Table A7.2 - 3 IRRIGATION AREA OF SUBSIDIARY CROPS UNDER MANAGEMENT OF MEA (3/4)

(Unit: ha)

Crop	Year	Season	EMB	CW	MW	BKM	AKP	Sub-total Righ bank	KIW	SW	Sub-total Left bank	Total
Bombay onion	1985	Yala	0	0	0	0	0	0	1	1	2	2
	1985/86	Maha	0	0	0	0	0	0	0	0	0	0
	1986	Yala	1	0	0	0	0	1	1	0	1	2
	1986/87	Maha	0	0	0	0	0	0	0	0	0	0
	1987	Yala	0	0	0	0	0	0	0	1	1	1
	1987/88	Maha	0	0	0	0	0	0	0	0	0	0
	1988	Yala	3	0	1	1	1	6	3	3	6	12
	1988/89	Maha	0	0	0	1	1	2	0	1	1	3
	1989	Yala	0	0	2	4	1	7	1	1	2	9
	1989/90	Maha	0	1	0	1	1	3	0	1	1	4
	1990	Yala	0	0	0	1	0	1	1	1	2	3
	1990/91	Maha	4	1	1	1	0	7	0	1	1	8
	1991	Yala										
	Average	Maha	1	0	0	1	0	2	0	1	1	3
		Yala	1	0	1	1	0	3	1	1	2	5
Manioc	1985	Yala	0	2	8	0	8	18	0	75	75	93
	1985/86	Maha	0	0	14	13	2	29	0	0	0	29
	1986	Yala	0	0	0	0	0	0	0	0	0	0
	1986/87	Maha	0	0	0	12	0	12	0	0	0	12
	1987	Yala	6	3	0	0	1	10	0	0	0	10
	1987/88	Maha	9	1	6	12	2	30	0	0	0	30
	1988	Yala	9	4	1	5	3	22	0	8	8	30
	1988/89	Maha	4	0	3	0	0	7	2	0	2	9
	1989	Yala	0	0	2	0	2	4	3	0	3	7
	1989/90	Maha	0	0	2	0	2	4	0	0	0	4
	1990	Yala	1	0	0	1	2	4	0	0	0	4
	1990/91	Maha	1	0	7	0	3	11	0	1	1	12
	1991	Yala										
	Average	Maha	2	0	5	6	2	16	0	0	1	16
		Yala	3	2	2	1	3	10	1	14	14	24
Sweet potato	1985	Yala	0	0	0	0	1	1	0	0	0	1
	1985/86	Maha	0	0	0	1	0	1	0	0	0	1
	1986	Yala	0	0	0	0	0	0	0	0	0	0
	1986/87	Maha	0	0	0	0	0	0	0	0	0	0
	1987	Yala	2	0	0	0	0	2	0	0	0	2
	1987/88	Maha	4	1	0	2	0	7	0	0	0	7
	1988	Yala	4	1	0	0	0	5	0	0	0	5
	1988/89	Maha	4	0	0	0	0	4	0	0	0	4
	1989	Yala	9	0	1	0	0	10	0	0	0	10
	1989/90	Maha	6	0	0	0	0	6	0	0	0	6
	1990	Yala	6	0	0	0	1	7	0	0	0	7
	1990/91	Maha	12	0	1	0	1	14	0	0	0	14
	1991	Yala										
	Average	Maha	4	0	0	1	0	5	0	0	0	5
		Yala	4	0	0	0	0	4	0	0	0	4
Gingelly	1985	Yala	0	0	0	0	0	0	0	0	0	0
	1985/86	Maha	0	0	0	0	12	12	0	0	0	12
	1986	Yala	0	0	0	0	0	0	0	0	0	0
	1986/87	Maha	0	0	0	0	0	0	0	0	0	0
	1987	Yala	0	0	0	0	1	1	0	0	0	1
	1987/88	Maha	0	0	1	0	2	3	0	0	0	3
	1988	Yala	0	6	0	1	0	7	0	0	0	7
	1988/89	Maha	0	0	0	0	0	0	0	0	0	0
	1989	Yala	0	0	0	0	0	0	0	0	0	0
	1989/90	Maha	0	0	2	0	0	2	0	0	0	2
	1990	Yala	0	0	3	0	0	3	0	0	0	3
	1990/91	Maha	0	0	0	0	0	0	0	0	0	0
	1991	Yala										
	Average	Maha	0	0	1	0	2	3	0	0	0	3
		Yala	0	1	1	0	0	2	0	0	0	2

Table A7.2 - 3 IRRIGATION AREA OF SUBSIDIARY CROPS UNDER MANAGEMENT OF MEA (4/4)

(Unit: ha)

Crop	Year	Season	EMB	CW	MW	BKM	AKP	Sub-total Righ bank	KIW	SW	Sub-total Left bank	Total
Ground-nuts	1985	Yala	1	1	0	0	2	4	1	0	1	5
	1985/86	Maha	0	0	1	0	5	6	0	0	0	6
	1986	Yala	0	0	0	0	0	0	0	0	0	0
	1986/87	Maha	0	0	0	0	0	0	0	0	0	0
	1987	Yala	0	0	0	0	2	2	0	0	0	2
	1987/88	Maha	0	0	0	0	1	1	0	0	0	1
	1988	Yala	0	25	0	1	0	26	0	0	0	26
	1988/89	Maha	0	0	0	1	1	2	0	0	0	2
	1989	Yala	0	0	0	0	0	0	0	0	0	0
	1989/90	Maha	0	3	0	0	0	3	0	0	0	3
	1990	Yala	0	0	0	0	0	0	0	0	0	0
	1990/91	Maha	0	0	0	0	0	0	0	0	0	0
	1991	Yala										
	Average	Maha	0	1	0	0	1	2	0	0	0	2
		Yala	0	4	0	0	1	5	0	0	0	6
Vegetables	1985	Yala	13	32	37	6	24	112	0	20	20	132
	1985/86	Maha	5	9	65	14	27	120	5	0	5	125
	1986	Yala	8	12	43	2	25	90	2	12	14	104
	1986/87	Maha	4	24	24	5	17	74	1	6	7	81
	1987	Yala	15	20	23	10	15	83	5	3	8	91
	1987/88	Maha	18	6	20	10	41	95	3	2	5	100
	1988	Yala	19	3	6	7	15	50	6	17	23	73
	1988/89	Maha	14	0	7	5	32	58	3	11	14	72
	1989	Yala	20	23	5	4	16	68	6	18	24	92
	1989/90	Maha	1	157	20	7	18	203	15	14	29	232
	1990	Yala	10	14	29	9	33	95	9	36	45	140
	1990/91	Maha	36	53	43	12	9	153	19	6	25	178
	1991	Yala										
	Average	Maha	13	42	30	9	24	117	8	7	14	131
		Yala	14	17	24	6	21	83	5	18	22	105
Total	1985	Yala	27	70	65	13	100	275	8	111	119	394
	1985/86	Maha	11	22	145	106	191	475	10	0	10	485
	1986	Yala	31	20	126	17	53	247	13	38	51	298
	1986/87	Maha	8	38	78	47	32	203	4	6	10	213
	1987	Yala	43	44	46	33	70	236	31	51	82	318
	1987/88	Maha	46	23	63	69	77	278	8	8	16	294
	1988	Yala	57	58	31	41	29	216	28	52	80	296
	1988/89	Maha	33	0	34	20	97	184	12	29	41	225
	1989	Yala	65	51	30	64	41	251	35	113	148	399
	1989/90	Maha	16	199	58	151	51	475	30	96	126	601
	1990	Yala	31	26	63	45	73	238	42	87	129	367
	1990/91	Maha	65	127	144	70	57	463	37	15	52	515
	1991	Yala										
	Average	Maha	30	68	87	77	84	346	17	26	43	389
		Yala	42	45	60	36	61	244	26	75	102	345

Block Name:

EMB	Embilipitiya	KW	Kiriibanwewa
CW	Chandrikawewa	SW	Suriyawewa
MWH	Murawasihena		
BKM	Binkama		
AKP	Angunukolapellessa		

Note: Irrigation area of Mahagama tank area of about 530 ha is included.

Source: Agricultural Division, MEA Walawe Special Area Office

Table A7.2 - 4 **IRRIGATION AREA IN SEVANAGALA SUGAR AREA ON LEFT BANK**

Crop	Year	Season	Area (ha)	Allotment (nos)	Remarks
Paddy	1985	Yala			
	1985/86	Maha			
	1986	Yala			
	1986/87	Maha			The area of paddy is estimated based
	1987	Yala	179	717	on the numbers of allotment of
	1987/88	Maha	179	717	sugar- cane and average paddy area of
	1988	Yala	262	1,047	0.25 ha/allotment
	1988/89	Maha	262	1,047	
	1989	Yala	321	1,284	
	1989/90	Maha	321	1,284	
	1990	Yala	371	1,485	
	1990/91	Maha	371	1,485	
	1991	Yala			
	Average	Maha	283	1,133	
		Yala	283	1,133	
Sugarcane	1985	Yala			
(0.75 ha	1985/86	Maha			
/allot)	1986	Yala			
	1986/87	Maha			
	1987	Yala	538	717	
	1987/88	Maha	538	717	
	1988	Yala	785	1,047	
	1988/89	Maha	785	1,047	
	1989	Yala	963	1,284	
	1989/90	Maha	963	1,284	
	1990	Yala	1,114	1,485	
	1990/91	Maha	1,114	1,485	
	1991	Yala			
	Average	Maha	850	1,133	
		Yala	850	1,133	

Source: Sugarcane Harvesting Report, Plantation and Settlement Division, Sevanagala Sugar Industries Ltd.,1990

Table A7.2 - 5 IRRIGATION AREA IN YALA 1992 UNDER MANAGEMENT OF MEA

Crop	Item	Block on Right Bank (RB)					Sub-total of RB	Block on LB		Sub-total of LB	Total of MEA
		EMB	CW	MW	BKM	AKP		KIW	SW		
Paddy	Yala-92	62	205	109	203	167	746	398	165	563	1,309
	(%)	4%	9%	13%	10%	13%	10%	35%	9%	20%	12%
	Ave.85-91	1,570	2,208	821	1,938	1,241	7,778	1,137	1,738	2,875	10,653
Banana	Yala-92	217	235	414	184	128	1,177	181	96	277	1,454
	(%)	543%	572%	236%	510%	154%	314%	723%	331%	513%	339%
	Ave.85-91	40	41	175	36	83	375	25	29	54	429
S.cane	Yala-92	83	0	0	0	0	83	0	0	0	83
	(%)	488%	-	-	0%	0%	218%	0%	-	0%	213%
	Ave.85-91	17	0	0	2	19	38	1	0	1	39
Chilli	Yala-92	15	43	24	53	78	213	51	52	103	315
	(%)	93%	289%	119%	278%	325%	226%	316%	200%	244%	232%
	Ave.85-91	16	15	20	19	24	94	16	26	42	136
Vegetables	Yala-92	49	55	36	44	100	283	29	61	90	373
	(%)	351%	321%	149%	730%	476%	345%	580%	339%	392%	356%
	Ave.85-91	14	17	24	6	21	82	5	18	23	105
Others*	Yala-92	114	42	72	68	65	360	72	90	162	522
	(%)	948%	320%	447%	619%	409%	530%	1444%	289%	449%	502%
	Ave.85-91	12	13	16	11	16	68	5	31	36	104
Total OFCs	Yala-92	478	374	545	348	371	2,116	333	299	631	2,748
	(%)	483%	435%	232%	471%	228%	322%	639%	287%	405%	338%
	Ave.85-91	99	86	235	74	163	657	52	104	156	813
Total of irri. area	Yala-92	540	579	653	552	538	2,862	730	464	1,194	4,056
	(%)	32%	25%	62%	27%	38%	34%	61%	25%	39%	35%
	Ave.85-91	1,669	2,294	1,056	2,012	1,404	8,435	1,189	1,842	3,031	11,466

Ave.85-91: average crop area in Yala season from 1985 to 1991

*: Others includes onion, pulses such as green gram, cowpea, groundnut, etc.

Table A7.2 - 6 YEARLY CROP AREA UNDER RAINFED CONDITION

Crop	Season	Block Name					Sub-total Right bank	Block Name		Sub-total Left bank	Total
		EMB	CW	MW	BKM	AKP		KIW	SW		
Maize	Maha	36	11	13	13	82	54	27	81	163	10,901
	Yala	0	0	1	0	0	1	0	0	1	10,653
Kurakkan	Maha	6	30	15	24	39	113	18	33	52	165
	Yala	1	1	0	0	1	2	0	0	0	2
Green gram	Maha	143	95	12	26	80	356	543	419	961	1,317
	Yala	37	3	1	2	3	45	8	2	10	55
Cowpea	Maha	23	31	6	13	11	85	53	96	149	234
	Yala	6	1	0	0	2	9	1	11	12	21
Lanka Parrippu	Maha	24	13	13	14	15	44	16	21	28	63
	Yala	2	0	0	0	0	2	0	0	0	2
Gingelly	Maha	2	4	2	0	10	18	3	7	10	28
	Yala	8	2	1	0	3	14	5	2	7	21
Groundnut	Maha	8	4	0	2	4	18	25	18	43	61
	Yala	7	0	0	0	0	8	7	1	9	16
Chillies	Maha	16	18	9	23	27	93	23	25	48	141
	Yala	2	1	2	3	8	15	1	2	3	18
Red Onion	Maha	1	1	0	3	1	5	0	7	7	12
	Yala	0	0	0	0	0	1	0	1	1	2
Manioc	Maha	28	15	12	18	15	53	29	23	44	89
	Yala	9	3	0	0	4	16	11	5	17	32
Sweetpoteto	Maha	4	2	0	2	1	8	0	3	3	11
	Yala	2	1	0	0	0	3	0	1	1	4
Vegetables	Maha	43	37	9	29	28	144	36	40	76	220
	Yala	8	4	7	1	7	27	2	16	18	45
Banana	Maha	138	107	66	56	65	433	657	80	738	1,170
	Yala	112	73	45	50	53	333	646	95	741	1,074
Sugarcane	Maha	0	0	0	2	2	4	1	0	1	5
	Yala	0	0	0	5	1	6	0	0	0	6

Block Name:

EMB	Embilipitiya	AKP	Angunkolapellesa
CW	Chandrikawewa	KW	Kiriibanwewa
MWH	Murawasihena	SW	Suriyawewa
BKM	*Binkama*		
AKP	Angunukolapellessa		

Note: Average area from 1985 to 1991

Source: Agricultural Division

ANNEX 7-3 PRESENT CONDITION OF RURAL INFRASTRUCTURE

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ANNEX 7-3 PRESENT CONDITION OF RURAL INFRASTRUCTURE

7.3.1 Roads

(1) Road system and classification mode in the country

The roads in Sri Lanka are classified into four categories; trunk, main, minor and farm roads. Trunk roads (class 'A' road) are paved and bitumen surfaced with carriage-way of 8 to 12 m and platform widths of 12 to 19 m. Terminal place of the class 'A' roads is Colombo, the administrative and commercial center in the country. There are twenty one (21) class 'A' roads, and they are numbered and 'posted' routes. They connect 12 municipalities and major towns, which are supported by network of main roads (class 'B' road). The class 'B' roads connect other important towns and also provide significant links within the trunk route system. These are metalled and bitumen surfaced with a carriage-way of 4 to 6 m and 6 to 8 m wide platform. Seventy five class 'B' roads link additional towns to major places and with trunk roads.

Minor roads are classified as class 'C', 'D', and 'E road'. Class 'C' roads are primarily agricultural roads and local roads with single line carriage-way of 4 m and a platform width of 7 m. They are mostly metalled by asphalt, but a small percentage are by gravel. Class 'D' roads are graveled roads with about 1-2 m wide surface, generally motorable during dry weather. Class 'E' roads are bridle paths and unspecified roads, the majority of which are not motorable.

Farm roads are classified into three categories: main, market, hamlet and on-farm roads. Main farm roads usually are class 'C' roads. Market roads are ranked as type I and type II. Type I market roads are metalled with carriage-way of 5.5 m and formation width of 8.7 m, which are connecting with main farm roads and village center. Type II market roads are graveled with carriage-way of 3.65 m and formation width of of 5.65 m, which are connecting between type I market roads and hamlets and cultivation fields. Hamlet road is a internal roads within the hamlet. They are graveled with carriage-way of 3.65 m and formation width of 5.65 m. On-farm roads consist of furrow paths and unspecified roads.

The road system in the country is summarized as follows:

Category	Type	Carriage-way (m)	Pavement condition	Total Length (km)
Trunk	Class 'A'	8 -12	Metal	4,050
Main	Class 'B'	6 - 8	Metal	4,875
Minor	Class 'C'	4 - 6	Metal	10,409
	Class 'D'	1 - 2	Gravel	5,418
	Class 'E'	< 1	-	714
Farm	Main	4 - 6	Metal	-
	Market I	5.5	Metal	-
	Market II	3.65	Gravel	-
	Hamlet	3.65	Gravel	-
	On Farm	< 1	-	-

(2) Present road condition in the Study area

The main road in the Uda Walawe area is Route 'A18'. 'A18' road runs on the Right bank of the Walawe river from north to south. This road is connected to 'A2' road at Nonagama located in southern part of the area and 'A4' road at Pelmadulla. Route 'A2' and 'A4' lead to Colombo. The Uda Walawe area has one class 'A' road, forty class 'C' roads , twenty seven class 'D' roads and some farm roads. The regional network in and around the Study area is illustrated in Fig. A7.3-1. Present roads condition in the Walawe area are summarized as follows:

Class	Length (km)	Rate (%)
(Total Length)		
a. Class 'A'	56	7.2
b. Class 'C'	129	16.6
c. Class 'D'	193	24.9
d. Market I	75	9.7
e. Market II	323	41.6
Total	776	100.0
(Pavement Length)		
a. Metal	128	16.5
b. Gravel	538	69.3
c. Nonpaved	110	14.2
Total	776	100.0

(3) Road condition in the Old area

Present condition of roads and its constraints in the Old area are summarized below:

a. Roads net-work are already set up.
b. Main roads are metaled and have enough width.
c. Farm roads have enough width.
d. Lack of related facilities such as bridges, culverts and causeways.
e. Occurrence of erosion gullies formed in the edge of the shoulders.
f. Repairs of clearing, embankments, surface leveling, pavement, etc are required.

(4) Road networks and conditions in the Extension area

The area has one main road which is connected between Mirijjawala and Suriyawewa, three sub-main roads which is linking with outside area and twenty of internal connection roads. The main road run from north to south and bisect the area to west to east. The road connects to 'A2' road at Mirijjawala, located in southern end part of the extension area and 'A18' road at Embilipitiya on the right bank of the Walawe river via Suriyawewa. This road is important road for rural transportation, but the road condition is very unsatisfactory for main road.

Other internal roads are systematized for connecting tank to tank or village to village, villages are located near tanks. Road network is not set up in this area. These roads are poor conditions such as narrow, bumpy and un-jeepable. The road networks in the extension area is shown in Table A7.3-1 and Fig. A7.3-2.

7.3.2 Household

Households in the Old Area are clustered in the high land areas. In general, the cluster forms a hamlet. A hamlet is the smallest administrative unit. Kiriibbanwewa Block consists of 6 hamlets, while Suriyawewa Block consists of 11 hamlets. The Extension Area is under the administrative control of Government Agent, Hambantota District. Three patterns of settlement in the Extension area are observed as follow.

1) Regularized settlements under village tanks and along the western boundary of the area. - mostly permanent and semi-permanent houses
2) Encroached settlements - mostly semi permanent houses
3) Seasonal settlements for rainfed shifting cultivation - mostly temporary houses

Numbers of families in blocks and hamlets are listed in Table A7.3-2.

7.3.3 Health and medical facilities

Existing health and medical facilities are summarized below, and these details and locations are tabulated in Table A7.3-3 and illustrated in Fig. A7.3-3 :

Facility	Sugar Area	Kiriibbanwewa	Suriyawewa
Gramodaya Health Center	-	-	1
Sub Divisional Health Center	-	-	2
Divisional Health Center	-	-	1
Dispensary	1	1	1
Hospital	-	-	-

The condition of Divisional Health Center in Kiriibbanwewa Block are summarized as follows:

a. Composition:
   Medical officer: 1 person (Doctor)
   Nurse: -
   Midwife: 8 Person (Family Health Worker)

b. Service hours: AM 9:00 - PM 3:00 (Monday - Friday)

c. Diagnosis items:
The center doctor makes a round of all the treatment items. The medical activities at the center are mainly designed for prevention and early treatment of diseases. Patients who need special medical attention will be sent by car to large hospitals in Embilipitiya or Hambantota.

d. Disease situation: General Diseases:
Stomach/Intestinal Catarrh Bronchitis (common cold, flu) Parasites Malarial fever, Diarrahera: Adult Diseases: High-blood pressure

7.3.4 Education facilities

(1) Education system in the country

The following education system is adopted for schooling in Sri Lanka.

Infant education	(Pre-primary School: One or two years)
Primary education	(Primary: School Five years)
Mid-level education	(Junior Secondary School: Three years)
Advanced education	(Senior Secondary School: Four years)
High-level education	(University: 3-5 years)

All schools are divided by following categories.

Category 1:	Primary School	:	School year 1 to 5 or 8
Category 2:	Junior School	:	School year 1 to 11
Category 3:	Senior School	:	School year 1 to 13

(2) Education facilities in the Study area

The education facilities in the Study area are summarized as follows, and these details and locations are tabulated in Table A7.3-3 and illustrated in Fig. A7.3-3 ::

Facility	Sugar Area	Kiriibbanwewa	Suriyawewa
Pre Primary	1	14	24
Primary School	4	-	2
Junior School	-	2	2
Senior School	4	5	1

7.3.5 Public transportation services

Only the bus service is available as a means of public transportation in the Study area.

7.3.6 Communication and postal services

(a) Telephone facility

No telephone station exists in the Study area, but is available in Embilipitiya. Dialing system is used for the ordinary calls. Long distance and overseas calls can be made through the operator. Some pay-phone booths are installed within the telephone station. It can be used to make ordinary calls, long distance calls and overseas calls. The station is open from Monday to Saturday, 8:00 - 22:00.

(b) Radio communication

In general, this mean of communication is used for public sector but not in popular in the area.

(c) Other communication facilities

Radio set diffusion rate	:	nearly 100 %
Television set diffusion rate	:	15 %

(d) Postal Service

Central post office is located in Embilipitiya city. And Divisional post offices are set up in Sevanagala sugar area and Suriyawewa. The post office is responsible for receiving and despatching mail, but does not conduct home delivery. Mail is received or sent to Colombo main office once a week. Office hours are AM 8:00 - 11:30 and 15:00 - 18:00. Details and location are tabulated in Table A7.3-3 and illustrated in Fig. A7.3-3

7.3.7 Electricity supply

Power is generated at the hydro-power station in Uda Walawe dam from where it is distributed Hambantota and Tangalla. For distribution, power is first reduced from 33 kv to 11 kv at Kiriibbanwewa. Existing electricity supply networks is shown in Fig.A7.3-4.

As seen in the figure, only 3 centers in the area are provided with electricity supply, that is, Sugar Factory Village, Kiriibbanwewa and Suriyawewa Towns.

7.3.8 Drinking water supply

No drinking water supply facilities is available in the rural area. Public tube wells, private wells and streams are the predominant sources of water. Most farm families have private wells which are about 10 m deep with the water depth of 1.0 - 3.0 m. Some of them, however, dry up in drought season.

Current situation of the water supply system in rural area is summarized as below and details are tabulated in Table A7.3-3.:

	Place	Beneficiary
Busy:	1. Sugar Factory Village	364
	2. Suriyawewa Town	250

7.3.9 Waste and sewage treatment

Rural areas have no sewer or drainage facilities. In most cases, human waste is buried in the ground by each farming family. Some of the households in the area are equipped with toilets, but their number is very few. As to the miscellaneous water, each farm family has a simple drainage channel within the premises to let the ground naturally absorb the water.

7.3.10 Assessment of present condition and its constraints

Based on the result of filed survey, the condition and constraints of present infrastructure facilities other than roads are summarized as below:

[Old Area]

a. Already improved basic infrastructures
b. A functional disorder of basic infrastructures
c. Lack of drinking water supply, Improvement of drinking water supply system is require.
b. Rehabilitation of roads surface and facilities is required.

e. Improvement of connecting facilities form left bank area to right bank area is required.
f. Improvement of rural electrification is required.
g. Improvement of rural sewage and refuse treatment system is required.
h. Improvement of telecommunication system is required.
i. More integrating of service center facilities is required.

[Extension Area]

a. Settle down scatter encroacher exists. Resettlement for already encroacher is required.
b. Lack of basic infrastructures. Construction of most of all items of rural infrastructure is required such as improvement of drinking water supply system, improvement of service center.and construction of education, communication, health, marketing facilities.

