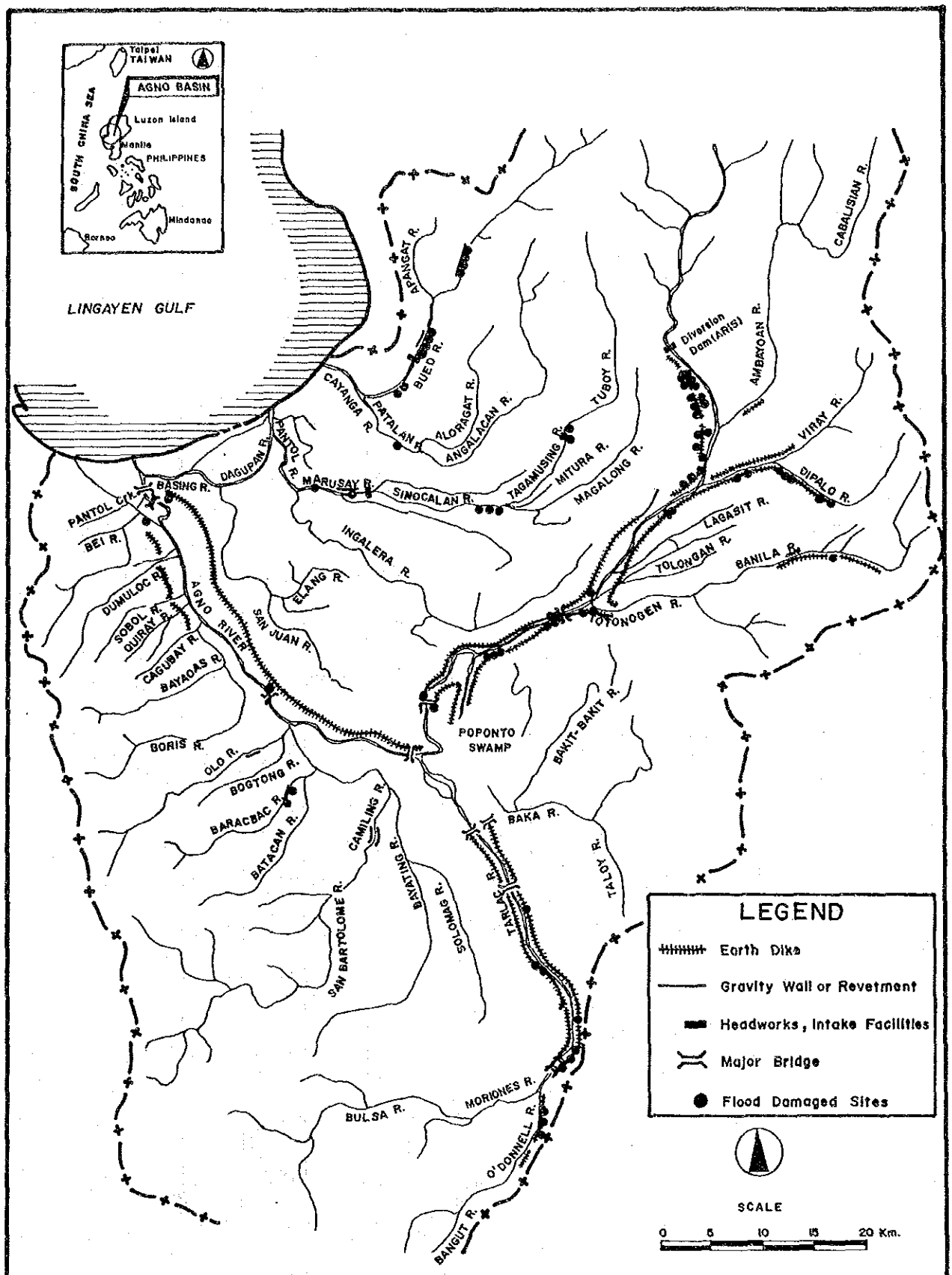


Fig. 2.7 LOCATION OF BREACHES/GAPS AND SCOURS CAUSED BY FLOODS (1984-1988)

