TABLES

Table A.1.1-1 Annual Withdrawals for the Three Irrigation Systems

(Unit:Million Acre-feet)

Year	LJC System			LCC System			CBDC System		
	Kharif	Rabi	Total	Kharif	Rabi	Total	Kharif	Rabi	Total
1985/86	1.79	1.27	3.06	4.27	3.43	7.70	0.81	0.66	1.47
1986/87	1.83	1.29	3.12	4.42	3.64	8.06	0.83	0.67	1.50
1987/88	1.76	1.50	3.26	4.68	3.67	8.35	0.77	0.66	1.43
1988/89	1.76	1.22	2.98	4.28	3.43	7.71	0.83	0.55	1.38
1989/90	1.68	1.13	2.81	4.05	3.30	7.35	0.80	0.65	1.45
1990/91	1.77	1.25	3.02	4.40	3.17	7.57	0.87	0.65	1.52
1991/92	1.82	1.23	3.05	3.97	2.80	6.77	0.85	0.65	1.50
1992/93	1.53	1.02	2.55	4.06	3.07	7.13	0.87	0.62	1.49
1993/94	1.69	1.23	2.92	4.11	3.11	7.22	0.83	0.65	1.48
1994/95	1.80	1.29	3.09	4.07	3.14	7.21	0.72	0.55	1.27
Minimum	1.53	1.02	2.55 (3.15)	3.97	2.80	6.77 (8.36)	0.72	0.55	1.27 (1.57)
Average	1.74	1.25	2.99 (3.69)	4.23	3.28	7.51 (9.27)	0.82	0.63	1.45 (1.79)
Maximum	1.83	1.50	3.33 (4.03)	4.68	3.67	8.35 (10.31)	0.87	0.67	1.52 (1.88)
Ave. depth	1.15 (351)	0.82 (250)	1.97 (601)	1.39 (424)	1.07 (326)	2.46 (750)	1.25 (381)	0.95 (290)	2.2 (671)

Notes : ( ) indicates quantity in million cubic meters.
Average dpth is shown in feet. ( ) indicates depth in mm.

Table A.1.3-1 (1/3) Seepage Measurement Summary for Lower Jhelum Canal System

No.	Name of Distry/Minor	Test Reach(ft) from	to	distance	Inflow (cfs)	Outflow (cfs)	Outlets (cfs)	Water loss (cfs)	Av. Perimeter (ft)	Wetted Surface(msf)	Seepage loss (cfs/msf)	Remarks	Seepage*1 (%)
1	Fatch Pur	24000	41500	17500	41.351	14.563	23.942	2.846	16.323	0.286	9.963	Old& poor brick lining	16.46
2	Lakh	36200	70000	33800	31.096	4.645	25.622	0.829	10.302	0.348	2.381		
3	Blochera	100	6700	6600	2.987	0.713	2.198	0.076	5.348	0.035	2.153	Partially in filling	2.99
4	Dherana	50	18000	17950	12.524	3.719	7.570	1.235	8.524	0.153	8.072	in filling	12.06
5	Jani	1600	15550	13950	14.234	3.895	10.030	0.309	11.500	0.160	1.926		2.53
6	Pindi	1500	16000	14500	22.727	12.600	7.690	2.437	14.400	0.209	11.671		11.6
7	Old Khatwan	500	24000	23500	20.860	3.700	15.533	1.627	10.460	0.246	6.619		6.47
8	Naurang	15500	61500	46000	98.710	59.380	33.460	5.870	12.500	0.575	10.209		22.05
9	Shergarh	100	14000	13900	9.685	5.210	3.755	0.720	9.635	0.134	5.376	Bank Condition poor	6.27
10	Lakhuwana	4000	10000	6000	11.886	7.395	4.330	0.161	6.834	0.041	3.926	Partially in filling	6.76
11	Sobhi	1000	28000	27000	26.402	8.800	15.840	1.762	11.910	0.322	5.479		9.81
12	Fujian	63200	95450	32250	79.300	39.170	33.481	6.649	22.381	0.722	9.212	Bank condition poor	13.33
13	Chokera	43000	67800	24800	89.200	54.988	32.635	1.577	25.210	0.625	2.522		3.87
14	Assian 1	133	6800	6667	30.943	22.590	7.920	0.433	13.310	0.089	4.880		3.68
16	Kirana 1	62100	96200	34100	241.890	198.640	30.700	12.550	38.322	1.307	9.604	in Filling	14.62
18	Malkana	13400	22000	8600	30.471	16.210	13.130	1.131	22.180	0.191	5.929	in Cutting	6.39
19	Wasuana	50	12000	11950	14.822	6.994	7.382	0.446	9.446	0.113	3.951		5.53
21	Lalian 1	102200	142100	39900	144.855	38.012	92.333	14.510	31.500	1.257	11.545	in filling	20.02
23	Kohri	100	15000	14900	18.363	7.154	9.370	1.839	9.285	0.138	13.293	in filling	12.67
	sum	368,733	762.600	393,867	942.306	508.378	376.921	57.007	289.370	6.950	128.711		
	average								15.23		6.77		9.84
15	Assian 2	6900	15200	8300	16.947	10.006	6.701	0.240	9.642	0.080	2.999	Lined Channel	2.26
17	Kirana 2	175000	195000	20000	38.344	8.875	28.785	0.684	17.950	0.359	1.905	Concrete lining	2.9
20	Rodian	400	14200	13800	19.452	8.583	10.704	0.165	10.110	0.140	1.183	Rocky Area	
22	Lalian 2	160000	176400	16400	20.878	8.881	11.836	0.161	9.758	0.160	1.006	Concrete lining	1.74
24	Ransdana	1000	18000	17000	16.880	8.006	8.250	0.624	10.010	0.170	3.667	Concrete lining	
25	Lalian	168875		1000							7.497	by ponding method	13
26	Kirana	180370		960							9.371	by ponding method	14.26
27	Ramdana	550		540							9.746	by ponding method	-

Note; Seepage*1 is calculated using head discharge and wetted area of each channel.

Table A.1.3-1 (2/3) Seepage Measurement Summary for Lower Chenab Canal System

No.	Name of Distry/Minor	Test Reach(ft) from	to	distance	Inflow (cfs)	Outflow (cfs)	Outlets (cfs)	Water loss (cfs)	Av. Perimeter (ft)	Wetted Surface(msf)	Seepage loss (cfs/msf)	Remarks	Seepage*1 (%)
1	Vanike	8400	44800	36400	147.853	85.921	55.780	6.152	34.722	1.264	4.868		5.67
2	Jalal pur	500	26500	26000	17.129	6.212	8.949	1.968	13.310	0.346	5.687		10.97
3	Chiniot	61000	83000	22000	65.162	44.172	19.879	1.111	22.200	0.488	2.275		4.67
4	Sarangwala	31000	49800	18800	49.753	28.979	18.356	2.418	17.410	0.327	7.388		12.49
6	Sultan Pakhara 1	1000	50000	49000	177.405	135.057	27.692	14.656	39.770	1.949	7.521		6.84
7	Sultan Pakhara 2	60000	89000	29000	125.881	84.658	37.090	4.133	33.000	0.957	4.319		?
8	Bhaugu	1000	31000	30000	173.838	124.940	46.510	2.388	38.160	1.145	2.086		3.24
9	Dhaular	31000	71000	40000	261.084	216.503	37.055	7.526	54.690	2.188	3.440		
10	Khewara 1	1000	23500	22500	269.100	213.334	44.062	11.704	59.571	1.340	8.732		
11	Khewara 2	96650	124000	27350	59.539	12.517	42.754	4.268	19.440	0.532	8.027		
12	Aruri	710	17000	16290	68.877	42.376	25.461	1.040	21.050	0.343	3.033		2.89
13	Sialwala	875	12500	11625	13.641	3.657	9.330	0.654	7.400	0.086	7.602		5.24
14	Dijkot 1	32200	63000	30800	227.197	151.328	69.877	5.992	36.930	1.137	5.268		6.47
15	Dijkot 2	77000	101008	24008	91.162	60.864	28.402	1.896	21.100	0.507	3.743		
16	Gajiana 1	675	10600	9925	77.561	73.129	3.246	1.186	33.100	0.329	3.610		9.83
17	Gajiana 2	74500	90500	16000	27.041	22.129	4.262	0.650	15.480	0.248	2.624		9.83
18	Karkan	5224	19240	14016	70.230	63.813	5.465	0.952	28.230	0.396	2.406		4.1
19	Ghour Dour	13140	24500	11360	27.701	19.398	6.476	1.827	14.360	0.163	11.200	in filling	24.87
20	Tarkhani	39250	71800	32550	104.139	59.202	40.573	4.364	35.630	1.160	3.763		6.43
21	Mungi 1	500	34800	34300	173.369	121.768	39.525	12.076	31.850	1.092	11.054		12.96
22	Mungi 2	34800	71400	36600	121.768	68.243	47.737	5.788	27.310	1.000	5.791		
24	Bhalak	1000	26000	25000	180.497	143.829	33.487	3.181	43.600	1.090	2.918		5.95
25	Kilian wala 1	35800	72700	36900	172.065	91.481	69.334	11.250	37.700	1.391	8.087	in filling	12.73
27	Ahmad Nagar	70	10000	9930	5.662	2.739	2.400	0.523	6.500	0.065	8.103		
	sum	607.294	1,217.648	610.354	2,707.654	1,876.249	723.702	107.703	692.513	19.541	133.544		
	average								28.855		5.564		8.54
26	Kilian wala 2	101550	114000	12450	12.893	6.547	5.956	0.390	13.640	0.170	2.297	brick lined	3.62
23	Pir Mahal	620	25000	24380	60.413	52.079	6.503	1.831	32.880	0.802	2.284	not runing at FSL	5.21
5	Narrana	50000	72000	22000	85.658	66.017	15.166	4.475	34.350	0.756	5.922	not runing at FSL	10.99
28	Bhalak	104140		488							2.707	by ponding method	5.52
29	Killian Wala	2150		500							4.759	by ponding at escape	7.49
30	Sumundri	31500		485							7.151	by ponding method	-
31	Pir Mahal	18300		520							6.346	by ponding at escape	14.47

Note: Seepage*1 is calculated using head discharge and wetted area of each channel.