TABLES

Table A7.3-1 ROAD CONDITION IN THE EXTENSION AREA

Name	Total Length (km)	Pavement L. (km)	Width (m)	Function	Evaluation
C-1	16.2	5.5	4.0	W+MF	A
C-2	10.4	-	4.0	CO+MF	B
C-3	7.2	-	4.0	CO+MF	B
C-4	20.3	-	4.0	W+MF	A
C-5	3.8	-	3.5	CO+MF	B
Sub total	57.9	5.5			
EF-1	3.8	-	3.0	CA+F	B
EF-2	6.6	-	3.5	CA+F	B
EF-3	3.8	-	2.5	CA+F	C
EF-4	5.4	-	3.0	CA+F	C
EF-5	3.0	-	2.5	CA+F	C
EF-6	3.5	-	2.0	CA+F	C
EF-7	2.1	-	3.0	CA+F	B
EF-8	2.9	-	3.0	CA+F	B
EF-9	3.9	-	3.5	CA+F	B
EF-10	4.7	-	2.5	CA+F	C
EF-11	6.4	-	3.0	CA+F	C
EF-12	4.1	-	2.5	CA+F	C
EF-13	4.7	-	2.5	CA+F	C+D
EF-14	3.5	-	3.0	CA+F	C
EF-15	0.6	-	2.0	CA+F	C
EF-16	2.5	-	2.0	CA+F	C
EF-17	3.2	-	3.0	CA+F	B
EF-18	6.5	-	3.5	CA+F	B
Sub total	71.2	-			
OF-1	3.7	-	3.0	CA+F	C
OF-2	1.6	-	3.0	CA+F	C
Sub total	5.3	-			
TOTAL	*134.4*	5.5			

Note:
W = Wide area arterial road
CO= Connection road (linking outside area)
CA= Connection road (linking the area)
MF= Main farm road
F = Farm road

A = Required road paving/repaving with asphalt
B = In need of minor repair
C = In need of widening and repair
D = In need of heavy repair or reconstruction

Table A7.3 - 2 NOS. OF FAMILIES IN BLOCKS AND HAMLETS

(Unit : Family)

HOUSEHOLD	FARM	NON-FARM	ENCROACHER	
Left Bank Area	9,038	4,025	7,209	
Sugar Area	3,238	448	-	
Sewanagala	599	39	-	Service center
Moraketiya	235	28	-	
Indikola Pelessa	147	-	-	
Thalapatta	94	-	-	
Muthumini Gama	179	1	-	
Daluketiya	187	-	-	
Giniga Pelessa	98	-	-	
Makuluwa	53	-	-	
Kowularama North	269	-	-	Village center
Kowularama South	363	6	-	
Usweliara	128	-	-	
Sevanagala North	69	-	-	
Rainfed Sector	817	-	-	
Company Employees-	400	-		
Kiriibbanwewa	1,816	717	1,080	
Kiriibbanwewa	432	312	34	Village center
Habaralu wewa	430	50	-	
Bahirawa	136	36	344	
Haburugala	359	49	14	
Mahagama	242	218	375	
Hathporuwa	217	52	313	
Suriyawewa	3,984	2,860	4,629	
Sanajasewapora	281	822	521	
Suriyawewa Towa	210	1,133	70	Village center
Beddewewa	424	411	485	
Viharagala I	424	136	190	
Viharagala II	236	305	242	
Bagamaruthya	495	6	229	
Alioloara	384	3	971	
Plimagala	308	-	1,012	
Bedigantota	406	27	90	
Mahaara Andarawewa	441	15	144	
Suwodagama	375	2	675	
Extension Area	-	-	1,500	

Table A7.3 - 3 PRESENT INFRASTRUCTURE FACILITIES (SUGAR AREA 1) 1/5

BLOCK / UNIT / HAMLET	SUGAR CANE AREA (IRRIGATED SECTOR)											
	1 SE	2 MO	3 IN	4 TH	5 MU	6 DA	7 GI	8 MA	9 KO-N	10 KO-S	11 US	12 SE-N
1.POPULATION												
Farm Families	599	235	147	94	179	187	98	53	269	363	128	69
Non-farm Families	39	28			1					6		
Encroachers												
2.EDUCATION												
PrePrimary School												
Primary School					1		1					
Junior School												
Senior Secondly												
Secondly School	1									1		
3.HEALTH & MEDICAL CARE												
Gramodaya Health Center												
Sub Divisional H.C.												
Divisional H.C.												
Hospital	1											
4.POSTAL												
Post Box			1	1	1			1			1	
Sub Post Office										1		
Post Office	1											
5.DRINKING WATER												
Individual Wells												
Common Wells												
Deep Weels	21	8	7	5	12	10	5	2	12	15	3	1
Pipe Water												
6.ELECTRIFICATION												
Individual Elec. Line												
Common Elec. Line												
7.OFFICES												
Unit Service Centre												
Block Manager's Office												
Unit Manager' Office	1						1			1		
Development Centre												
Divisional Education Off.												
8.OTHERS												
Police Box												
Police Station												
Banks												
Co-operative (Small Scale)		1								1		
Co-operative Complex	1											
Pola												
Sport Ground (Small Scale)												
Sports Complex												
Temples	1				1					1		
Noted & Historic Spots												

Note : SE : Sewanagala MO : Moraketiya IN : Indikola Pelessa TH : Thalapatta MU : Muthumini Gama
DA : Daluketiya GI : Giniga Pelessa MA : Makuluwa KO-N : Kowularagma North
KO-S : Kowularagma South US : Usweli Ara SE-N : Sevanagala North

Table A7.3 - 3 PRESENT INFRASTRUCTURE FACILITIES (SUGAR AREA 2) 2/5

BLOCK	SUGAR CANE AREA (RAINFED SECTOR)				
UNIT					
HAMLET	1	2	3	4	5
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1.POPULATION					
Farm Families	250	138	79	174	176
Non-farm Families					
Encroachers					
2.EDUCATION					
PrePrimary School					
Primary School			1		
Junior School					
Senior Secondly					
Secondly School					
3.HEALTH & MEDICAL CARE					
Gramodaya Health Center					
Sub Divisional H.C.					
Divisional H.C.					
Hospital					
4.POSTAL					
Post Box	1		1		
Sub Post Office					
Post Office					
5.DRINKING WATER					
Individual Wells					
Common Wells	6	7	5	4	2
Deep Weels					
Pipe Water					
6.ELECTRIFICATION					
Individual Elec. Line					
Common Elec. Line					
7.OFFICES					
Unit Service Centre					
Block Manager's Office					
Unit Manager' Office	1		1		1
Development Centre					
Divisional Education Off.					
8.OTHERS					
Police Box					
Police Station					
Banks					
Co-operative (Small Scale)					
Co-operative Complex					
Pola					
Sport Ground (Small Scale)					
Sports Complex					
Temples					
Noted & Historic Spots			1		

Table A7.3 - 3 PRESENT INFRASTRUCTURE FACILITIES (SUGAR AREA 3) 3/5

BLOCK / UNIT / HAMLET	SUGAR CANE AREA (COMPANY EMPLOYEES)							
	1 FV	2 SE	3 DA	4 GI	5 MA	6 KA	7 KO	8 CH
1.POPULATION								
Farm Families								
Non-farm Families	250	41	21	23	15	29	7	14
Encroachers								
2.EDUCATION								
PrePrimary School	1							
Primary School				1				
Junior School								
Senior Secondly								
Secondly School			1				1	
3.HEALTH & MEDICAL CARE								
Gramodaya Health Center								
Sub Divisional H.C.								
Divisional H.C.								
Hospital								
4.POSTAL								
Post Box								
Sub Post Office								
Post Office								
5.DRINKING WATER								
Individual Wells								
Common Wells								
Deep Weels								
Pipe Water	*	*	*	*	*			*
6.ELECTRIFICATION								
Individual Elec. Line								
Common Elec. Line	*	*	*	*	*	*		*
7.OFFICES								
Unit Service Centre							1	1
Block Manager's Office				1	1	1		
Unit Manager' Office	1	1	1					
Development Centre								
Divisional Education Off.								
8.OTHERS								
Police Box								
Police Station								
Banks								
Co-operative (Small Scale)							1	
Co-operative Complex								
Pola								
Sport Ground (Small Scale)	1	1						
Sports Complex								
Temples	1							
Noted & Historic Spots								

NOTE : FV : Factory Village SE : Seranagala DA : Danduina GI : Ginigal Pelessa
MA : Makuluwa KA : Katupila KO : Koul Ara CH : Chandimarama

Table A7.3 - 3 PRESENT INFRASTRUCTURE FACILITIES (KIRI IBBAN WEWA) 4/5

BLOCK	KIRI IBBAN WEWA					
UNIT						
HAMLET	1 KI	2 HA-W	3 BA	4 HA	5 NA	6 HAT
1.POPULATION						
Farm Families	432	430	136	359	242	217
Non-farm Families	312	50	36	49	218	52
Encroachers	34		344	14	375	313
2.EDUCATION						
PrePrimary School	5	2	2	2		3
Primary School				(1)		
Junior School	1					1
Senior Secondly	2	1	1			
Secondly School					1	
3.HEALTH & MEDICAL CARE						
Gramodaya Health Center						
Sub Divisional H.C.						
Divisional H.C.						
Hospital	1					
4.POSTAL						
Post Box	4	3	2	1	4	1
Sub Post Office	1	1			1	1
Post Office						
5.DRINKING WATER						
Individual Wells	33	18	8	23	2	
Common Wells						
Deep Weels	1(5)	2(8)			1	
Pipe Water						
6.ELECTRIFICATION						
Individual Elec. Line						
Common Elec. Line	*					
7.OFFICES						
Unit Service Centre						
Block Manager's Office	1					
Unit Manager' Office	1	1		1	1	1
Development Centre						
Divisional Education Off.						
8.OTHERS						
Police Box						
Police Station						
Banks						
Co-operative (Small Scale)	1	1			1	1
Co-operative Complex	1				1	
Pola						
Sport Ground (Small Scale)						
Sports Complex						
Temples	4	1		1	2	1
Noted & Historic Spots	1					

Note : KI : Kiri Ibann Wewa HA-W : Habaralu Wewa BA : Bahirawa
HA : Haburugala NA : Nahagama HAT : Hathporuwa

Table A7.3 - 3 PRESENT INFRASTRUCTURE FACILITIES (SURIYA WEWA) 5/5

BLOCK / UNIT / HAMLET	SURIYA WEWA										
	1 SA	2 SU	3 BE	4 VI-I	5 VI-II	6 BA	7 AL	8 BED	9 PL-II	10 MA	11 SU-I
1.POPULATION											
Farm Families	281	210	424	424	236	495	384	308	406	441	375
Non-farm Families	822	1133	411	136	305	6	3		27	15	2
Encroachers	521	70	485	190	242	229	971	1012	90	144	675
2.EDUCATION											
PrePrimary School	5	5	3		2	1	2	2	2	2	
Primary School										1	1
Junior School							1	1			
Senior Secondly											
Secondly School		1									
3.HEALTH & MEDICAL CARE											
Gramodaya Health Center	1										
Sub Divisional H.C.		1							1		
Divisional H.C.		1									
Hospital		1									
4.POSTAL											
Post Box	1	2	1		1					1	
Sub Post Office											
Post Office		1									
5.DRINKING WATER											
Individual Wells	22	31	29	25	28	32	38	28	7	5	6
Common Wells	1		3		2					2	2
Deep Weels	6	4	2		3					1	1
Pipe Water											
6.ELECTRIFICATION											
Individual Elec. Line											
Common Elec. Line											
7.OFFICES											
Unit Service Centre		2									
Block Manager's Office		1									
Unit Manager' Office		2	1		1	1					
Development Centre											
Divisional Education Off.											
8.OTHERS											
Police Box											
Police Station		1									
Banks		3									
Co-operative (Small Scale)	2	2			1				1		
Co-operative Complex		1									
Pola		1									
Sport Ground (Small Scale)	1	1			2			1			
Sports Complex		1									
Temples	2	2	1		1		2	1		1	
Noted & Historic Spots	1						1		2		

Note : SA : Sanajasewapora SU : Suriyawewa Towa BE : Beddewewa VI-I : Viharagala-I VI-II : Viharagala-II
BA : Bagamaruthya AL : Alioloara BED : Bedigantota PL-II : Plimagala Thelanilla-II
MA : Mahara Andarawewa SU-I : Suwodagama Thelavilla-I

FIGURES

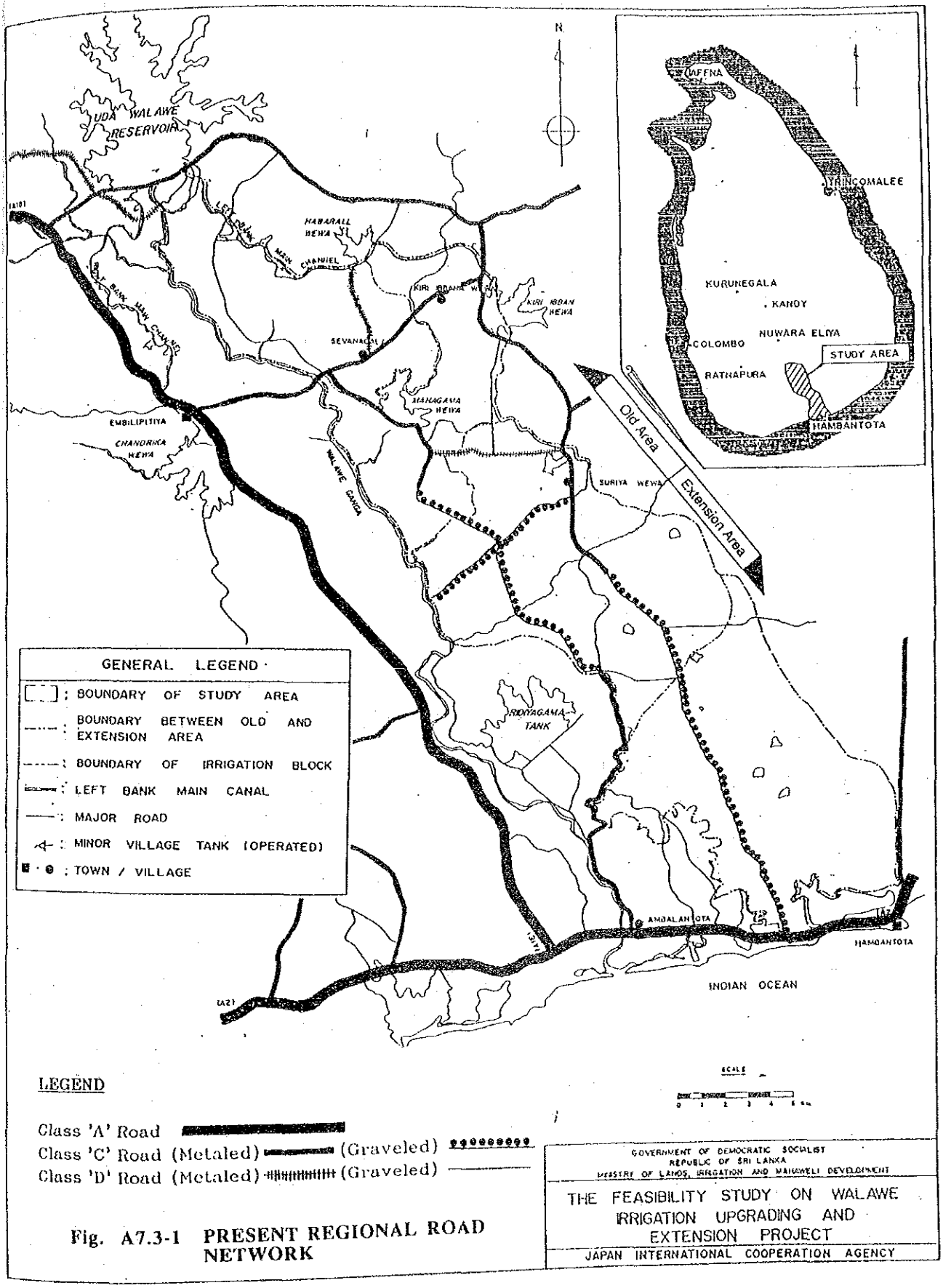
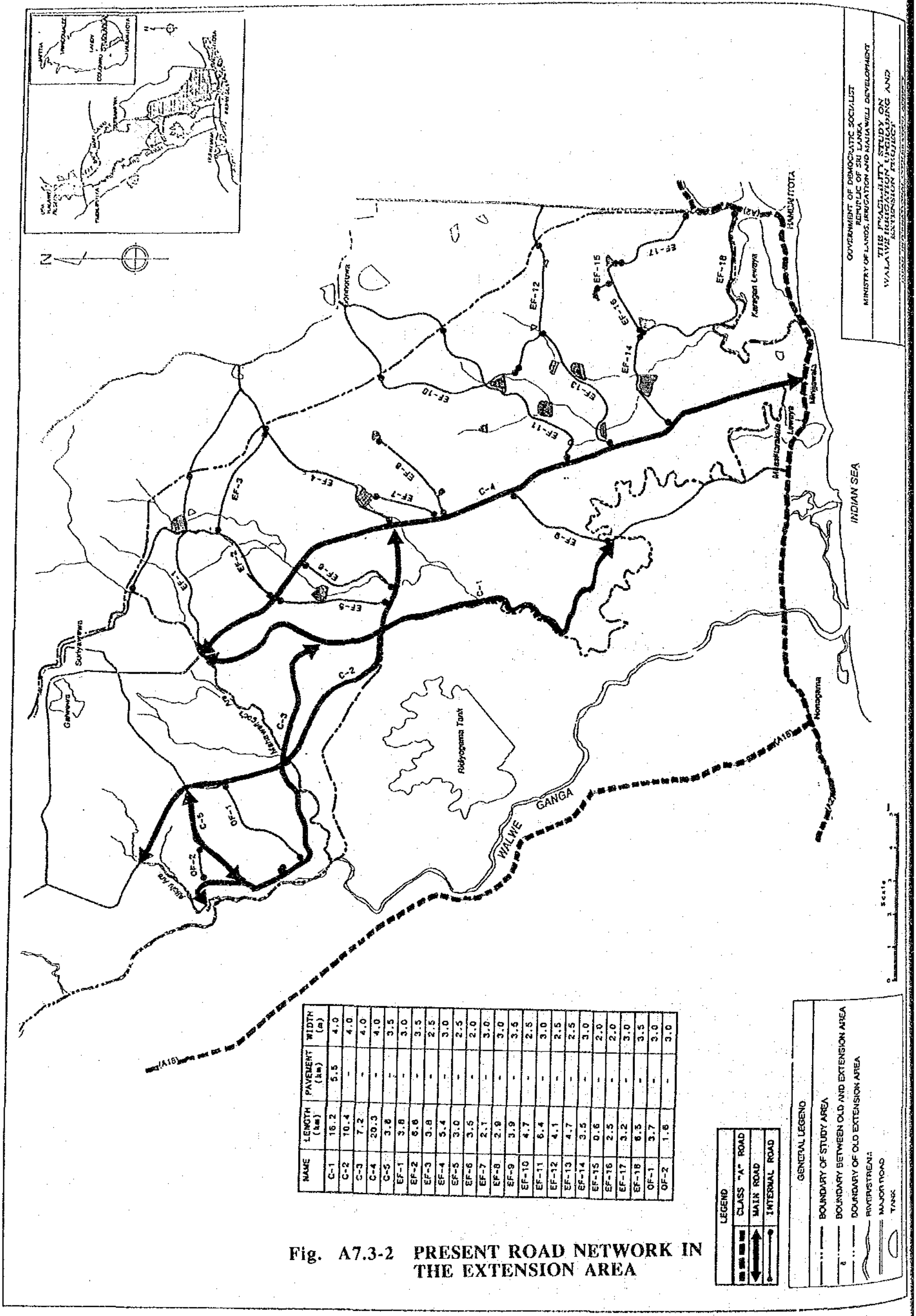


Fig. A7.3-1 PRESENT REGIONAL ROAD NETWORK



NAME	LENGTH (km)	PAVEMENT (km)	WIDTH (m)
C-1	16.2	5.5	4.0
C-2	10.4	-	4.0
C-3	7.2	-	4.0
C-4	20.3	-	4.0
C-5	3.8	-	3.5
EF-1	3.8	-	3.0
EF-2	6.6	-	3.5
EF-3	3.8	-	2.5
EF-4	5.4	-	3.0
EF-5	3.0	-	2.5
EF-6	3.5	-	2.0
EF-7	2.1	-	3.0
EF-8	2.9	-	3.0
EF-9	3.9	-	3.5
EF-10	4.7	-	2.5
EF-11	6.4	-	3.0
EF-12	4.1	-	2.5
EF-13	4.7	-	2.5
EF-14	3.5	-	3.0
EF-15	0.6	-	2.0
EF-16	2.5	-	2.0
EF-17	3.2	-	3.0
EF-18	6.5	-	3.5
OF-1	3.7	-	3.0
OF-2	1.6	-	3.0