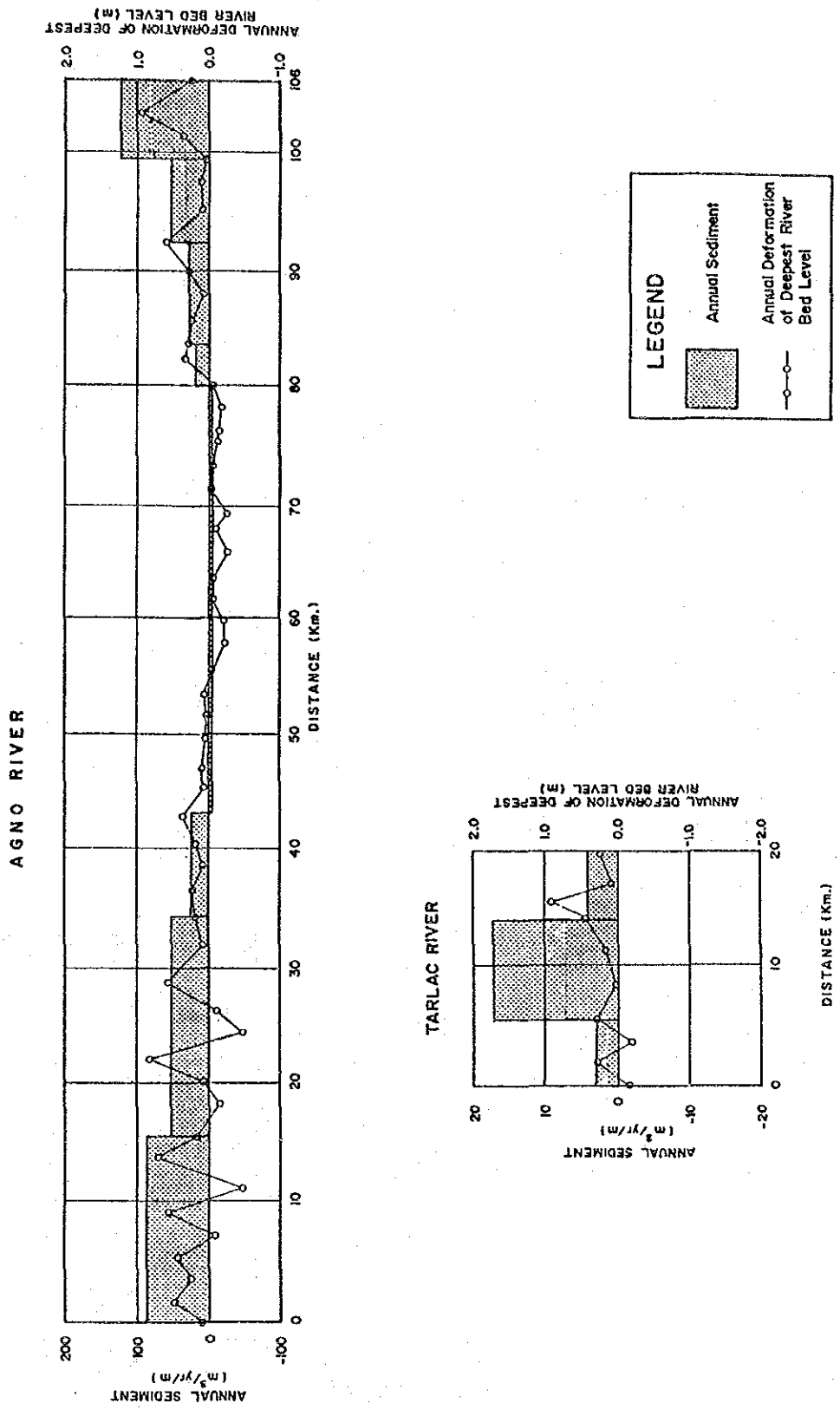


Fig. 2.8 ANNUAL SEDIMENT AND DEFORMATION OF DEEPEST RIVER BED LEVEL OF EXISTING CHANNEL

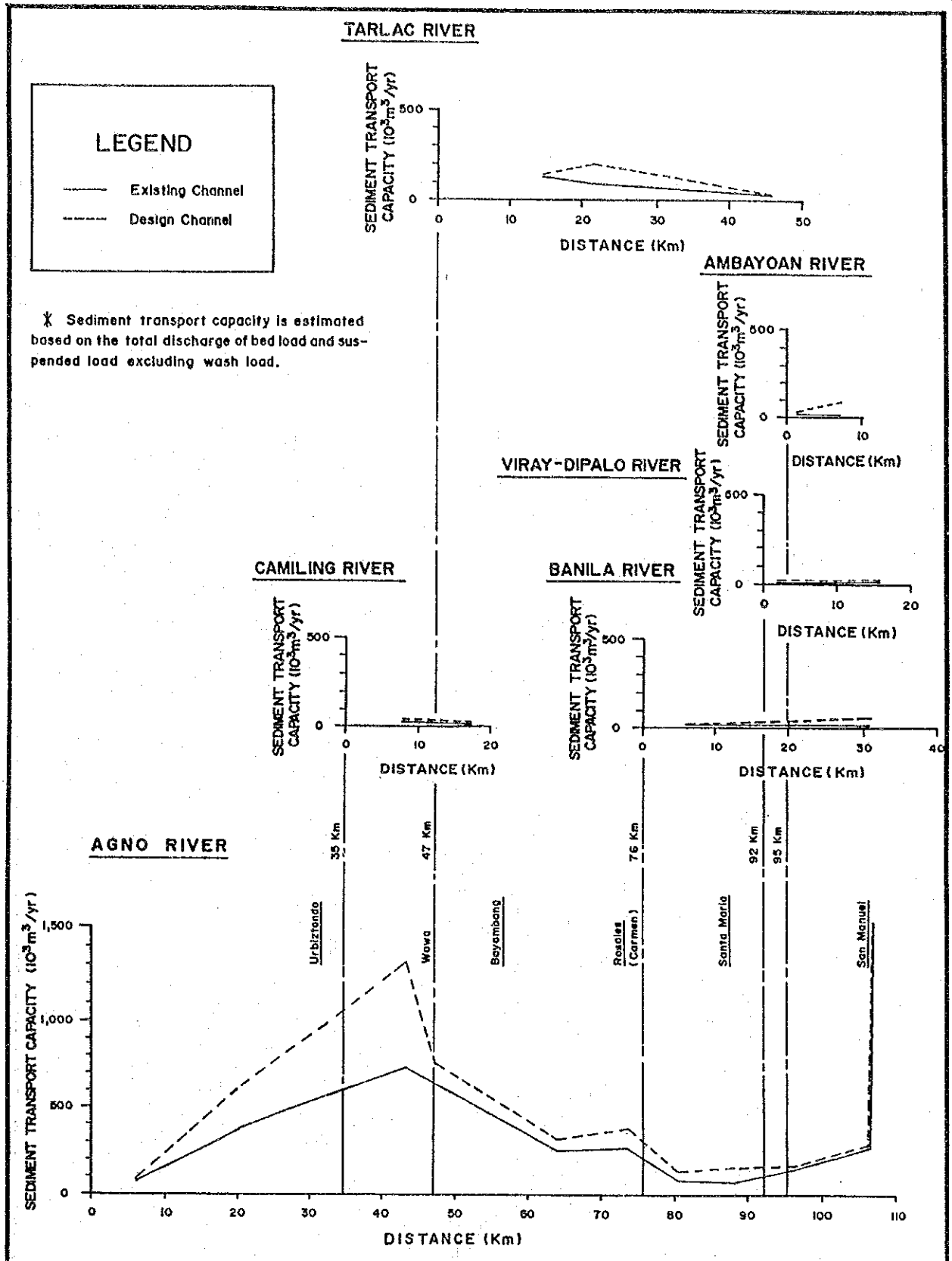


Fig. 2.9 SEDIMENT TRANSPORT CAPACITY

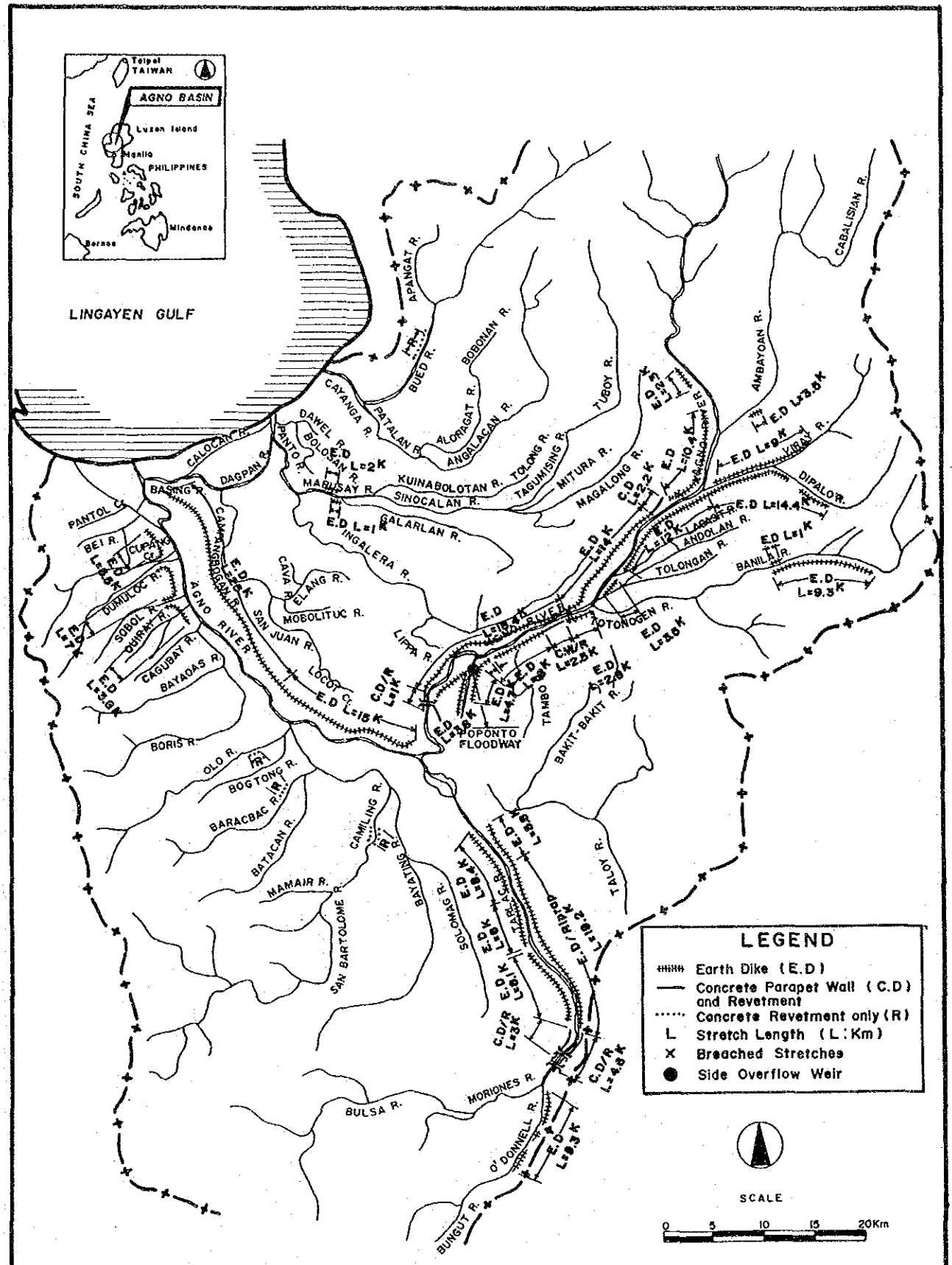


Fig. 2.10 LOCATION OF EXISTING FLOOD CONTROL FACILITIES

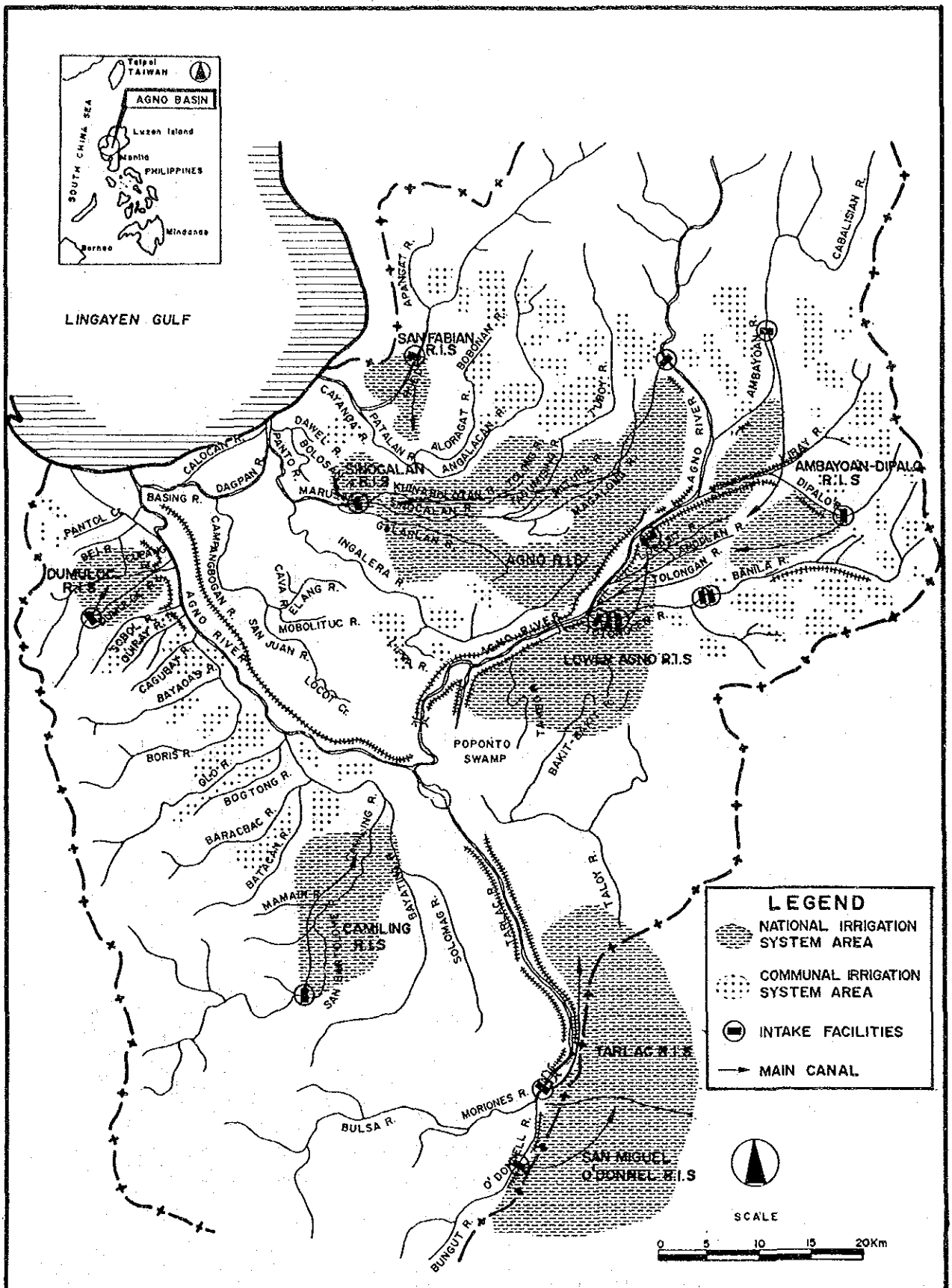
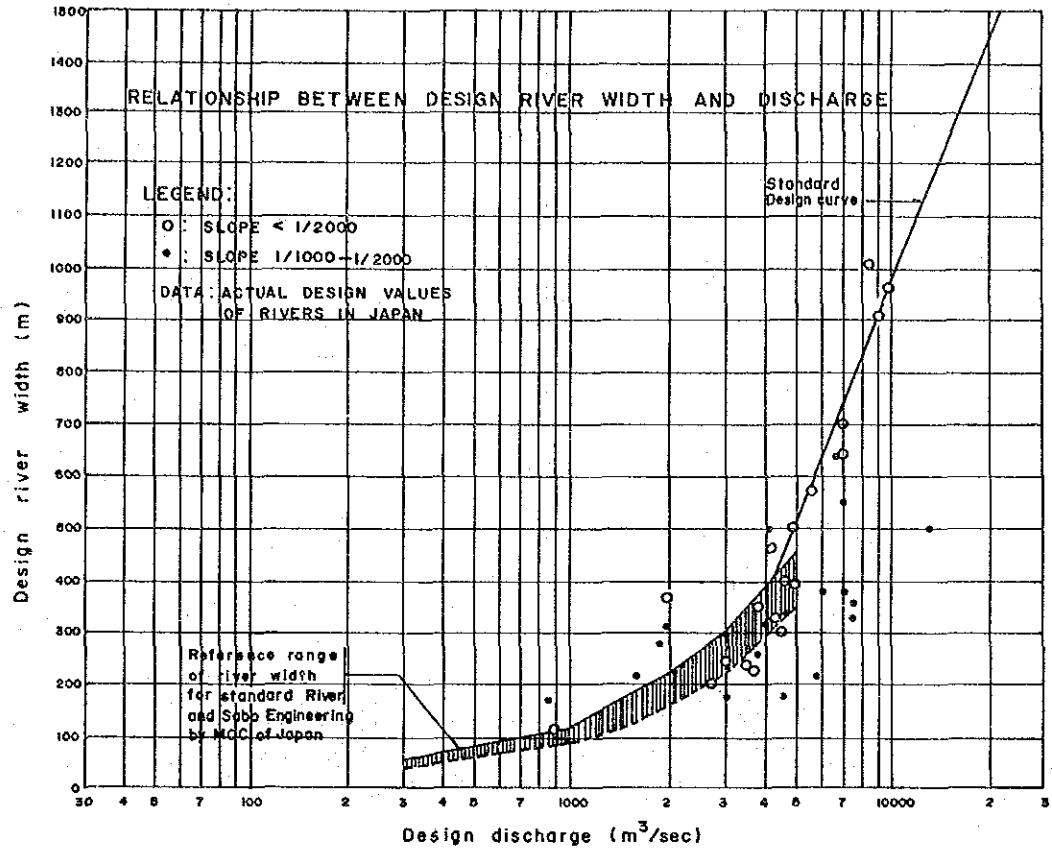