Table A.1.3-1 (3/3) Seepage Measurement Summary for Central Bari Doab Canal System

No.	Name of Disty/Minor	Test Reach(ft) from	to	distance	Inflow (cfs)	Outflow (cfs)	Outlets (cfs)	Water loss (cfs)	Av. Perimeter (ft)	Wetted Surface(msf)	Seepage loss (cfs/msf)	Remarks	Seepage*1 (%)
1	Chinna	35200	56450	21250	89.427	34.775	49.691	4.961	24.450	0.520	9.548	in filling	13.43
3	Handal	1500	32800	31300	143.274	102.634	27.852	12.788	31.700	0.992	12.888	breaches in bank	21.46
4	Rakh	10650	38800	28150	285.462	212.087	64.912	8.463	49.560	1.395	6.066		9.18
5	Tarman	26500	56000	29500	86.449	65.617	14.945	5.887	27.129	0.800	7.356	banks in poor condition	
6	Athipur	5500	27800	22300	114.765	90.167	20.113	4.485	30.860	0.688	6.517	banks in poor condition	7.89
	sum	79.350	211.850	132.500	719.377	505.280	177.513	36.584	163.699	4.395	42.376		
	average								32.740		8.475		12.99
2	Turkwind	48000	70000	22000	50.661	14.686	34.669	1.306	15.520	0.341	3.825	concrete lining	
7	Vahn	6950		415							1.458	by ponding at escape	1.67

Note; Seepage*1 is calculated using head discharge and wetted area of each channel.

Table A.1.3-2 (1/3) Seepage Rate of Selected Canals for LJC Area

No.	Name of Distributary	Name of Minor	Length (km)	Authorize Discharge (m3/s)	Command Area (ha)	Seepage Rate un-lined (cfs/msf)	Seepage Rate lined (cfs/msf)	Total Wet Surface Present (msf)	Total Wet Surface Designed (msf)	Seepage Volume un-lined (m3/s)	Seepage Volume un-lined (%)	Seepage Volume lined (m3/s)	Seepage Volume lined (%)	Water Saving after lining (m3/s)	Water Saving after lining (%)	Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Pindi		6.86	0.46	2,285	6.32	1.47	0.23	0.18	0.04	8.95	0.01	1.63	0.03	7.32	
2	Hujan		33.98	5.16	11,329	6.32	1.47	2.99	1.67	0.54		0.07		0.47		
3	Hujan	Arian	5.43	0.28	1,392	6.32	1.47	0.14	0.14	0.03		0.01		0.02		
4	Hujjan	Kot Moman	6.78	0.54	2,668	6.32	1.47	0.25	0.18	0.04		0.01		0.04		
5	Hujjan	Kot Raja	2.81	0.17	866	6.32	1.47	0.06	0.06	0.01		0.00		0.01		
6	Hujjan	Bhikhi	6.34	0.39	1,974	6.32	1.47	0.20	0.16	0.04		0.01		0.03		
7	Hujjan	Sahowal	5.76	0.31	1,575	6.32	1.47	0.16	0.15	0.03		0.01		0.02		
8	Hujjan	M.Wala	5.87	0.26	1,311	6.32	1.47	0.15	0.15	0.03		0.01		0.02		
9	Hujjan	Tangu	4.84	0.29	1,470	6.32	1.47	0.13	0.12	0.02		0.01		0.02		
10	Hujjan	Jaspal	8.32	0.54	2,651	6.32	1.47	0.31	0.22	0.05		0.01		0.05		
	sub-total		80.13	5.16	25,236			4.38	2.85	0.78	15.18	0.12	2.30	0.66	12.88	
11	Kirana		62.95	10.52	21,374	6.32	1.47	6.71	4.40	1.20		0.18		1.02		
12	Kirana	Saruli	1.59	0.12	606	6.32	1.47	0.03	0.03	0.00		0.00		0.00		
13	Kirana	Hadda	4.11	0.36	1,639	6.32	1.47	0.12	0.11	0.02		0.00		0.02		
14	Kirana	Malkana	10.16	0.73	3,548	6.32	1.47	0.36	0.28	0.06		0.01		0.05		
15	Kirana	Wasuana	6.89	0.34	1,731	6.32	1.47	0.18	0.18	0.03		0.01		0.02		
16	Kirana	Tandalian	3.96	0.28	1,304	6.32	1.47	0.10	0.10	0.02		0.00		0.01		
17	Kirana	Rodian	6.04	0.49	2,374	6.32	1.47	0.21	0.16	0.04		0.01		0.03		
18	Kirana	Hunde	4.92	0.37	1,778	6.32	1.47	0.15	0.13	0.03		0.01		0.02		
19	Kirana	Killa	4.10	0.23	1,147	6.32	1.47	0.10	0.10	0.02		0.00		0.01		
20	Kirana	Dhabian	2.41	0.16	822	6.32	1.47	0.05	0.05	0.01		0.00		0.01		
	sub-total		107.13	10.52	36,324			8.00	5.52	1.43	13.61	0.23	2.19	1.20	11.43	
	Total		194.12	16.14	63,844			12.61	8.55	2.26	13.98	0.36	2.20	1.90	11.78	

Note: 7: measured/estimated, 9: calculated based on existing canal profile, 10&12: calculated on 5,7 &8, 11&13: ratio of 10&12 to 5
8: average seepage rate at concrete lined portion, 14:10-12, 15: 5*14/100

Table A.1.3-2 (2/3) Seepage Rate of Selected Canals for LCC Area

No.	Name of Distributary	Name of Minor	Length (km)	Authorize Discharge (m3/s)	Command Area (ha)	Seepage Rate un-lined (cfs/msf)	Seepage Rate lined (cfs/msf)	Total Wet Surface Present (msf)	Total Wet Surface Designed (msf)	Seepage Volume un-lined (m3/s)	Seepage Volume un-lined (%)	Seepage Volume lined (m3/s)	Seepage Volume lined (%)	Water Saving after lining (m3/s)	Water Saving after lining (%)	Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Sarangwala		25.04	1.99	6.627	6.32	1.47	1.35	0.86	0.24	12.14	0.04	1.79	0.21	10.35	
2	Nasrana		54.64	7.02	25.094	6.32	1.47	5.07	3.11	0.91		0.13		0.78		
3	Nasrana	Saduana	2.76	0.12	720	6.32	1.47	0.05	0.05	0.01		0.00		0.01		
4	Nasrana	Khilliana	4.43	0.26	1.293	6.32	1.47	0.11	0.11	0.02		0.00		0.02		
5	Nasrana	Narwala	5.82	0.41	2.139	6.32	1.47	0.19	0.15	0.03		0.01		0.03		
6	Nasrana	Satiana	3.66	0.20	1.015	6.32	1.47	0.08	0.08	0.01		0.00		0.01		
7	Nasrana	Natheri	4.60	0.38	1.800	6.32	1.47	0.14	0.12	0.03		0.00		0.02		
8	Nasrana	Domra	5.51	0.52	2.616	6.32	1.47	0.20	0.15	0.04		0.01		0.03		
	Sub-total		81.42	7.02	34.677			5.83	3.77	1.04	14.87	0.16	2.23	0.89	12.64	
9	Gojra		15.06	1.64	6.347	6.32	1.47	1.00	0.49	0.18		0.02		0.16		
10	Gojra	Zeera	2.71	0.22	1.193	6.32	1.47	0.06	0.06	0.01		0.00		0.01		
	Sub-total		17.77	1.64	7.540			1.06	0.55	0.19	11.58	0.02	1.40	0.17	10.19	
11	Mungi		36.97	4.05	17.657	6.32	1.47	2.88	1.63	0.52		0.07		0.45		
12	Mungi	Mungi	4.32	0.31	1.504	6.32	1.47	0.12	0.11	0.02		0.00		0.02		
	Sub-total		41.29	4.05	19.161			3.00	1.74	0.54	13.25	0.07	1.79	0.46	11.46	
13	Janiwala/Hamza		10.96	1.31	4.360	6.32	1.47	0.65	0.34	0.12		0.01		0.10		
14	Janiwala	Amirwala	7.62	0.43	2.153	6.32	1.47	0.25	0.20	0.04		0.01		0.04		
	Sub-total		18.58	1.31	6.513			0.89	0.54	0.16	12.23	0.02	1.70	0.14	10.52	
15	Pir Mahal		47.57	3.88	9.902	6.32	1.47	2.92	2.06	0.52		0.09		0.44		
16	Pir Mahal	Thera	4.85	0.19	1.012	6.32	1.47	0.10	0.10	0.02		0.00		0.01		
17	Pir Mahal	Megneja	9.89	0.37	1.818	6.32	1.47	0.30	0.26	0.05		0.01		0.04		
18	Pir Mahal	Junejwala	16.08	0.98	4.703	6.32	1.47	0.81	0.47	0.15		0.02		0.13		
19	Pir Mahal	Jandwala	3.74	0.15	807	6.32	1.47	0.07	0.07	0.01		0.00		0.01		
	Sub-total		82.13	3.88	18.242			4.20	2.96	0.75	19.39	0.12	3.17	0.63	16.22	
20	Killianwala		46.05	5.66	19.278	6.32	1.47	3.34	2.36	0.60		0.10		0.50		
22	Killianwala	Minor #3	6.66	0.33	1.741	6.32	1.47	0.19	0.17	0.03		0.01		0.03		
	Sub-total		52.71	5.66	21.019			3.53	2.53	0.63	11.16	0.11	1.86	0.53	9.30	
	Total		318.94	25.55	113.779			19.87	12.94	3.56	13.92	0.54	2.11	3.02	11.81	

Note: 7: measured/estimated, 9: calculated based on existing canal profile, 10&12: calculated on 5.7 &8, 11&13: ratio of 10&12 to 5
8: average seepage rate at concrete lined portion, 14:10-12, 15: 5*14/100