Fig. A7.3-2 PRESENT ROAD NETWORK IN THE EXTENSION AREA

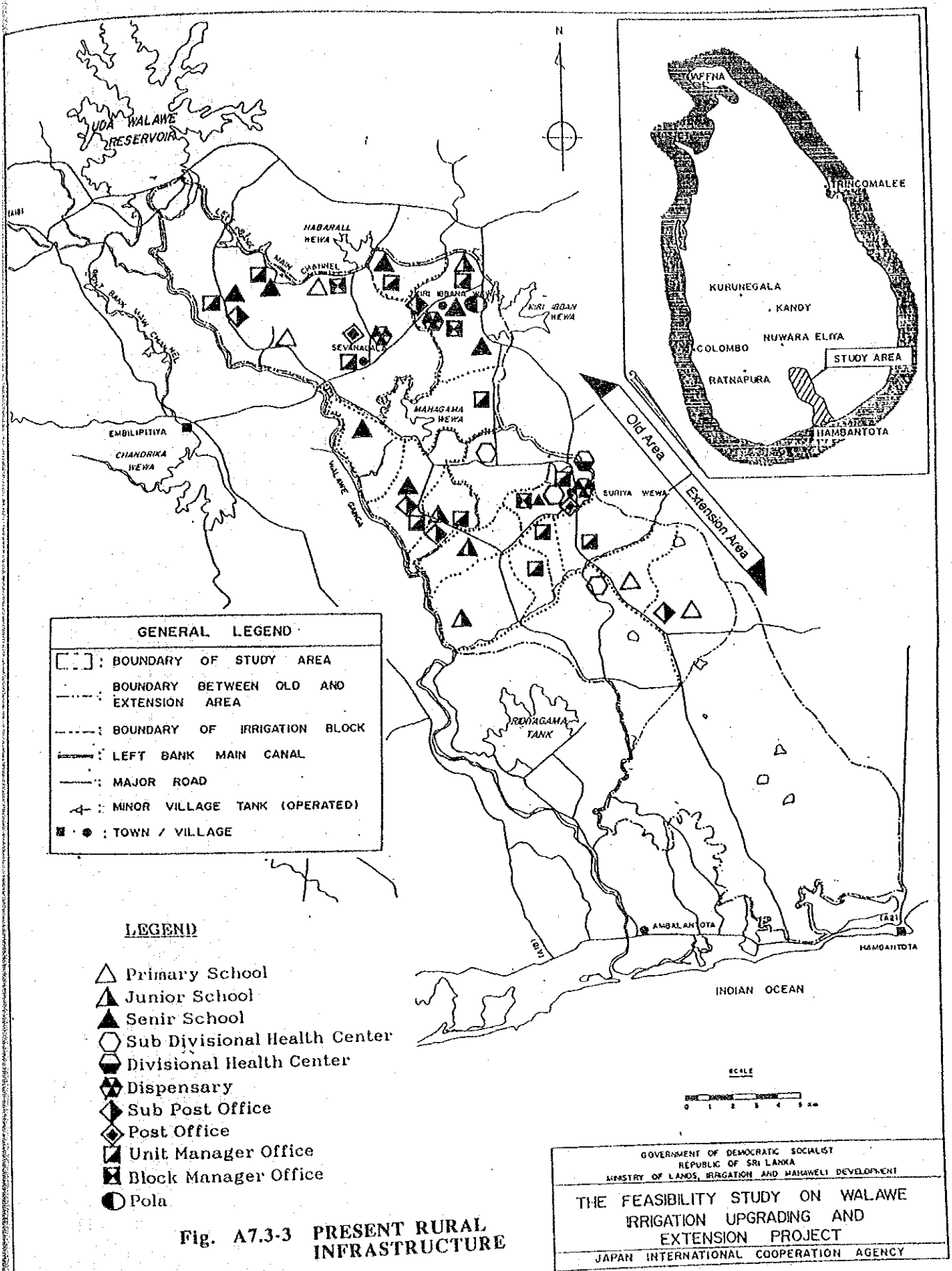


Fig. A7.3-3 PRESENT RURAL INFRASTRUCTURE

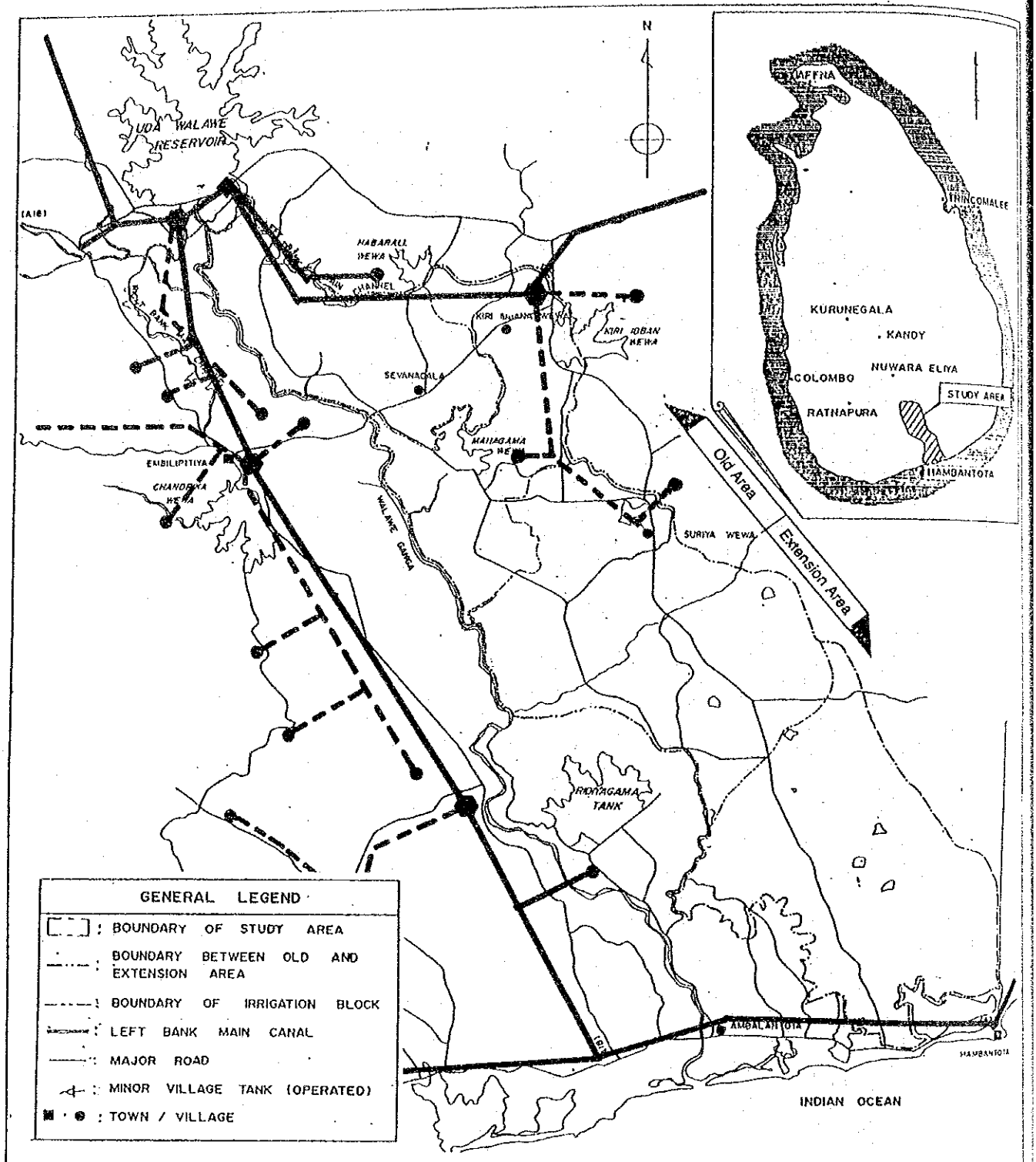


Fig. A7.3-4 PRESENT ELECTRICITY SUPPLY NETWORK

ANNEX 7-4 ASSESSMENT FOR FLOW CAPACITY OF LMBC AND BBC

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ANNEX 7-4 ASSESSMENT FOR FLOW CAPACITY OF LMBC AND BBC

7.4.1 General

Flow capacities of the existing LBMC (Left Bank Main Canal) and BBC (Beddewewa Branch Canal) were roughly assessed by non-uniform hydraulic calculation on the six(6) discharge of 5, 10, 15, 20, 25 and 30 m^3/s for LBMC and on the three(3) discharge of 5, 10 and 15 m^3/s for BBC using the topographic survey data prepared by MEA in January 1992 to judge whether these canals can flow the increased design discharges with the extension of irrigation area.

7.4.2 Control points

The control points are set at the 30,150 m point (end point) for LBMC and at the 5,500 m, 4,400 m and 3,800 m points for BBC taking into account the drop structures. The water levels at each control point (water levels at starting point of hydraulic calculation) are calculated by the Manning's formula and results are shown in Table A7.4.-1.

7.4.3 Calculation of head loss

There are syphon at the 557 m point and aqueduct at the 15,100 m point in the LBMC. The head losses of these structures were calculated by using the following formulas.

(1) Head Loss of Syphon

$$h = a \times (fc + f \times L/D + fe) \times V \times V / 2g$$

where,
- h : Head Loss (m)
- a : Allowance, a = 1.1
- fc : Co-efficient of contraction loss, fc = 0.3
- f : Co-efficient of friction loss
  $f = 124.5 \times n \times n / D^{(1/3)}$, n = 0.015
- L : Length of syphon (m), L = 304.8 m
- D : Diameter of pipe (m), D = 3.66 m
- fe : Co-efficient of expansion loss, fe = 0.3
- V : Velocity (m/s)

(2) Head Loss of Aqueduct

$$h = (fc + f \times L/R + fe) \times V \times V /2g$$

where,
- h : Head Loss (m)
- fc : Co-efficient of contraction loss, fc = 0.3
- f : Co-efficient of friction loss
  $f = 2g \times n \times n / R^{(1/3)}$, n = 0.015
- L : Length of aqueduct (m), L=82.5 m
- R : Hydraulic radius (m)
- fe : Co-efficient of expansion loss, fe = 0.3
- V : Velocity (m/s)

The calculation results are shown in Tables A7.4-2 and A7.4-3.

7.4.4 Result

(1) Left Bank Main Canal

1) Length and number of point of the overflow from the bank

The length and number of the point of the overflow from the top of the bank taking into account the free board of 1.2 m are shown as below.

Discharge (m^3/s)	Length			No. of Point		
	Left Bank (m)	Right Bank (m)	Total (m)	Left Bank (no.)	Right Bank (no.)	Total (no.)
5	900	2,100	3,000	4	8	12
10	900	2,100	3,000	5	8	13
15	1,500	2,600	4,100	7	10	17
20	2,900	5,100	8,000	12	21	33
25	4,700	8,600	13,300	14	25	39
30	5,600	11,100	16,700	15	32	47

In case of the discharge up to 15 m^3/s, the stretch of less banking height is about 200 m at all overflow points. In case of the discharge of 20 m^3/s which is the estimated monthly peak diversion water requirement of LBMC, stretches of less banking height are mainly defined at stretches from Reduced Distance (RD) 22,900 m to RD 23,900 m and from RD 28,700 m to RD 29,200 m and maximum and average required additional banking height are 1.7 m and 0.4 m, respectively. In case of the discharge of more than 25 m^3/s, stretches of less banking height are mainly defined at stretches from RD 4,200 m to RD 4,900 m, from RD 5,100 m to RD 5,800 m, from RD 9,400 m to RD 10,100 m, from RD 21,300 m to RD 22,000 m, from RD 22,800 m to RD 24,000 m and from RD 27,700 m to RD 29,200 m (See Table A7.4-4 and Figures A7.4-1 and A7.4-3).

2) Flow capacity of the aqueduct

Flow capacity of the aqueduct crossing over the Mau river, with internal dimension of 5.5 m wide and 2.1 m high, is estimated at about 15 m^3/s without taking freeboard. Main reason of the low flow capacity is less wall height of the aqueduct as shown below.

Discharge (m^3/s)	Water Level (m)	Wall Top Level (m)	Difference (m)
5	68.48	69.25	0.77
10	68.88	69.25	0.37
15	69.17	69.25	0.08
20	69.42	69.25	-0.17
25	69.64	69.25	-0.39
30	69.86	69.25	-0.61

(2) Beddewewa Branch Canal

The length and number of the point of the overflow from the top of the bank taking into account the free board of 0.9 m are shown as below.

Discharge (m^3/s)	Length			No. of Point		
	Left Bank (m)	Right Bank (m)	Total (m)	Left Bank (no.)	Right Bank (no.)	Total (no.)
5	4,000	4,200	8,200	8	13	21
10	4,600	5,100	9,700	3	5	8
15	5,000	5,200	10,200	4	4	8

In case of the discharge of 5 m^3/s, heightening work is necessary to flow a 5 m^3/s at almost all sections. The present flow capacity of BBC is estimated at about 3 m^3/s (See Table A7.4-5 and Figures A7.4-2 and A7.4-4).

TABLES

Table A7.4 - 1 WATER LEVEL AT CONTROL POINT

Q (m3/s)	B (m)	I	n	m	H (m)	V (m/s)	CB (m)	WL (m)
(1) Left Bank Main Canal								
5	9.0	3100	0.03	1	0.96	0.52	62.42	63.38
10	9.0	3100	0.03	1	1.45	0.66	62.42	63.87
15	9.0	3100	0.03	1	1.84	0.75	62.42	64.26
20	9.0	3100	0.03	1	2.18	0.82	62.42	64.60
25	9.0	3100	0.03	1	2.48	0.88	62.42	64.90
30	9.0	3100	0.03	1	2.75	0.93	62.42	65.17
(2) Beddewewa Branch Canal								
1) Reduced Distance 5,500 m								
5	1.5	1100	0.03	1.5	1.46	0.88	55.64	57.10
10	1.5	1100	0.03	1.5	2.02	1.05	55.64	57.66
15	1.5	1100	0.03	1.5	2.42	1.16	55.64	58.06
2) Reduced Distance 4,400 m								
5	3.4	750	0.03	1.5	1.03	0.98	59.24	60.27
10	3.4	750	0.03	1.5	1.50	1.18	59.24	60.74
15	3.4	750	0.03	1.5	1.84	1.32	59.24	61.08
3) Reduced Distance 3,800 m								
5	3.0	3100	0.03	1.5	1.58	0.59	60.80	62.38
10	3.0	3100	0.03	1.5	2.23	0.71	60.80	63.03
15	3.0	3100	0.03	1.5	2.71	0.78	60.80	63.51

Note : Q : Discharge B : Base Width I : Hydraulic Gradient
n : Co-efficient of Roughness m : Side Slope
H : Water Depth V : Velocity CB : Canal Base
WL : Water Level

Table A7.4 - 2 HEAD LOSS OF SYPHON

Q (m3/s)	D (m)	A (m2)	L (m)	V (m/s)	f	h (m)
5	3.66	10.52	304.8	0.48	0.018	0.03
10	3.66	10.52	304.8	0.95	0.018	0.11
15	3.66	10.52	304.8	1.43	0.018	0.24
20	3.66	10.52	304.8	1.90	0.018	0.43
25	3.66	10.52	304.8	2.38	0.018	0.67
30	3.66	10.52	304.8	2.85	0.018	0.96

Table A7.4 - 3 HEAD LOSS OF AQUEDUCT

Q (m3/s)	A (m2)	S (m)	R (m)	L (m)	V (m/s)	f	h (m)
5	7.52	8.23	0.91	82.5	0.66	0.0046	0.02
10	9.72	9.03	1.08	82.5	1.03	0.0043	0.05
15	11.31	9.61	1.18	82.5	1.33	0.0042	0.08
20	12.68	10.11	1.25	82.5	1.58	0.0041	0.11
25	13.89	10.55	1.32	82.5	1.80	0.0040	0.14
30	15.10	10.99	1.37	82.5	1.99	0.0040	0.17

Table A7.4 - 4 FLOW CAPACITY OF LEFT BANK MAIN CANAL (1/5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)=(2)-(4)	(11)=(3)-(4)	(12)=(2)-(5)	(13)=(3)-(5)	(14)=(2)-(6)	(15)=(3)-(6)	(16)=(2)-(7)	(17)=(3)-(7)	(18)=(2)-(8)	(19)=(3)-(8)	(20)=(2)-(9)	(21)=(3)-(9)	Flow Capacity	Remarks
Reduced	Existing	Existing	Required Bank Level (Water Level + 1.2)						5 m3/s		10 m3/s		15 m3/s		20 m3/s		25 m3/s		30 m3/s			
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	20 m3/s	25 m3/s	30 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)	
0	83.11	81.80	74.87	75.18	75.50	75.86	76.29	76.73	8.24	6.93	7.93	6.62	7.61	6.30	7.25	5.94	6.82	5.51	6.38	5.07	>30	
100	81.76	81.56	74.82	75.11	75.44	75.82	76.26	76.71	6.65	6.45	6.65	6.45	6.32	6.12	5.94	5.74	5.50	5.30	5.05	4.85	>30	
200	79.00	78.42	74.68	75.01	75.37	75.77	76.23	76.68	3.99	3.41	3.99	3.41	3.63	3.05	3.23	2.65	2.77	2.19	2.32	1.74	>30	
300	80.38	78.00	74.58	74.93	75.32	75.73	76.20	76.67	5.45	3.07	5.45	3.07	5.06	2.68	4.65	2.27	4.18	1.80	3.71	1.33	>30	
400	79.20	79.47	74.38	74.82	75.25	75.69	76.17	76.65	4.38	4.65	4.38	4.65	3.95	4.22	3.51	3.78	3.03	3.30	2.55	2.82	>30	
500	77.46	77.92	74.30	74.80	75.25	75.69	76.18	76.66	2.66	3.12	2.66	3.12	2.21	2.67	1.77	2.23	1.28	1.74	0.80	1.26	>30	
557	76.87	76.61	74.30	74.80	75.25	75.69	76.18	76.66	2.07	1.81	2.07	1.81	1.62	1.36	1.18	0.92	0.69	0.43	0.21	-0.03	29	Syphon
850	74.97	74.68	74.27	74.69	75.01	75.26	75.51	75.70	0.28	-0.01	0.28	-0.01	-0.04	-0.33	-0.29	-0.58	-0.54	-0.83	-0.73	-1.02	5	Syphon
900	78.12	74.39	74.27	74.69	75.00	75.25	75.50	75.69	3.43	-0.30	3.43	-0.30	3.12	-0.61	2.87	-0.86	2.62	-1.11	2.43	-1.30	>30	
1,000	80.30	78.97	74.24	74.65	74.96	75.20	75.45	75.64	5.65	4.32	5.65	4.32	5.34	4.01	5.10	3.77	4.85	3.52	4.66	3.33	>30	
1,100	76.97	78.98	74.23	74.64	74.94	75.18	75.43	75.62	2.33	4.34	2.33	4.34	2.03	4.04	1.79	3.80	1.54	3.55	1.35	3.36	>30	
1,200	74.49	75.61	74.22	74.62	74.92	75.16	75.40	75.59	-0.13	0.99	-0.13	0.99	-0.43	0.69	-0.67	0.45	-0.91	0.21	-1.10	0.02	>30	L/Bank(W/Hole)
1,300	73.85	76.11	74.21	74.62	74.92	75.16	75.40	75.60	-0.77	1.49	-0.77	1.49	-1.07	1.19	-1.31	0.95	-1.55	0.71	-1.75	0.51	>30	L/Bank(W/Hole)
1,400	74.52	75.63	74.21	74.62	74.92	75.16	75.40	75.60	-0.10	1.01	-0.10	1.01	-0.40	0.71	-0.64	0.47	-0.88	0.23	-1.08	0.03	>30	L/Bank(W/Hole)
1,500	74.43	74.98	74.20	74.60	74.90	75.14	75.38	75.58	-0.17	0.38	-0.17	0.38	-0.47	0.08	-0.71	-0.16	-0.95	-0.40	-1.15	-0.60	17	L/Bank(W/Hole)
1,600	75.60	75.42	74.19	74.59	74.88	75.12	75.36	75.56	1.01	0.83	1.01	0.83	0.72	0.54	0.48	0.30	0.24	0.06	0.04	-0.14	27	L/Bank(W/Hole)
1,700	75.00	75.22	74.19	74.59	74.88	75.12	75.36	75.56	0.41	0.63	0.41	0.63	0.12	0.34	-0.12	0.10	-0.36	-0.14	-0.56	-0.34	23	L/Bank(W/Hole)
1,800	76.03	77.40	74.18	74.58	74.86	75.10	75.34	75.54	1.45	2.82	1.45	2.82	1.17	2.54	0.93	2.30	0.69	2.06	0.49	1.86	>30	
1,900	78.74	78.79	74.18	74.56	74.84	75.08	75.31	75.50	4.18	4.23	4.18	4.23	3.90	3.95	3.66	3.71	3.43	3.48	3.24	3.29	>30	
2,000	78.26	78.31	74.16	74.53	74.80	75.03	75.25	75.44	3.73	3.78	3.73	3.78	3.46	3.51	3.23	3.28	3.01	3.06	2.82	2.87	>30	
2,100	73.66	76.21	74.15	74.52	74.80	75.03	75.26	75.46	-0.86	1.69	-0.86	1.69	-1.14	1.41	-1.37	1.18	-1.60	0.95	-1.80	0.75	>30	L/Bank(W/Hole)
2,200	74.69	75.78	74.15	74.51	74.78	75.01	75.24	75.44	0.18	1.27	0.18	1.27	-0.09	1.00	-0.32	0.77	-0.55	0.54	-0.75	0.34	>30	L/Bank(W/Hole)
2,300	75.88	75.64	74.13	74.49	74.75	74.98	75.20	75.40	1.39	1.15	1.39	1.15	1.13	0.89	0.90	0.66	0.68	0.44	0.48	0.24	>30	
2,400	74.25	75.61	74.13	74.48	74.74	74.97	75.18	75.38	-0.23	1.13	-0.23	1.13	-0.49	0.87	-0.72	0.64	-0.93	0.43	-1.13	0.23	>30	L/Bank(W/Hole)
2,500	74.51	76.70	74.12	74.47	74.73	74.96	75.17	75.37	0.04	2.23	0.04	2.23	-0.22	1.97	-0.45	1.74	-0.66	1.53	-0.86	1.33	>30	L/Bank(W/Hole)
2,600	75.28	77.31	74.12	74.46	74.72	74.94	75.15	75.34	0.82	2.85	0.82	2.85	0.56	2.59	0.34	2.37	0.13	2.16	-0.06	1.97	>30	L/Bank(W/Hole)
2,700	76.00	77.64	74.10	74.44	74.70	74.91	75.13	75.31	1.56	3.20	1.56	3.20	1.30	2.94	1.09	2.73	0.87	2.51	0.69	2.33	>30	
2,800	80.41	80.18	74.08	74.42	74.67	74.88	75.09	75.28	5.99	5.76	5.99	5.76	5.74	5.51	5.53	5.30	5.32	5.09	5.13	4.90	>30	
2,900	83.54	83.42	74.05	74.37	74.61	74.82	75.01	75.19	9.17	9.05	9.17	9.05	8.93	8.81	8.72	8.60	8.53	8.41	8.35	8.23	>30	
3,000	84.16	84.17	73.95	74.26	74.48	74.68	74.88	75.05	9.90	9.91	9.90	9.91	9.68	9.69	9.48	9.49	9.28	9.29	9.11	9.12	>30	
3,100	80.72	80.61	73.87	74.18	74.40	74.61	74.80	74.98	6.54	6.43	6.54	6.43	6.32	6.21	6.11	6.00	5.92	5.81	5.74	5.63	>30	
3,200	78.66	78.55	73.78	74.10	74.31	74.52	74.72	74.90	4.56	4.45	4.56	4.45	4.35	4.24	4.14	4.03	3.94	3.83	3.76	3.65	>30	
3,300	77.30	79.37	73.76	74.08	74.30	74.51	74.72	74.90	3.22	5.29	3.22	5.29	3.00	5.07	2.79	4.86	2.58	4.65	2.40	4.47	>30	
3,400	74.97	77.01	73.75	74.07	74.29	74.50	74.70	74.88	0.90	2.94	0.90	2.94	0.68	2.72	0.47	2.51	0.27	2.31	0.09	2.13	>30	
3,500	72.82	75.74	73.75	74.05	74.27	74.48	74.68	74.86	-1.23	1.69	-1.23	1.69	-1.45	1.47	-1.66	1.26	-1.86	1.06	-2.04	0.88	>30	L/Bank(Tank)
4,100	73.05	73.14	73.70	74.00	74.22	74.43	74.63	74.81	-0.95	-0.86	-0.95	-0.86	-1.17	-1.08	-1.38	-1.29	-1.58	-1.49	-1.76	-1.67	>30	L&R/Bank(Tank)
4,200	75.85	75.13	73.70	73.99	74.20	74.41	74.60	74.78	1.86	1.14	1.86	1.14	1.65	0.93	1.44	0.72	1.25	0.53	1.07	0.35	>30	
4,300	72.45	74.76	73.69	73.98	74.20	74.41	74.61	74.79	-1.53	0.78	-1.53	0.78	-1.75	0.56	-1.96	0.35	-2.16	0.15	-2.34	-0.03	29	L/Bank(Tank)
4,400	72.82	74.22	73.68	73.97	74.19	74.40	74.60	74.78	-1.15	0.25	-1.15	0.25	-1.37	0.03	-1.58	-0.18	-1.78	-0.38	-1.96	-0.56	17	L/Bank(Tank)
4,500	74.76	74.31	73.68	73.97	74.18	74.39	74.59	74.78	0.79	0.34	0.79	0.34	0.58	0.13	0.37	-0.08	0.17	-0.28	-0.02	-0.47	18	L/Bank(Tank)
4,700	72.58	72.66	73.68	73.95	74.16	74.37	74.58	74.77	-1.37	-1.29	-1.37	-1.29	-1.58	-1.50	-1.79	-1.71	-2.00	-1.92	-2.19	-2.11	2	L/Bank(Tank)
4,800	74.24	74.32	73.67	73.93	74.15	74.35	74.55	74.74	0.31	0.39	0.31	0.39	0.09	0.17	-0.11	-0.03	-0.31	-0.23	-0.50	-0.42	19	L/Bank(Tank)
4,900	75.36	74.84	73.67	73.93	74.13	74.34	74.54	74.72	1.43	0.91	1.43	0.91	1.23	0.71	1.02	0.50	0.82	0.30	0.64	0.12	>30	
5,000	75.57	75.57	73.66	73.91	74.11	74.31	74.51	74.69	1.66	1.66	1.66	1.66	1.46	1.46	1.26	1.26	1.06	1.06	0.88	0.88	>30	
5,100	74.80	75.01	73.66	73.89	74.08	74.27	74.47	74.65	0.91	1.12	0.91	1.12	0.72	0.93	0.53	0.74	0.33	0.54	0.15	0.36	>30	
5,200	74.02	74.30	73.65	73.88	74.06	74.24	74.43	74.61	0.14	0.42	0.14	0.42	-0.04	0.24	-0.22	0.06	-0.41	-0.13	-0.59	-0.31	23	L/Bank(W/Hole)
5,250	73.41	74.05	73.65	73.88	74.06	74.25	74.44	74.63	-0.47	0.17	-0.47	0.17	-0.65	-0.01	-0.84	-0.20	-1.03	-0.39	-1.22	-0.58	14	L/Bank(W/Hole)
5,544	74.12	74.34	73.64	73.84	74.00	74.17	74.34	74.52	0.28	0.50	0.28	0.50	0.12	0.34	-0.05	0.17	-0.22	0.00	-0.40	-0.18	27	L/Bank(W/Hole)
5,600	74.57	74.84	73.25	73.50	73.71	73.91	74.12	74.30	1.07	1.34	1.07	1.34	0.86	1.13	0.66	0.93	0.45	0.72	0.27	0.54	>30	
5,700	72.34	72.57	72.88	73.28	73.60	73.86	74.10	74.32	-0.94	-0.71	-0.94	-0.71	-1.26	-1.03	-1.52	-1.29	-1.76	-1.53	-1.98	-1.75	3	
5,800	76.41	76.24	72.86	73.25	73.56	73.80	74.03	74.24	3.16	2.99	3.16	2.99	2.85	2.68	2.61	2.44	2.38	2.21	2.17	2.00	>30	