Fig. 2.11 LOCATION OF EXISTING INTAKE FACILITIES



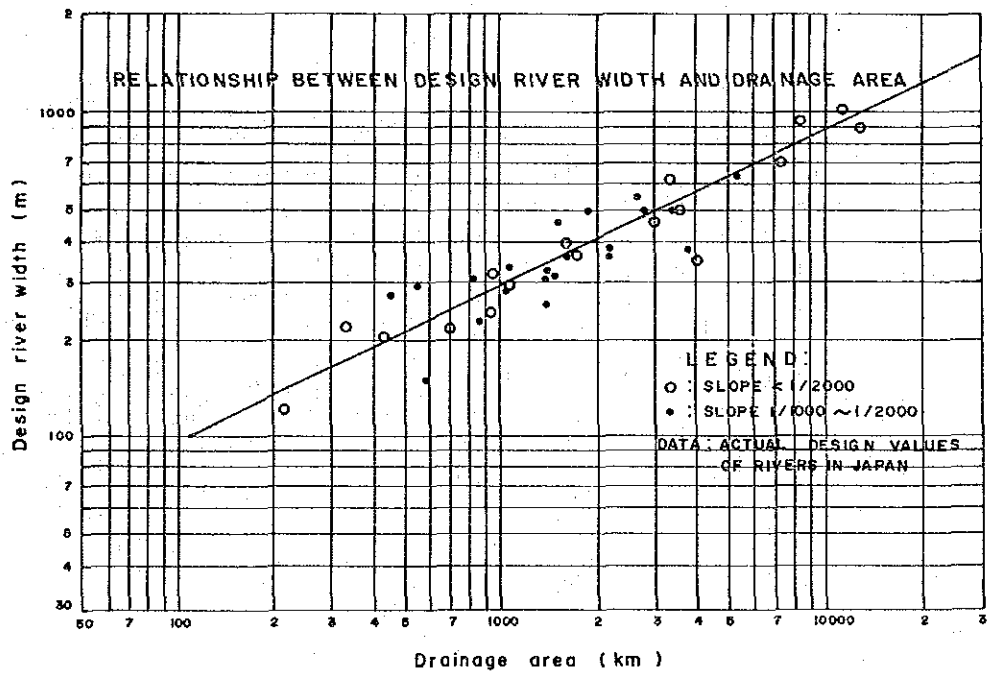
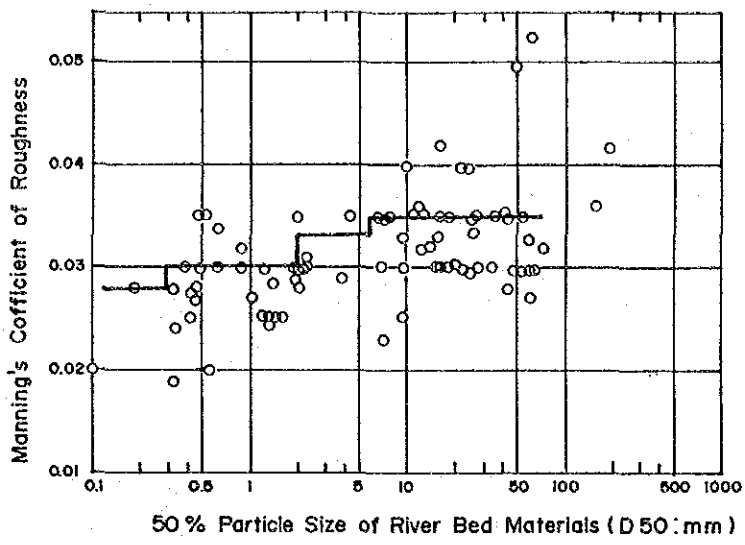


Fig. 4.1 STANDARD RIVER WIDTH



Source : Standard for River and Sabo Engineering by MOC of Japan.

Fig. 4.2 RELATIONSHIP BETWEEN MAINNING'S COEFFICIENT AND SIZE OF RIVER BED MATERIALS

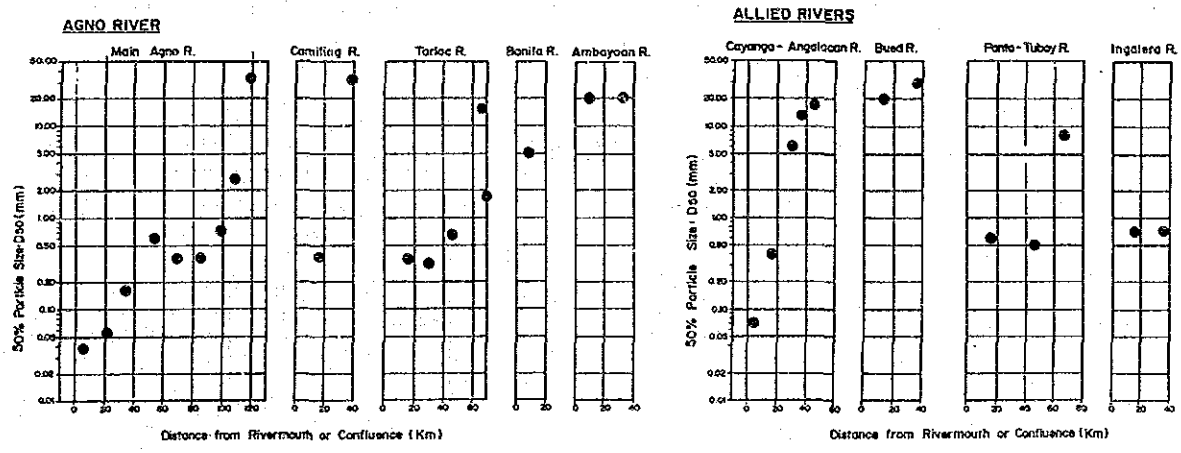
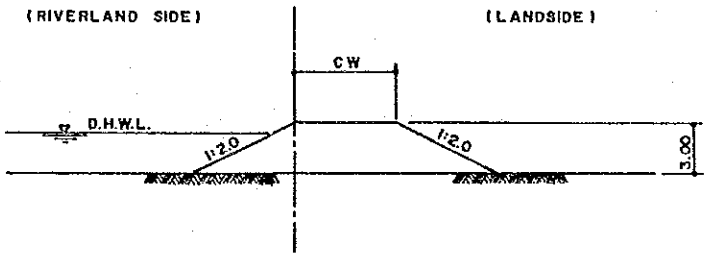


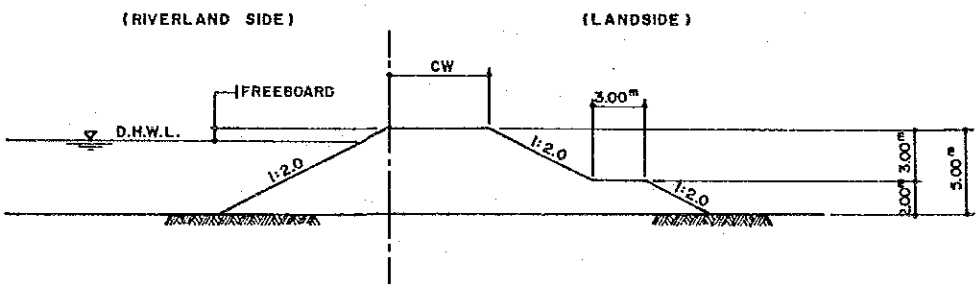
Fig. 4.3 PARTICLE SIZE OF RIVER BED MATERIALS OF AGNO AND ALLIED RIVERS

DESIGN DISCHARGE Q(m³/s)	FREEBOARD FB(m) NOT LESS THAN	CROWN WIDTH CW(m) NOT LESS THAN
< 200	0.60	3.00
200 ∿ 500	0.80	3.00
500 ∿ 2,000	1.00	4.00
2,000 ∿ 5,000	1.20	5.00
5,000 ∿ 10,000	1.50	6.00
10,000 <	2.00	7.00

DIKE HEIGHT : $H \leqq 3.00^m$



DIKE HEIGHT : $3.00^m < H \leqq 5.00^m$



DIKE HEIGHT : $5.00^m < H \leqq 9.00^m$

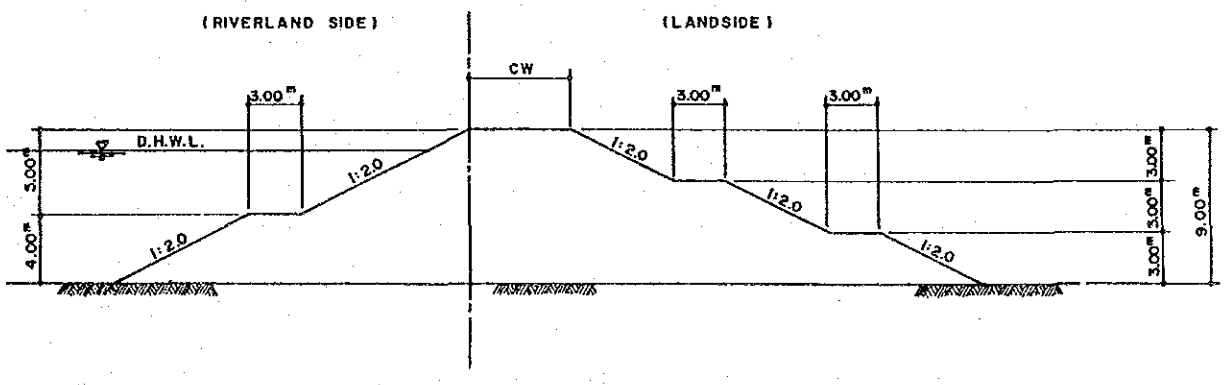
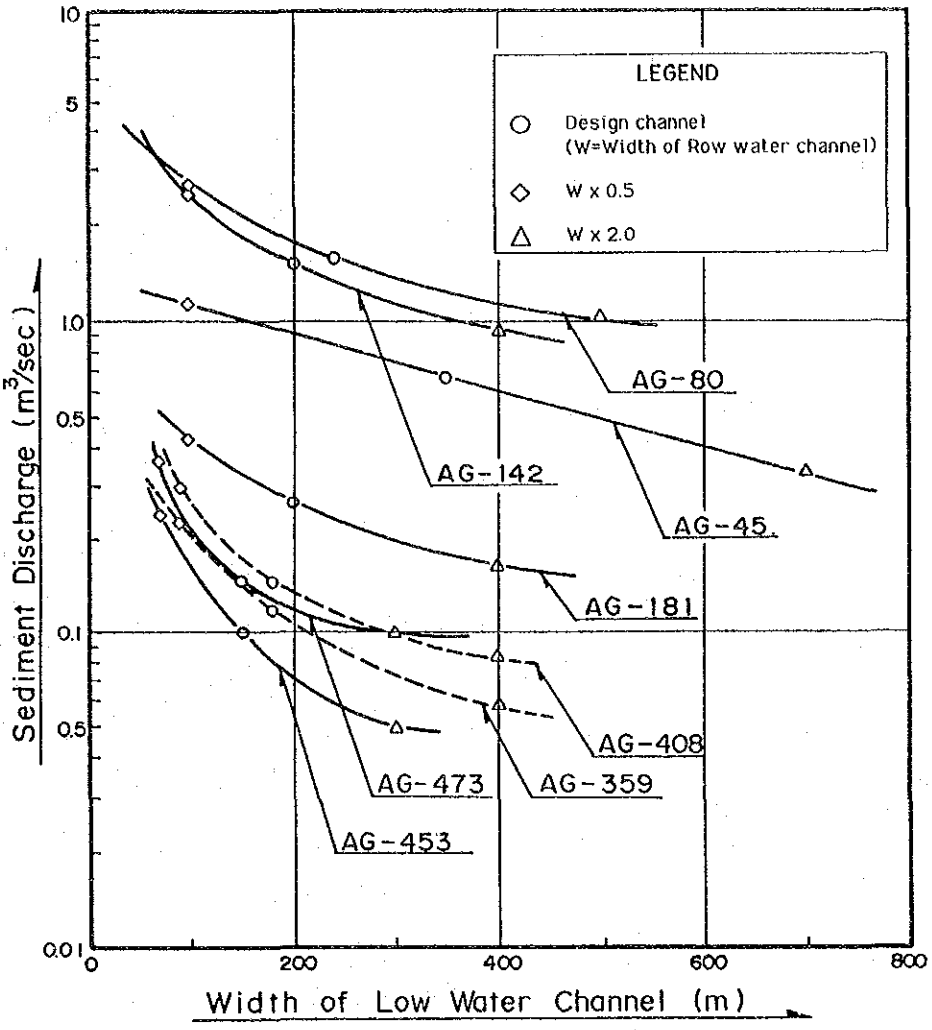


Fig. 4.4 APPLIED STANDARD DIKE SECTION FOR RIVER DESIGN



River Section	Dist. from River mouth (km)	2-yr Probable Flood (m^3/sec)
AG-45	6.9	2,520
AG-80	20.3	2,520
AG-142	40.0	2,260
AG-181	43.5	1,320
AG-359	73.0	1,140
AG-408	80.9	1,140
AG-453	89.4	710
AG-473	90.0	710