Table A.1.3-2 (3/3) Seepage Rate of Selected Canals for CBDC Area

No.	Name of Distributary	Name of Minor	Length (km)	Authorize Discharge (m3/s)	Command Area (ha)	Seepage Rate un-lined (cfs/msf)	Seepage Rate lined (cfs/msf)	Total Wet Surface Present (msf)	Total Wet Surface Designed (msf)	Seepage Volume un-lined (m3/s)	Seepage Volume un-lined (%)	Seepage Volume lined (m3/s)	Seepage Volume lined (%)	Water Saving after lining (m3/s)	Water Saving after lining (%)	Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Thamman		29.85	7.27	6,599	6.32	1.47	2.55	1.73	0.46		0.07		0.38		
2	Themman	Saharan	7.24	0.71	3,217	6.32	1.47	0.31	0.20	0.06		0.01		0.05		
	sub-total		37.09	7.27	9,816			2.86	1.93	0.51	7.04	0.08	1.11	0.43	5.93	
3	China		25.46	3.60	12,664	6.32	1.47	1.56	1.07	0.28		0.04		0.23		
4	China	Kale Minor	7.81	0.83	3,726	6.32	1.47	0.36	0.22	0.06		0.01		0.06		
	sub-total		33.27	3.60	16,390			1.92	1.29	0.34	9.55	0.05	1.49	0.29	8.06	
	Total		70.36	10.87	26,206			4.78	3.22	0.86	7.87	0.13	1.23	0.72	6.64	

Note: 7: measured/estimated. 9: calculated based on existing canal profile. 10&12: calculated on 5,7 &8, 11&13: ratio of 10&12 to 5
8: average seepage rate at concrete lined portion. 14:10-12, 15: 5*14/100

Table A.1.4-1 Comparison Between Measured and Authorized Discharges

Distributaries and Minors	Total Length (km)	Nos of Watercourses	Total CCA (acre)	Average CCA of Watercourse (acre)	Average Delta (cusec/1000 ac)	Authorized Discharge (cusec)	Actual Measurement (cusec)	Ratio of Actual Measurement over Authorized Discharge (%)		
								Average	Maximum	Minimum
1. LCC										
Mungi - 1	37.0	18	8,595	478	2.96	25.42	33.629	132	227	71
Mungi - 2		26	12,354	475	3.37	41.61	47.530	114	181	55
Kilian wala - 1	46.1	17	8,077	475	2.96	23.94	41.010	171	351	62
Kilian wala - 2		7	3,329	476	2.93	9.76	4.196	43	87	12
Nasarana	54.7	11	6,498	591	2.84	18.45	15.165	82	153	43
Sub-total	137.7	79	38,853	492	3.01	119.18	141.530	108	200	49
2 LJC										
Naurang	52.4	14	9,455	675	2.45	23.18	22.802	98	198	48
Dherana	64.3	3	1,849	616	2.21	4.09	7.570	185	283	110
Kirana - 1	64.3	16	7,934	496	3.05	24.19	29.691	123	174	75
Kirana - 2		9	4,369	485	2.85	12.47	15.911	128	162	101
Pindi	6.9	4	2,345	586	3.28	7.70	7.689	100	159	68
Fujjan	34.0	16	8,332	521	2.81	23.41	24.029	103	676	56
Sub-total	221.9	62	34,284	553	2.78	95.04	107.692	123	275	76
3. CBDC										
Thaman	30.9	8	2,793	349	3.01	8.41	11.304	134	310	50
Athipur	15.9	5	1,937	387	2.88	5.58	8.825	158	425	39
Chinna	25.5	18	8,904	495	3.10	27.59	49.282	179	409	76
Sub-total	72.3	31	13,634	440	3.00	41.58	69.411	157	381	55
Total	431.9	172	86,771	504	2.93	255.80	318.633	129	285	60

Table A.1.8-1(1/3) Potential Evapotranspiration for Lower Jhelum Canal System

Meteorogical station : Sargodha lat 32° 05 ′ N long 72° 40 ′ E

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
T mean	(℃)	12.2	14.6	18.8	24.5	30.7	33.9	31.3	31.1	29.5	24.4	19.0	13.8
RH mean	(%)	76.0	71.4	68.1	59.9	49.3	50.4	69.2	74.6	70.7	68.6	74.9	77.4
U km/day(Lahore)	(km/hr)	2.1	3.4	4.4	4.1	4.3	4.9	4.9	3.7	2.6	1.8	1.3	1.3
	(km/day)	49.7	80.9	104.4	99.1	103.4	116.4	117.8	88.3	62.6	43.4	30.7	31.9
ea(saturated v/pressure)	(mbar)	14.2	16.6	21.7	30.8	44.2	52.9	45.7	45.2	41.3	30.6	22.0	15.9
ed	(mbar)	10.8	11.9	14.8	18.4	21.8	26.7	31.6	33.7	29.2	21.0	16.5	12.3
ea-ed	(mbar)	3.4	4.8	6.9	12.3	22.4	26.2	14.1	11.5	12.1	9.6	5.5	3.6
f(u)		0.4	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4
(1-W)		0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
(1-w) x f(u) x (ea-ed)	((mm/day)	0.6	0.9	1.2	1.7	2.5	2.8	1.7	1.2	1.1	1.0	0.6	0.5
Ra	(mm/day)	8.3	10.2	12.8	15.0	16.5	17.0	16.8	15.6	13.6	11.2	9.0	7.8
n	(hr/day)	6.7	7.1	7.6	9.0	9.8	9.0	8.2	8.3	8.9	9.1	8.1	6.5
N	(hr/day)	10.3	11.1	12.0	12.8	13.4	13.8	13.7	13.1	12.4	11.4	10.5	10.0
n/N		0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.8	0.8	0.6
Rs=(0.25+0.5 x n/N)Ra		4.8	5.8	7.3	9.0	10.1	9.8	9.2	8.8	8.3	7.2	5.7	4.5
Rns=(1- α) x Rs	(mm/day)	3.6	4.4	5.5	6.8	7.6	7.3	6.9	6.6	6.2	5.4	4.3	3.4
f(T)= σ TK⁴		13.1	13.6	14.4	15.5	16.9	17.7	17.0	17.0	16.6	15.5	14.4	13.5
f(ed)		0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
f(n/N)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rnl=f(T) x f(ed) x f(n/N)	(mm/day)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Rn=Rns-Rnl		3.4	4.2	5.3	6.6	7.5	7.2	6.8	6.6	6.1	5.3	4.1	3.2
W		0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6
W x Rn	(2)	2.1	2.7	3.6	5.0	6.0	5.9	5.5	5.2	4.8	3.9	2.8	2.0
c	(3)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.1	1.1
ETo= (3) * ((2) + (1))	(mm/day)	2.9	3.9	5.3	7.3	9.3	9.6	7.8	7.1	6.5	6.1	3.8	2.7

Table A.1.8-1(2/3) Potential Evapotranspiration for Lower Chenab Canal System

Meteorogical station :Faisalabad lat 3 1 ° 26 ′ N long 73° 06 ′ E

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
T mean	(℃)	12.4	14.7	19.2	25.1	30.8	32.8	31.4	31.6	29.7	24.9	19.3	13.9
RH mean	(%)	66.9	61.4	56.7	42.1	32.2	37.6	58.6	62.9	59.5	54.2	64.3	67.5
U km/day(Lahore)	(km/hr)	2.1	3.4	4.4	4.1	4.3	4.9	4.9	3.7	2.6	1.8	1.3	1.3
	(km/day)	49.7	80.9	104.4	99.1	103.4	116.4	117.8	88.3	62.6	43.4	30.7	31.9
ea(saturated v/pressure)	(mbar)	14.4	16.7	22.3	31.9	44.4	49.8	46.0	46.5	41.7	31.5	22.4	16.0
ed	(mbar)	9.6	10.3	12.6	13.4	14.3	18.7	26.9	29.3	24.8	17.1	14.4	10.8
ea-ed	(mbar)	4.8	6.5	9.6	18.5	30.1	31.1	19.1	17.3	16.9	14.4	8.0	5.2
f(u)		0.4	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4
(1-W)		0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
(1-w) x f(u) x (ea-ed)	((mm/day)	0.8	1.2	1.8	2.5	3.3	3.4	2.2	1.7	1.6	1.4	0.9	0.7
Ra	(mm/day)	8.4	10.3	12.9	15.1	16.5	17.0	16.8	15.6	13.7	11.3	9.1	7.9
n	(hr/day)	6.7	7.1	7.6	9.0	9.8	9.0	8.2	8.3	8.9	9.1	8.1	6.5
N	(hr/day)	10.3	11.1	12.0	12.9	13.5	14.2	14.0	13.3	12.4	11.4	10.5	10.1
n/N		0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.6
Rs=(0.25+0.5 x n/N)Ra		4.8	5.9	7.3	9.0	10.1	9.7	9.1	8.8	8.3	7.3	5.8	4.5
Rns=(1- α) x Rs	(mm/day)	3.6	4.4	5.5	6.8	7.6	7.2	6.8	6.6	6.3	5.5	4.3	3.4
f(T)= σ TK^4		13.2	13.6	14.4	15.7	16.9	17.4	16.9	17.1	16.6	15.6	14.5	13.5
f(ed)		0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2
f(n/N)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rnl=f(T) x f(ed) x f(n/N)	(mm/day)	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Rn=Rns-Rnl		3.5	4.3	5.3	6.6	7.4	7.1	6.7	6.5	6.1	5.3	4.2	3.3
W		0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6
W x Rn (2)		2.1	2.7	3.6	5.0	5.9	5.7	5.4	5.2	4.8	4.0	2.9	2.0
c (3)		1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.1	1.1
ETo= (3) * ((2) + (1))	(mm/day)	3.1	4.2	5.9	8.2	10.1	10.1	8.4	7.6	7.0	6.8	4.1	3.0