Note : -2.00 shows overflow portion. W/Hole : Water Hole

Table A7.4 - 4 FLOW CAPACITY OF LEFT BANK MAIN CANAL (2/5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)=(2)-(4)	(11)=(3)-(4)	(12)=(2)-(5)	(13)=(3)-(5)	(14)=(2)-(6)	(15)=(3)-(6)	(16)=(2)-(7)	(17)=(3)-(7)	(18)=(2)-(8)	(19)=(3)-(8)	(20)=(2)-(9)	(21)=(3)-(9)	Flow Capacity	Remarks
Reduced	Existing	Existing	Required Bank Level (Water Level + 1.2)						5 m3/s		10 m3/s		15 m3/s		20 m3/s		25 m3/s		30 m3/s			
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	20 m3/s	25 m3/s	30 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)	
5.900	75.72	75.40	72.85	73.23	73.53	73.78	74.01	74.22	2.49	2.17	2.49	2.17	2.19	1.87	1.94	1.62	1.71	1.39	1.50	1.18	>30	
6.000	75.11	75.42	72.81	73.18	73.48	73.72	73.95	74.15	1.93	2.24	1.93	2.24	1.63	1.94	1.39	1.70	1.16	1.47	0.96	1.27	>30	
6.100	73.56	75.01	72.80	73.17	73.46	73.70	73.94	74.14	0.39	1.84	0.39	1.84	0.10	1.55	-0.14	1.31	-0.38	1.07	-0.58	0.87	>30	L/Bank(Tank)
6.200	72.59	74.26	72.80	73.17	73.46	73.71	73.95	74.15	-0.58	1.09	-0.58	1.09	-0.87	0.80	-1.12	0.55	-1.36	0.31	-1.56	0.11	>30	L/Bank(Tank)
6.300	72.44	74.01	72.79	73.17	73.45	73.70	73.93	74.13	-0.73	0.84	-0.73	0.84	-1.01	0.56	-1.26	0.31	-1.49	0.08	-1.69	-0.12	27	L/Bank(Tank)
6.390	73.26	74.38	72.78	73.15	73.43	73.67	73.90	74.10	0.11	1.23	0.11	1.23	-0.17	0.95	-0.41	0.71	-0.64	0.48	-0.84	0.28	>30	L/Bank(Tank)
6.700	72.21	72.07	72.73	73.10	73.38	73.62	73.85	74.05	-0.89	-1.03	-0.89	-1.03	-1.17	-1.31	-1.41	-1.55	-1.64	-1.78	-1.84	-1.98	>30	L&R/Bank(Tank)
6.800	73.85	73.07	72.72	73.08	73.35	73.59	73.81	74.01	0.77	-0.01	0.77	-0.01	0.50	-0.28	0.26	-0.52	0.04	-0.74	-0.16	-0.94	>30	L&R/Bank(Tank)
6.900	72.42	74.51	72.70	73.06	73.33	73.56	73.79	73.98	-0.64	1.45	-0.64	1.45	-0.91	1.18	-1.14	0.95	-1.37	0.72	-1.56	0.53	>30	L/Bank(Tank)
7.000	73.14	74.72	72.69	73.05	73.30	73.53	73.75	73.94	0.09	1.67	0.09	1.67	-0.16	1.42	-0.39	1.19	-0.61	0.97	-0.80	0.78	>30	L/Bank(Tank)
7.100	78.26	77.85	72.65	72.98	73.22	73.42	73.63	73.80	5.28	4.87	5.28	4.87	5.04	4.63	4.84	4.43	4.63	4.22	4.46	4.05	>30	
7.200	77.95	78.69	72.62	72.93	73.15	73.35	73.54	73.71	5.02	5.76	5.02	5.76	4.80	5.54	4.60	5.34	4.41	5.15	4.24	4.98	>30	
7.300	77.95	78.42	72.57	72.87	73.08	73.27	73.45	73.62	5.08	5.55	5.08	5.55	4.87	5.34	4.68	5.15	4.50	4.97	4.33	4.80	>30	
7.400	78.30	78.30	72.54	72.82	73.01	73.19	73.35	73.51	5.48	5.48	5.48	5.48	5.29	5.29	5.11	5.11	4.95	4.95	4.79	4.79	>30	
7.500	76.62	77.27	72.52	72.79	72.97	73.13	73.29	73.45	3.83	4.48	3.83	4.48	3.65	4.30	3.49	4.14	3.33	3.98	3.17	3.82	>30	
7.600	75.70	75.03	72.20	72.45	72.67	72.88	73.07	73.28	3.25	2.58	3.25	2.58	3.03	2.36	2.82	2.15	2.63	1.96	2.42	1.75	>30	
7.700	77.43	73.86	72.00	72.28	72.53	72.77	72.99	73.21	5.15	1.58	5.15	1.58	4.90	1.33	4.66	1.09	4.44	0.87	4.22	0.65	>30	
7.795	71.90	73.35	71.94	72.21	72.48	72.73	72.95	73.18	-0.31	1.14	-0.31	1.14	-0.58	0.87	-0.83	0.62	-1.05	0.40	-1.28	0.17	>30	L/Bank(Tank)
8.000	72.63	72.76	71.72	72.07	72.37	72.64	72.86	73.10	0.56	0.69	0.56	0.69	0.26	0.39	-0.01	0.12	-0.23	-0.10	-0.47	-0.34	23	L/Bank(Tank)
8.074	71.44	72.68	71.70	72.06	72.38	72.64	72.87	73.11	-0.62	0.62	-0.62	0.62	-0.94	0.30	-1.20	0.04	-1.43	-0.19	-1.67	-0.43	22	L/Bank(Tank)
8.200	71.66	73.17	71.69	72.05	72.35	72.61	72.84	73.07	-0.39	1.12	-0.39	1.12	-0.69	0.82	-0.95	0.56	-1.18	0.33	-1.41	0.10	>30	L/Bank(Tank)
8.300	73.56	73.18	71.66	72.02	72.33	72.59	72.82	73.05	1.54	1.16	1.54	1.16	1.23	0.85	0.97	0.59	0.74	0.36	0.51	0.13	>30	
8.400	74.58	75.22	71.64	72.00	72.30	72.56	72.79	73.02	2.58	3.22	2.58	3.22	2.28	2.92	2.02	2.66	1.79	2.43	1.56	2.20	>30	
8.500	74.72	75.39	71.62	71.98	72.28	72.54	72.77	73.00	2.74	3.41	2.74	3.41	2.44	3.11	2.18	2.85	1.95	2.62	1.72	2.39	>30	
8.600	76.82	75.51	71.60	71.96	72.24	72.50	72.73	72.95	4.86	3.55	4.86	3.55	4.58	3.27	4.32	3.01	4.09	2.78	3.87	2.56	>30	
8.700	77.20	76.46	71.56	71.89	72.15	72.40	72.61	72.82	5.31	4.57	5.31	4.57	5.05	4.31	4.80	4.06	4.59	3.85	4.38	3.64	>30	
8.800	80.22	80.20	71.50	71.80	72.04	72.27	72.47	72.67	8.42	8.40	8.42	8.40	8.18	8.16	7.95	7.93	7.75	7.73	7.55	7.53	>30	
8.900	78.81	77.74	71.49	71.78	72.03	72.26	72.47	72.67	7.03	5.96	7.03	5.96	6.78	5.71	6.55	5.48	6.34	5.27	6.14	5.07	>30	
9.000	75.91	76.34	71.48	71.76	72.00	72.23	72.44	72.64	4.15	4.58	4.15	4.58	3.91	4.34	3.68	4.11	3.47	3.90	3.27	3.70	>30	
9.100	71.92	76.45	71.47	71.74	71.97	72.20	72.40	72.59	0.18	4.71	0.18	4.71	-0.05	4.48	-0.28	4.25	-0.48	4.05	-0.67	3.86	>30	L/Bank(W/Hole)
9.200	75.25	75.25	71.41	71.67	71.90	72.13	72.34	72.54	3.58	3.58	3.58	3.58	3.35	3.35	3.12	3.12	2.91	2.91	2.71	2.71	>30	
9.300	70.78	73.96	71.37	71.61	71.86	72.09	72.31	72.53	-0.83	2.35	-0.83	2.35	-1.08	2.10	-1.31	1.87	-1.53	1.65	-1.75	1.43	>30	L/Bank(W/Hole)
9.400	71.34	72.87	71.36	71.60	71.84	72.08	72.31	72.53	-0.26	1.27	-0.26	1.27	-0.50	1.03	-0.74	0.79	-0.97	0.56	-1.19	0.34	>30	L/Bank(W/Hole)
9.500	71.92	72.15	71.27	71.58	71.83	72.07	72.31	72.52	0.34	0.57	0.34	0.57	0.09	0.32	-0.15	0.08	-0.39	-0.16	-0.60	-0.37	23	L/Bank(W/Hole)
9.600	70.94	72.27	71.21	71.56	71.82	72.06	72.31	72.52	-0.62	0.71	-0.62	0.71	-0.88	0.45	-1.12	0.21	-1.37	-0.04	-1.58	-0.25	24	L/Bank(W/Hole)
9.700	73.34	72.00	71.21	71.56	71.82	72.06	72.31	72.52	1.78	0.44	1.78	0.44	1.52	0.18	1.28	-0.06	1.03	-0.31	0.82	-0.52	19	L/Bank(W/Hole)
9.800	72.53	72.19	71.20	71.56	71.82	72.06	72.30	72.51	0.97	0.63	0.97	0.63	0.71	0.37	0.47	0.13	0.23	-0.11	0.02	-0.32	23	L/Bank(W/Hole)
9.900	72.92	72.21	71.20	71.54	71.80	72.03	72.27	72.49	1.38	0.67	1.38	0.67	1.12	0.41	0.89	0.18	0.65	-0.06	0.43	-0.28	24	L/Bank(W/Hole)
10.000	71.00	72.26	71.19	71.53	71.78	72.02	72.26	72.48	-0.53	0.73	-0.53	0.73	-0.78	0.48	-1.02	0.24	-1.26	0.00	-1.48	-0.22	25	L/Bank(W/Hole)
10.100	70.93	72.50	71.18	71.51	71.77	72.00	72.24	72.45	-0.58	0.99	-0.58	0.99	-0.84	0.73	-1.07	0.50	-1.31	0.26	-1.52	0.05	>30	L/Bank(W/Hole)
10.200	73.30	72.94	71.15	71.48	71.73	71.96	72.21	72.42	1.82	1.46	1.82	1.46	1.57	1.21	1.34	0.98	1.09	0.73	0.88	0.52	>30	
10.300	74.17	73.07	71.08	71.39	71.62	71.85	72.09	72.30	2.78	1.68	2.78	1.68	2.55	1.45	2.32	1.22	2.08	0.98	1.87	0.77	>30	
10.400	72.38	72.34	71.05	71.36	71.60	71.83	72.08	72.30	1.02	0.98	1.02	0.98	0.78	0.74	0.55	0.51	0.30	0.26	0.08	0.04	>30	
10.452	70.40	72.97	71.05	71.36	71.60	71.83	72.09	72.31	-0.96	1.61	-0.96	1.61	-1.20	1.37	-1.43	1.14	-1.69	0.88	-1.91	0.66	>30	L/Bank(Tank)
11.500	73.98	73.24	70.95	71.26	71.50	71.73	71.99	72.21	2.72	1.98	2.72	1.98	2.48	1.74	2.25	1.51	1.99	1.25	1.77	1.03	>30	
11.600	73.43	72.24	70.83	71.18	71.45	71.69	71.96	72.18	2.25	1.06	2.25	1.06	1.98	0.79	1.74	0.55	1.47	0.28	1.25	0.06	>30	
11.900	71.59	72.62	70.56	70.89	71.21	71.48	71.78	72.01	0.70	1.73	0.70	1.73	0.38	1.41	0.11	1.14	-0.19	0.84	-0.42	0.61	>30	L/Bank(W/Hole)
12.000	71.13	72.91	70.46	70.83	71.16	71.45	71.75	71.99	0.30	2.08	0.30	2.08	-0.03	1.75	-0.32	1.46	-0.62	1.16	-0.86	0.92	>30	L/Bank(W/Hole)
12.200	70.24	72.74	70.34	70.75	71.10	71.39	71.68	71.93	-0.51	1.99	-0.51	1.99	-0.86	1.64	-1.15	1.35	-1.44	1.06	-1.69	0.81	>30	L/Bank(W/Hole)
12.300	72.52	73.06	70.31	70.71	71.06	71.36	71.62	71.88	1.81	2.35	1.81	2.35	1.46	2.00	1.16	1.70	0.90	1.44	0.64	1.18	>30	
12.400	73.56	73.12	70.29	70.69	71.03	71.33	71.59	71.84	2.87	2.43	2.87	2.43	2.53	2.09	2.23	1.79	1.97	1.53	1.72	1.28	>30	

Note : -2.00 shows overflow portion. W/Hole : Water Hole

Table A7.4 - 4 FLOW CAPACITY OF LEFT BANK MAIN CANAL (3/5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)=(2)-(4)	(11)=(3)-(4)	(12)=(2)-(5)	(13)=(3)-(5)	(14)=(2)-(6)	(15)=(3)-(6)	(16)=(2)-(7)	(17)=(3)-(7)	(18)=(2)-(8)	(19)=(3)-(8)	(20)=(2)-(9)	(21)=(3)-(9)	Flow Capacity	Remarks
Reduced	Existing	Existing	Required Bank Level (Water Level + 1.2)						5 m3/s		10 m3/s		15 m3/s		20 m3/s		25 m3/s		30 m3/s			
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	20 m3/s	25 m3/s	30 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)	
12,500	71.40	72.20	70.22	70.63	70.98	71.28	71.54	71.80	0.77	1.57	0.77	1.57	0.42	1.22	0.12	0.92	-0.14	0.66	-0.40	0.40	>30	L/Bank(W/Hole)
12,600	70.55	72.44	70.18	70.61	70.98	71.28	71.55	71.81	-0.06	1.83	-0.06	1.83	-0.43	1.46	-0.73	1.16	-1.00	0.89	-1.26	0.65	>30	L/Bank(W/Hole)
12,700	70.66	72.17	70.16	70.59	70.96	71.27	71.54	71.80	0.07	1.58	0.07	1.58	-0.30	1.21	-0.61	0.90	-0.88	0.63	-1.14	0.37	>30	L/Bank(W/Hole)
12,800	71.44	72.66	70.13	70.56	70.92	71.22	71.49	71.74	0.88	2.10	0.88	2.10	0.52	1.74	0.22	1.44	-0.05	1.17	-0.30	0.92	>30	L/Bank(W/Hole)
12,900	73.42	72.35	70.06	70.51	70.87	71.17	71.44	71.69	2.91	1.84	2.91	1.84	2.55	1.48	2.25	1.18	1.98	0.91	1.73	0.66	>30	
13,000	70.88	71.96	70.01	70.46	70.83	71.14	71.41	71.66	0.42	1.50	0.42	1.50	0.05	1.13	-0.26	0.82	-0.53	0.55	-0.78	0.30	>30	L/Bank(Tank)
13,400	70.73	71.86	70.01	70.46	70.83	71.14	71.41	71.66	0.27	1.40	0.27	1.40	-0.10	1.03	-0.41	0.72	-0.68	0.45	-0.93	0.20	>30	L/Bank(Tank)
13,500	71.28	71.66	70.00	70.45	70.81	71.11	71.38	71.64	0.83	1.21	0.83	1.21	0.47	0.85	0.17	0.55	-0.10	0.28	-0.36	0.02	>30	L/Bank(Tank)
13,800	70.89	71.67	69.98	70.42	70.77	71.08	71.34	71.59	0.47	1.25	0.47	1.25	0.12	0.90	-0.19	0.59	-0.45	0.33	-0.70	0.08	>30	L/Bank(Tank)
13,900	70.91	70.89	69.93	70.36	70.70	71.00	71.26	71.51	0.55	0.53	0.55	0.53	0.21	0.19	-0.09	-0.13	-0.35	-0.37	-0.60	-0.62	18	L/Bank(W/Hole)
14,000	70.64	71.70	69.91	70.35	70.70	71.00	71.25	71.51	0.29	1.35	0.29	1.35	-0.06	1.00	-0.36	0.70	-0.61	0.45	-0.87	0.19	>30	L/Bank(W/Hole)
14,100	71.92	71.34	69.91	70.34	70.68	70.98	71.24	71.50	1.58	1.00	1.58	1.00	1.24	0.66	0.94	0.36	0.68	0.10	0.42	-0.16	27	L/Bank(W/Hole)
14,200	72.21	71.31	69.90	70.32	70.66	70.95	71.21	71.46	1.89	0.99	1.89	0.99	1.55	0.65	1.26	0.36	1.00	0.10	0.75	-0.15	27	
14,300	71.88	71.30	69.88	70.30	70.64	70.93	71.18	71.44	1.58	1.00	1.58	1.00	1.24	0.66	0.95	0.37	0.70	0.12	0.44	-0.14	27	
14,400	71.75	71.70	69.86	70.28	70.62	70.90	71.16	71.41	1.47	1.42	1.47	1.42	1.13	1.08	0.85	0.80	0.59	0.54	0.34	0.29	>30	
14,500	71.60	71.77	69.85	70.26	70.59	70.87	71.13	71.38	1.34	1.51	1.34	1.51	1.01	1.18	0.73	0.90	0.47	0.64	0.22	0.39	>30	
14,600	71.69	71.54	69.83	70.23	70.56	70.84	71.10	71.35	1.46	1.31	1.46	1.31	1.13	0.98	0.85	0.70	0.59	0.44	0.34	0.19	>30	
14,700	70.96	70.87	69.82	70.21	70.54	70.82	71.08	71.33	0.75	0.66	0.75	0.66	0.42	0.33	0.14	0.05	-0.12	-0.21	-0.37	-0.46	22	
14,800	71.12	71.62	69.81	70.21	70.53	70.81	71.07	71.33	0.91	1.41	0.91	1.41	0.59	1.09	0.31	0.81	0.05	0.55	-0.23	0.29	26	
14,900	71.24	71.14	69.80	70.18	70.50	70.78	71.03	71.29	1.06	0.96	1.06	0.96	0.74	0.64	0.46	0.36	0.21	0.11	-0.05	-0.15	29	
15,000	71.50	71.35	69.79	70.16	70.47	70.75	71.00	71.25	1.34	1.19	1.34	1.19	1.03	0.88	0.75	0.60	0.50	0.35	0.25	0.10	>30	
15,100	69.25	69.25	69.78	70.14	70.45	70.73	70.98	71.23	-0.89	-0.89	-0.89	-0.89	-1.20	-1.20	-1.48	-1.48	-1.73	-1.73	-1.98	-1.98	4	Aqueduct
15,183	69.25	69.25	69.68	70.08	70.37	70.62	70.84	71.06	-0.83	-0.83	-0.83	-0.83	-1.12	-1.12	-1.37	-1.37	-1.59	-1.59	-1.81	-1.81	4	Aqueduct
15,300	70.67	70.59	69.61	70.00	70.29	70.54	70.75	70.97	0.67	0.59	0.67	0.59	0.38	0.30	0.13	0.05	-0.08	-0.16	-0.30	-0.38	21	
15,400	70.61	70.99	69.58	69.98	70.28	70.53	70.75	70.98	0.63	1.01	0.63	1.01	0.33	0.71	0.08	0.46	-0.14	0.24	-0.37	0.01	21	
15,500	70.59	70.95	69.56	69.96	70.26	70.51	70.73	70.95	0.63	0.99	0.63	0.99	0.33	0.69	0.08	0.44	-0.14	0.22	-0.36	0.00	21	
15,600	71.15	70.91	69.55	69.95	70.24	70.49	70.71	70.93	1.20	0.96	1.20	0.96	0.91	0.67	0.66	0.42	0.44	0.20	0.22	-0.02	29	
15,700	70.09	70.73	69.53	69.93	70.22	70.47	70.69	70.91	0.16	0.80	0.16	0.80	-0.13	0.51	-0.38	0.26	-0.60	0.04	-0.82	-0.18	13	
15,800	71.04	70.94	69.52	69.91	70.20	70.45	70.67	70.88	1.13	1.03	1.13	1.03	0.84	0.74	0.59	0.49	0.37	0.27	0.16	0.06	>30	
15,900	68.66	70.81	69.51	69.90	70.19	70.44	70.67	70.88	-1.24	0.91	-1.24	0.91	-1.53	0.62	-1.78	0.37	-2.01	0.14	-2.22	-0.07	28	L/Bank(Tank)
16,319	68.78	70.54	69.46	69.83	70.12	70.36	70.59	70.79	-1.05	0.71	-1.05	0.71	-1.34	0.42	-1.58	0.18	-1.81	-0.05	-2.01	-0.25	24	L/Bank(Tank)
16,400	70.99	70.57	69.43	69.80	70.08	70.32	70.54	70.75	1.19	0.77	1.19	0.77	0.91	0.49	0.67	0.25	0.45	0.03	0.24	-0.18	25	
16,500	72.91	72.14	69.33	69.70	69.98	70.22	70.45	70.66	3.21	2.44	3.21	2.44	2.93	2.16	2.69	1.92	2.46	1.69	2.25	1.48	>30	
16,600	71.60	71.50	69.27	69.65	69.93	70.18	70.41	70.62	1.95	1.85	1.95	1.85	1.67	1.57	1.42	1.32	1.19	1.09	0.98	0.88	>30	
16,700	69.93	69.15	69.23	69.61	69.90	70.14	70.37	70.58	0.32	-0.46	0.32	-0.46	0.03	-0.75	-0.21	-0.99	-0.44	-1.23	-0.65	-1.43	4	L/Bank(Tank)
16,980	68.55	71.35	69.16	69.53	69.80	70.04	70.26	70.46	-0.98	1.82	-0.98	1.82	-1.25	1.55	-1.49	1.31	-1.71	1.09	-1.91	0.89	>30	L/Bank(Tank)
17,000	69.20	71.42	69.16	69.53	69.80	70.04	70.26	70.46	-0.33	1.89	-0.33	1.89	-0.60	1.62	-0.84	1.38	-1.06	1.16	-1.26	0.96	>30	L/Bank(Tank)
17,100	69.52	70.76	69.15	69.50	69.77	70.01	70.23	70.42	0.02	1.26	0.02	1.26	-0.25	0.99	-0.49	0.75	-0.71	0.53	-0.90	0.34	>30	L/Bank(Tank)
17,200	72.45	74.38	69.07	69.37	69.61	69.82	70.01	70.18	3.08	5.01	3.08	5.01	2.84	4.77	2.63	4.56	2.44	4.37	2.27	4.20	>30	
17,300	73.46	74.26	69.02	69.33	69.57	69.79	69.99	70.17	4.13	4.93	4.13	4.93	3.89	4.69	3.67	4.47	3.47	4.27	3.29	4.09	>30	
17,400	77.26	78.31	68.88	69.18	69.42	69.62	69.81	69.99	8.08	9.13	8.08	9.13	7.84	8.89	7.64	8.69	7.45	8.50	7.27	8.32	>30	
17,500	76.92	77.52	68.77	69.07	69.30	69.50	69.69	69.88	7.85	8.45	7.85	8.45	7.62	8.22	7.42	8.02	7.23	7.83	7.04	7.64	>30	
17,600	75.22	78.04	68.51	68.76	68.97	69.19	69.39	69.60	6.46	9.28	6.46	9.28	6.25	9.07	6.03	8.85	5.83	8.65	5.62	8.44	>30	
17,700	72.39	74.70	68.23	68.50	68.76	69.02	69.27	69.50	3.89	6.20	3.89	6.20	3.63	5.94	3.37	5.68	3.12	5.43	2.89	5.20	>30	
17,800	70.32	71.68	68.08	68.36	68.64	68.93	69.19	69.43	1.96	3.32	1.96	3.32	1.68	3.04	1.39	2.75	1.13	2.49	0.89	2.25	>30	
17,880	68.05	68.13	68.06	68.35	68.64	68.94	69.21	69.46	-0.30	-0.22	-0.30	-0.22	-0.59	-0.51	-0.89	-0.81	-1.16	-1.08	-1.41	-1.33	>30	L&R/Bank(Tank)
19,700	67.31	68.74	67.96	68.25	68.54	68.84	69.11	69.36	-0.94	0.49	-0.94	0.49	-1.23	0.20	-1.53	-0.10	-1.80	-0.37	-2.05	-0.62	>30	L&R/Bank(Tank)
19,800	67.30	69.01	67.84	68.14	68.46	68.77	69.05	69.30	-0.84	0.87	-0.84	0.87	-1.16	0.55	-1.47	0.24	-1.75	-0.04	-2.00	-0.29	>30	L&R/Bank(Tank)
19,900	68.59	73.53	67.65	68.01	68.37	68.69	68.99	69.24	0.58	5.52	0.58	5.52	0.22	5.16	-0.10	4.84	-0.40	4.54	-0.65	4.29	>30	L&R/Bank(Tank)
20,000	72.14	72.00	67.45	67.91	68.29	68.63	68.93	69.19	4.23	4.09	4.23	4.09	3.85	3.71	3.51	3.37	3.21	3.07	2.95	2.81	>30	
20,100	69.78	71.12	67.35	67.86	68.26	68.59	68.90	69.16	1.92	3.26	1.92	3.26	1.52	2.86	1.19	2.53	0.88	2.22	0.62	1.96	>30	