Fig. 4.5 RELATION BETWEEN WIDTH OF LOW FLOW CHANNEL AND SEDIMENT TRANSPORT CAPACITY

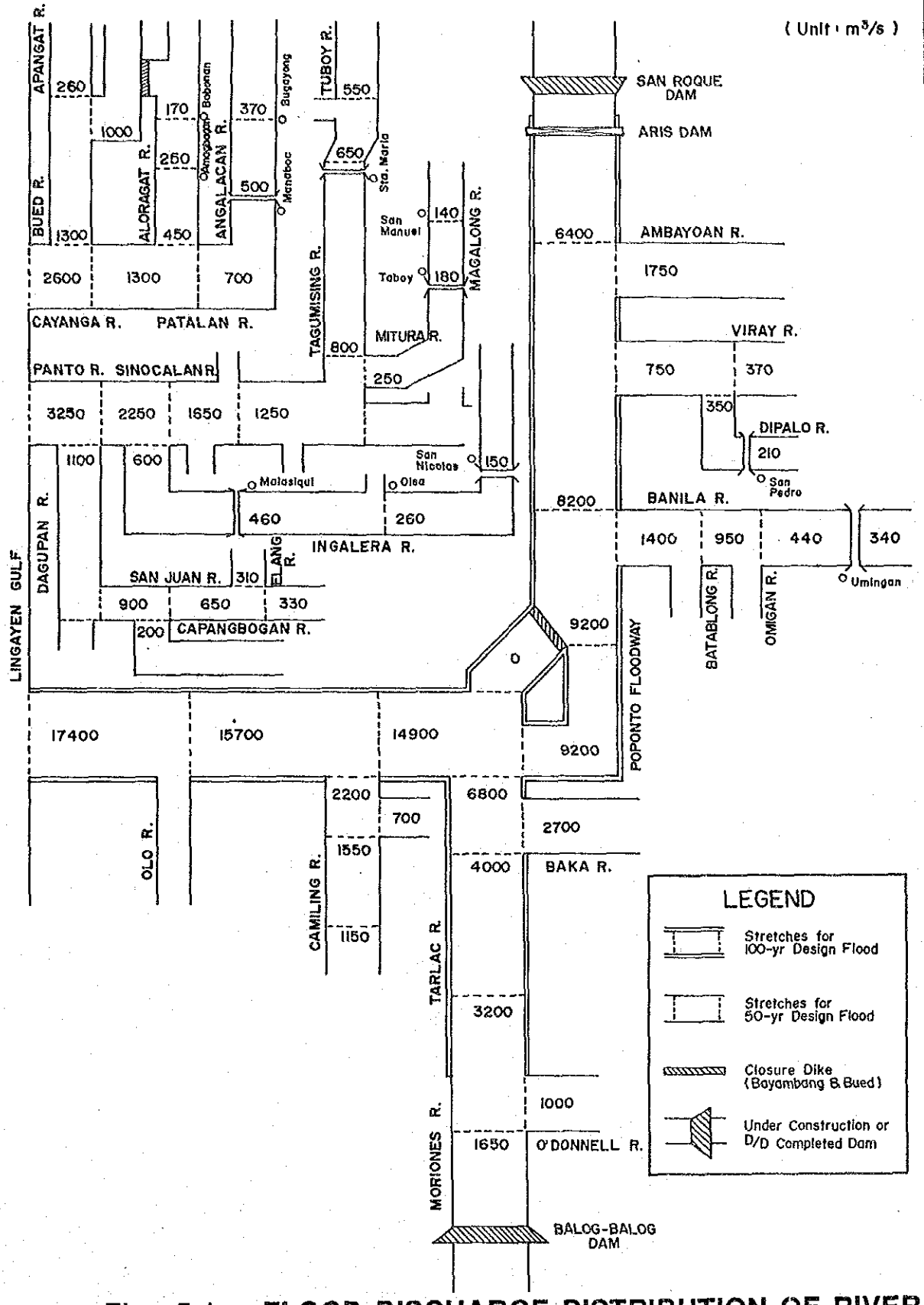


Fig. 5.1 FLOOD DISCHARGE DISTRIBUTION OF RIVER IMPROVEMENT ONLY ALTERNATIVE

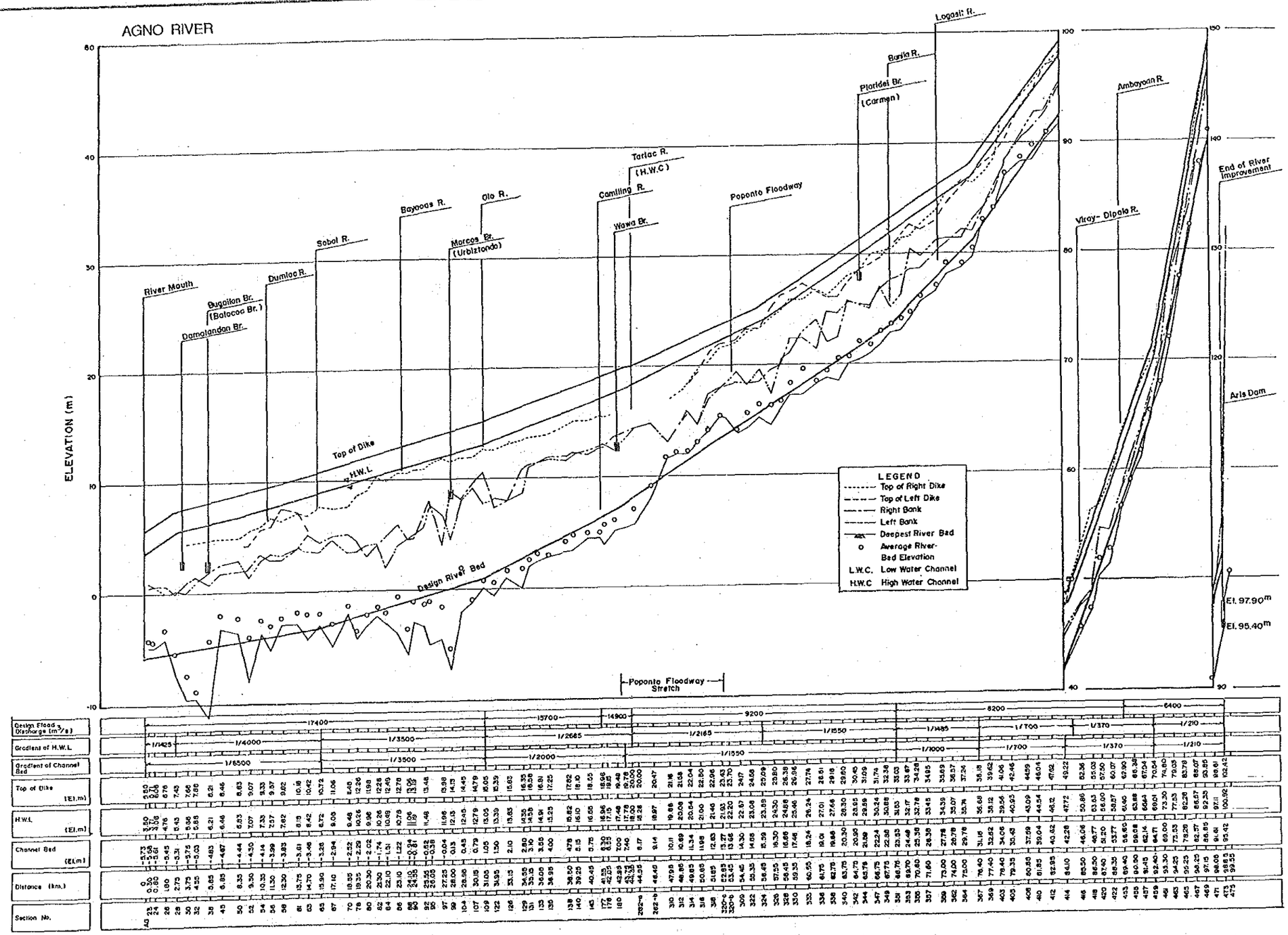


Fig. 5.2 LONGITUDINAL PROFILE OF AGNO RIVER FOR FRAMEWORK PLAN (RIVER IMPROVEMENT ONLY ALTERNATIVE)

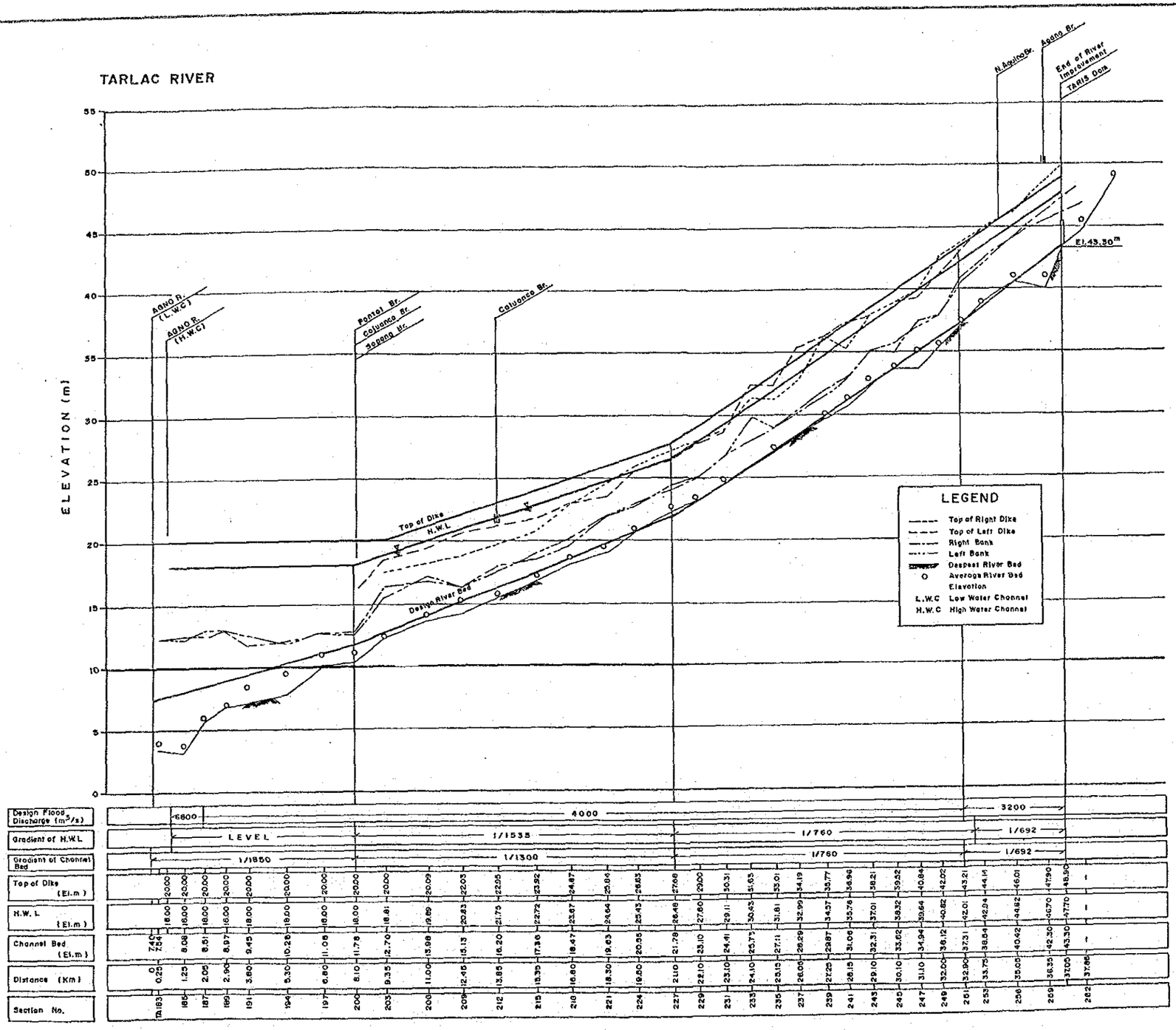


Fig. 5.3 LONGITUDINAL PROFILE OF TARLAC RIVER FOR FRAMEWORK PLAN (RIVER IMPROVEMENT ONLY ALTERNATIVE)