Table A.1.8-1 (3/3) Potential Evapotranspiration for C.B.D.C System

Meteorogical station : Lahore lat 3 1 ° 33 ´ N long 74° 20 ´ E

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
T mean	(℃)	13.8	16.1	19.9	26.4	31.6	34.1	31.6	30.9	30.0	25.8	20.5	15.3
RH mean	(%)	67.9	63.6	59.5	45.7	40.5	45.2	68.4	74.1	67.5	61.0	67.0	70.7
U km/day(Lahore)	(km/hr)	2.1	3.4	4.4	4.1	4.3	4.9	4.9	3.7	2.6	1.8	1.3	1.3
	(km/day)	49.7	80.9	104.4	99.1	103.4	116.4	117.8	88.3	62.6	43.4	30.7	31.9
ea(saturated v/pressure)	(mbar)	15.9	18.3	23.3	34.4	46.5	53.5	46.5	44.7	42.4	33.2	24.2	17.4
ed	(mbar)	10.8	11.7	13.8	15.7	18.8	24.2	31.8	33.1	28.6	20.3	16.2	12.3
ea-ed	(mbar)	5.1	6.7	9.4	18.7	27.7	29.3	14.7	11.6	13.8	13.0	8.0	5.1
f(u)		0.4	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4
(1-W)		0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
(1-w) x f(u) x (ea-ed)	((mm/day)	0.8	1.1	1.6	2.3	3.0	3.1	1.7	1.2	1.3	1.2	0.8	0.7
Ra	(mm/day)	8.4	10.3	12.9	15.1	16.5	17.0	16.8	15.6	13.7	11.3	9.1	7.9
n	(hr/day)	6.7	7.5	7.5	9.3	9.7	9.2	7.9	7.6	8.2	9.3	8.6	6.3
N	(hr/day)	10.3	11.1	12.0	12.9	13.5	14.2	14.0	13.3	12.4	11.4	10.5	10.1
n/N		0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.6
Rs=(0.25+0.5 x n/N)Ra		4.8	6.1	7.2	9.2	10.0	9.7	8.9	8.4	8.0	7.4	6.0	4.5
Rns=(1- α) x Rs	(mm/day)	3.6	4.6	5.4	6.9	7.5	7.3	6.7	6.3	6.0	5.6	4.5	3.3
f(T)= σ TK⁴		13.5	13.8	14.6	16.0	17.1	17.7	17.1	17.0	16.7	15.9	14.7	13.7
f(ed)		0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
f(n/N)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rnl=f(T) x f(ed) x f(n/N)	(mm/day)	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Rn=Rns-Rnl		3.5	4.4	5.3	6.7	7.4	7.2	6.6	6.2	5.9	5.4	4.3	3.2
W		0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6
W x Rn	(2)	2.1	2.9	3.7	5.2	5.9	5.9	5.3	5.0	4.6	4.1	3.0	2.0
c	(3)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.1	1.1
ETo= (3) * ((2) + (1))	(mm/day)	3.2	4.4	5.8	8.2	9.8	9.9	7.7	6.8	6.5	6.7	4.3	3.0

Table A.1.8-2.(1/15) : Water Requirement for Lower Jhelum Canal System

Crop :Wheat

	Month	OCT			NOV			DEC			JAN			FEB			MAR			APR			MAY			JUN			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	6.1	6.1	6.1	3.8	3.8	3.8	2.7	2.7	2.7	2.9	2.9	2.9	3.9	3.9	3.9	5.3	5.3	5.3	7.3	7.3	7.3	9.3	9.3	9.3	9.6	9.6	9.6	
(ETo)	(mm/10day)	61	61	67	38	38	38	27	27	30	29	29	32	39	39	31	53	53	58	73	73	73	93	93	102	96	96	96	
Cropping Area					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
							0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17				
								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area					0.33	0.33	0.50	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	0.33	0.17					
Crop Coefficent					0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10									
							0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10							
					0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10									
Weighted Mean Crop Coefficient					0.12	0.17	0.28	0.44	0.59	0.77	0.89	0.93	0.97	0.89	0.83	0.68	0.54	0.39	0.28	0.16	0.11	0.06	0.03	0.00					
(1)Crop Consumptive Use (ETc)	(mm)			0.0	4.7	6.5	10.6	11.8	15.8	22.9	25.8	27.1	30.8	34.8	32.4	21.3	28.6	20.7	16.3	11.9	8.0	4.1	3.1	0.0					337.2
(2)Monthly Crop Consumptive Use	(mm)						21.7			50.5			83.7			88.5			65.6			24.1			3.1				
(3)Soaking	(mm)			16.7		16.7		16.7																					50.1
(4)Effective Rainfall	(mm)			3.1	0.6	0.6	0.6	4.7	4.7	5.2	1.3	1.3	1.4	8.0	8.0	0.6	13.0	13.0	14.3	8.8	8.8	8.8	4.7	4.7					
(5)Leaching Requirement ((1)+(3)-(4)) * 10%	(mm)			1.4	0.4	2.3	1.0	2.4	1.1	1.8	2.5	2.6	2.9	2.7	2.4	2.1	1.6	0.8	0.2	0.3	0.0	0.0	0.0	0.0					
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)			15.0	4.5	24.8	11.0	26.2	12.2	19.4	27.0	28.3	32.4	29.5	26.8	22.7	17.2	8.4	2.2	3.4	0.0	0.0	0.0	0.0					311.1
(7)Monthly Net Irrigation Requirement	(mm)			15.0			40.3			57.8			87.7			79.1			27.8			3.4			0.0				

Table A.1.8-2 (2/15) : Water Requirement for Lower Jhelum Canal System

Crop :Maize

	Month	MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	10	10	10	11	
Evapotranspiration	(mm/day)	9.3	9.3	9.3	9.6	9.6	9.6	7.8	7.8	7.8	7.1	7.1	7.1	6.5	6.5	6.5	6.1	6.1	6.1	3.8	3.8	3.8	2.7	2.7	2.7	
(ETo)	(mm/10day)	93	93	102	96	96	96	78	78	86	71	71	78	65	65	65	61	61	67	38	38	38	27	27	30	
Cropping Area								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
									0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17					
								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area								0.17	0.33	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.50	0.33					
Crop Coefficent										0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40						
									0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40							
								0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40								
Weighted Mean Crop Coefficient								0.03	0.08	0.18	0.36	0.52	0.72	0.94	1.02	0.99	0.68	0.60	0.27	0.00	0.00					
(1)Crop Consumptive Use (ETc)	(mm)							0.0	2.6	6.9	12.5	25.8	40.9	46.8	60.9	66.3	60.2	41.5	40.3	10.4	0.0	0.0				415.0
(2)Monthly Crop Consumptive Use	(mm)									9.5			79.2			174			142			10.4				
(3)Soaking	(mm)							16.7		16.7	16.7															50.0
(4)Effective Rainfall	(mm)							31.0	31.0	34.1	21.8	21.8	24.0	14.9	14.9	14.9	2.8	2.8	3.1	0.6	0.6	0.7				
(5)Leaching Reqirement ((1)+(3)-(4))*10%	(mm)							0.0	0.0	0.0	0.7	0.4	1.7	3.2	4.6	5.1	5.7	3.9	3.7	1.0	0.0	0.0				
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)							0.0	0.0	0.0	8.2	4.4	18.6	35.1	50.6	56.5	63.1	42.5	40.9	10.8	0.0	0.0				330.7
(7)Monthly Net Irrigation Requirement	(mm)									0.0			31.1			142			147			10.8			

Table A.1.8-2 (3/15) : Water Requirement for Lower Jhelum Canal System

Crop : Basmati Rice

	Month	MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	9.3	9.3	9.3	9.6	9.6	9.6	7.8	7.8	7.8	7.1	7.1	7.1	6.5	6.5	6.5	6.1	6.1	6.1	3.8	3.8	3.8	2.7	2.7	2.7	
(ETo)	(mm/10day)	93	93	102	96	96	96	78	78	86	71	71	78	65	65	65	61	61	67	38	38	42	27	27	30	
Cropping Area							NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33					
						NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
					NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33								
Total Crop Area					0.02	0.02	0.02	0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.33					
Crop Coefficent										0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64					
									0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64						
								0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64							
Weighted Mean Crop Coeffcient								0.3	0.6	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.1	0.7	0.3	0.0					
(1)Crop Consumptive Use (ETc)	(mm)							23.1	48.4	83.5	75.0	80.2	93.2	81.0	83.0	81.5	72.4	66.7	47.0	12.7	0.0					847.7
(2)Monthly Crop Consumptive Use	(mm)									155			248			245			186			13				
(3)Land Preparation	(mm)						40.0	40.0	40.0																	120.0
(4)Nursery	(mm)				0.33	0.67	0.67	0.33																		2.0
(5)Percolation (1.5mm/day)	(mm)						5.0	10.0	15.0	16.5	15.0	15.0	16.5	15.0	15.0	15.0	15.0	15.0	11.0	5.0	0.0					184.0
(6)Effective Rainfall	(mm)				7.7	7.7	8.47	31.0	31.0	34.1	21.8	21.8	24.0	14.9	14.9	14.9	2.8	2.8	3.08	0.6	0.6					
(7)Net Irrigation Requirement ((1)+(3)+(4)+(5)-(6))	(mm)				0.0	0.0	37.2	42.5	72.4	65.9	68.2	73.4	85.7	81.1	83.1	81.6	84.6	78.9	54.9	17.1	0.0					926.5
(8)Monthly Net Irrigation Requirement	(mm)						37.2			181			227			246			218			17.1				