Note : 2.00 shows overflow portion. W/Hole : Water Hole

Table A7.4 - 4 FLOW CAPACITY OF LEFT BANK MAIN CANAL (4/5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)=(2)-(4)	(11)=(3)-(4)	(12)=(2)-(5)	(13)=(3)-(5)	(14)=(2)-(6)	(15)=(3)-(6)	(16)=(2)-(7)	(17)=(3)-(7)	(18)=(2)-(8)	(19)=(3)-(8)	(20)=(2)-(9)	(21)=(3)-(9)	Flow Capacity	Remarks
Reduced	Existing	Existing	Required Bank Level (Water Level + 1.2)						5 m3/s		10 m3/s		15 m3/s		20 m3/s		25 m3/s		30 m3/s			
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	20 m3/s	25 m3/s	30 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)	
20,200	69.91	69.01	67.31	67.83	68.24	68.58	68.89	69.14	2.08	1.18	2.08	1.18	1.67	0.77	1.33	0.43	1.02	0.12	0.77	-0.13	28	
20,300	70.03	69.23	67.29	67.81	68.21	68.54	68.85	69.11	2.22	1.42	2.22	1.42	1.82	1.02	1.49	0.69	1.18	0.38	0.92	0.12	>30	
20,400	70.09	69.24	67.27	67.79	68.19	68.53	68.84	69.09	2.30	1.45	2.30	1.45	1.90	1.05	1.56	0.71	1.25	0.40	1.00	0.15	>30	
20,500	70.77	70.20	67.23	67.74	68.15	68.48	68.79	69.04	3.03	2.46	3.03	2.46	2.62	2.05	2.29	1.72	1.98	1.41	1.73	1.16	>30	
20,600	69.11	68.79	67.21	67.72	68.13	68.45	68.76	69.02	1.39	1.07	1.39	1.07	0.98	0.66	0.66	0.34	0.35	0.03	0.09	-0.23	25	
20,700	69.30	69.04	67.18	67.69	68.09	68.41	68.72	68.98	1.61	1.35	1.61	1.35	1.21	0.95	0.89	0.63	0.58	0.32	0.32	0.06	>30	
20,800	69.15	68.90	67.16	67.67	68.07	68.39	68.70	68.95	1.48	1.23	1.48	1.23	1.08	0.83	0.76	0.51	0.45	0.20	0.20	-0.05	28	
20,900	68.16	68.30	67.15	67.66	68.06	68.38	68.69	68.95	0.50	0.64	0.50	0.64	0.10	0.24	-0.22	-0.08	-0.53	-0.39	-0.79	-0.65	16	
21,000	68.36	68.48	67.13	67.64	68.04	68.37	68.68	68.93	0.72	0.84	0.72	0.84	0.32	0.44	-0.01	0.11	-0.32	-0.20	-0.57	-0.45	20	
21,100	69.09	69.00	67.11	67.62	68.02	68.34	68.65	68.90	1.47	1.38	1.47	1.38	1.07	0.98	0.75	0.66	0.44	0.35	0.19	0.10	>30	
21,200	70.90	70.13	67.11	67.61	68.01	68.33	68.64	68.89	3.29	2.52	3.29	2.52	2.89	2.12	2.57	1.80	2.26	1.49	2.01	1.24	>30	
21,300	71.31	71.11	67.10	67.61	67.99	68.32	68.62	68.87	3.70	3.50	3.70	3.50	3.32	3.12	2.99	2.79	2.69	2.49	2.44	2.24	>30	
21,400	69.01	68.37	67.08	67.56	67.94	68.27	68.56	68.81	1.45	0.81	1.45	0.81	1.07	0.43	0.74	0.10	0.45	-0.19	0.20	-0.44	23	
21,500	68.43	67.79	67.06	67.54	67.93	68.25	68.54	68.79	0.89	0.25	0.89	0.25	0.50	-0.14	0.18	-0.46	-0.11	-0.75	-0.36	-1.00	13	
21,600	69.00	68.25	67.02	67.51	67.88	68.21	68.49	68.74	1.49	0.74	1.49	0.74	1.12	0.37	0.79	0.04	0.51	-0.24	0.26	-0.49	20	
21,700	68.72	68.36	66.99	67.47	67.84	68.17	68.45	68.70	1.25	0.89	1.25	0.89	0.88	0.52	0.55	0.19	0.27	-0.09	0.02	-0.34	24	
21,800	68.70	68.31	66.98	67.46	67.84	68.16	68.44	68.69	1.24	0.85	1.24	0.85	0.86	0.47	0.54	0.15	0.26	-0.13	0.01	-0.38	24	
21,900	69.17	68.47	66.95	67.43	67.80	68.13	68.40	68.65	1.74	1.04	1.74	1.04	1.37	0.67	1.04	0.34	0.77	0.07	0.52	-0.18	26	
22,000	69.72	69.10	66.92	67.39	67.77	68.09	68.36	68.60	2.33	1.71	2.33	1.71	1.95	1.33	1.63	1.01	1.36	0.74	1.12	0.50	>30	
22,100	68.69	67.94	66.90	67.38	67.76	68.08	68.35	68.60	1.31	0.56	1.31	0.56	0.93	0.18	0.61	-0.14	0.34	-0.41	0.09	-0.66	18	
22,200	69.35	69.07	66.86	67.34	67.71	68.02	68.29	68.54	2.01	1.73	2.01	1.73	1.64	1.36	1.33	1.05	1.06	0.78	0.81	0.53	>30	
22,300	70.46	70.17	66.86	67.33	67.70	68.01	68.29	68.54	3.13	2.84	3.13	2.84	2.76	2.47	2.45	2.16	2.17	1.88	1.92	1.63	>30	
22,400	72.25	71.85	66.83	67.30	67.66	67.98	68.25	68.49	4.95	4.55	4.95	4.55	4.59	4.19	4.27	3.87	4.00	3.60	3.76	3.36	>30	
22,500	72.59	71.77	66.80	67.26	67.62	67.93	68.19	68.44	5.33	4.51	5.33	4.51	4.97	4.15	4.66	3.84	4.40	3.58	4.15	3.33	>30	
22,600	72.00	71.74	66.73	67.18	67.54	67.85	68.12	68.37	4.82	4.56	4.82	4.56	4.46	4.20	4.15	3.89	3.88	3.62	3.63	3.37	>30	
22,700	70.52	69.43	66.69	67.15	67.51	67.82	68.09	68.34	3.37	2.28	3.37	2.28	3.01	1.92	2.70	1.61	2.43	1.34	2.18	1.09	>30	
22,800	70.08	69.63	66.67	67.12	67.48	67.78	68.04	68.29	2.96	2.51	2.96	2.51	2.60	2.15	2.30	1.85	2.04	1.59	1.79	1.34	>30	
22,900	68.62	68.26	66.65	67.09	67.45	67.76	68.02	68.27	1.53	1.17	1.53	1.17	1.17	0.81	0.86	0.50	0.60	0.24	0.35	-0.01	29	
23,000	68.11	67.63	66.64	67.08	67.44	67.74	68.01	68.26	1.03	0.55	1.03	0.55	0.67	0.19	0.37	-0.11	0.10	-0.38	-0.15	-0.63	18	
23,100	67.59	66.66	66.63	67.07	67.43	67.73	68.00	68.25	0.52	-0.41	0.52	-0.41	0.16	-0.77	-0.14	-1.07	-0.41	-1.34	-0.66	-1.59	3	
23,200	67.56	67.01	66.63	67.06	67.42	67.73	67.99	68.24	0.50	-0.05	0.50	-0.05	0.14	-0.41	-0.17	-0.72	-0.43	-0.98	-0.68	-1.23	3	
23,300	67.68	67.94	66.63	67.06	67.41	67.72	67.99	68.24	0.62	0.88	0.62	0.88	0.27	0.53	-0.04	0.22	-0.31	-0.05	-0.56	-0.30	14	
23,400	67.73	67.73	66.62	67.05	67.40	67.71	67.97	68.22	0.68	0.68	0.68	0.68	0.33	0.33	0.02	0.02	-0.24	-0.24	-0.49	-0.49	20	
23,500	67.74	66.92	66.61	67.04	67.39	67.70	67.97	68.22	0.70	-0.12	0.70	-0.12	0.35	-0.47	0.04	-0.78	-0.23	-1.05	-0.48	-1.30	4	
23,600	67.78	67.15	66.61	67.03	67.38	67.68	67.95	68.20	0.75	0.12	0.75	0.12	0.40	-0.23	0.10	-0.53	-0.17	-0.80	-0.42	-1.05	12	
23,700	67.88	66.86	66.59	67.01	67.36	67.66	67.92	68.17	0.87	-0.15	0.87	-0.15	0.52	-0.50	0.22	-0.80	-0.04	-1.06	-0.29	-1.31	4	
23,800	68.08	66.84	66.55	66.99	67.33	67.64	67.90	68.15	1.09	-0.15	1.09	-0.15	0.75	-0.49	0.44	-0.80	0.18	-1.06	-0.07	-1.31	4	
23,900	68.25	67.64	66.54	66.97	67.32	67.62	67.88	68.13	1.28	0.67	1.28	0.67	0.93	0.32	0.63	0.02	0.37	-0.24	0.12	-0.49	20	
24,000	68.74	68.81	66.52	66.96	67.30	67.59	67.85	68.10	1.78	1.85	1.78	1.85	1.44	1.51	1.15	1.22	0.89	0.96	0.64	0.71	>30	
24,100	68.28	70.14	66.48	66.91	67.25	67.54	67.80	68.04	1.37	3.23	1.37	3.23	1.03	2.89	0.74	2.60	0.48	2.34	0.24	2.10	>30	
24,200	69.25	70.67	66.45	66.88	67.22	67.52	67.78	68.02	2.37	3.79	2.37	3.79	2.03	3.45	1.73	3.15	1.47	2.89	1.23	2.65	>30	
24,300	71.83	71.31	66.40	66.83	67.17	67.47	67.73	67.97	5.00	4.48	5.00	4.48	4.66	4.14	4.36	3.84	4.10	3.58	3.86	3.34	>30	
24,400	71.64	72.59	66.36	66.80	67.14	67.44	67.70	67.93	4.84	5.79	4.84	5.79	4.50	5.45	4.20	5.15	3.94	4.89	3.71	4.66	>30	
24,500	74.23	74.06	66.34	66.77	67.11	67.41	67.67	67.90	7.46	7.29	7.46	7.29	7.12	6.95	6.82	6.65	6.56	6.39	6.33	6.16	>30	
24,600	71.17	71.07	66.31	66.75	67.08	67.38	67.63	67.87	4.42	4.32	4.42	4.32	4.09	3.99	3.79	3.69	3.54	3.44	3.30	3.20	>30	
24,700	70.12	70.88	66.27	66.69	67.01	67.31	67.56	67.80	3.43	4.19	3.43	4.19	3.11	3.87	2.81	3.57	2.56	3.32	2.32	3.08	>30	
24,800	68.67	69.30	66.22	66.64	66.97	67.26	67.52	67.77	2.03	2.66	2.03	2.66	1.70	2.33	1.41	2.04	1.15	1.78	0.90	1.53	>30	
24,900	67.22	68.32	66.19	66.62	66.95	67.24	67.50	67.75	0.60	1.70	0.60	1.70	0.27	1.37	-0.02	1.08	-0.28	0.82	-0.53	0.57	14	
25,000	66.56	67.34	66.17	66.59	66.92	67.21	67.47	67.72	-0.03	0.75	-0.03	0.75	-0.36	0.42	-0.65	0.13	-0.91	-0.13	-1.16	-0.38	4	
25,100	67.39	68.00	66.14	66.56	66.89	67.18	67.43	67.68	0.83	1.44	0.83	1.44	0.50	1.11	0.21	0.82	-0.04	0.57	-0.29	0.32	19	
25,200	68.93	69.01	66.11	66.52	66.84	67.13	67.38	67.62	2.41	2.49	2.41	2.49	2.09	2.17	1.80	1.88	1.55	1.63	1.31	1.39	>30	

Note : -2.00 shows overflow portion. W/Hole : Water Hole

Table A7.4 - 4 FLOW CAPACITY OF LEFT BANK MAIN CANAL (5/5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)=(2)-(4)	(11)=(3)-(4)	(12)=(2)-(5)	(13)=(3)-(5)	(14)=(2)-(6)	(15)=(3)-(6)	(16)=(2)-(7)	(17)=(3)-(7)	(18)=(2)-(8)	(19)=(3)-(8)	(20)=(2)-(9)	(21)=(3)-(9)	Flow Capacity	Remarks
Reduced	Existing	Existing	Required Bank Level (Water Level + 1.2)						5 m3/s		10 m3/s		15 m3/s		20 m3/s		25 m3/s		30 m3/s			
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	20 m3/s	25 m3/s	30 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)	
25,300	67.82	68.12	66.07	66.47	66.80	67.08	67.34	67.58	1.35	1.65	1.35	1.65	1.02	1.32	0.74	1.04	0.48	0.78	0.24	0.54	>30	
25,400	67.62	67.15	66.06	66.46	66.78	67.06	67.32	67.57	1.16	0.69	1.16	0.69	0.84	0.37	0.56	0.09	0.30	-0.17	0.05	-0.42	22	
25,500	67.42	66.96	66.02	66.41	66.74	67.02	67.28	67.52	1.01	0.55	1.01	0.55	0.68	0.22	0.40	-0.06	0.14	-0.32	-0.10	-0.56	14	
25,600	67.71	68.03	65.97	66.36	66.68	66.97	67.23	67.47	1.35	1.67	1.35	1.67	1.03	1.35	0.74	1.06	0.48	0.80	0.24	0.56	>30	
25,700	67.85	68.44	65.87	66.27	66.60	66.89	67.15	67.40	1.58	2.17	1.58	2.17	1.25	1.84	0.96	1.55	0.70	1.29	0.45	1.04	>30	
25,800	67.79	67.75	65.79	66.22	66.56	66.86	67.12	67.38	1.57	1.53	1.57	1.53	1.23	1.19	0.93	0.89	0.67	0.63	0.41	0.37	>30	
25,900	66.86	67.02	65.76	66.19	66.53	66.84	67.11	67.37	0.67	0.83	0.67	0.83	0.33	0.49	0.02	0.18	-0.25	-0.09	-0.51	-0.35	23	
26,000	67.00	66.83	65.71	66.15	66.49	66.79	67.07	67.32	0.85	0.68	0.85	0.68	0.51	0.34	0.21	0.04	-0.07	-0.24	-0.32	-0.49	21	
26,100	68.28	68.44	65.67	66.11	66.44	66.75	67.02	67.28	2.17	2.33	2.17	2.33	1.84	2.00	1.53	1.69	1.26	1.42	1.00	1.16	>30	
26,200	69.34	68.95	65.59	66.04	66.38	66.69	66.97	67.22	3.30	2.91	3.30	2.91	2.96	2.57	2.65	2.26	2.37	1.98	2.12	1.73	>30	
26,300	68.58	67.99	65.52	65.98	66.33	66.65	66.92	67.18	2.60	2.01	2.60	2.01	2.25	1.66	1.93	1.34	1.66	1.07	1.40	0.81	>30	
26,400	67.37	67.31	65.50	65.97	66.32	66.64	66.92	67.17	1.40	1.34	1.40	1.34	1.05	0.99	0.73	0.67	0.45	0.39	0.20	0.14	>30	
26,500	66.94	67.39	65.44	65.91	66.26	66.58	66.86	67.12	1.03	1.48	1.03	1.48	0.68	1.13	0.36	0.81	0.08	0.53	-0.18	0.27	26	
26,600	66.43	66.86	65.41	65.89	66.24	66.57	66.85	67.11	0.54	0.97	0.54	0.97	0.19	0.62	-0.14	0.29	-0.42	0.01	-0.68	-0.25	18	
26,700	66.62	66.80	65.39	65.87	66.22	66.55	66.84	67.10	0.75	0.93	0.75	0.93	0.40	0.58	0.07	0.25	-0.22	-0.04	-0.48	-0.30	21	
26,800	67.26	67.01	65.39	65.87	66.22	66.54	66.83	67.09	1.39	1.14	1.39	1.14	1.04	0.79	0.72	0.47	0.43	0.18	0.17	-0.08	28	
26,900	67.99	67.99	65.38	65.86	66.21	66.53	66.82	67.07	2.13	2.13	2.13	2.13	1.78	1.78	1.46	1.46	1.17	1.17	0.92	0.92	>30	
27,000	67.21	66.91	65.38	65.85	66.20	66.52	66.81	67.07	1.36	1.06	1.36	1.06	1.01	0.71	0.69	0.39	0.40	0.10	0.14	-0.16	27	
27,100	67.61	67.57	65.38	65.84	66.19	66.51	66.80	67.05	1.77	1.73	1.77	1.73	1.42	1.38	1.10	1.06	0.81	0.77	0.56	0.52	>30	
27,200	69.00	68.77	65.34	65.79	66.14	66.46	66.74	67.00	3.21	2.98	3.21	2.98	2.86	2.63	2.54	2.31	2.26	2.03	2.00	1.77	>30	
27,300	69.71	69.54	65.24	65.70	66.05	66.37	66.66	66.92	4.01	3.84	4.01	3.84	3.66	3.49	3.34	3.17	3.05	2.88	2.79	2.62	>30	
27,400	67.89	67.46	65.16	65.65	66.01	66.35	66.64	66.90	2.24	1.81	2.24	1.81	1.88	1.45	1.54	1.11	1.25	0.82	0.99	0.56	>30	
27,500	67.30	66.59	65.13	65.64	66.00	66.34	66.63	66.90	1.66	0.95	1.66	0.95	1.30	0.59	0.96	0.25	0.67	-0.04	0.40	-0.31	24	
27,600	67.85	67.20	65.13	65.63	65.99	66.33	66.62	66.89	2.22	1.57	2.22	1.57	1.86	1.21	1.52	0.87	1.23	0.58	0.96	0.31	>30	
27,700	67.80	67.43	65.11	65.61	65.98	66.30	66.60	66.86	2.19	1.82	2.19	1.82	1.82	1.45	1.50	1.13	1.20	0.83	0.94	0.57	>30	
27,800	67.26	66.02	65.11	65.61	65.98	66.31	66.60	66.87	1.65	0.41	1.65	0.41	1.28	0.04	0.95	-0.29	0.66	-0.58	0.39	-0.85	16	
27,900	67.20	66.34	65.11	65.60	65.98	66.30	66.59	66.85	1.60	0.74	1.60	0.74	1.22	0.36	0.90	0.04	0.61	-0.25	0.35	-0.51	21	
28,000	66.66	66.19	65.11	65.60	65.98	66.30	66.59	66.85	1.06	0.59	1.06	0.59	0.68	0.21	0.36	-0.11	0.07	-0.40	-0.19	-0.66	18	
28,100	66.29	66.25	65.11	65.60	65.98	66.30	66.59	66.85	0.69	0.65	0.69	0.65	0.31	0.27	-0.01	-0.05	-0.30	-0.34	-0.56	-0.60	19	
28,200	66.35	66.32	65.11	65.60	65.97	66.29	66.58	66.85	0.75	0.72	0.75	0.72	0.38	0.35	0.06	0.03	-0.23	-0.26	-0.50	-0.53	20	
28,300	66.31	66.45	65.11	65.59	65.96	66.28	66.57	66.84	0.72	0.86	0.72	0.86	0.35	0.49	0.03	0.17	-0.26	-0.12	-0.53	-0.39	20	
28,400	66.17	66.58	65.10	65.57	65.94	66.26	66.55	66.81	0.60	1.01	0.60	1.01	0.23	0.64	-0.09	0.32	-0.38	0.03	-0.64	-0.23	19	
28,500	66.40	66.61	65.08	65.54	65.91	66.23	66.51	66.77	0.86	1.07	0.86	1.07	0.49	0.70	0.17	0.38	-0.11	0.10	-0.37	-0.16	23	
28,600	67.75	68.07	65.05	65.51	65.88	66.20	66.48	66.74	2.24	2.56	2.24	2.56	1.87	2.19	1.55	1.87	1.27	1.59	1.01	1.33	>30	
28,700	66.63	66.94	65.04	65.50	65.86	66.18	66.47	66.73	1.13	1.44	1.13	1.44	0.77	1.08	0.45	0.76	0.16	0.47	-0.10	0.21	27	
28,800	65.60	66.04	65.03	65.49	65.86	66.18	66.46	66.72	0.11	0.55	0.11	0.55	-0.26	0.18	-0.58	-0.14	-0.86	-0.42	-1.12	-0.68	12	
28,900	65.62	66.21	65.03	65.48	65.84	66.17	66.45	66.71	0.14	0.73	0.14	0.73	-0.22	0.37	-0.55	0.04	-0.83	-0.24	-1.09	-0.50	12	
29,000	65.30	65.49	65.02	65.47	65.84	66.16	66.44	66.71	-0.17	0.02	-0.17	0.02	-0.54	-0.35	-0.86	-0.67	-1.14	-0.95	-1.41	-1.22	3	
29,100	65.58	65.49	65.01	65.46	65.83	66.15	66.43	66.70	0.12	0.03	0.12	0.03	-0.25	-0.34	-0.57	-0.66	-0.85	-0.94	-1.12	-1.21	11	
29,200	67.79	66.68	65.00	65.44	65.79	66.12	66.40	66.66	2.35	1.24	2.35	1.24	2.00	0.89	1.67	0.56	1.39	0.28	1.13	0.02	>30	
29,300	67.93	66.89	64.96	65.40	65.76	66.08	66.36	66.62	2.53	1.49	2.53	1.49	2.17	1.13	1.85	0.81	1.57	0.53	1.31	0.27	>30	
29,400	69.26	68.22	64.94	65.37	65.73	66.05	66.33	66.59	3.89	2.85	3.89	2.85	3.53	2.49	3.21	2.17	2.93	1.89	2.67	1.63	>30	
29,500	68.11	67.66	64.90	65.32	65.69	66.01	66.30	66.56	2.79	2.34	2.79	2.34	2.42	1.97	2.10	1.65	1.81	1.36	1.55	1.10	>30	
29,600	66.99	67.02	64.85	65.29	65.65	65.98	66.27	66.54	1.70	1.73	1.70	1.73	1.34	1.37	1.01	1.04	0.72	0.75	0.45	0.48	>30	
29,700	67.29	67.49	64.81	65.25	65.63	65.95	66.25	66.51	2.04	2.24	2.04	2.24	1.66	1.86	1.34	1.54	1.04	1.24	0.78	0.98	>30	
29,800	67.95	69.01	64.80	65.24	65.61	65.93	66.22	66.49	2.71	3.77	2.71	3.77	2.34	3.40	2.02	3.08	1.73	2.79	1.46	2.52	>30	
29,900	71.20	71.19	64.78	65.20	65.58	65.90	66.18	66.45	6.00	5.99	6.00	5.99	5.62	5.61	5.30	5.29	5.02	5.01	4.75	4.74	>30	
30,000	69.85	68.70	64.66	65.12	65.50	65.83	66.12	66.39	4.73	3.58	4.73	3.58	4.35	3.20	4.02	2.87	3.73	2.58	3.46	2.31	>30	
30,100	67.29	66.86	64.59	65.07	65.46	65.80	66.10	66.37	2.22	1.79	2.22	1.79	1.83	1.40	1.49	1.06	1.19	0.76	0.92	0.49	>30	
30,150	65.27	65.55	64.58	65.07	65.46	65.80	66.10	66.37	0.20	0.48	0.20	0.48	-0.19	0.09	-0.53	-0.25	-0.83	-0.55	-1.10	-0.82	13	