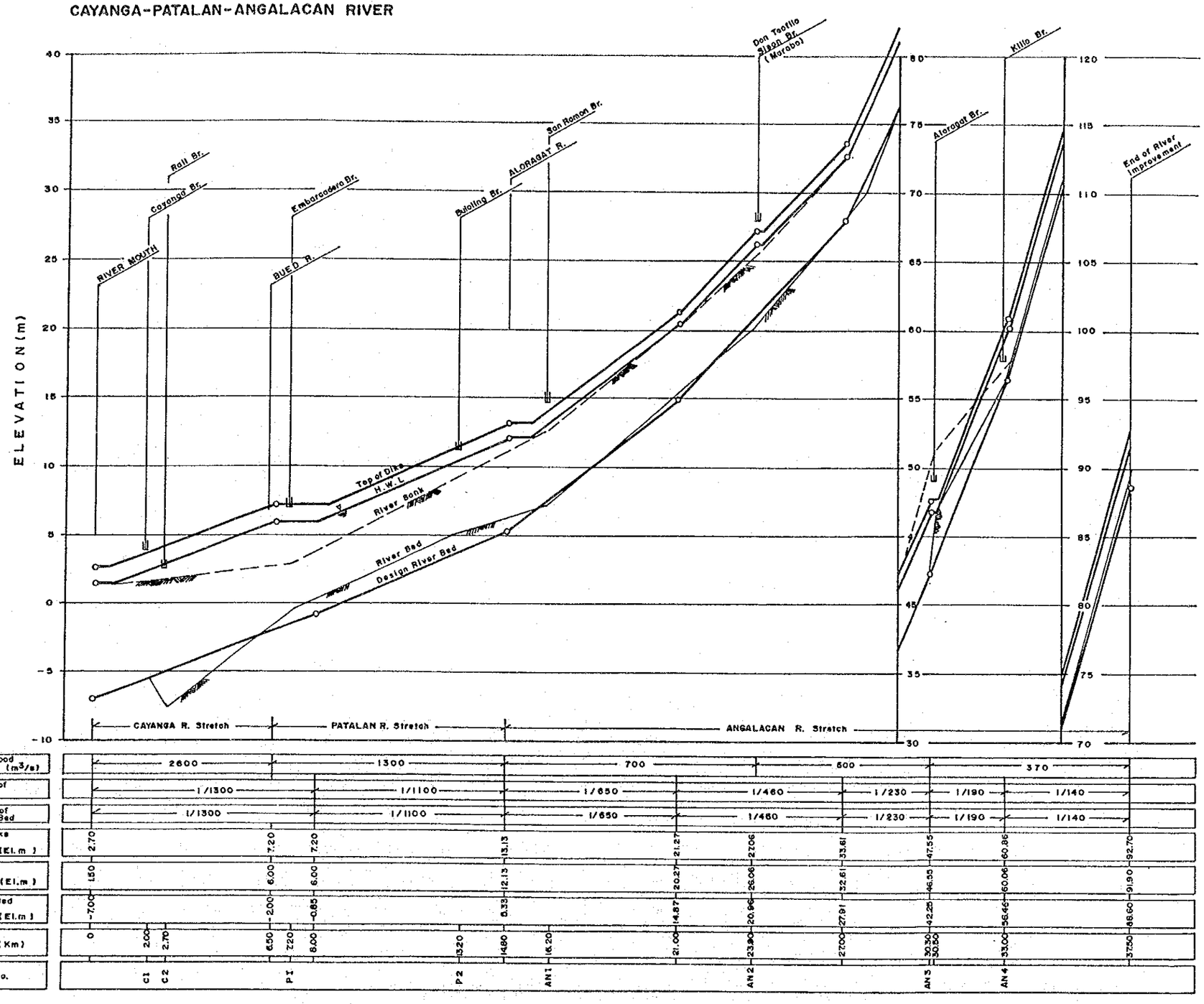


Fig. 5.4 LONGITUDINAL PROFILE OF CAYANGA-PATALAN RIVER FOR FRAMEWORK PLAN (RIVER IMPROVEMENT ONLY ALTERNATIVE)

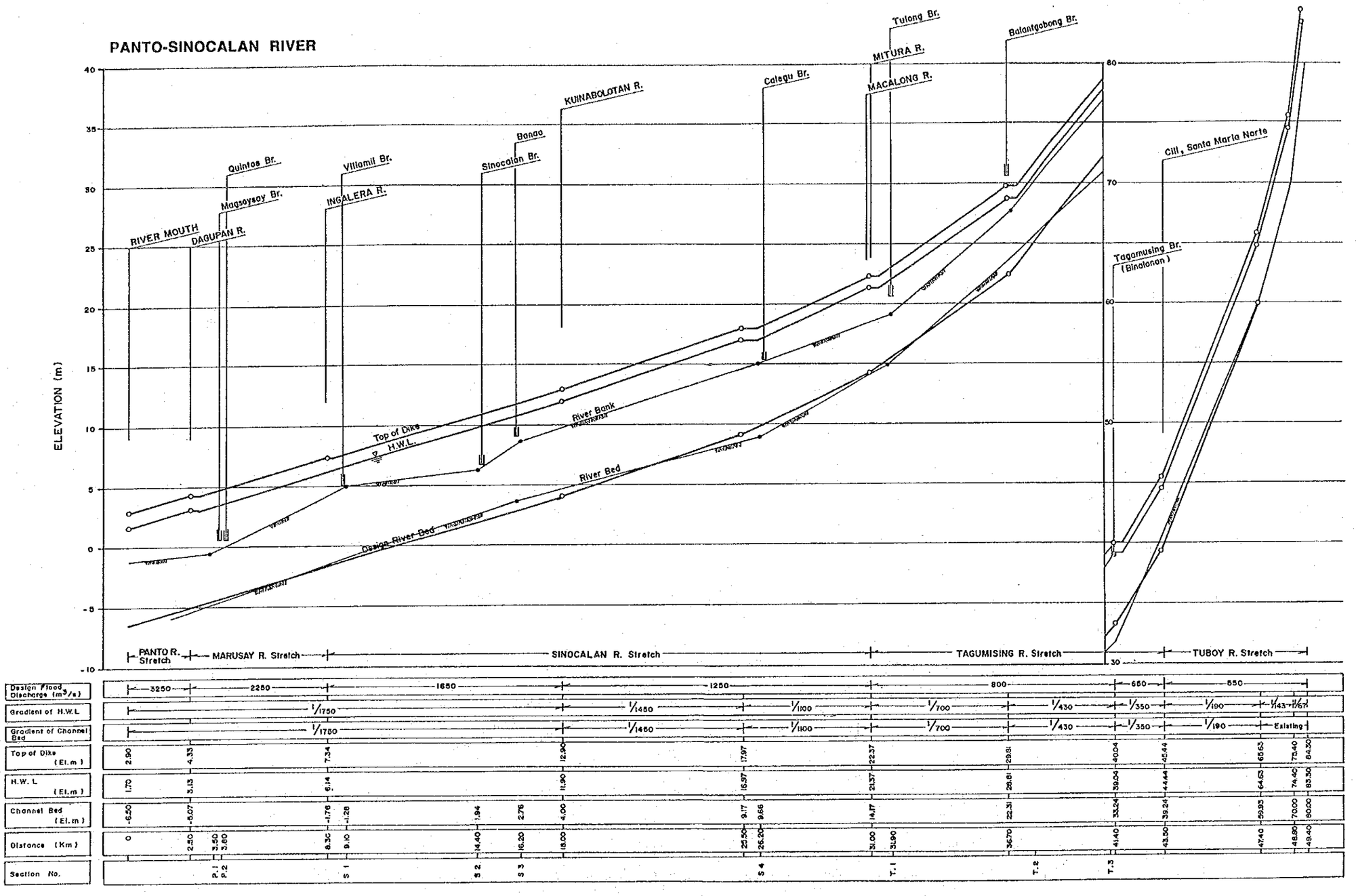
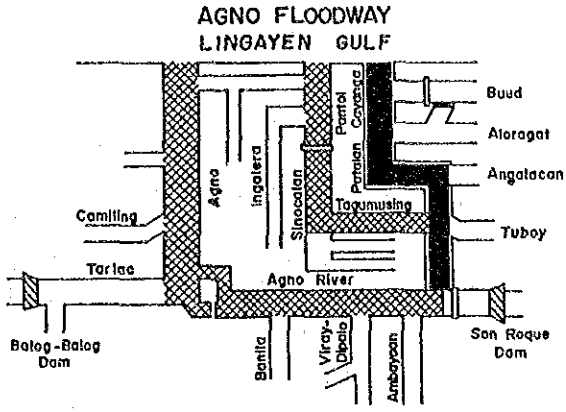
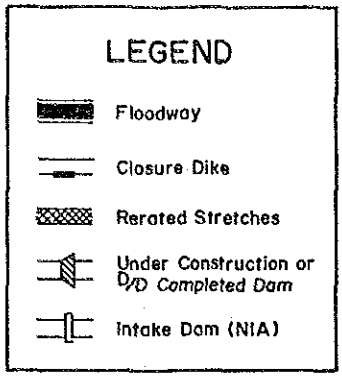


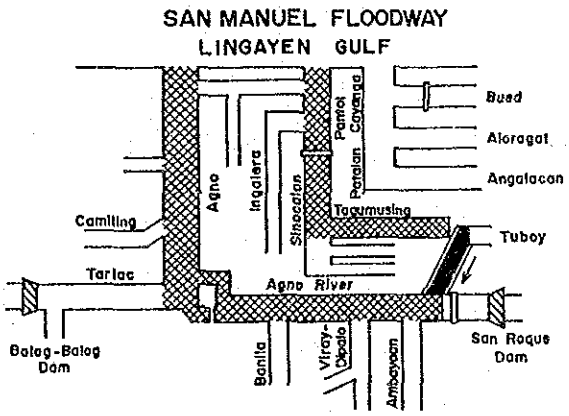
Fig. 5.5 LONGITUDINAL PROFILE OF PANTO-SINOCALAN RIVER FOR FRAMEWORK PLAN (RIVER IMPROVEMENT ONLY ALTERNATIVE)