Table A.1.8.-2 (4/15) : Water Requirement for Lower Jhelum Canal System

Crop :Cotton

ITEM	Month	APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
		10	10	10	10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	7.3	7.3	7.3	9.3	9.3	9.3	9.6	9.6	9.6	7.8	7.8	7.8	7.1	7.1	7.1	6.5	6.5	6.5	6.1	6.1	6.1	3.8	3.8	3.8	2.7	2.7	2.7	
(ETo)	(mm/10day)	73	73	73	93	93	102	96	96	96	78	78	86	71	71	78	65	65	65	61	61	67	38	38	42	27	27	30	
Cropping Area							0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33					
						0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33						
					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area					0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.33	0.00				
Crop Coefficent							0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45					
						0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45						
					0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45							
Weighted Mean Crop Coefficient					0.07	0.15	0.23	0.24	0.28	0.41	0.60	0.81	0.95	1.03	1.06	1.07	1.04	0.99	0.91	0.81	0.50	0.23	0.0	0.0					
(1)Crop Consumptive Use (ETc)	(mm)			0.0	6.8	13.6	23.2	23.0	27.2	39.0	47.1	62.9	81.5	72.9	75.5	83.3	67.6	64.4	58.9	49.2	30.5	15.7	0.0	0.0					842.4
(2)Monthly Crop Consumptive Use	(mm)						43.6			89.3			191			232			191			95.4							
(3)Soaking	(mm)			16.7	16.7	16.7																							50.0
(4)Effective Rainfall	(mm)			9.7	4.7	4.7	5.2	7.7	7.7	8.5	31.0	31.0	34.1	21.8	21.8	24.0	14.9	14.9	14.9	2.8	2.8	3.1	0.6	0.6					
(5)Leaching Reqirement ((1)+(3)-(4))*10%	(mm)			0.7	1.9	2.6	1.8	1.5	2.0	3.1	1.6	3.2	4.7	5.1	5.4	5.9	5.3	4.9	4.4	4.6	2.8	1.3	0.0	0.0					
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)			7.7	20.7	28.2	19.8	16.9	21.5	33.6	17.7	35.1	52.2	56.2	59.1	65.3	58.0	54.4	48.4	51.0	30.5	13.8	0.0	0.0					689.9
(7)Monthly Net Irrigation Requirement	(mm)			7.7			68.7			72.0			105			181			161			95.4							

Table A.1.8-2 (5/15) : Water Requirement for Lower Jhelum Canal System

Crop : Sugarcane

	Month	JAN			FEB			MAR			APR			MAY			JUN			
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	2.9	2.9	2.9	3.9	3.9	3.9	5.3	5.3	5.3	7.3	7.3	7.3	9.3	9.3	9.3	9.6	9.6	9.6	
(ETo)	(mm/10day)	29	29	32	39	39	31	53	53	58	73	73	73	93	93	102	96	96	96	
Cropping Area								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
							0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
					0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
Total Crop Area Ratio		0.00	0.00		0.17	0.33	0.67	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Crop Coefficent								0.48	0.50	0.53	0.54	0.56	0.59	0.61	0.69	0.73	0.78	0.82		
							0.48	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.73	0.78	0.82	0.85	0.87	
					0.48	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.75	0.78	0.82	0.85	0.87	0.88	0.89	
Weighted Mean Crop Coefficient		0.0	0.0		0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	
(1)Crop Consumptive Use																				sub total
	(mm)	0.0	0.0	0.0	3.1	6.5	10.5	18.4	23.5	31.7	42.1	44.3	47.5	63.9	68.5	79.1	78.1	80.3	82.6	679.9
(2)Monthly Crop Consumptive Use	(mm)			0.0			20.1			73.5			134			211			241	
(3)Soaking	(mm)			16.7		16.7		16.7												50.1
(4)Effective Rainfall	(mm)	1.3	1.3	1.4	8.0	8.0	6.4	13.0	13.0	14.3	8.8	8.8	8.8	4.7	4.7	5.2	7.7	7.7	8.5	
(5) Leaching Requirement ((1)+(3)-(4))*10%	(mm)	0.0	0.0	1.5	0.0	1.5	0.4	2.2	1.0	1.7	3.3	3.5	3.9	5.9	6.4	7.4	7.0	7.3	7.4	0
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	0.0	0.0	16.8	0.0	16.7	4.5	24.3	11.5	19.1	36.6	39.0	42.5	65.1	70.2	81.3	77.4	79.9	81.5	sub total 666.6
(7)Monthly Net Irrigation Requirement	(mm)			16.8			21.2			54.9			118			217			239	

	Month	JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	7.8	7.8	7.8	7.1	7.1	7.1	6.5	6.5	6.5	6.1	6.1	6.1	3.8	3.8	3.8	2.7	2.7	2.7	
(ETo)	(mm/10day)	78	78	86	71	71	78	65	65	65	61	61	67	38	38	42	27	27	30	
Cropping Area		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
Total Crop Area Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	
Crop Coefficent		0.85	0.87	0.88	0.89	0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.66	0.63	0.57	0.52	0.51	0.50	0.50	
		0.88	0.89	0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.52	0.51	0.50	0.50			
		0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.52	0.51	0.50	0.50					
Weighted Mean Crop Coefficient		0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.4	0.4	0.4	0.2	0.2	0.0	0.0	
(1)Crop Consumptive Use	(mm)	68.4	69.2	76.1	62.7	60.6	65.1	51.1	49.6	45.7	40.7	37.6	28.2	14.6	13.7	7.2	4.6	0.0	0.0	1375.0
(2)Monthly Crop Consumptive Use	(mm)			214			188			146			106			35.5			4.6	
(3)Soaking	(mm)																			50.1
(4)Effective Rainfall	(mm)	31.0	31.0	34.1	21.8	21.8	24.0	14.9	14.9	14.9	2.8	2.8	3.1	0.6	0.6	0.7	4.7	4.7	5.2	
(5)Leaching Requirement ((1)+(3)-(4))*10%		3.7	3.8	4.2	4.1	3.9	4.1	3.6	3.5	3.1	3.8	3.5	2.5	1.4	1.3	0.7	0.0	0.0	0.0	
(5)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	41.1	42.0	46.2	45.0	42.7	45.2	39.9	38.2	33.9	41.7	38.3	27.6	15.4	14.4	7.2	0.0	0.0	0.0	1185.2
(6)Monthly Net Irrigation Requirement	(mm)			129			133			112			108			37			0	

Table A.1.8-2 (6/15) : Water Requirement for Lower Chenab Canal System

Crop :Wheat

	Month	OCT			NOV			DEC			JAN			FEB			MAR			APR			MAY			JUN			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	6.8	6.8	6.8	4.1	4.1	4.1	3.0	3.0	3.0	3.1	3.1	3.1	4.2	4.2	4.2	5.9	5.9	5.9	8.2	8.2	8.2	10.1	10.1	10.1	10.1	10.1	10.1	
(ETo)	(mm/10day)	68	68	75	41	41	41	30	30	33	31	31	34	42	42	34	59	59	65	82	82	82	101	101	111	101	101	101	
Cropping Area					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
							0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17				
								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17				
Total Crop Area					0.33	0.33	0.50	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	0.33	0.17				
Crop Coefficent					0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10									
						0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10								
					0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.88	0.68	0.51	0.37	0.23	0.12	0.10	0.10									
Weighted Mean Crop Coefficient					0.12	0.17	0.28	0.44	0.59	0.77	0.89	0.93	0.97	0.89	0.83	0.68	0.54	0.39	0.28	0.16	0.11	0.06	0.03	0.00				
(1)Crop Consumptive Use (ETc)	(mm)			0.0	5.1	7.0	11.4	13.1	17.6	25.4	27.6	28.9	33.0	37.5	34.9	23.0	31.9	23.0	18.2	13.4	9.0	4.6	3.4	0.0					367.8
(2)Monthly Crop Consumptive Use	(mm)			0.0			23.4			56.1			89.5			95.3			73.0			27.1			3.4			
(3)Soaking	(mm)			16.7		16.7		16.7																					50.1
(4)Effective Rainfall	(mm)			0.1	0.0	0.0	0.0	1.5	1.5	1.6	2.3	2.3	2.5	5.0	5.0	4.0	4.8	4.8	5.3	6.0	6.0	6.6	4.9	4.9					
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)			1.7	0.5	2.4	1.1	2.8	1.6	2.4	2.5	2.7	3.0	3.3	3.0	1.9	2.7	1.8	1.3	0.7	0.3	0.0	0.0	0.0					
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)			18.3	5.6	26.0	12.6	31.1	17.7	26.2	27.8	29.3	33.5	35.8	32.8	20.9	29.8	20.0	14.2	8.1	3.3	0.0	0.0	0.0					392.9
(7) Monthly Net Irrigation Requirement	(mm)			18.3			44.2			75.0			90.6			89.5			64.0			11.5			0.0			

Table A.1.8-2 (7/15) : Water Requirement for Lower Chenab Canal System

Crop :Maize

	Month	MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	10	10	10	11	
Evapotranspiration	(mm/day)	10.1	10.1	10.1	10.1	10.1	10.1	8.4	8.4	8.4	7.6	7.6	7.6	7.0	7.0	7.0	6.8	6.8	6.8	4.1	4.1	4.1	3.0	3.0	3.0	
(ETo)	(mm/10day)	101	101	111	101	101	101	84	84	92	76	76	84	70	70	70	68	68	75	41	41	41	30	30	33	
Cropping Area											0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
											0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17					
								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area								0.17	0.33	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.50	0.33					
Crop Coefficent											0.20	0.24	0.33	0.75	1.00	1.06	1.06	0.98	0.82	0.59	0.40					
											0.20	0.24	0.35	0.75	1.00	1.06	0.98	0.82	0.59	0.40						
								0.20	0.24	0.35	0.75	1.00	1.06	1.06	0.98	0.82	0.59	0.40								
Weighted Mean Crop Coefficient								0.03	0.08	0.18	0.36	0.52	0.72	0.94	1.02	0.99	0.68	0.60	0.27	0.00	0.00					
(1)Crop Consumptive Use (ETc)	(mm)							0.0	2.8	7.4	13.4	27.6	43.8	50.4	65.6	71.4	67.1	46.2	44.9	11.2	0.0	0.0				451.8
(2)Monthly Crop Consumptive Use	(mm)									10.2			84.8			187			158			11.2				
(3)Soaking	(mm)							16.7		16.7	16.7															50.0
(4)Effective Rainfall	(mm)							18.4	18.4	20.2	12.4	12.4	13.6	10.6	10.6	10.6	0.1	0.1	0.1							
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)							0.0	0.0	0.4	1.8	1.5	3.0	4.0	5.5	6.1	6.7	4.6	4.5	1.1	0.0	0.0	0.0	0.0	0.0	50.2
(5)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)							0.0	0.0	4.2	19.5	16.7	33.1	43.8	60.5	66.9	73.7	50.8	49.3	12.3	0.0	0.0				430.7
(6) Monthly Net Irrigation Requirement	(mm)									4.2			69.3			171			174			12.3			