Note : -2.00 shows overflow portion. W/Hole : Water Hole

Table A7.4 - 5 FLOW CAPACITY OF BEDDEWEWA BRANCH CANAL

(1)	(2)	(3)	(4)	(5)	(6)	(7)=(2)-(4)	(8)=(3)-(4)	(9)=(2)-(5)	(10)=(3)-(5)	(11)=(2)-(6)	(12)=(3)-(6)	Flow Capacity
Reduced	Existing	Existing	Required Bank Level			5 m3/s		10 m3/s		15 m3/s		
Distance	L/Bank	R/Bank	5 m3/s	10 m3/s	15 m3/s	L/Bank	R/Bank	L/Bank	R/Bank	L/Bank	R/Bank	(m3/s)
0	64.74	64.75	64.61	65.36	65.94	0.13	0.14	-0.62	-0.61	-1.20	-1.19	7
100	64.62	64.76	64.59	65.35	65.93	0.03	0.17	-0.73	-0.59	-1.31	-1.17	6
200	64.31	64.25	64.58	65.34	65.92	-0.27	-0.33	-1.03	-1.09	-1.61	-1.67	4
300	64.35	64.51	64.56	65.32	65.89	-0.21	-0.05	-0.97	-0.81	-1.54	-1.38	4
400	64.31	64.57	64.53	65.30	65.88	-0.22	0.04	-0.99	-0.73	-1.57	-1.31	4
500	64.26	65.67	64.49	65.25	65.83	-0.23	1.18	-0.99	0.42	-1.57	-0.16	4
600	63.56	63.29	64.44	65.20	65.79	-0.88	-1.15	-1.64	-1.91	-2.23	-2.50	1
700	63.35	63.02	64.37	65.10	65.64	-1.02	-1.35	-1.75	-2.08	-2.29	-2.62	1
800	64.3	64.66	64.30	65.03	65.59	0.00	0.36	-0.73	-0.37	-1.29	-0.93	5
900	64.05	63.86	64.27	65.00	65.58	-0.22	-0.41	-0.95	-1.14	-1.53	-1.72	4
1000	64.09	64.4	64.25	64.98	65.56	-0.16	0.15	-0.89	-0.58	-1.47	-1.16	4
1100	63.99	64.44	64.23	64.95	65.53	-0.24	0.21	-0.96	-0.51	-1.54	-1.09	4
1200	63.45	63.03	64.15	64.82	65.34	-0.70	-1.12	-1.37	-1.79	-1.89	-2.31	1
1300	63.19	62.79	64.08	64.72	65.23	-0.89	-1.29	-1.53	-1.93	-2.04	-2.44	1
1400	63.09	63.46	63.98	64.66	65.18	-0.89	-0.52	-1.57	-1.20	-2.09	-1.72	2
1500	65.13	64.66	63.93	64.62	65.15	1.20	0.73	0.51	0.04	-0.02	-0.49	10
1600	66.23	66.12	63.90	64.60	65.13	2.33	2.22	1.63	1.52	1.10	0.99	>15
1700	65.28	64.35	63.88	64.58	65.11	1.40	0.47	0.70	-0.23	0.17	-0.76	7
1800	64.82	63.88	63.86	64.56	65.09	0.96	0.02	0.26	-0.68	-0.27	-1.21	6
1900	65.93	65.26	63.85	64.53	65.07	2.08	1.41	1.40	0.73	0.86	0.19	>15
2000	65.3	64.53	63.82	64.51	65.04	1.48	0.71	0.79	0.02	0.26	-0.51	10
2100	64.77	63.53	63.81	64.50	65.03	0.96	-0.28	0.27	-0.97	-0.26	-1.50	4
2200	64.52	63.95	63.76	64.45	64.99	0.76	0.19	0.07	-0.50	-0.47	-1.04	6
2300	63.86	63.39	63.74	64.43	64.97	0.12	-0.35	-0.57	-1.04	-1.11	-1.58	3
2400	63.13	62.44	63.69	64.38	64.92	-0.56	-1.25	-1.25	-1.94	-1.79	-2.48	1
2500	65.77	65.05	63.67	64.36	64.91	2.10	1.38	1.41	0.69	0.86	0.14	>15
2600	67.29	66.18	63.65	64.34	64.88	3.64	2.53	2.95	1.84	2.41	1.30	>15
2700	65.79	64.95	63.63	64.33	64.87	2.16	1.32	1.46	0.62	0.92	0.08	>15
2800	63.91	63.36	63.61	64.31	64.84	0.30	-0.25	-0.40	-0.95	-0.93	-1.48	4
2900	63.04	62.55	63.60	64.29	64.83	-0.56	-1.05	-1.25	-1.74	-1.79	-2.28	1
3000	63.44	63.19	63.57	64.27	64.81	-0.13	-0.38	-0.83	-1.08	-1.37	-1.62	3
3100	63.66	63.89	63.54	64.25	64.79	0.12	0.35	-0.59	-0.36	-1.13	-0.90	6
3200	63.22	63.21	63.49	64.22	64.78	-0.27	-0.28	-1.00	-1.01	-1.56	-1.57	4
3300	63.01	63.05	63.46	64.20	64.76	-0.45	-0.41	-1.19	-1.15	-1.75	-1.71	3
3400	63	62.8	63.45	64.19	64.74	-0.45	-0.65	-1.19	-1.39	-1.74	-1.94	2
3500	63.02	62.82	63.43	64.18	64.74	-0.41	-0.61	-1.16	-1.36	-1.72	-1.92	2
3600	63.07	63.22	63.41	64.16	64.72	-0.34	-0.19	-1.09	-0.94	-1.65	-1.50	3
3700	62.74	62.78	63.40	64.15	64.71	-0.66	-0.62	-1.41	-1.37	-1.97	-1.93	2
3800	62.39	62.38	63.28	63.93	64.41	-0.89	-0.90	-1.54	-1.55	-2.02	-2.03	1
3810	62.3	62.3	61.96	62.48	62.85	0.34	0.34	-0.18	-0.18	-0.55	-0.55	7
3900	62.21	61.99	61.95	62.47	62.84	0.26	0.04	-0.26	-0.48	-0.63	-0.85	5
4000	61.97	62.15	61.78	62.29	62.65	0.19	0.37	-0.32	-0.14	-0.68	-0.50	7
4100	61.56	61.77	61.65	62.15	62.52	-0.09	0.12	-0.59	-0.38	-0.96	-0.75	4
4200	61.57	61.4	61.56	62.06	62.44	0.01	-0.16	-0.49	-0.66	-0.87	-1.04	3
4300	61.38	61.8	61.38	61.81	62.15	0.00	0.42	-0.43	-0.01	-0.77	-0.35	5
4400	61.19	61.04	61.17	61.64	61.98	0.02	-0.13	-0.45	-0.60	-0.79	-0.94	4
4431	61	61	60.57	61.04	61.38	0.43	0.43	-0.04	-0.04	-0.38	-0.38	9
4500	59.56	59.95	60.56	61.03	61.37	-1.00	-0.61	-1.47	-1.08	-1.81	-1.42	2
4509	59.5	59.9	59.63	60.10	60.44	-0.13	0.27	-0.60	-0.20	-0.94	-0.54	4
4600	58.61	58.39	59.60	60.07	60.41	-0.99	-1.21	-1.46	-1.68	-1.80	-2.02	2
4640	58.89	58.89	59.58	60.05	60.39	-0.69	-0.69	-1.16	-1.16	-1.50	-1.50	3
4652	58.8	58.8	58.75	59.44	60.02	0.05	0.05	-0.64	-0.64	-1.22	-1.22	6
4700	58.4	58.69	58.74	59.43	60.01	-0.34	-0.05	-1.03	-0.74	-1.61	-1.32	3
4800	57.93	58.17	58.68	59.39	59.99	-0.75	-0.51	-1.46	-1.22	-2.06	-1.82	3
4900	57.63	57.89	58.62	59.34	59.93	-0.99	-0.73	-1.71	-1.45	-2.30	-2.04	1
5000	57.24	57.24	58.58	59.31	59.91	-1.34	-1.34	-2.07	-2.07	-2.67	-2.67	1
5100	57.43	57.1	58.47	59.16	59.71	-1.04	-1.37	-1.73	-2.06	-2.28	-2.61	1
5200	57.31	56.95	58.41	59.10	59.66	-1.10	-1.46	-1.79	-2.15	-2.35	-2.71	1
5300	57.08	56.91	58.34	59.02	59.56	-1.26	-1.43	-1.94	-2.11	-2.48	-2.65	1
5400	57.4	57.1	58.27	58.95	59.49	-0.87	-1.17	-1.55	-1.85	-2.09	-2.39	1
5500	56.88	56.89	58.00	58.56	58.96	-1.12	-1.11	-1.68	-1.67	-2.08	-2.07	1

Note : -2.00 shows overflow portion. Required Bank Level = Water level + 0.90 m

FIGURES

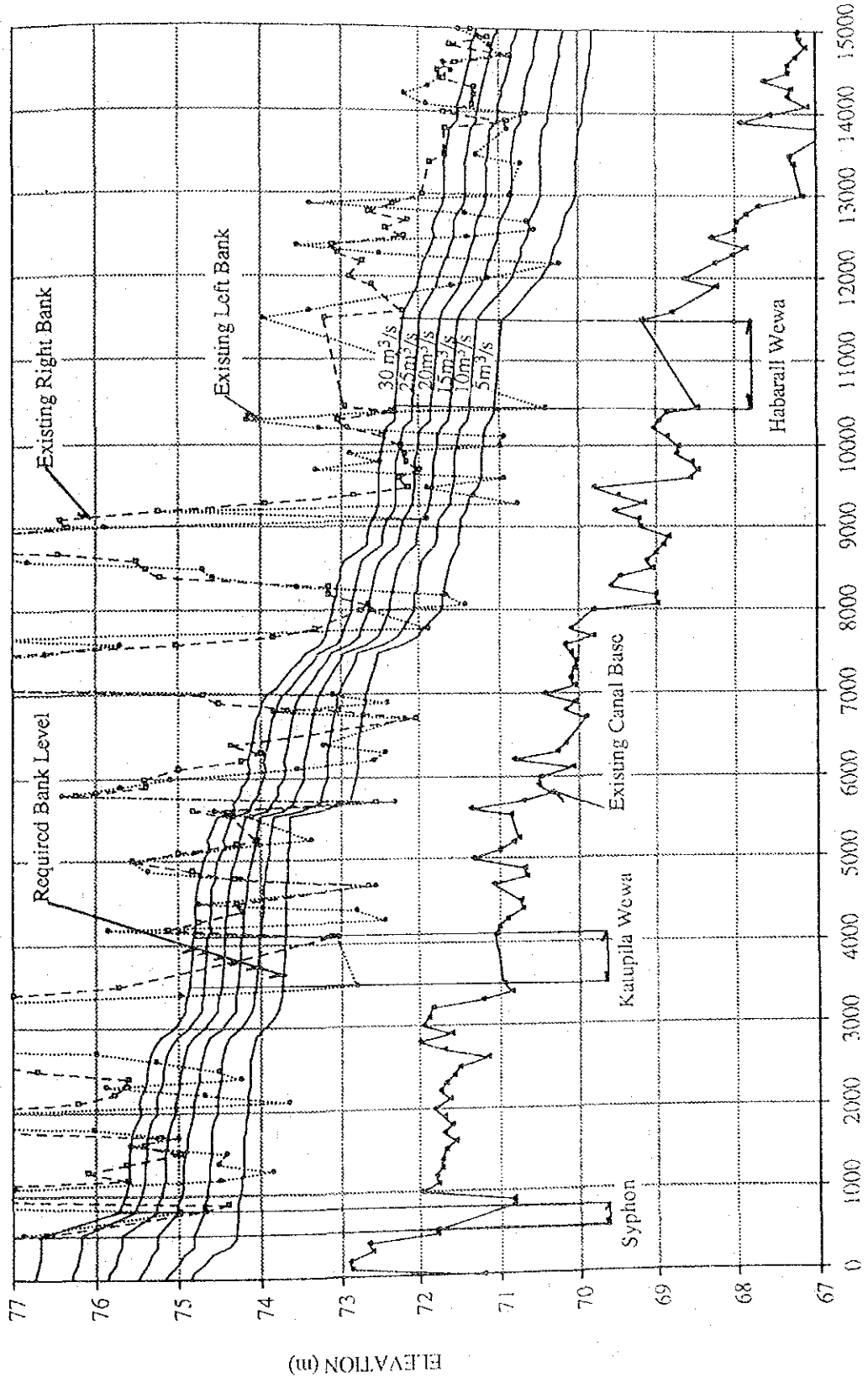

Fig. A7.4-1 BANK LEVEL PROFILE OF LEFT BANK LEFT BANK MAIN CANAL (1/2)

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT

THE FEASIBILITY STUDY ON WALAWE IRRIGATION UPGRADING AND EXTENSION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

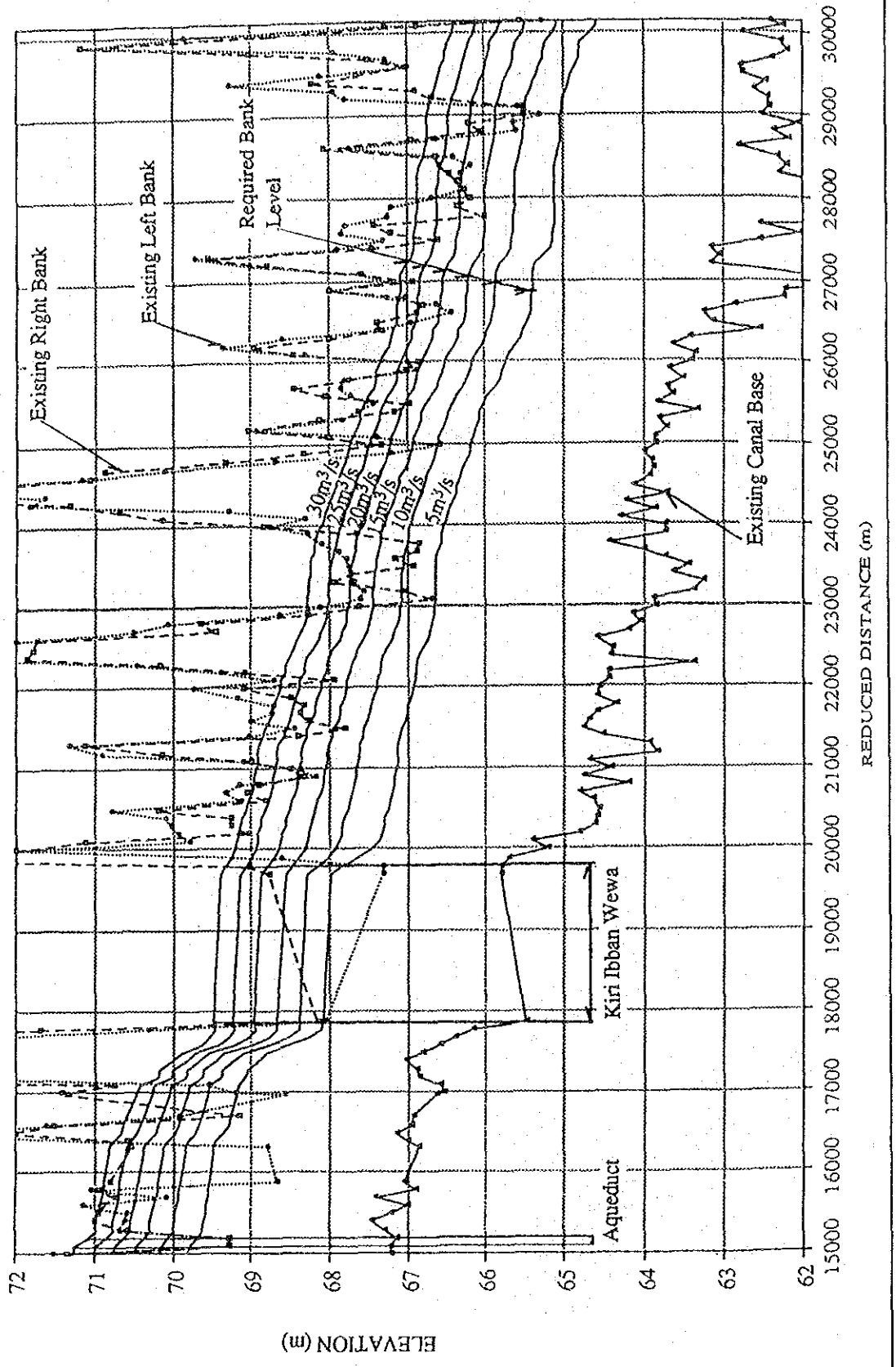

Fig. A7.4-1 BANK LEVEL PROFILE OF LEFT BANK LEFT BANK MAIN CANAL (2/2)

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT

THE FEASIBILITY STUDY ON WALAWE IRRIGATION UPGRADING AND EXTENSION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

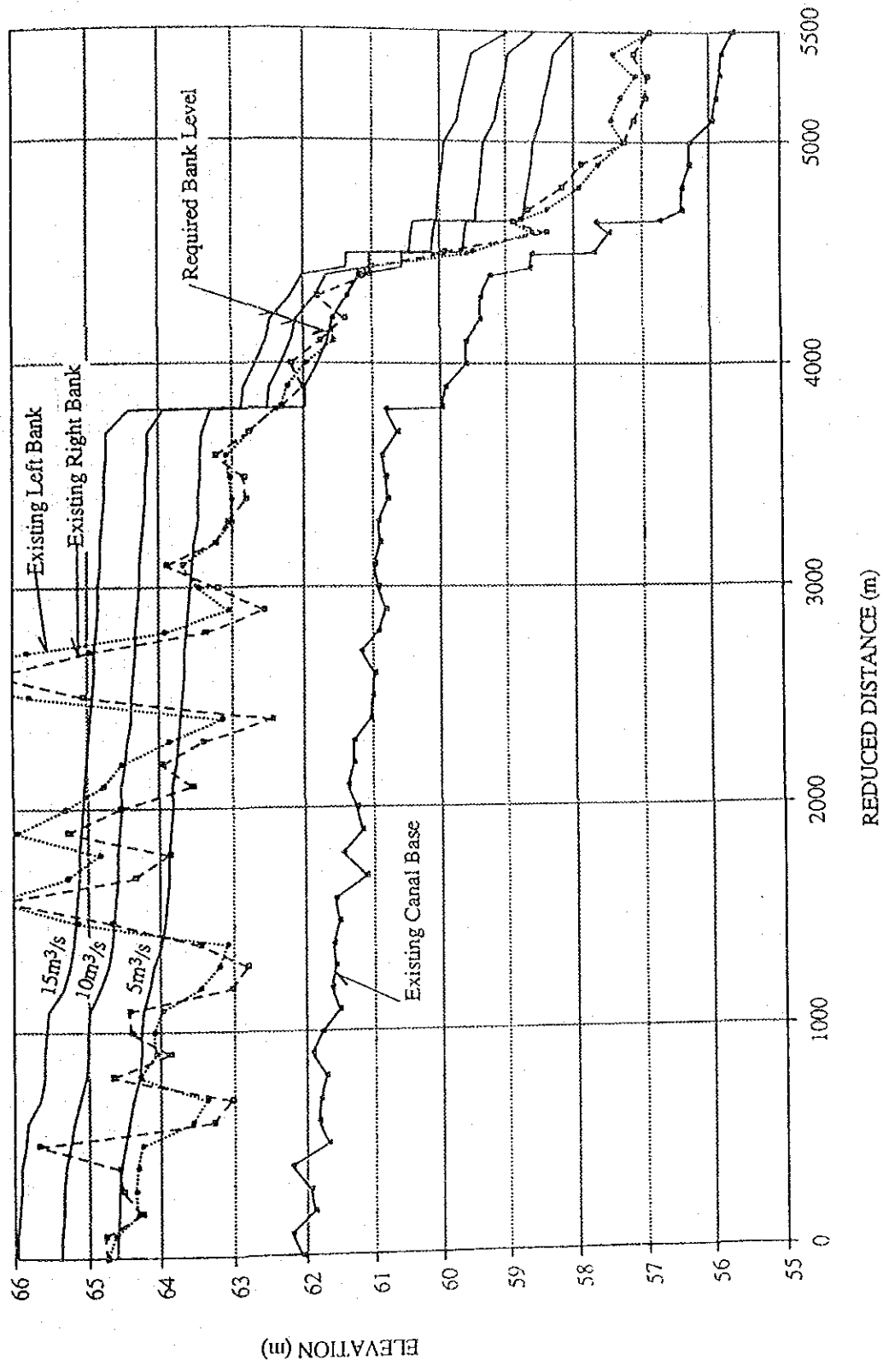

Fig. A7.4-2 BANK LEVEL PROFILE OF BEDDEWEWA BRANCH CANAL

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT
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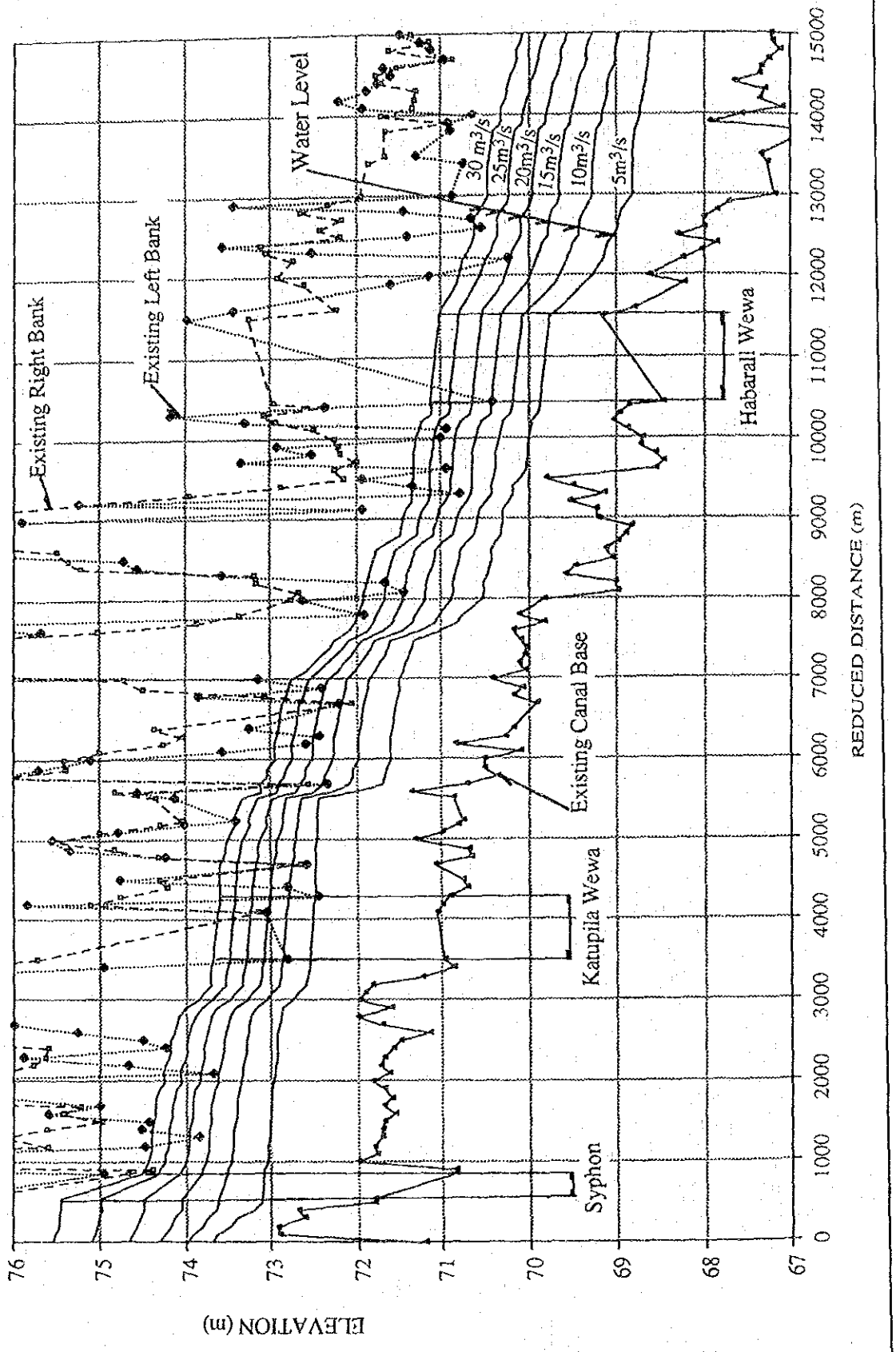

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT

THE FEASIBILITY STUDY ON WALAWE IRRIGATION UPGRADING AND EXTENSION PROJECT

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Fig. A7.4-3 WATER LEVEL PROFILE OF LEFT BANK MAIN CANAL (1/2)

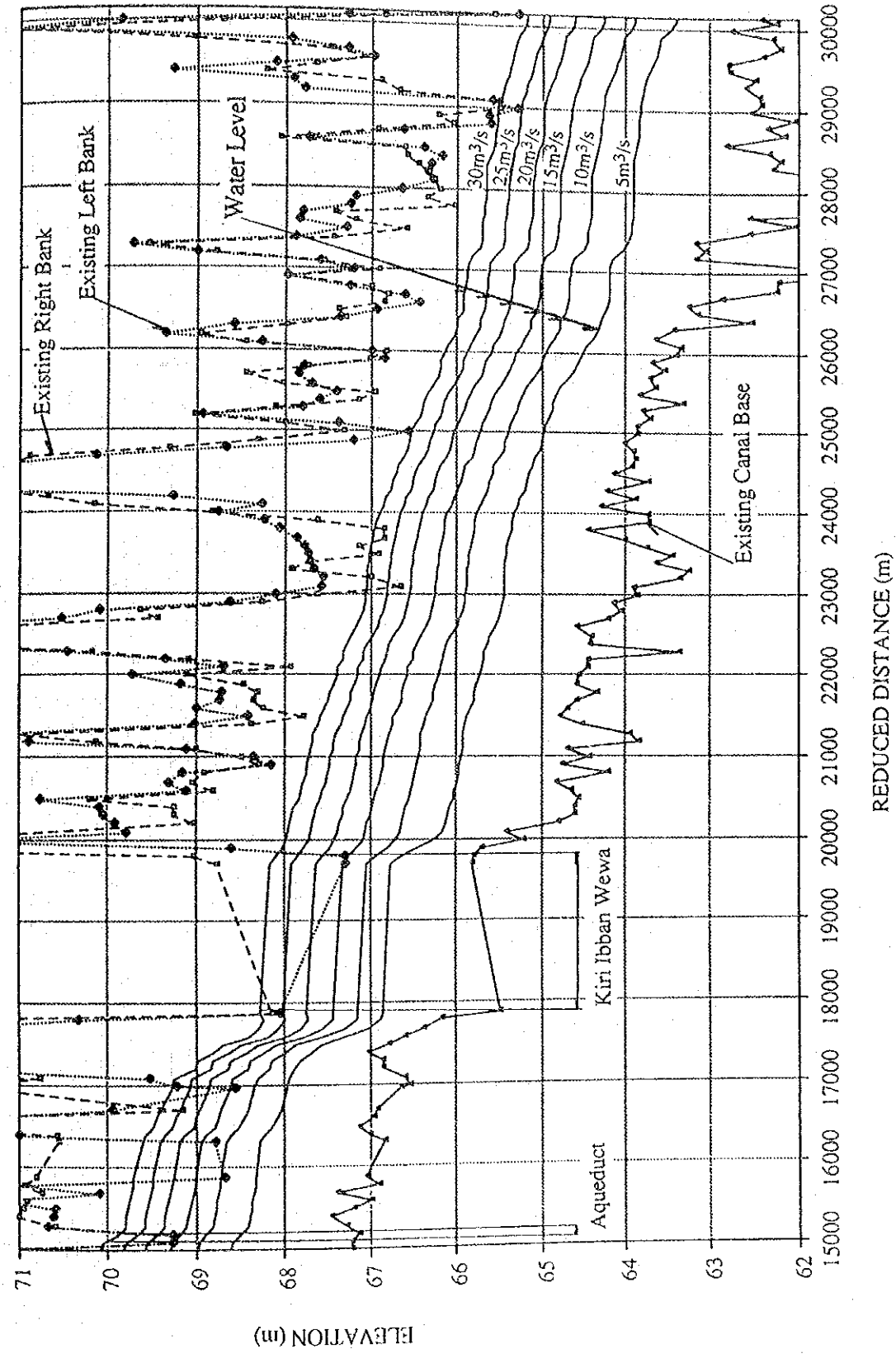

Fig. A7.4-3 WATER LEVEL PROFILE OF LEFT BANK MAIN CANAL (2/2)