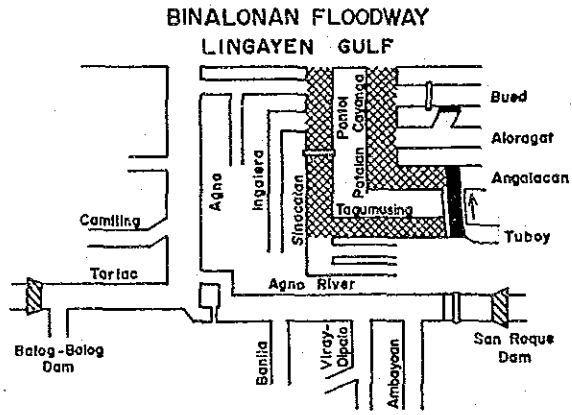
AGNO RIVER MAINSTREAM

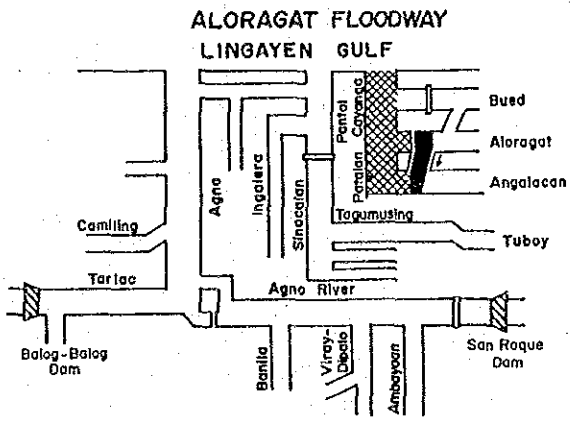




ALLIED RIVERS







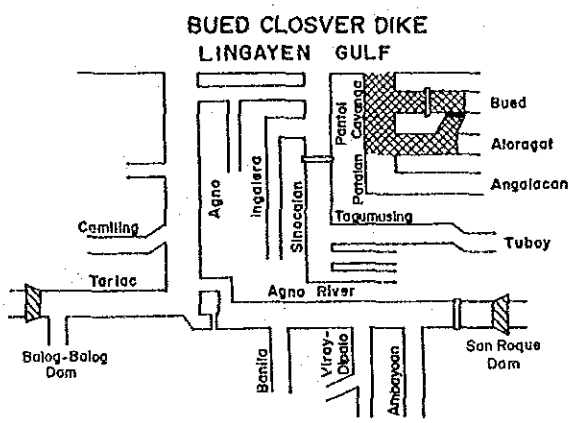


Fig. 6.1 FLOODWAY ALTERNATIVES DIAGRAM

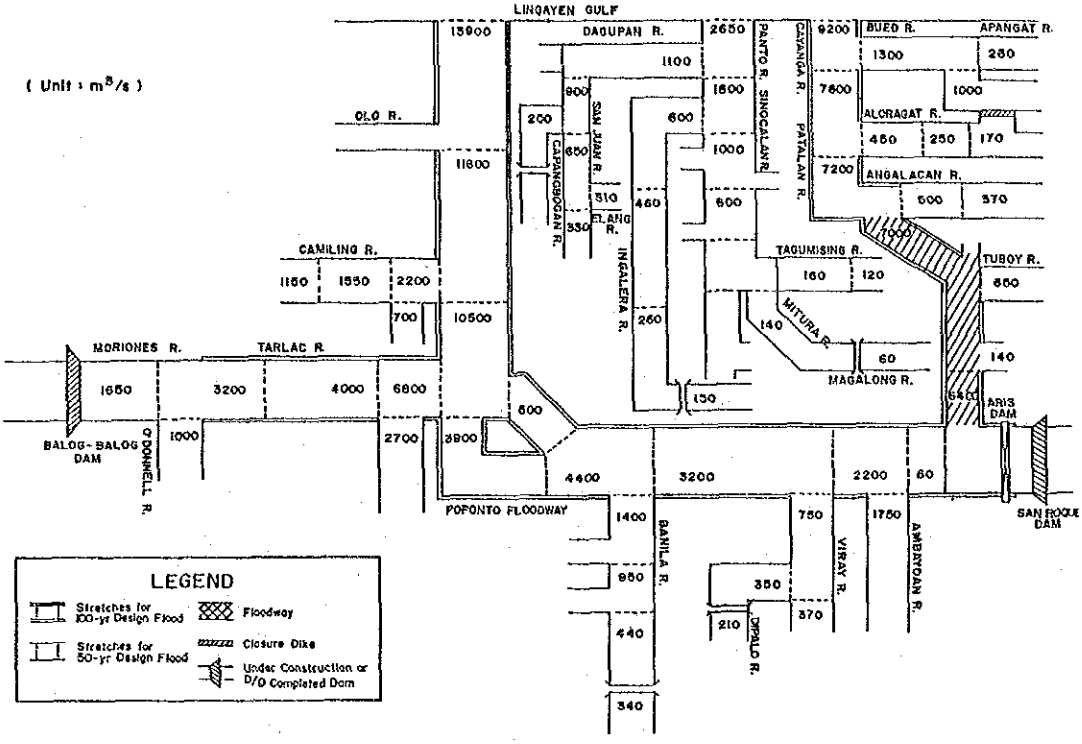


Fig. 6.2 FLOOD DISCHARGE DISTRIBUTION OF FLOODWAY ALTERNATIVE (AGNO FLOODWAY)

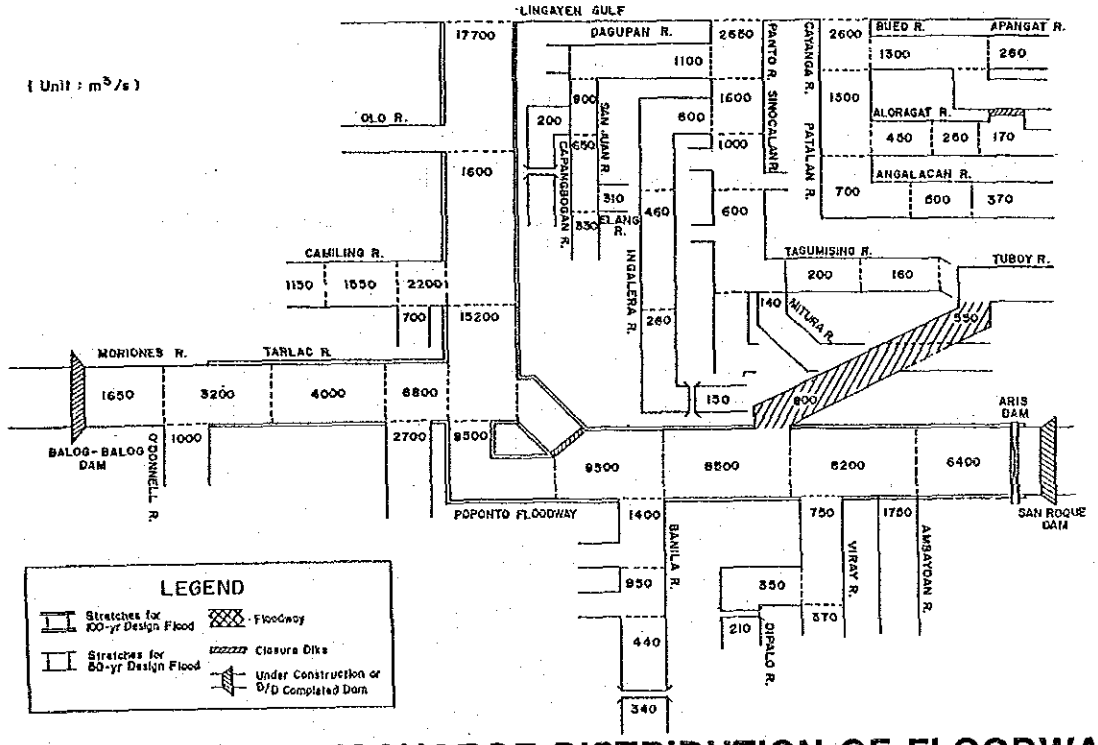


Fig. 6.3 FLOOD DISCHARGE DISTRIBUTION OF FLOODWAY ALTERNATIVE (SAN MANUEL FLOODWAY)

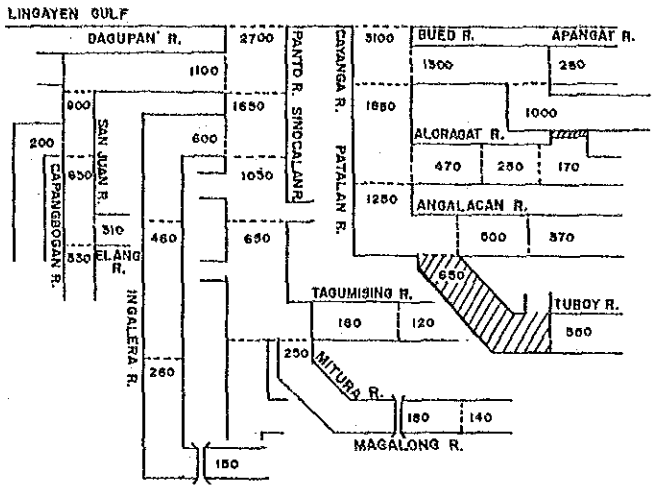


Fig. 6.4 FLOOD DISCHARGE DISTRIBUTION OF FLOODWAY ALTERNATIVE (BINALONAN FLOODWAY)

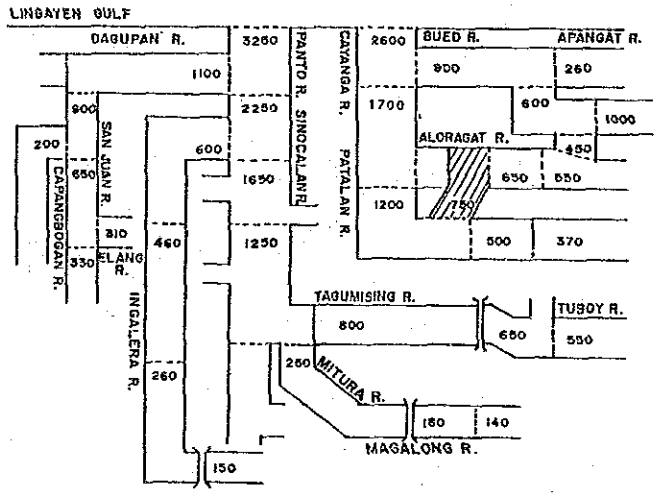


Fig. 6.5 FLOOD DISCHARGE DISTRIBUTION OF FLOODWAY ALTERNATIVE (ALORAGAT FLOODWAY)