Table A.1.8-2 (8/15) : Water Requirement for Lower Chenab Canal System

Crop : Basmati Rice

	Month	APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC		
	(days)	1	2	3	1	2	3	1	2	3	1	2	3.0	1	2	3.0	1	2	3.0	1	2	3.0	1	2	3	1	2	3
ITEM		10	10	10	10	10	11	10	10	10	10	10	11.0	10	10	11.0	10	10	10.0	10	10	11.0	10	10	11	10	10	11
Evapotranspiration	(mm/day)	8.2	8.2	8.2	10.1	10.1	10.1	10.1	10.1	10.1	8.4	8.4	8.4	7.6	7.6	7.6	7.0	7.0	7.0	6.8	6.8	6.8	4.1	4.1	4.1	3.0	3.0	3.0
(ETo)	(mm/10day)	82	82	82	101	101	111	101	101	101	84	84	92.4	76	76	83.6	70	70	70.0	68	68	74.8	41	41	45	30	30	33
Cropping Area										NS	NS	LP	0.3	0.33	0.33	0.3	0.33	0.33	0.3	0.33	0.33	0.3	0.33	0.33				
									NS	NS	LP	0.33	0.3	0.33	0.33	0.3	0.33	0.33	0.3	0.33	0.33	0.3	0.33					
								NS	NS	LP	0.33	0.3	0.3	0.33	0.33	0.3	0.33	0.33	0.3	0.33	0.33	0.3						
Total Crop Area								0.02	0.02	0.02	0.33	0.67	1.0	1.00	1.00	1.0	1.00	1.00	1.0	1.00	1.00	1.0	0.67	0.33				
Crop Coefficent													0.9	0.97	1.06	1.1	1.19	1.25	1.3	1.28	1.18	1.1	1.00	0.64			
												0.89	1.0	1.06	1.14	1.2	1.23	1.30	1.2	1.18	1.10	1.0	0.64				
											0.89	0.97	1.0	1.14	1.19	1.2	1.20	1.28	1.2	1.10	1.00	0.6					
Weighted Mean Crop Coeffcient											0.3	0.6	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.1	0.7	0.3	0.0			
(1)Crop Consumptive Use (ETc)	(mm)										24.9	52.1	89.9	80.3	85.9	99.8	87.3	89.4	87.7	80.7	74.3	52.4	13.7	0.0				
(2)Monthly Crop Consumptive Use	(mm)									0.0			166.9			265.9			264.4			207.4			13.7		
(3)Land Preparation	(mm)									40.0	40.0	40.0																
(4)Nursery	(mm)							0.33	0.67	0.67	0.33																	
(5)Percolation (1.5mm/day)										5.0	10.0	15.0	16.5	15.0	15.0	16.5	15.0	15.0	15.0	15.0	15.0	11.0	5.0	0.0				
(6)Effective Rainfall	(mm)							7.1	7.1	7.81	18.4	18.4	20.2	12.4	12.4	13.6	10.6	10.6	10.6	0.1	0.1	0.1	0	0	0			
(7)Net Irrigation Requirement ((1)+(3)+(4)+(5)-(6))	(mm)							0.0	0.0	37.9	56.9	88.7	86.2	82.9	88.5	102.7	91.7	93.8	92.1	95.6	89.2	63.3	18.7	0.0	0.0			
(8)Monthly Net Irrigation Requirement	(mm)									37.9			231.8			274.0			277.6			248.1			18.7		

Table A.1.8-2 (9/15) : Water Requirement for Lower Chenab Canal System

Crop :Cotton

	Month	APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	10	10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	8.2	8.2	8.2	10.1	10.1	10.1	10.1	10.1	10.1	8.4	8.4	8.4	7.6	7.6	7.6	7.0	7.0	7.0	6.8	6.8	6.8	4.1	4.1	4.1	3.0	3.0	3.0	
(ETo)	(mm/10day)	82	82	82	101	101	111	101	101	101	84	84	92	76	76	84	70	70	70	68	68	75	41	41	45	30	30	33	
Cropping Area					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33					
					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33						
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area					0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.33	0.00				
Crop Coefficent					0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45							
					0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45							
		0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45										
Weighted Mean Crop Coefficient					0.07	0.15	0.23	0.24	0.28	0.41	0.60	0.81	0.95	1.03	1.06	1.07	1.04	0.99	0.91	0.81	0.50	0.23	0.00	0.00					
(1)Crop Consumptive Use (ETc)	(mm)		0.0	7.4	14.8	25.2	24.2	28.6	41.1	50.7	67.8	87.8	78.0	80.8	89.2	72.8	69.3	63.5	54.9	34.0	17.5	0.0	0.0						907.4
(2)Monthly Consumtive Use	(mm)		0.0			47.4			93.9			206			248			206			106			0.0					
(3)Soaking	(mm)		16.7	16.7	16.7																								50.0
(4)Effective Rainfall	(mm)		6.0	4.9	4.9	5.4	7.1	7.1	7.81	18.4	18.4	20.2	12.4	12.4	13.6	10.6	10.6	10.6	0.1	0.1	0.1	0.0	0.0						
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)		1.1	1.9	2.7	2.0	1.7	2.2	3.3	3.2	4.9	6.8	6.6	6.8	7.6	6.2	5.9	5.3	5.5	3.4	1.7	0.0	0.0						
(5)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)		11.7	21.1	29.2	21.8	18.9	23.7	36.6	35.5	54.3	74.3	72.2	75.3	83.1	68.4	64.6	58.2	60.2	37.3	19.1	0.0	0.0						865.4
(6)Monthly Net Irrigation Requirement	(mm)		11.7			72.1			79.1			164			231			191			117			0.0					

Table A.1.8-2 (10/15) : Water Requirement for Lower Chenab Canal System

Crop : Sugarcane

	Month	JAN			FEB			MAR			APR			MAY			JUN			
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	3.1	3.1	3.1	4.2	4.2	4.2	5.9	5.9	5.9	8.2	8.2	8.2	10.1	10.1	10.1	10.1	10.1	10.1	
(ETo)	(mm/10day)	31	31	34	42	42	34	59	59	65	82	82	82	101	101	111	101	101	101	
Cropping Area								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
							0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
					0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
Total Crop Area Ratio		0.00	0.00		0.17	0.33	0.67	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Crop Coefficent								0.48	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.73	0.78	0.82	0.85	
							0.48	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.73	0.78	0.82	0.85	0.87	
					0.48	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.73	0.78	0.82	0.85	0.87	0.88	0.88	
Weighted Mean Crop Coefficient		0.0	0.0		0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	
(1)Crop Consumptive Use (ETc)	(mm)	0.0	0.0	0.0	3.4	7.0	11.3	20.5	26.2	35.3	47.3	49.7	53.3	69.4	74.4	85.9	82.1	84.5	86.9	sub total 737.1
(2)Monthly Crop Consumptive Use	(mm)			0.0			21.7			81.9			150			230			254	
(3)Soaking	(mm)			16.7		16.7		16.7												50.0
(4)Effective Rainfall	(mm)	2.3	2.3	2.5	5.0	5.0	4.0	4.8	4.8	5.3	6.0	6.0	6.0	4.9	4.9	5.4	7.1	7.1	7.1	
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)	0.0	0.0	1.4	0.0	1.9	0.7	3.2	2.1	3.0	4.1	4.4	4.7	6.4	7.0	8.1	7.5	7.7	8.0	
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	0.0	0.0	15.6	0.0	20.5	8.0	35.6	23.5	33.0	45.4	48.1	52.0	70.9	76.5	88.6	82.6	85.1	87.7	sub total 773.1
(7)Monthly Net Irrigation Requirement	(mm)			15.6			28.6			92.0			146			236			255	

	Month	JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	8.4	8.4	8.4	7.6	7.6	7.6	7.0	7.0	7.0	6.8	6.8	6.8	4.1	4.1	4.1	3.0	3.0	3.0	
(ETo)	(mm/10day)	84	84	92	76	76	84	70	70	70	68	68	75	41	41	45	30	30	33	
Cropping Area		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
Total Crop Area Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	
Crop Coefficent		0.85	0.87	0.88	0.89	0.90	0.90	0.88	0.85	0.78	0.74	0.70	0.69	0.61	0.57	0.52	0.51	0.50	0.50	
		0.88	0.89	0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.53	0.51	0.50	0.50			
		0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.53	0.51	0.50	0.50					
Weighted Mean Crop Coefficient		0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.4	0.4	0.4	0.2	0.2	0.0	0.0	
(1)Crop Consumptive Use (ETc)		73.6	74.5	81.9	67.1	64.9	69.7	55.1	53.4	49.2	45.3	41.9	31.4	15.7	14.8	7.8	5.1	0.0	0.0	1458.6
(2)Monthly Crop Consumptive Use	(mm)			230			202			158			119			38.3			5.1	
(3)Soaking	(mm)																			50.0
(4)Effective Rainfall	(mm)	18.4	18.4	20.2	12.4	12.4	13.6	10.6	10.6	10.6	0.1	0.1	0.1	0.0	0.0	0.0	1.5	1.5	1.7	
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)	5.5	5.6	6.2	5.5	5.2	5.6	4.4	4.3	3.9	4.5	4.2	3.1	1.6	1.5	0.8	0.4	0.0	0.0	
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	60.8	61.7	67.9	60.2	57.7	61.7	48.9	47.1	42.5	49.8	46.0	34.4	17.3	16.2	8.6	4.0	0.0	0.0	1457.8
(7)Monthly Net Irrigation Requirement	(mm)			190			180			139			130			42.1			4.0	