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT

THE FEASIBILITY STUDY ON WALAWE IRRIGATION UPGRADING AND EXTENSION PROJECT

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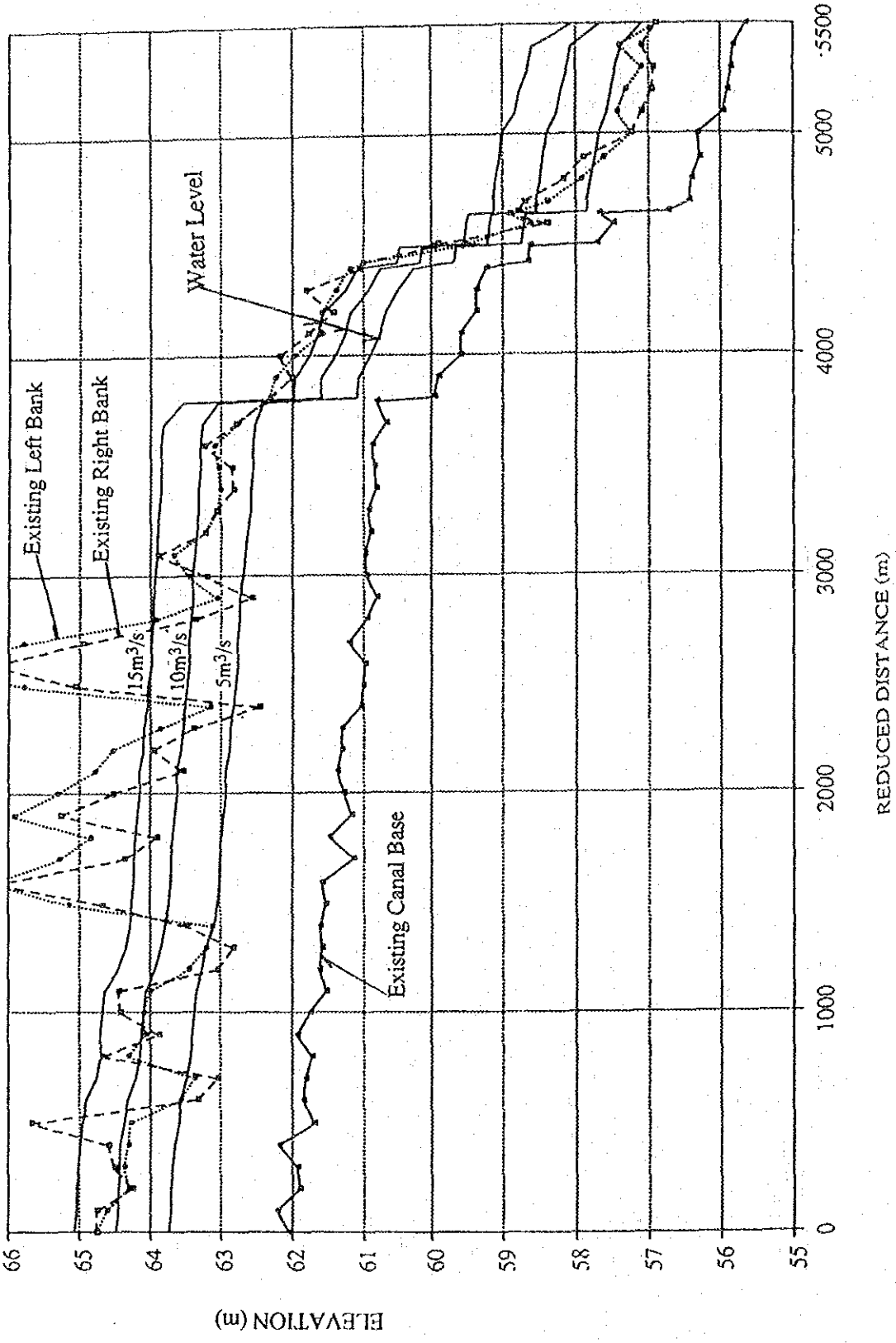

Fig. A7.4-4 WATER LEVEL PROFILE OF BEDDEWEWA BRANCH CANAL

GOVERNMENT OF DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF LANDS, IRRIGATION AND MAHAWELI DEVELOPMENT

THE FEASIBILITY STUDY ON WALAWE IRRIGATION UPGRADING AND EXTENSION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

ANNEX 7-5 ESTIMATE OF IRRIGATION AND DRAINAGE WATER REQUIREMENTS

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ANNEX 7-5 ESTIMATE OF IRRIGATION AND DRAINAGE WATER REQUIREMENTS

7.5.1 Irrigation field tests

(1) General

De to no availability of percolation rate data of paddy fields and basic intake rate in the study area, both tests were carried out at 71 points in total consisting of 50 points of percolation test and 21 points for basic intake rate . As a results of the test, it is defined that (i) percolation rate of the existing paddy field on the LHG soils is about 5 mm/day and on the RBE soils is higher than 10 mm/day and less than about 30 mm/day, and (ii) basic intake rates at the most of the study area are less than 50 mm/hour and surface irrigation method could be applied for upland crop field.

The location of the testing points are shown in Fig. A7.5.1-1.

(2) Field percolation test in the existing paddy fields

Water requirement of paddy field is composed of evapo-transpiration, vertical percolation and percolation under border. Vertical percolation rate varies with soils and topographic conditions. The field percolation test aims to measure the vertical percolation rate in the existing paddy fields. Measurement was made by using the rapid leakage meter. Conditions of the observation points of 50 sites are as follow:

Area	Nos. of Obs.	Topo. Condition	Soil Type
Kiriiban Block	25	top to bottom	RBE, LHG, SS
Suriyawewa Block	14	top to bottom	LHG, SS
Embilipitiya Block	5	top to middle	RBE, LHG, SS
Muravasihena Block	1	middle	LHG
Ridiyagama Area	5	flat	LHG

SS: Sandy soil

The results of percolation test in paddy field are summarized below and details are shown in Table A7.5-1.

Area	Topo. Condition	Nos. of Point	Rate (mm/day)	Av. Rate	Soil Type
Kiriiban Block	Top	9	2 -10	3.8	RBE,LHG
	Middle	9	2 -10	4.1	LHG,SS
	Bottom	7	2 -16	5.4	LHG,SS
Suriyawewa Block	Top	4	2 -15	7.5	LHG,SS
	Middle	4	2 - 5	3.3	LHG
	Bottom	6	2 -15	4.5	LHG,SS
Embilipitiya Block	Top	3	3 -11	8.3	LHG,SS,RBE
	Middle	3	4 -32	15.3	LHG,SS,RBE
Ridiyagama Area	Flat	5	2 -11	4.8	LHG

Percolation rates of each soil type are summarized below.

Area	Topo. Condition	Soil Type					
		LHG		RBE		SS	
		Nos.	Rate(mm/d)	Nos.	Rate(mm/d)	Nos.	Rate(mm/d)
Kiriiban Block	Top	8	2 -10 (4.0)	1	4	-	-
	Middle	8	2 - 6 (3.4)	-	-	1	10
	Bottom	6	2 - 7 (3.7)	-	-	1	16
Suriyawewa Block	Top	3	2 - 9 (5.0)	-	-	1	15
	Middle	4	2 - 5 (3.3)	-	-	-	-
	Bottom	5	2 - 3 (2.4)	-	-	1	15
Embilipitiya Block	Top	1	3	1	11	1	11
	Middle	1	4	1	10	1	32
Ridiyagama Area	Flat	5	2 -11 (4.8)	-	-	-	-

Figure in ( ) is average.

(3) Basic intake rate test

The main purpose of the test is to define the irrigation method based on the measurement of total discharge in the cylinder. The Cylinder Intake Rate is given by the following empirical formula;

$$Dc = CT^{n} \quad \text{(mm)}$$
$$Ic = 60CnT^{n-1} \quad \text{(mm/h)}$$
$$Ib = 60Cn\{600(1-n)\}^{n-1} \quad \text{(mm/hr)}$$

where,

Dc = Total Discharge
Ic = Cylinder Intake Rate
Ib = Basic Intake Rate
T = Time (minute)
C = constant
n = constant

As a results summarized below, the basic intake rates range from 1.01 to 173.69 (mm/hr). The basic intake rates could be classified into three groups as follow from view point of suitable irrigation method.

Group 1 :	zero - 50 (mm/hr)	: Surface irrigation
Group 2 :	50 - 75 (mm/hr)	: Surface/Spray irrigation
Group 3 :	over 75 (mm/hr)	: Spray irrigation

No.	Test point	Ib(mm/hr)	Proposed Irrigation Method (Group 1)	(Group 3)
1	SC-1	3.19	*	
2	SC-2	1.01	*	
3	NO-1	20.27	*	
4	NO-2	136.55		*
5	NO-3	173.69		*
6	O-3	1.33	*	
7	S-1	42.79	*	
8	E-2	24.29	*	
9	E-6	7.70	*	
10	E-9-1	50.35	*	
11	E-9-2	40.81	*	
12	BI-1	9.37	*	
13	BI-2	7.41	*	
14	BI-3	3.01	*	
15	BI-4	6.54	*	
16	BI-5	12.78	*	
17	BI-6	3.18	*	
18	BI-7	3.77	*	
19	BI-8	12.47	*	
20	BI-9	5.59	*	
21	BI-10	7.14	*	

The basic intake rates at 19 points are classified into Group 1 and the remaining two points at NO-2 and No-3 exceed 75 mm/hr (Group 3). Taking into account the above result and water management, surface irrigation method could be adapted as the irrigation method for the upland irrigation.

7.5.2 Estimate of irrigation water requirements of the Study area

(1) Diversion irrigation water requirement

The diversion irrigation water requirement at the head of LBMC is calculated by the following equation and monthly diversion water requirements of proposed cropping pattern is shown in Table A7.5-2.

$$DWR = (CU + P + PR + WLR - ER) / IE - RF + DW + DS$$

where,
- CU : Consumptive use
- P : Percolation rate (paddy field only)
- PR : Land preparation requirement (paddy field only)
- ER : Effective rainfall
- IE : Overall irrigation efficiency
- RF : Return flow yielded in upstream paddy fields
- DW : Domestic water demand in the area except sugar area
- DS : Water demand of the Sevanagala Sugar area

(2) Consumptive use of water

The consumptive use of water is the product of the reference crop evapo-transpiration (ETo) and the crop coefficient (Kc). Meteorological data at Sugar Research Institute and Hambantota Climate Station are used for estimate of ETo. Considering the locations of two stations,

located at northern and southern ends of the Study area, average value of estimated ETo values are applied for the study. The ETo applied for the study is tabulated as below.

Monthly Reference Crop Evapo-transpiration

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
158	160	192	171	174	162	184	191	180	167	141	144	2,024

Due to no existence of the measured data and information regarding the crop coefficient in and around the study area, the coefficients applied for the study are set based on the references of in the country and FAO. The applied coefficients are shown in Table A7.5-3.

(3) Percolation rate of paddy fields

Percolation rate of paddy fields are set as below taking into account the field observation results of the Study Team in 1992 (refer to Annex 7.5.1) and of MMP on the Right Bank area in 1987 (Interim Report No.3, " Visit of the Irrigation Management Engineer", MMP for WIIP).

(Unit ; mm/day)

Soil	Growing period	Land preparation period
LHG	5	5
RBE (Moderate drain)	10	15
RBE (Well drain)	20	30

(4) Land preparation requirement

The land preparation requirement is estimated only for paddy fields based on the assumptions that (i) land preparation period is 45 day in total, (ii) water requirement for land tillage is 75 mm, (iii) air phase of 3 % can not be replaced with water, (iv) standing water after sowing is 75 mm, and percolation rate during the period is 5 mm/day for LHG soils, 15 mm/day and 30 mm/day for RBE (mod. drain) and RBE (well drain). The estimated land preparation requirement by soil type is summarized below and its detailed calculations are shown in Table A7.5-4.

Soil type	Land pre. req't (mm)
LHG	725
RBE (Mod.drain)	1,175
RBE (Well drain)	1,850

(5) Effective rainfall

Effective rainfall of the Study area is estimated based on the data of 80 % probable annual rainfall estimated by Gumbel method at Sugar Research Institute at Uda Walawe and Rice Research Station at Ambalantota and ratio of monthly distribution for 31 years from 1960 to 1990. The effective rainfall is estimated by employing the method mentioned in " Technical Guide Line for Irrigation Works, A.J. P.Ponrajah, Irrigation Department of M/LIMD, 1988". The estimated annual effective rainfall for paddy and upland field are summarized as below and its detailed calculations are tabulated in Table A7.5-5.

	Annual effective rain(mm/year)
Paddy	514
Upland crops	562

(6) Irrigation efficiency

Irrigation efficiency is set as below by referring to the references of FAO (Irrigation and drainage Paper No.24). Regarding the field application efficiency, it is considered that field application efficiency for paddy field is taken at 1.0 assuming that the losses are already included in the percolation losses and field canal losses. It is assumed that the field canals composing D and F canals are lined by concrete.

Efficiency	Paddy field	Upland field
Conveyance	0.80	0.80
Field canal	0.85	0.85
Field application	1.00	0.60
Overall	0.68	0.41

It is noted that ADB Appraisal in 1984, for the "Walawe Irrigation Improvement Project" on Right bank, took the overall efficiency of 0.53 for both paddy and upland fields.

(7) Unit crop water requirements

Unit water requirement for each crops are estimated based on the above figures and proposed cropping calender as shown in Fig. A7.5-2. Annual crop diversion water requirements of major proposed crops are summarized as below and its details are presented in Tables A7.5-6 to A7.5-8.

(Unit; mm)

Crop	Maha	Yala	Annual
Paddy (LHG)	1,929	2,367	4,296
Paddy (RBE-Mod.drain)	3,224	3,696	6,916
Paddy (RBE-Well.drain)	5,485	6,008	11,493
Big Onion	464	578	1,042
Sunflower	610	670	1,280
Vegetable	553	864	1,417
Banana			2,765
Sugarcane			2,729

(8) Return flow from the paddy fields

It is assumed that 90 % of the percolation amount in the upstream paddy fields could be re-used in the downstream irrigation area where a collection facilities such as village tank and catch weir on the drainage canals is provided. Return flow ratio between diversion water

requirement and estimated amount is shown as below and its details are presented in Tables A7.5-6 to A7.5-8.

(Unit; mm)

Crop	Return flow rate (%)
Paddy (LHG)	28
Paddy (RBE-Mod.drain)	41
Paddy (RBE-Well.drain)	49

(9) Return flows to the Walawe river

It is expected that the return flow from the operation losses and excess water of return flow yielded by percolation could be used in the downstream stretch of the river. Return flow to the Walawe river is estimated for the water balance study at the Liyangastota anicut and river mouth point based on the return flow from the paddy field as mentioned above and operation losses with assumptions that 80 % of operation losses of both paddy and upland fields would also be re-used in the downstream part of the river. Return flow from the Sevanagala sugar area, the Right Bank area of MEA (WIIP) and Liyangastota scheme area are estimated based on the assumptions that return flow ratio estimated for the Study area could be applied for the areas. The estimated procedures and estimated results are tabulated in Tables A7.5-6 to 7.5-11. Estimated amount of return flows from the upstream area of the Liyangastota anicut to the Walawe river are summarized as below

(Unit; MCM/year)

Area	Return flow to the Walawe river
Kiriibanwewa block	21
Suriyawewa block	34
Sevanagala sugar area	22
Right Bank area of MEA (WIIP)	127
Total	204

(10) Irrigation water requirement of the study area

Irrigation water requirement of the study area is estimated based on the unit crop diversion water requirements and proposed cropping pattern. The requirement is estimated for each irrigation block taking into account the return flow yielded by percolation losses in the upstream paddy fields. The estimated irrigation diversion water requirement for the proposed cropping patterns is summarized below and its details are shown in Table A7.5-2.

(Unit; MCM/year)

Area	Area	Diversion water requirement at Uda Walawe reservoir
Sevanagala sugar area	2,750	61
Old area	3,360	111
Extension area	5,340	168
Total	11,450	340

Commanding area of Mahagama tank system of 580 ha is not included in that of Old area

Regarding Sevanagala sugar area, the water demand of 61 MCM/year for the development of 2,750 ha, which was estimated by the Sugar Industries, is taken as the entire water demand of the area. The demand comprises irrigation water requirement of 56 MCM and other demand of 5 MCM such as sugar factory demand and settlers demand as shown in Table A7.5-9. Commanding area of the Mahagama tank system of 580 ha is not included as the irrigation water requirement of the above since the area has been fed by the river flow of the Mau river and return flows yielded in the upstream area fed by Left Bank Main Canal from the reservoir.

7.5.3 Irrigaiton and other water requirements of related areas

(1) Irrigation water requirement of Kaltota scheme

The Kaltota scheme of 610 ha is located at the just downstream of the Samanalawewa reservoir. The area is cultivated by 100 % of paddy. The irrigation water requirement is estimated based on the same cropping calender of paddy which applied to the study area (LHG soils) and effective rainfall at M060 station. The return flow is also estimated by employing the same procedure applied for the Right Bank area (WIIP). The estimated irrigation water requirement and return flow are tabulated in Table A7.5-12.

(2) Water requirement of Liyangastota scheme

Irrigation water requirement of the scheme for the 6,210 ha is estimated based on the basic cropping pattern used for the left bank area and with assumption that all of the area will be cultivated by paddy on LHG soils. In addition to the irrigation water requirement, the domestic and other purpose demand of 18,000 m3/day, which is estimated by Irrigation office for the scheme, is taken for the estimate. The water demand of the area is shown in Table A7.5-13.

(3) Water requirement of Right bank area

It was considered that the water requirement of Right bank area estimated in ADB appraisal for the Walawe Irrigation Improvement Project in 1984 was an official and the most recent estimate at the initial stage of the Study. The estimated water requirement of the area is 435 MCM/year comprising irrigation water demand of 405 MCM and domestic and industrial of 30 MCM as tabulated in Table A7.5-10. No thorough assessment of the water requirement of the right bank area under the "Walawe Irrigation Improvement Project" has been made since ADB appraisal till July 1992 because the current right bank project concentrated on improving infrastructure and operation at minor canal level.

In the course of the Study on the development of the left bank by the Team of JICA, ADB decided to make re-assessment of the irrigation water requirement of the right bank area based on changes of irrigation conditions such as progress of crop diversification program from paddy to other upland crops and improvement of water management activities and facilities.

The re-assessment was carried out by one irrigation engineer of MMP in June and August 1992. As a result, irrigation water requirement of the area is estimated at 346 MCM/year under the condition that (i) 40 % of the irrigation area is cultivated by upland crops (cropping pattern-A) , (ii) water management will be made in medium efficiency level with improved irrigation facilities (water management level-2), and (iii) considerable amount of return flows will be re-used within the area. The estimated irrigation water required from the Uda Walawe reservoir by MMP and return flow at the Liyangastota anicut are shown in Table A7.5-14 and 7.5-15.

7.5.4 Water requirement of the Walawe area

Through discussion with MASL, two kinds of water requirements of the Walawe area (Scenario-1 and 2) are prepared for the water balance study. Difference between two scenarios is the irrigation water requirement of the right bank area of 405 (ADB estimate) and 346 MM/year (MMP estimate). The water requirements of the Walawe basin related to the study is summarized as below and monthly requirement is shown in Table A7.5-2.

(Unit : MCM/year)

Area	Scenario-1	Scenario-2
Left bank area	343	343
Right bank area	405	346
Liyangastota scheme	273	273
Kaltota scheme	52	52

7.5.5 Estimate of drainage water requirement

Unit drainage water requirement of the Study area is estimated based on the one-day rainfall with return period of one in five years. Considering areal rainfall distribution pattern (refer to the isohyeto map in Annex-II) and availability of daily rainfall record, an average probable rainfall of two rainfall stations is employed for the estimate. Two rainfall stations employed are ; (i) Sugar Research Station (SRI) at the Uda Walawe dam, northern end of the Left bank area and (ii) Agricultural Research Station (ARS) at Angunalolapelesa. Daily maximum rainfall and probable exceedance rainfalls at both stations are tabulated in Table A7.5.16. The probable daily rainfall with return period of once in five years at SRI and ARS are estimated at 132 and 106 mm/day, respectively. The design rainfall is determined at 119 mm/day.

Unit drainage water requirement of paddy field and non-paddy field are estimated separately with assumption that drainage water will be drained within two days from the paddy field and one day from non-paddy field. Table A7.5.17 shows the estimation procedure of the drainage requirement. Estimated unit drainage water requirement of paddy field and non-paddy field are 4.1 and 6.9 l/s/ha, respectively.