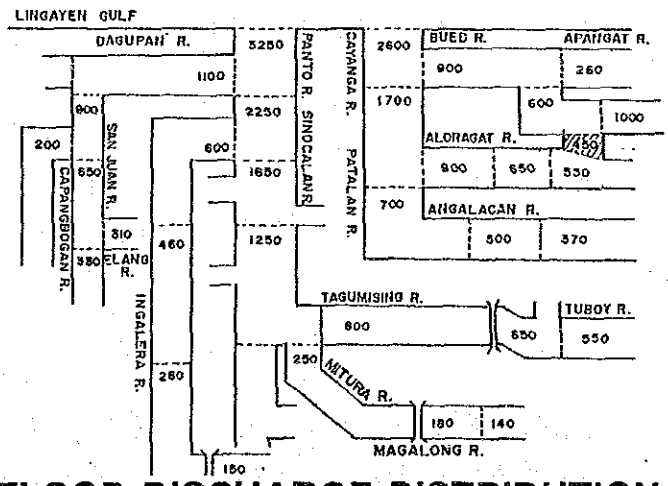
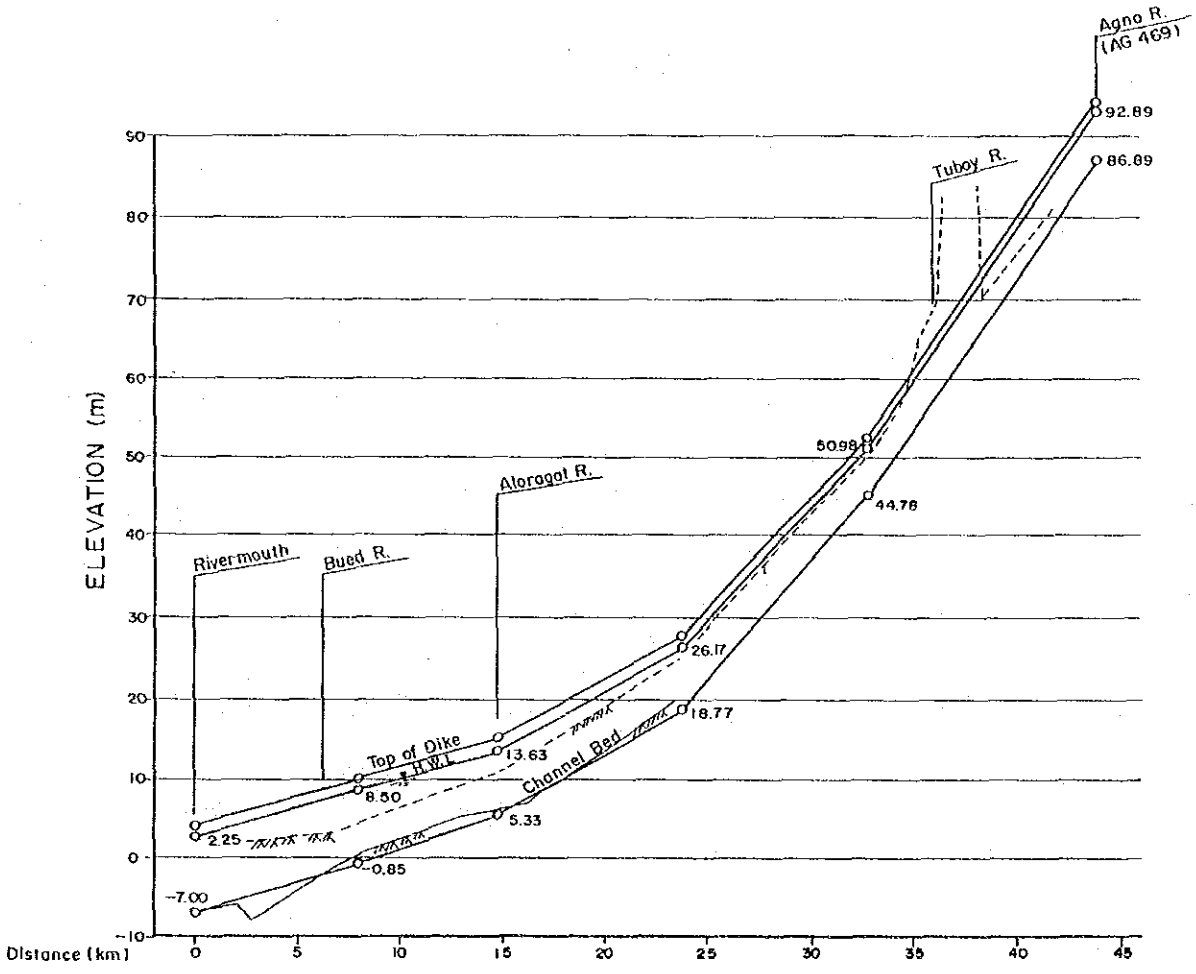
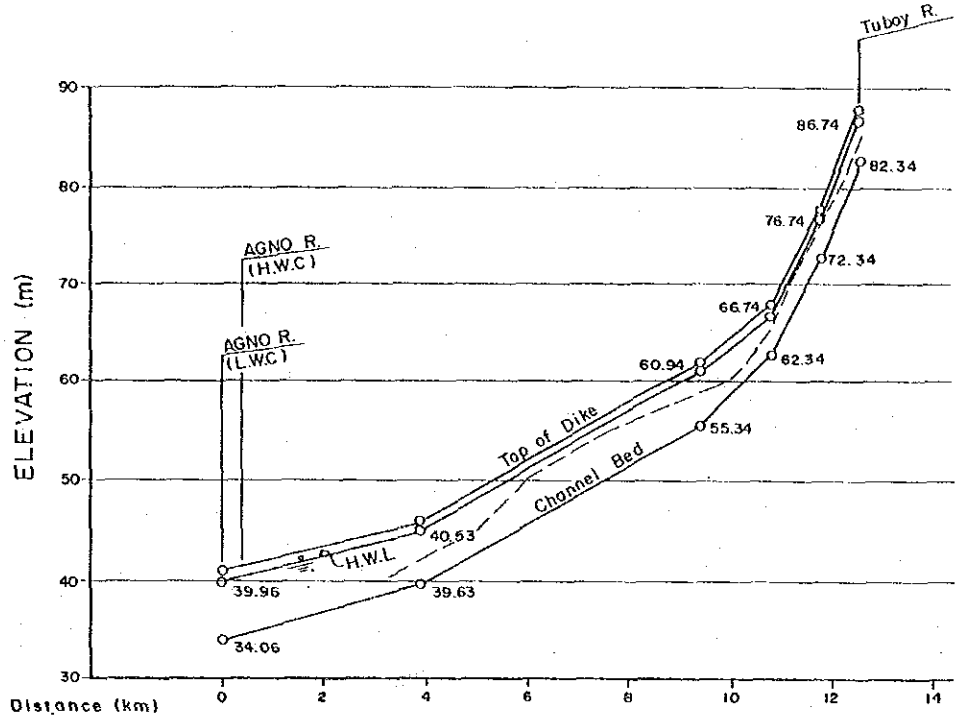


Fig. 6.6 FLOOD DISCHARGE DISTRIBUTION OF FLOODWAY ALTERNATIVE (WITHOUT BUED CLOSURE DIKE)



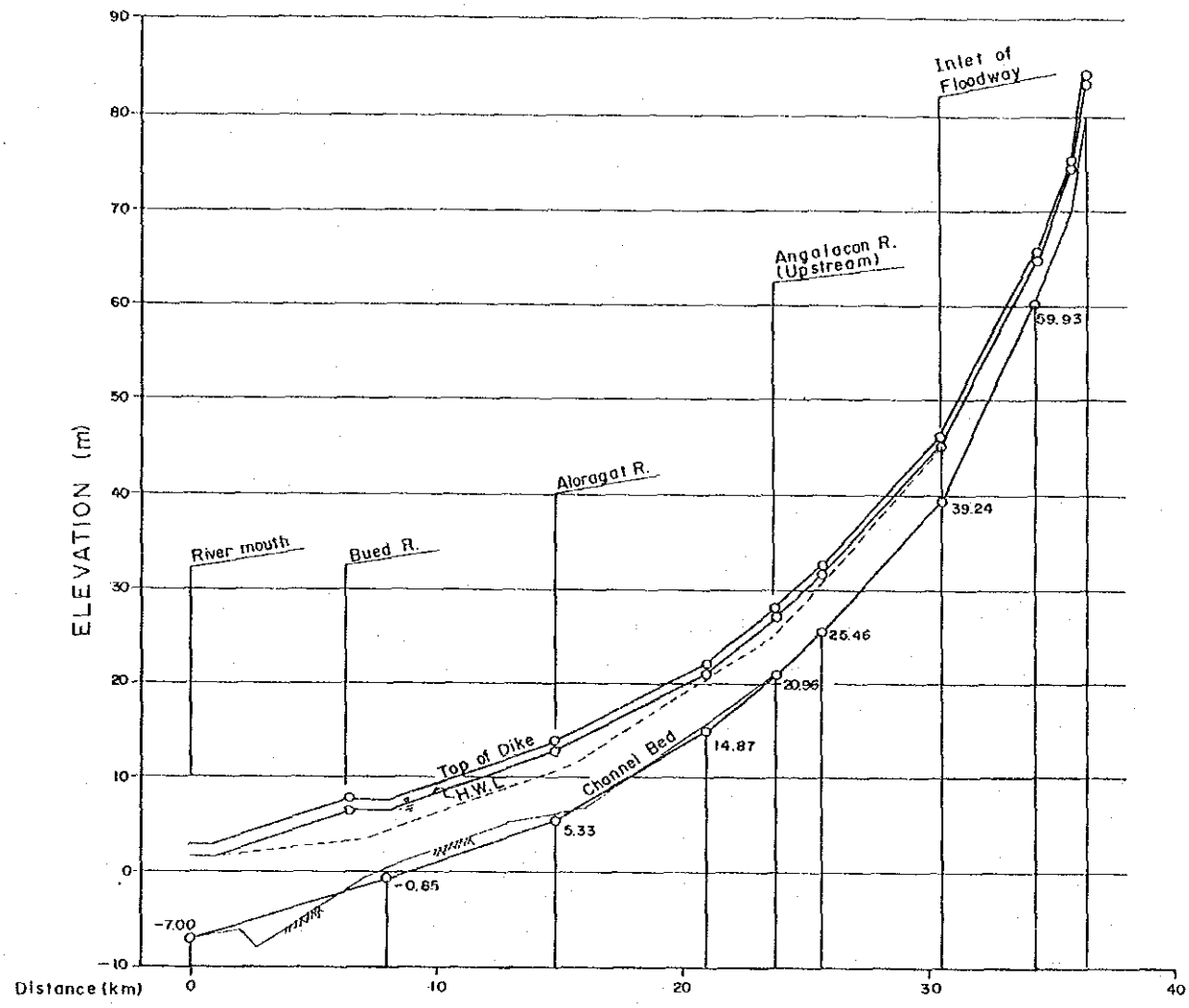
Stretches	CAYANGA R.	PATALAN R.	ANGALACAN R.	NEW CHANNEL	TUBOY R.	NEW CHANNEL
Discharge (m^3/s)	9200	7800	7200	7000		6400
Gradient of Channel Bed	1/1300	1/1100	1/583	1/345		1/266
River Width (m)	1000					
Width of Channel Bed (m)	100	80	80	70		70
Low Channel Depth (Ave, m)	6	5	5	4		4

Fig. 6.7 FEATURES OF DESIGN CHANNEL FOR AGNO FLOODWAY ALTERNATIVE



Stretch	FLOODWAY						
Discharge (m^3/s)	800			550			
Gradient of Channel Bed	1/700		1/350		1/200	1/100	1/80
River Width (m)	80			60			
Width of Channel Bed (m)	25		20		15	15	10
Low Channel Depth (Ave, m)	3.5		4		4	4	4

Fig. 6.8 FEATURES OF DESIGN CHANNEL FOR SAN MANUEL FLOODWAY ALTERNATIVE



Stretches	CAYANGA R.	PATALAN R.	ANGALACAN R.	FLOODWAY	TUBOY R.
Discharge (m^3/s)	3100	1850	1250	650	550
Gradient of Channel Bed	1/1300	1/1100	1/650	1/460 – 1/400 – 1/355.5	1/190 – Exis
River Width (m)	500	200	150	120 – 60	60
Width of Channel Bed (m)	65	45	40	35 – 15	15 – 15 – 10