Table A.1.8-2 (11/15) : Water Requirement for Central Bali Doab Canal System

Crop :Wheat

	Month	OCT			NOV			DEC			JAN			FEB			MAR			APR			MAY			JUN			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	6.7	6.7	6.7	4.3	4.3	4.3	3.0	3.0	3.0	3.2	3.2	3.2	4.4	4.4	4.4	5.8	5.8	5.8	8.2	8.2	8.2	9.8	9.8	9.8	9.9	9.9	9.9	
(ETo)	(mm/10day)	67	67	74	43	43	43	30	30	33	32	32	35	44	44	35	58	58	64	82	82	82	98	98	108	99	99	99	
Cropping Area					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17				
						0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17					
								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area					0.33	0.33	0.50	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	0.33	0.17					
Crop Coefficent					0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.85	0.68	0.51	0.37	0.23	0.12	0.10	0.10									
						0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.85	0.68	0.51	0.37	0.23	0.12	0.10									
								0.37	0.51	0.65	0.80	0.92	1.00	1.10	1.00	0.85	0.68	0.51	0.37	0.23	0.12	0.10	0.10						
Weighted Mean Crop Coefficient					0.12	0.17	0.28	0.44	0.59	0.77	0.89	0.93	0.97	0.89	0.83	0.68	0.54	0.39	0.28	0.16	0.11	0.04	0.03	0.00					
(1)Crop Consumptive Use (ETc)	(mm)		0.0		5.3	7.3	12.0	13.1	17.6	25.4	28.5	29.9	34.0	39.3	36.5	24.1	31.3	22.6	17.9	13.4	9.0	3.3	3.3	0.0					373.7
(2)Monthly Crop Consumptive Use	(mm)		0.0				24.6			56.1			92.4			99.9			71.8			25.7			3.3				
(3)Soaking	(mm)		16.7			16.7		16.7																					50.1
(4)Effective Rainfall	(mm)		1.5		0.8	0.8	0.6	3.7	3.7	4.1	5.5	5.5	6.1	12.1	12.1	9.7	8.2	8.2	9.0	4.4	4.4	4.4	5.1	5.1					
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)		1.5		0.5	2.3	1.1	2.6	1.4	2.1	2.3	2.4	2.8	2.7	2.4	1.4	2.3	1.4	0.9	0.9	0.5	0.0	0.0	0.0					
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)		16.7		5.0	25.5	12.5	28.7	15.2	23.5	25.3	26.8	30.8	29.9	26.9	15.8	25.4	15.9	9.7	9.9	5.1	0.0	0.0	0.0					348.5
(7)Monthly Net Irrigation Requrement	(mm)		16.7				42.9			67.4			82.9			72.6			51.0			15.0			0.0				

Table A.1.8-2 (12/15) : Water Requirement for Central Bali Doab Canal System

Crop :Maize

	Month	MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	10	10	10	11	
Evapotranspiration	(mm/day)	9.8	9.8	9.8	9.9	9.9	9.9	7.7	7.7	7.7	6.8	6.8	6.8	6.5	6.5	6.5	6.7	6.7	6.7	4.3	4.3	4.3	3.0	3.0	3.0	
(ETo)	(mm/10day)	98	98	108	99	99	99	77	77	85	68	68	75	65	65	65	67	67	74	43	43	43	30	30	33	
Cropping Area								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17				
										0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17					
											0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33						
Total Crop Area								0.17	0.33	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.50	0.33					
Crop Coefficent								0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40								
										0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40						
											0.20	0.24	0.33	0.75	1.00	1.08	1.06	0.98	0.82	0.59	0.40					
Weighted Mean Crop Coefficient	(mm)							0.03	0.08	0.18	0.36	0.52	0.72	0.94	1.02	0.99	0.68	0.60	0.27	0.00	0.00					
(1)Crop Consumptive Use (ETc)	(mm)							2.6	6.8	12.0	24.7	39.1	46.8	60.9	66.3	66.1	45.6	44.2	11.8	0.0	0.0					426.8
(2)Monthly Crop Consumptive Use	(mm)								9.3			63.9			127			89.8			11.8					
(3)Soaking	(mm)							16.7		16.7	16.7															50.0
(4)Effective Rainfall	(mm)							36.4	36.4	40.0	40.6	40.6	44.7	19.2	19.2	21.1	1.4	1.4	1.54	0.8	0.8	0.9				
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)							0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.2	4.5	6.5	4.4	4.3	1.1	0.0	0.0	0.0	0.0	0.0	47.7
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)							0.0	0.0	0.0	0.0	0.0	0.0	30.4	45.9	49.7	71.2	48.6	46.9	12.0	0.0	0.0				304.7
(7)Monthly Irrigation Requirement	(mm)								0.0			0.0			126			167			12.0					

Table A.1.8-2 (13/15) : Water Requirement for Central Bali Doab Canal System

Crop : Basmati Rice

	Month	MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	9.8	9.8	9.8	9.9	9.9	9.9	7.7	7.7	7.7	6.8	6.8	6.8	6.5	6.5	6.5	6.7	6.7	6.7	4.3	4.3	4.3	3.0	3.0	3.0	
(ETo)	(mm/10day)	98	98	108	99	99	99	77	77	85	68	68	75	65	65	65	67	67	74	43	43	47	30	30	33	
Cropping Area							NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33					
						NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
					NS	NS	LP	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33								
Total Crop Area					0.02	0.02	0.02	0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.33					
Crop Coefficient								0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64							
								0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64							
								0.89	0.97	1.06	1.14	1.19	1.25	1.30	1.28	1.18	1.10	1.00	0.64							
Weighted Mean Crop Coefficient								0.3	0.6	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.1	0.7	0.3	0.0					
(1)Crop Consumptive Use	(mm)				0.0	0.0	0.0	22.8	47.7	82.4	71.9	76.8	89.3	81.0	83.0	81.5	79.5	73.3	51.6	14.3	0.00					855.1
(2)Monthly Crop Consumptive Use	(mm)						0.0			153			238			245			204			14.3				
(3)Land Preparation	(mm)						40.0	40.0	40.0																	120.0
(4)Nursery	(mm)				0.33	0.67	0.67	0.33																		2.0
(5)Percolation (1.5mm/day)							5.0	10.0	15.0	16.5	15.0	15.0	16.5	15.0	15.0	15.0	15.0	15.0	11.0	5.0	0.0					184.0
(6)Effective Rainfall	(mm)				9.9	9.9	10.9	36.4	36.4	40.0	40.6	40.6	44.7	19.2	19.2	21.1	1.4	1.4	1.54	0.8	0.8					334.8
(7)Net Irrigation Requirement	(mm)				0.0	0.0	34.8	36.8	66.3	58.9	46.3	51.2	61.1	76.8	78.8	75.4	93.1	86.9	61.1	18.5	0.0					845.9
(8)Monthly Net Irrigation Requirement	(mm)						34.8			162			159			231			241			18.5				

Table A.1.8-2 (14/15) : Water Requirement for Central Bali Doab Canal System

Crop :Cotton

	Month	APR			MAY			JUN			JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	10	10	10	11	10	10	10	10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	8.2	8.2	8.2	9.8	9.8	9.8	9.9	9.9	9.9	7.7	7.7	7.7	6.8	6.8	6.8	6.5	6.5	6.5	6.7	6.7	6.7	4.3	4.3	4.3	3.0	3.0	3.0	
(ETo)	(mm/10day)	82	82	82	98	98	108	99	99	99	77	77	85	68	68	75	65	65	65	67	67	74	43	43	47	30	30	33	
Cropping Area							0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33					
						0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33						
					0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33							
Total Crop Area					0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.33	0.00				
Crop Coefficent							0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45					
						0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45						
					0.22	0.22	0.24	0.26	0.35	0.61	0.85	0.96	1.04	1.08	1.07	1.05	1.00	0.92	0.80	0.70	0.65	0.45							
Weighted Mean Crop Coefficient					0.07	0.15	0.23	0.24	0.28	0.41	0.60	0.81	0.95	1.03	1.06	1.07	1.04	0.99	0.91	0.81	0.50	0.23	0.00	0.00					
(1)Crop Consumptive Use (ETc)	(mm)			0.0	7.2	14.4	24.4	23.8	28.1	40.3	46.5	62.1	80.5	69.8	72.3	79.8	67.6	64.4	58.9	54.0	33.5	17.2	0.0	0.0					844.6
(2)Monthly Crop Consumptive Use	(mm)			0.0			46.0			92.1			189			222			191			105			0.0				
(3)Soaking	(mm)			16.7	16.7	16.7																							50.0
(4)Effective Rainfall	(mm)			4.4	5.1	5.1	5.6	9.9	9.9	10.9	36.4	36.4	40.0	40.6	40.6	44.7	19.2	19.2	21.1	1.4	1.4	1.5	0.8	0.8					
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)			1.2	1.9	2.6	1.9	1.4	1.8	2.9	1.0	2.6	4.0	2.9	3.2	3.5	4.8	4.5	3.8	5.3	3.2	1.6	0.0	0.0					
(5)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)			13.5	20.6	28.5	20.7	15.2	20.0	32.3	11.1	28.3	44.5	32.1	34.9	38.6	53.2	49.7	41.6	57.9	35.3	17.2	0.0	0.0					595.3
(6)Monthly Net Irrigation Requirement	(mm)			13.5			69.9			67.5			83.9			106			145			110			0.0				