TABLES

Table A7.5 - 1 MAESUREMEMENT OF PERCOLATION RATE IN THE EXISTING PADDY FIELDS 1/2

No.	Area (1)	Block (2)	Location Name (3)	Topo. condition (4)	Soil type (5)	Measured rate (mm/day) (6)	Percolation rate (mm/day) (7)	Remarks
9	LB	K'iban	K-5/6-8	B	LHG	2	<5	FC-11/RBMC of KI
20	LB	K'iban	M-4-4	B	LHG	4	<5	Yodo Ela canal
24	LB	K'iban	M-3-4	B	LHG	3	<5	Yodo Ela canal
2	LB	K'iban	K-2	B	LHG	4	<5	FC-12/RBMC of KI
8	LB	K'iban	K-5/6-7	B	LHG	2	<5	FC-11/RBMC of KI
14	LB	K'iban	K-7	B	LHG	7	<10	D-13 of LBMC
39	LB	S'wewa	S-7-3	B	LHG	2	<5	D-2 canal of BBC
26	LB	S'wewa	S-1	B	LHG	3	<5	D-5 canal of BBC
31	LB	S'wewa	S-6	B	LHG	2	<5	D-4 canal of BBC
36	LB	S'wewa	S-4-3	B	LHG	2	<5	D-2 canal of BBC
27	LB	S'wewa	S-2	B	LHG	3	<5	D-1 canal of BBC
7	LB	K'iban	K-5/6-5	M	LHG	3	<5	FC-11/RBMC of KI
18	LB	K'iban	M-4-2	M	LHG	3	<5	Yodo Ela canal
13	LB	K'iban	K-2-2	M	LHG	4	<5	D-4 of LBMC
19	LB	K'iban	M-4-3	M	LHG	3	<5	Yodo Ela canal
5	LB	K'iban	K-5/6-3	M	LHG	3	<5	FC-11/RBMC of KI
23	LB	K'iban	M-3-3	M	LHG	6	<10	Yodo Ela canal
11	LB	K'iban	K-1-2	M	LHG	3	<5	D-4 of LBMC
22	LB	K'iban	M-3-2	M	LHG	2	<5	Yodo Ela canal
38	LB	S'wewa	S-7-2	M	LHG	2	<5	D-2 canal of BBC
28	LB	S'wewa	S-3	M	LHG	5	<5	D-3 canal of BBC
35	LB	S'wewa	S-4-2	M	LHG	2	<5	D-2 canal of BBC
29	LB	S'wewa	S-4	M	LHG	4	<5	D-4 canal of BBC
4	LB	K'iban	K-5/6-2	T	LHG	3	<5	FC-11/RBMC of KI
3	LB	K'iban	K-5/6-1	T	LHG	4	<5	FC-11/RBMC of KI
10	LB	K'iban	K-1-1	T	LHG	2	<5	D-4 of LBMC
21	LB	K'iban	M-3-1	T	LHG	2	<5	Yodo Ela canal
25	LB	K'iban	M-2	T	LHG	10	<10	Yodo Ela canal
12	LB	K'iban	K-2-1	T	LHG	6	<10	D-4 of LBMC
15	LB	K'iban	M-1	T	LHG	3	<5	Yodo Ela canal
17	LB	K'iban	M-4-1	T	LHG	2	<5	Yodo Ela canal
32	LB	S'wewa	S-S	T	LHG	9	<10	D-4 canal of BBC
37	LB	S'wewa	S-7-1	T	LHG	2	<5	D-2 canal of BBC
30	LB	S'wewa	S-5	T	LHG	4	<5	D-4 canal of BBC
1	LB	K'iban	K-1	T	RBE	2	<5	RBMC of Kiri Iban(KI)
16	LB	K'iban	M-1-1	B	SS	16	<20	Yodo Ela canal
34	LB	S'wewa	S-5-5	B	SS	15	<15	D-2 canal of BBC
6	LB	K'iban	K-5/6-4	M	SS	10	<10	FC-11/RBMC of KI
33	LB	S'wewa	S-5-2	T	SS	15	<15	D-2 canal of BBC
Average of Left bank				All data		4.6		
				LHG (B)		3.1		
				LHG (M)		3.3		
				LHG (T)		4.4		
				Others		11.6		

Table A7.5 - 1 MAESUREMEMENT OF PERCOLATION RATE IN THE EXISTING PADDY FIELDS 2/2

No.	Area (1)	Block (2)	Location Name (3)	Topo. condition (4)	Soil type (5)	Measured rate (mm/day) (6)	Percolation rate (mm/day) (7)	Remarks
45	RB	M'sihena	RB-9M	M	LHG	4	<5	Tract-10
42	RB	E'pitiya	RB-7	T	LHG	3	<5	Tract-2
44	RB	E'pitiya	RB-5M	M	RBE	10	<10	Tract-4
43	RB	E'pitiya	RB-4M	T	RBE	11	<15	Tract-4
41	RB	E'pitiya	RB-3	M	SS	32	>30	Tract-3
40	RB	E'pitiya	RB-2	T	SS	11	<15	Tract-3
46	LT	Ridiyagama	LT-1M	Flat land	LHG	4	<5	LB of the Walawe river
47	LT	Ridiyagama	LT-2M	Flat land	LHG	2	<5	LB of the Walawe river
48	LT	Ridiyagama	LT-31M	Flat land	LHG	5	<5	LB of the Walawe river
49	LT	Ridiyagama	LT-3	Flat land	LHG	2	<5	LB of the Walawe river
50	LT	Ridiyagama	RB-11	Flat land	LHG	11	<15	RB of the Walawe river

(1) LB; Left bank of the Walawe river
RB; Right bank of the Walawe river
RT; Ridiyagama Tank (Liyangastota anicut) area

(2) K'iban; Kiriiban block area of MEA
S'wewa; Suriyawewa block of MEA
M'sihena; Muravasihena block of MEA

(3) Refer to Fig. ***

(4) B; bottom of valley T; Top or higher part of valley
M; Middle of B and T

(5) According to the soil map attached with I/R
LHG; Low humic grey soil RBE; Reddish brown earth SS; Sandy soil

(6) Measured value in the field by the Team in July 1992 by employing "rapid leakage meter(Todai type)"
<5 ; less than 5 mm/day <20; less than 20 mm/day
<10; less than 10 mm/day <30; less than 30 mm/day
<15; less than 15 mm/day >30; more than 30 mm/day

Notes:
Measurement of the perolation rates were made by employing the "Rapid Leakage Meter-Todai Type" in July 1992 by the Team.

Table A7.5-2 **SUMMARY OF MONTHLY DIVERSION WATER REQUIREMENTS** 1/2

(Unit : MCM)

Item	Area (ha)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual total
Scenario-1 (Right bank water requrement of 405+30 MCM)														
1 Kiriibanwewa block	900	3.06	2.66	1.93	3.31	1.36	2.14	4.35	2.89	3.60	3.43	1.11	0.60	30.43
2 Beddewewa Branch Left	810	3.00	2.63	1.90	3.20	1.39	2.18	4.26	2.76	3.29	3.11	0.99	0.55	29.28
3 Beddewewa Branch Right	1,650	4.49	3.83	2.96	5.77	3.21	4.22	7.08	4.86	5.49	5.36	2.16	1.42	50.85
4 Sugar area (fixed value)	2,750	8.11	0.28	0.28	4.01	8.63	4.90	4.37	4.48	7.48	7.48	7.48	3.56	61.06
Sub-total of Old Area	6,110	18.66	9.40	7.07	16.29	14.59	13.44	20.06	14.99	19.86	19.38	11.74	6.13	171.62
5 Irrigation Block-1 (North)	2,880	7.22	6.39	4.91	9.74	6.27	7.58	11.59	8.17	8.85	8.82	4.01	2.91	86.46
6 Irrigation Block-2 (South)	2,460	8.34	7.38	5.30	8.94	4.72	6.68	11.83	7.48	8.49	8.18	2.96	1.94	82.22
Sub-total of Extension Area	5,340	15.55	13.77	10.20	18.67	10.99	14.26	23.42	15.65	17.33	17.00	6.98	4.84	168.68
Total Irrigaiton demand of Left Bank to Uda Walawe	11,450	34.21	23.17	17.28	34.97	25.57	27.70	43.48	30.64	37.19	36.38	18.72	10.98	340.30
7 Demand other than irrigation use in the Left Bank														
- domestic supply		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.20
- industrial supply		0.28						0.28	0.28	0.28	0.28	0.28	0.28	1.96
Sub-total		0.38	0.10	0.10	0.10	0.10	0.10	0.38	0.38	0.38	0.38	0.38	0.38	3.16
Total of Left Bank		34.59	23.27	17.38	35.07	25.67	27.80	43.86	31.02	37.57	36.76	19.10	11.36	343.46
8 Right Bank of MEA (ADB Estimate)														
-Irrigation demand	10,900	20.20	31.70	31.90	47.10	51.70	20.50	17.00	46.30	47.60	57.30	32.30	1.60	405.20
- Other demands		2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	30.00
Total		22.70	34.20	34.40	49.60	54.20	23.00	19.50	48.80	50.10	59.80	34.80	4.10	435.20
9 Liyangastota scheme	6,210	34.95	31.40	22.91	29.65	3.53	20.01	47.08	26.96	30.87	24.90	0.56	0.54	273.36
10 Kaltota Scheme	870	7.70	6.20	4.20	5.10	0.50	4.30	8.90	5.00	6.20	4.20	0.00	0.00	52.30
Total of other areas	17,980	65.35	71.80	61.51	84.35	58.23	47.31	75.48	80.76	87.17	88.90	35.36	4.64	760.86
Total	29,430	99.9	95.1	78.9	119.4	83.9	75.1	119.3	111.8	124.7	125.7	54.5	16.0	1,104.3

Table A7.5-2 **SUMMARY OF MONTHLY DIVERSION WATER REQUIREMENTS** 2/2

(Unit : MCM)

Item	Area (ha)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual total
Scenario-2 (Right bank water requrement of 346+30 MCM)														
1 Kiriibanwewa block	900	3.06	2.66	1.93	3.31	1.36	2.14	4.35	2.89	3.60	3.43	1.11	0.60	30.43
2 Beddewewa Branch Left	810	3.00	2.63	1.90	3.20	1.39	2.18	4.26	2.76	3.29	3.11	0.99	0.55	29.28
3 Beddewewa Branch Right	1,650	4.49	3.83	2.96	5.77	3.21	4.22	7.08	4.86	5.49	5.36	2.16	1.42	50.85
4 Sugar area (fixed value)	2,750	8.11	0.28	0.28	4.01	8.63	4.90	4.37	4.48	7.48	7.48	7.48	3.56	61.06
Sub-total of Old Area	6,110	18.66	9.40	7.07	16.29	14.59	13.44	20.06	14.99	19.86	19.38	11.74	6.13	171.62
5 Irrigation Block-1 (North)	2,880	7.22	6.39	4.91	9.74	6.27	7.58	11.59	8.17	8.85	8.82	4.01	2.91	86.46
6 Irrigation Block-2 (South)	2,460	8.34	7.38	5.30	8.94	4.72	6.68	11.83	7.48	8.49	8.18	2.96	1.94	82.22
Sub-total of Extension Area	5,340	15.55	13.77	10.20	18.67	10.99	14.26	23.42	15.65	17.33	17.00	6.98	4.84	168.68
Total Irrigaiton demand of Left Bank	11,450	34.21	23.17	17.28	34.97	25.57	27.70	43.48	30.64	37.19	36.38	18.72	10.98	340.30
11 Demand other than irrigation use in the Left Bank														
- domestic supply		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.20
- industrial supply		0.28						0.28	0.28	0.28	0.28	0.28	0.28	1.96
Sub-total		0.38	0.10	0.10	0.10	0.10	0.10	0.38	0.38	0.38	0.38	0.38	0.38	3.16
Total of Left Bank		34.59	23.27	17.38	35.07	25.67	27.80	43.86	31.02	37.57	36.76	19.10	11.36	343.46
8 Right Bank of MEA (MMP Estimate)														
-Irrigation demand	12,300	33.04	22.23	28.37	49.96	11.14	19.06	35.99	39.02	45.89	40.84	12.35	8.35	346.24
- Other demands		2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	30.00
Total		35.54	24.73	30.87	52.46	13.64	21.56	38.49	41.52	48.39	43.34	14.85	10.85	376.24
9 Liyangastota scheme	6,210	34.95	31.40	22.91	29.65	3.53	20.01	47.08	26.96	30.87	24.90	0.56	0.54	273.36
10 Kaltota Scheme	870	7.70	6.20	4.20	5.10	0.50	4.30	8.90	5.00	6.20	4.20	0.00	0.00	52.30
Total of other areas		78.19	62.33	57.98	87.21	17.67	45.87	94.47	73.48	85.46	72.44	15.41	11.39	701.90
Total	30,830	112.8	85.6	75.4	122.3	43.3	73.7	138.3	104.5	123.0	109.2	34.5	22.7	1,045.4

Note Water demands for industrial and domestic purposes for Sugar area, Right Banka dn Lidiyagama areas are already included in the irrigaiton demand in the above figures.

Commanding area of the Mahagama tank of 580 ha is not including in that of Kiriibanwewa block.

Table A7.5 - 3 CROP COEFFICIENTS OF SELECTED CROPS

Crop		Growing stage Initial	Develop.	Mid	Late	Total	Source
Paddy	Days	20	30	30	25	105	1
	Kc	1.00	1.15	1.20	0.90		
(MMP	Kc	1.1	1.1	1.1	0.95)		3
Chillies	Days	25	25	75	25	150	1
	Kc	0.65	0.85	1.00	0.90		
Pulses	Days	15	20	25	15	75	1
(Green Gram)	Kc	0.50	0.80	1.05	0.70		
Big Onion	Days	20	40	30	10	100	2
	Kc	0.45	0.70	0.95	0.75		
Red Onion	Days	20	40	20	10	90	2
	Kc	0.45	0.70	0.95	0.95		
					0.2087		
Vegetables	Days	20	30	50	20	120	2
(Snake Gout /	Kc	0.45	0.68	0.90	0.70		
Bittter Gout)							
<Cucumber>							
Sunflower	Days	25	35	40	20	120	2
	Kc	0.45	0.75	1.05	0.40		

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Source
										Start			
Banana	0.70	0.75	0.90	1.05	1.05	1.05	1.00	1.00	1.00	0.80	0.75	0.70	2
Humid, light wind													
Second season													
						Start							
Sugarcane	1.05	1.05	1.05	0.8	0.6	0.55	0.8	0.95	1.05	1.05	1.05	1.05	2
RHmin>70%, light wind						Start							
12 month													

Source:

1 Technical Guide Line for Irrigation Works, A.J P. Ponrajah, 1988

2 Crop Water Requirement, FAO Irrigation and Drainage Paper, 24

3 Draft Water management and Operation manual, Walawe Irrigaion and Improvement Project, Sir M. MacDonald &Partners, July 1986

Table A7.5 - 4 WATER REQUIREMENT FOR LAND PREPARATION (PADDY FIELD)

1. Formula

$$Lp = Ls + Lt + E + Pd + Sd$$

$$Ls = (Var - 0.03) \times Dr + (Vah - 0.03) \times Dh$$

where,

Lp :	Wate rrequirement of land preparation, in mm
Ls :	Water requirement for land soaking, in mm (assuming air phase of 3 % cannot be replaced with water)
Lt :	Water requirement for land tillage, in mm
E :	Evaporation during land preparation time, assuming at 4 mm/day
Pd :	Deep percolation during land preparation, im mm
Var :	Air phase ratio in plow layer, assuming at 0.2
Vah :	Air phase ratio in sub-soil layer, assuming at 0.2
Dr :	Thickness of plow layer, in mm, assuming at 200 mm
Dh :	Thickness of sub-soil layer, in mm, assuming at 800 mm
Sd :	Depth of standing water, assuming at 75 mm

2. Assumptions :

1 Land preparation period of 45 days

2 Lt is 75 mm (Technical Guide Line for Irrigation Works, Ponrajah, 1988)

3 Deep percolation rates during land preparation

LHG	5 mm/day	RBE-1 (Mod. drain)	15 mm/day
		RBE-2 (Well drain)	30 mm/day

4 Ground water table is to be one m below the soil surface

5 Evaporation rate is estimated by average evaporation rate in the land preparation period of 5 mm in Mar-Apr and Sep-Oct and pan coefficient of 0.80

3. Calculation

(Unit : mm)

Soil	Soil	Ls	Lt	E	Pd	Sd	Lp
LHG		170	75	180	225	75	725
RBE-1	(Mod. drain)	170	75	180	675	75	1,175
RBE-2	(Well drain)	170	75	180	1,350	75	1,850

Note:

E = 4 mm/day x 45 days
Pd = (Deep percolation rate) x 45 days
Sd will be supplied after sowing according to the height of paddy

Table A7.5 - 5 CALCULATION OF EFFECTIVE RAINFALL

(mm)

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Basic Data (80 % probable monthly rainfall)													
SRI Ratio	0.04	0.06	0.11	0.11	0.06	0.02	0.02	0.02	0.05	0.19	0.20	0.11	1.00
SRI R80	48.1	79.9	145.5	140.4	83.8	25.5	28.7	28.7	62.0	248.0	263.5	137.2	1291.2
RRS Ratio	0.05	0.04	0.09	0.08	0.09	0.06	0.03	0.05	0.08	0.14	0.18	0.12	1.00
RRS R80	39.7	29.9	75.8	70.7	72.3	49.0	27.2	43.8	65.8	120.5	152.0	97.1	843.8
Average	43.9	54.9	110.7	105.5	78.1	37.2	27.9	36.2	63.9	184.3	207.8	117.1	1067.5
Effective rainfall (Paddy field)	Re=0.67 x (R-25) ; max =225 mm, zero when R is 25 mm or lower R is monthly average rainfall of RRS ad SRI												
	12.7	20.0	57.4	54.0	35.6	8.2	1.9	7.5	26.0	106.7	122.5	61.7	514.2
(Upland field)	Re=0.67 x (R-6) ; max =75 mm, zero when R is 6 mm or lower												
1'st calc	25.4	32.8	70.1	66.7	48.3	20.9	14.7	20.3	38.8	119.4	135.2	74.5	667.0
2'nd calc	25.4	32.8	70.1	66.7	48.3	20.9	14.7	20.3	38.8	75.0	75.0	74.5	562.4

Note: SRI: Sugar Research Institute at Uda Walawe
RRS: Rice Research Station at Ambalantota

80 % probable rainfalls are obtained by Gumbel method based on the extended rainfall data for 31 years from 1960 to 1990

Eeffective rainfalls are estimated by employing the proposed method of "Technical Guide Line for Irrigation Works", A.J.P. Ponrajah, Irrigaiton Dept. of Ministry of Lands, Irrigation and mahaweli Development, 1988

Ratio: Average rainfall distribution for 31 years from 1960 to 1990

R80 : 80 % monthly probable rainfall estimated by 80 % probable annual rainfall and the Ratio mentioned above.

Table A7.5 - 6 UNIT CROP WATER REQUIREMENT OF PADDY 1/2

Item	Unit	Sep	Maha Paddy Oct	Nov	Dec	Jan	Feb	Yala Paddy Mar	Apr	May	Jun	Jul	Aug	Annual total
Basic Data for Calculation														
1 ETo	mm/day	6.0	5.4	4.7	4.7	5.1	5.7	6.2	5.7	5.6	5.4	6.0	6.2	
2 Effective rainfall	mm/m	26	107	123	62	13	20	57	54	36	8	2	8	514
3 Field application effeciency	%	100%												
4 Operation efficiency	%	68%												
A Paddy on LHG soils	Area :	1,000 ha												
	Percolation rate :		5 mm/day for growing period					(5 mm/day for land preparation period)						
1 Crop coefficient														
Kc-1				1.01	1.15	1.17			1.00	1.07	1.20	1.14		
Kc-2				1.00	1.07	1.20	1.14			1.01	1.15	1.17		
Kc-3														
Average			0.00	1.01	1.11	1.19	1.14	0.00	1.00	1.04	1.18	1.16		
2 Days of irrigation	days		30	30	30	30	15	15	30	30	30	30	0	
3 ET crop (ETo x Kc)	mm	0	0	142	157	181	97	0	171	175	190	208	0	
4 Area factor (Fa)	mm		0.00	0.75	1.00	1.00	0.25	0.00	0.25	1.00	1.00	0.75		
5 ET crop net (ETo x Kc x Fa)	mm	0	0	106	157	181	24	0	43	175	190	156	0	
6 Land preparation	mm		483	242				242	483					
7 Percolation	mm		0	113	150	150	19	0	38	150	150	113	0	
8 Sub-total (= (5)+(6)+(7))	mm	0	483	460	307	331	43	242	564	325	340	268	0	
9 Effective rainfall	mm	0	107	123	62	13	10	29	54	36	8	2	0	442
10 Net requirement (= (8)-(9))	mm	0	377	338	245	319	33	213	510	289	332	267	0	2,921
11 Farm requirement	mm	0	377	338	245	319	33	213	510	289	332	267	0	2,921
12 Diversion requirement	mm	0	554	497	360	469	49	313	749	425	488	392	0	4,295
13 Diversion requirement	MCM	0.0	5.5	5.0	3.6	4.7	0.5	3.1	7.5	4.3	4.9	3.9	0.0	43.0
(Expected Return Flow)		<<90 % of Percolation Loss>>												
1 Percolation in land preparation	mm		150	75				75	150					450
2 Percolation in growing stage	mm	0	0	113	150	150	19	0	38	150	150	113	0	881
3 Total	mm	0	150	188	150	150	19	75	188	150	150	113	0	1,331
4 Return flow (0.9 x (3))	mm	0	135	169	135	135	17	68	169	135	135	101	0	1,198
	MCM	0.0	1.4	1.7	1.4	1.4	0.2	0.7	1.7	1.4	1.4	1.0	0.0	12.0
														(28%)
5 R/flow other than percolation	mm	0	141.8	127.2	92.16	119.9	12.47	80.18	191.8	108.8	125	100.3	0	1,100
(80 % of Operation losses)	MCM	0.0	1.4	1.3	0.9	1.2	0.1	0.8	1.9	1.1	1.3	1.0	0.0	11.0
														(26%)
A Paddy on RBE (Moderate drain) soi	Area :	1,000 ha												
	Percolation rate :		10 mm/day for growing period					(15 mm/day for land preparation period)						
1 Crop coefficient														
Kc-1				1.01	1.15	1.17			1.00	1.07	1.20	1.14		
Kc-2				1.00	1.07	1.20	1.14			1.01	1.15	1.17		
Kc-3														
Average			0.00	1.01	1.11	1.19	1.14	0.00	1.00	1.04	1.18	1.16		
2 Days of irrigation	days		30	30	30	30	15	15	30	30	30	30	0	
3 ET crop (ETo x Kc)	mm	0	0	142	157	181	97	0	171	175	190	208	0	
4 Area factor (Fa)	mm		0.00	0.75	1.00	1.00	0.25	0.00	0.25	1.00	1.00	0.75		
5 ET crop net (ETo x Kc x Fa)	mm	0	0	106	157	181	24	0	43	175	190	156	0	
6 Land preparation	mm		783	392				392	783					
7 Percolation	mm		0	225	300	300	38	0	75	300	300	225	0	
8 Sub-total (= (5)+(6)+(7))	mm	0	783	723	457	481	62	392	901	475	490	381	0	
9 Effective rainfall	mm	0	107	123	62	13	10	29	54	36	8	2	0	442
10 Net requirement (= (8)-(9))	mm	0	677	600	395	469	52	363	847	439	482	379	0	4,703
11 Farm requirement	mm	0	677	600	395	469	52	363	847	439	482	379	0	4,703
12 Diversion requirement	mm	0	995	883	581	689	76	534	1245	646	709	557	0	6,916
13 Diversion requirement	MCM	0.0	10.0	8.8	5.8	6.9	0.8	5.3	12.5	6.5	7.1	5.6	0.0	69.2
(Expected Return Flow)		<<90 % of Percolation Loss>>												
1 Percolation in land preparation	mm		450	225				225	450					1,350
2 Percolation in growing stage	mm	0	0	225	300	300	38	0	75	300	300	225	0	1,763
3 Total	mm	0	450	450	300	300	38	225	525	300	300	225	0	3,113
4 Return flow (0.9 x (3))	mm	0	405	405	270	270	34	203	473	270	270	203	0	2,801
	MCM	0.0	4.1	4.1	2.7	2.7	0.3	2.0	4.7	2.7	2.7	2.0	0.0	28.0
														(41%)
5 R/flow other than percolation	mm	0	254.7	226.1	148.6	176.4	19.53	136.8	318.8	165.3	181.5	142.7	0	1,770
(80 % of Operation losses)	MCM	0.0	2.5	2.3	1.5	1.8	0.2	1.4	3.2	1.7	1.8	1.4	0.0	17.7
														(26%)

Table A7.5 - 6 UNIT CROP WATER REQUIREMENT OF PADDY 2/2

Item	Unit	Sep	Maha Paddy Oct	Nov	Dec	Jan	Feb	Yala Paddy Mar	Apr	May	Jun	Jul	Aug	Annual total
A Paddy on RBE (well drain) soils	Area :	1,000 ha												
	Percolation rate :		20 mm/day for growing period (30 mm/day for land preparation period)											
1 Crop coefficient Kc-1				1.01	1.15	1.17			1.00	1.07	1.20	1.14		
Kc-2				1.00	1.07	1.20	1.14			1.01	1.15	1.17		
Kc-3														
Average			0.00	1.01	1.11	1.19	1.14	0.00	1.00	1.04	1.18	1.16		
2 Days of irrigation	days		30	30	30	30	15	15	30	30	30	30	0	
3 ET crop (ETo x Kc)	mm	0	0	142	157	181	97	0	171	175	190	208	0	
4 Area factor (Fa)	mm		0.00	0.75	1.00	1.00	0.25	0.00	0.25	1.00	1.00	0.75		
5 ET crop net (ETo x Kc x Fa)	mm	0	0	106	157	181	24	0	43	175	190	156	0	
6 Land preparation	mm		1233	617				617	1233					
7 Percolation	mm		0	450	600	600	75	0	150	600	600	450	0	
8 Sub-total (= (5)+(6)+(7))	mm	0	1233	1173	757	781	99	617	1426	775	790	606	0	
9 Effective rainfall	mm	0	107	123	62	13	10	29	54	36	8	2	0	442
10 Net requirement (= (8)-(9))	mm	0	1127	1050	695	769	89	588	1372	739	782	604	0	7,815
11 Farm requirement	mm	0	1127	1050	695	769	89	588	1372	739	782	604	0	7,815
12 Diversion requirement	mm	0	1657	1545	1022	1130	131	865	2017	1087	1150	888	0	11,493
13 Diversion requirement	MCM	0.0	16.6	15.4	10.2	11.3	1.3	8.7	20.2	10.9	11.5	8.9	0.0	114.9
(Expected Return Flow)		<<90 % of Percolation Loss>>												
1 Percolation in land preparation	mm		900	450				450	900					2,700
2 Percolation in growing stage	mm	0	0	450	600	600	75	0	150	600	600	450	0	3,525
3 Total	mm	0	900	900	600	600	75	450	1,050	600	600	450	0	6,225
4 Return flow (0.9 x (3))	mm	0	810	810	540	540	68	405	945	540	540	405	0	5,603
	MCM	0.0	8.1	8.1	5.4	5.4	0.7	4.1	9.5	5.4	5.4	4.1	0.0	56.0 (49%)
5 R/flow other than percolation	mm	0	424.1	395.5	261.6	289.4	33.64	221.5	516.4	278.3	294.5	227.4	0	2,942
(80 % of Operation losses)	MCM	0.0	4.2	4.0	2.6	2.9	0.3	2.2	5.2	2.8	2.9	2.3	0.0	29.4 (49%)