Fig. 6.9 FEATURES OF DESIGN CHANNEL FOR BINALONAN FLOODWAY ALTERNATIVE

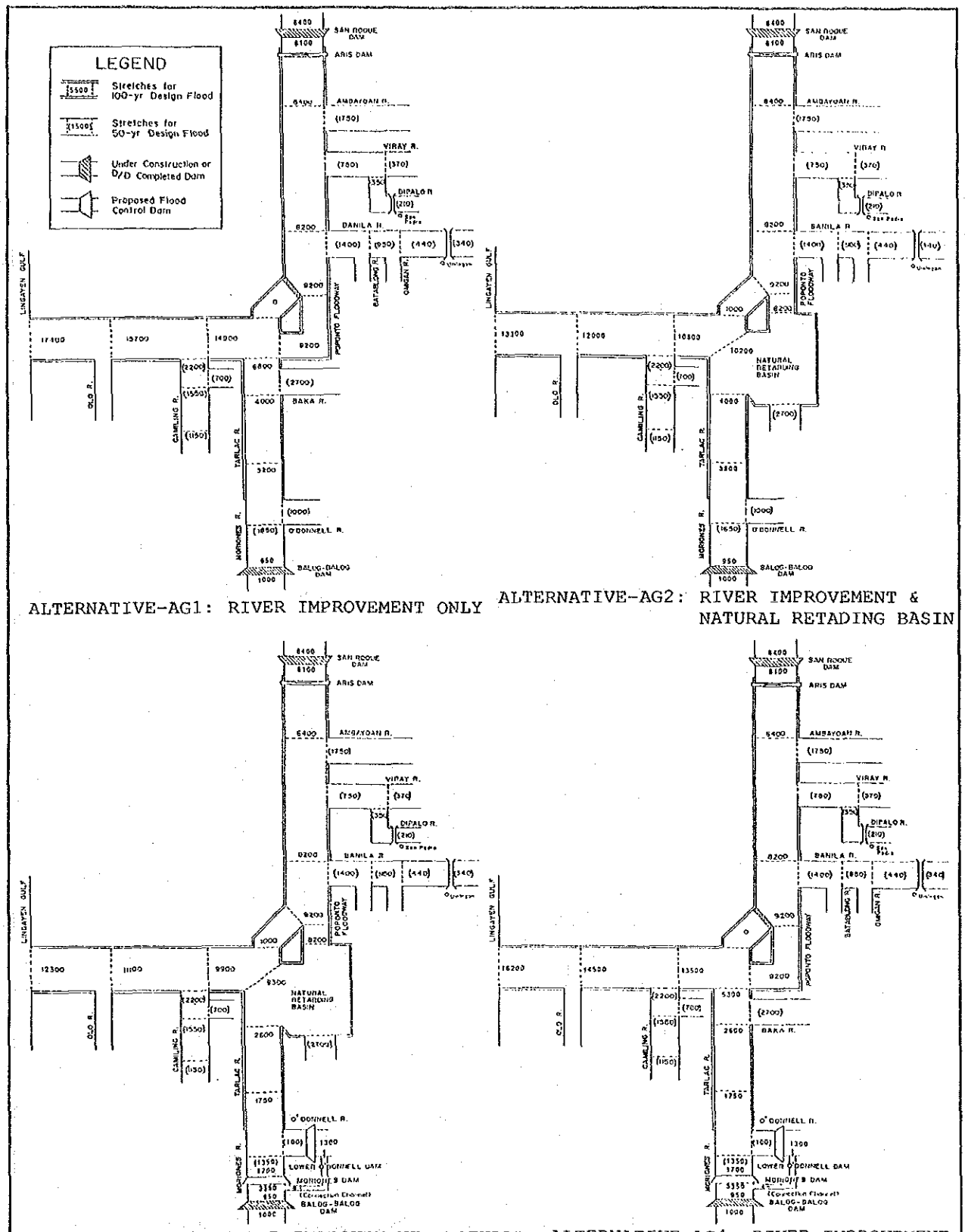
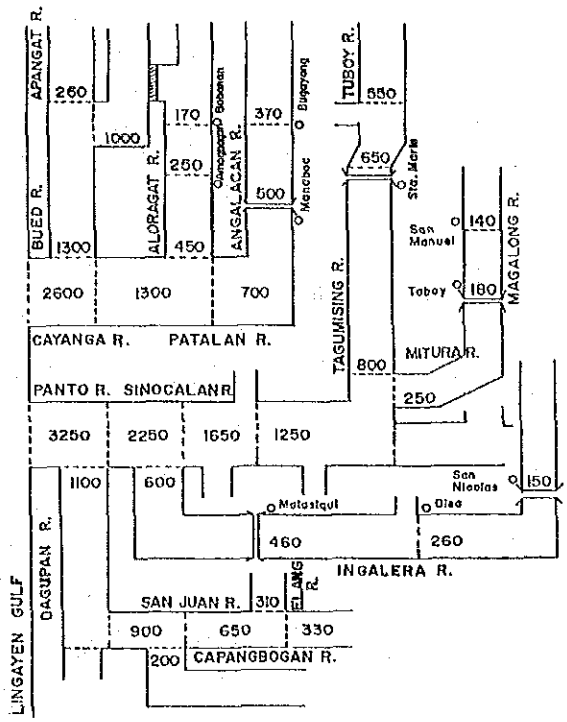
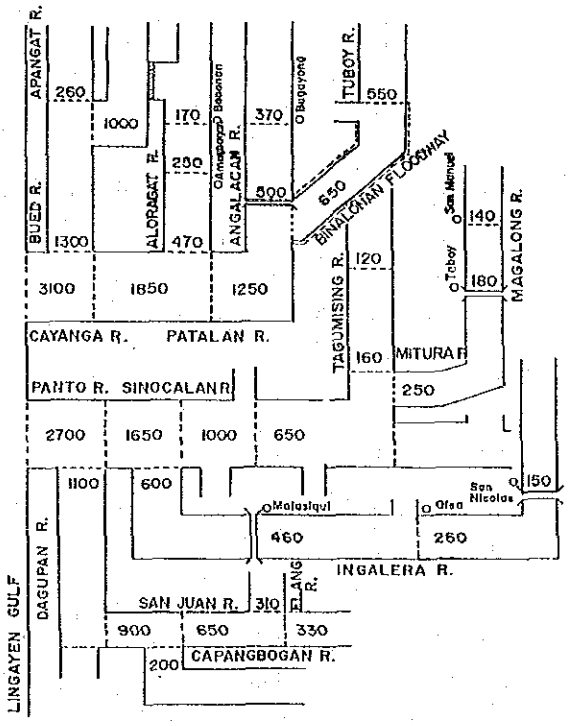


Fig. 7.1 (1/2) FLOOD DISCHARGE DISTRIBUTION OF ALTERNATIVE FRAMEWORK PLANS



ALTERNATIVE-AL1: RIVER IMPROVEMENT WITHOUT FLOODWAY



ALTERNATIVE-AL2: RIVER IMPROVEMENT WITH FLOODWAY

Fig. 7.1 (2/2) FLOOD DISCHARGE DISTRIBUTION OF ALTERNATIVE FRAMEWORK PLANS

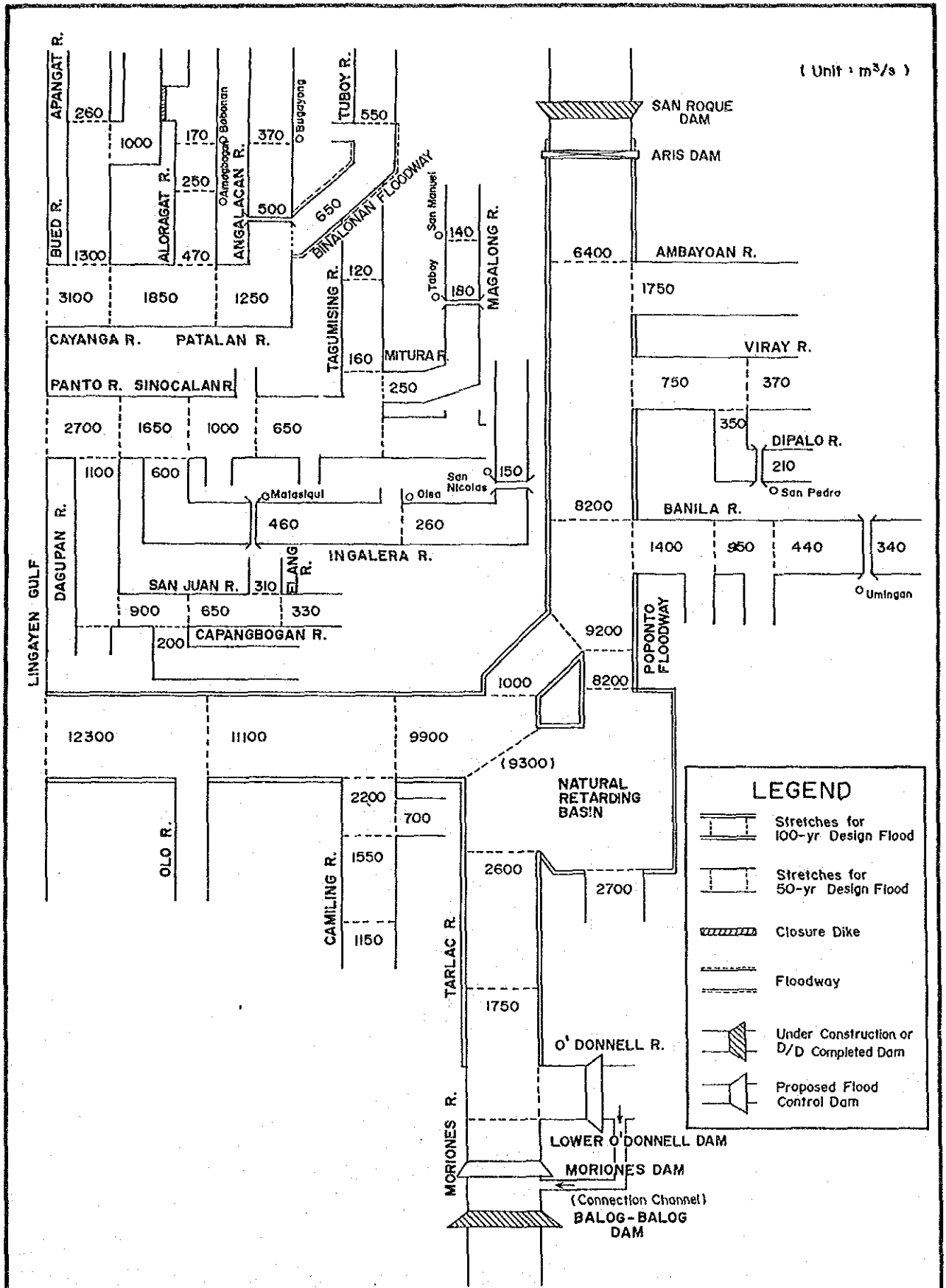


Fig. 7.2 DESIGN FLOOD DISCHARGE DISTRIBUTION OF FRAMEWORK PLAN

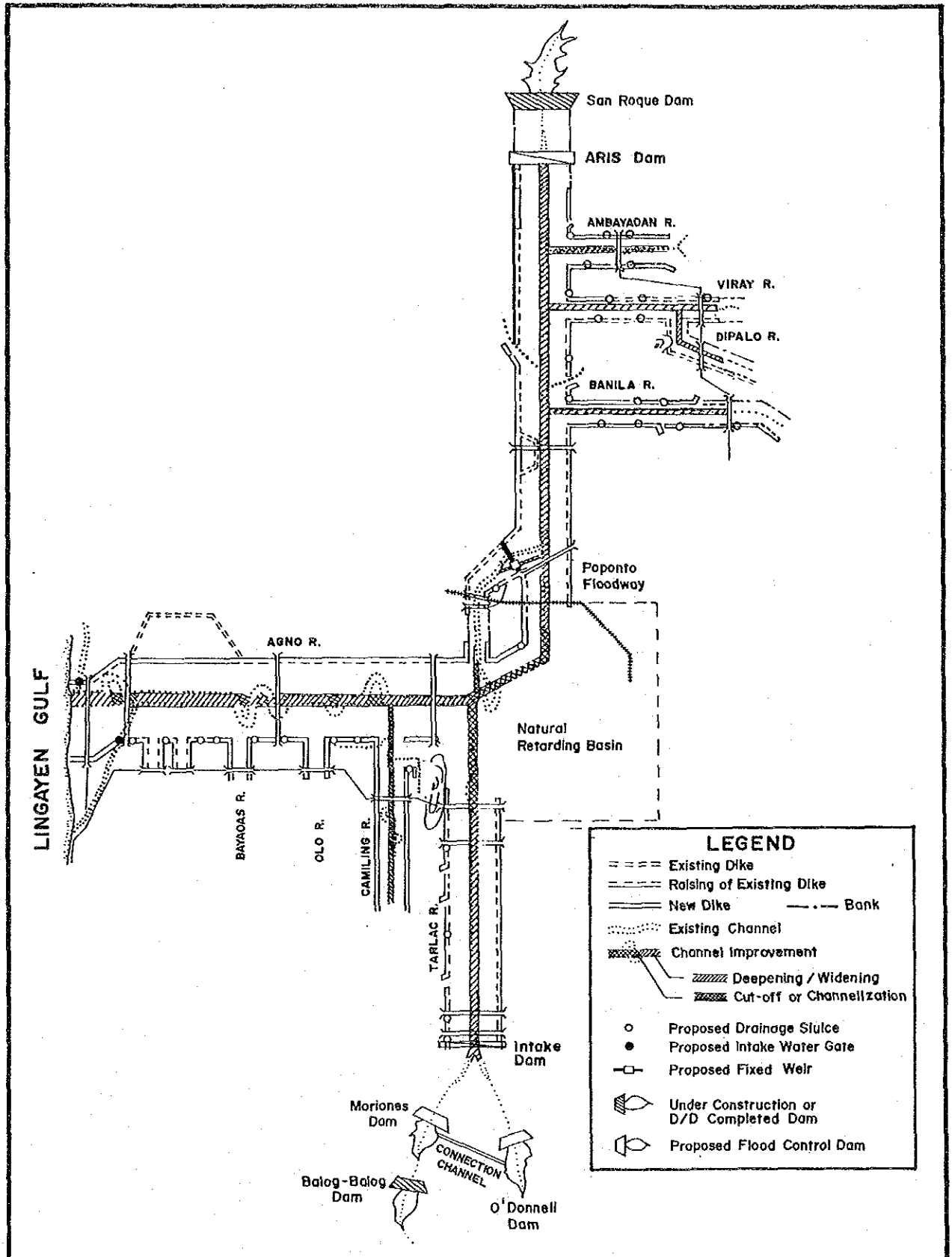


Fig. 7.3 GENERAL LAYOUT OF AGNO RIVER IMPROVEMENT PLAN FOR FRAMEWORK PLAN