Table A.1.8-2 (15/15) : Water Requirement for Central Bali Doab Canal System

Crop : Sugarcane

	Month	JAN			FEB			MAR			APR			MAY			JUN			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	8	10	10	11	10	10	10	10	10	11	10	10	10	
Evapotranspiration	(mm/day)	3.2	3.2	3.2	4.4	4.4	4.4	5.8	5.8	5.8	8.2	8.2	8.2	9.8	9.8	9.8	9.9	9.9	9.9	
(ETo)	(mm/10day)	32	32	35	44	44	35	58	58	64	82	82	82	98	98	108	99	99	99	
Sugarcane																				
Cropping Area								0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
							0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
					0.17	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
Total Crop Area Ratio		0.00	0.00		0.17	0.33	0.67	0.67	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Crop Coefficent								0.45	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.75	0.78	0.82		
							0.45	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.75	0.78	0.82	0.85	0.87	
					0.45	0.50	0.53	0.54	0.56	0.59	0.64	0.69	0.75	0.78	0.82	0.85	0.87	0.88	0.89	
Weighted Mean Crop Coefficient		0.0	0.0		0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	
(1)Crop Consumptive Use																				sub total
	(mm)	0.0	0.0		3.5	7.3	11.9	20.1	25.7	34.7	47.3	49.7	53.3	67.3	72.2	83.4	80.5	82.8	85.1	724.9
(2)Monthly Crop Consumptive Use				0.0			10.9			45.8			97.0			139			163	
(3)Soaking	(mm)			16.7		16.7		16.7												50.0
(4)Effective Rainfall																				
	(mm)	5.5	5.5	6.1	12.1	12.1	9.7	8.2	8.2	9.0	4.4	4.4	4.4	5.1	5.1	5.6	9.9	9.9	10.9	
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)	0.0	0.0	1.1	0.0	1.2	0.2	2.9	1.8	2.6	4.3	4.5	4.9	6.2	6.7	7.8	7.1	7.3	7.4	
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	0.0	0.0	11.7	0.0	13.1	2.4	31.4	19.3	28.2	47.2	49.9	53.8	68.4	73.8	85.5	77.7	80.2	81.7	sub total 724.2
(7)Monthly Net Irrigation Requirement	(mm)			11.7			15.5			78.9			151			228			240	

	Month	JUL			AUG			SEP			OCT			NOV			DEC			Total
	(days)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ITEM		10	10	11	10	10	11	10	10	10	10	10	11	10	10	11	10	10	11	
Evapotranspiration	(mm/day)	7.7	7.7	7.7	6.8	6.8	6.8	6.5	6.5	6.5	6.7	6.7	6.7	4.3	4.3	4.3	3.0	3.0	3.0	
(ETo)	(mm/10day)	77	77	85	68	68	75	65	65	65	67	67	74	43	43	47	30	30	33	
Sugarcane																				
Cropping Area		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.17	
		0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33				
Total Crop Area Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.50	
Crop Coefficent		0.85	0.87	0.88	0.89	0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.52	0.51	0.50	0.50	
		0.88	0.89	0.90	0.90	0.88	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.52	0.51	0.50	0.50			
		0.90	0.90	0.89	0.86	0.78	0.74	0.70	0.69	0.63	0.57	0.52	0.51	0.50	0.50					
Weighted Mean Crop Coefficient		0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.4	0.4	0.4	0.2	0.2	0.0	0.0	10.3
(1)Crop Consumptive Use (ETc)		67.5	68.3	75.1	60.1	58.0	62.3	51.1	49.6	45.7	44.7	41.3	31.0	16.5	15.5	8.2	5.1	0.0	0.0	1424.8
(2)Monthly Crop Consumptive Use	(mm)			211			180			146			117			40.2			5.1	
(3)Soaking	(mm)																			50.0
(4)Effective Rainfall																				
	(mm)	36.4	36.4	40.0	40.6	40.6	44.7	19.2	19.2	21.1	1.4	1.4	1.5	0.8	0.8	0.9	3.7	3.7	4.1	
(5)Leaching Requirement ((1)+(3)-(4))*10%	(mm)	3.1	3.2	3.5	1.9	1.7	1.8	3.2	3.0	2.5	4.3	4.0	2.9	1.6	1.5	0.7	0.1	0.0	0.0	
(6)Net Irrigation Requirement ((1)+(3)-(4)+(5))	(mm)	34.2	35.1	38.6	21.4	19.2	19.4	35.1	33.5	27.1	47.6	43.9	32.4	17.3	16.1	8.0	1.5	0.0	0.0	1154.6
(7)Monthly Net Irrigation Requirement	(mm)			108			60.0			95.7			124			41.4			1.5	

Table A.1.9-1 Performance of Canal Lining Types under Experiment

Types of Lining	Water Tightness (% saving against unlined case)(R:repaied)							Penetration	Clack/Joint	Remarks
	Initial	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	Weed/Rodent	Damage	
(Single Material Lining)										
1) 3" Flat Brick lining	85.5	80.2(R)	76.7	71.6	67.9	55.8	34.7	N	H	Joints damaged at toe mainly by rodent
2) 1/2" Ceramic tile lining	75.9	74.4	70.1	65.8	61.2	57.4	-	N	H	More damage by weed observed than brick
3) 1.5mm EPDM Rubber lining	99.1	(under experiment)						N	N	Some bites by rodent are observed
4) Compacted Clay Type Soil	61.1	60	54.5	31.3	-	-	-	H	H	Damaged by rodent
5) Soil Sealants/Asphalt Emalsion	20-90	-	-	-	-	-	-	O	O	Losing thier efficiency very soon
(Combination Type Lining)										
1) 3" Flat Brick + 1/2" Mortar Top	98.6	98(R)	97.7	92.9	85.3	70.9	-	N	O	showed longer stability
2) EPDM Rubber + 3" Flat Brick	94.6	99.4	99.1	(under experiment)				N	N	highly resistant for any type of damage
3) EPDM Rubber + 9" Soil Cover	99.6	99.4	99.44	(under experiment)				O	N	soil cover is required against cattle or machinery for application
4) Bentonite(5%) mix soil+ 9" Soil cover	97.6	-	86.1	79.8	66.5	44.5	-	O	O	longer term monitoring is on-going
5) 0.1mm Polyethylene + 9" Soil Cover	93.4	92.4	67.9	80.3(R)	37.4	-	-	H	O	Resin sheets are week against weed/rodent even covered by soil or brick
6) 1/2" Mortar Cover+ 2" Concrete Lining	92.2	83.4	(under experiment)					N	O	Thin Concrete showed cracks
7) Double of 6)	98	(under experiment)						N	N	

Note: 1)level of damege: H(heavily), M(Moderately),O(some observed), N(negative)
2)All lining are placed on 1/2" cement sand mortar(1: 10 mix) subgrade

Table A.1.9-2 (1/10) Current Status of Lining of Distributaries and Minors in the Study Area

(Unit: km)

Name of System	Lining Status (Type)		Length(km) Distributaries	Minors	Disty & Minors	Percectage lined	kind
C.B.D.C	unlined		403.86	274.71	678.58	(80)	
(Lahore)		Concrete	47.95	25.49	73.44		(44)
	lined	Brick	57.17	29.16	86.33		(51)
		Brick(Slope)	0.40	8.00	8.40		(5)
		Total linied	105.52	62.66	168.17	(20)	
	Total length		509.38	337.37	846.75		
LCC	unlined		2,331.46	898.78	3,230.25	(85)	
(Faisalabad)		Concrete	73.74	45.25	118.98		(21)
	lined	Brick	216.63	146.25	362.89		(65)
		Brick(Slope)	57.70	15.21	72.90		(13)
		Total linied	348.07	206.71	554.77	(15)	
	Total length		2,679.53	1,105.49	3,785.02		
LJC	unlined		1,253.69	634.43	1,888.12	(95)	
(Salgodha)		Concrete	50.28	2.66	52.94		(58)
	lined	Brick	3.91	15.81	19.72		(22)
		Brick(Slope)	11.25	7.31	18.56		(20)
		Total linied	65.44	25.78	91.22	(5)	
	Total length		1,319.13	660.21	1,979.34		
Total	unlined		3,989.01	1,807.92	5,796.94	(88)	
		Concrete	171.97	73.40	245.37		(30)
	lined	Brick	277.72	191.23	468.95		(58)
		Brick(Slope)	69.34	30.52	99.86		(12)
		Total linied	519.03	295.15	814.17	(12)	
	Total length		4,508.04	2,103.07	6,611.11		

Note: Many portions are lined near town, parent canal or some facilities, which are not included within the length.
Cost data are in lack for considerable numbers of canal and hence undependable.

Table A.1.9-2 (2/10)

List of Canal Lining Works Performed in Lower Jhelm Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
1	ISRP Phase I	Kirana	Chokera	Distributary	84,450	90,000	5,550	1986	1987	Brick Lining	1.49
2	ISRP Phase I	Kirana	Asian	Minor	6,900	24,300	17,400	1986	1987	Brick Side Protection	1.26
3	ISRP Phase I	Kirana	Manazar	Distributary	20	26,670	26,650	1986	1987	Brick Side Protection	0.45
4	ISRP Phase I	Kirana	Uppi	Minor	0	6,648	6,648	1986	1987	Brick Side Protection	0.42
5	ISRP Phase I	Kirana	Jhol Pur	Distributary	34,500	44,850	10,350	1986	1987	Brick Side Protection	0.67
					Sub-total		66,598				4.29
6	ISRP Phase II	Kirana	Devidas Pur	Minor	3,050	14,770	11,720	1993	1994	Brick Lining	1.49
7	ISRP Phase II	Kirana	Pindi	Minor	0	4,800	4,800	1993	1994	Brick Lining	0.63
8	ISRP Phase II	Kirana	Qazian	Minor	21,000	25,665	4,665	1993	1994	Brick Lining	0.73
9	ISRP Phase II	Kirana	Deowal	Distriburary	62,000	93,024	31,024	1993	1994	Brick Side Protection	5.33
					Sub-total		52,209				8.18
10	M&R	Kirana	Darya	Minor	0	27,363	27,363	1987	1993	Brick Lining	2.35
11	ADP	Kirana	Kandi	Minor	8,630	11,930	3,300	1991	1992	Brick Lining	0.50
12	ADP	Kirana	Mian	Minor	0	8,720	8,720	1991	1992	Concrete Lining	1.38
13	ADP	Kirana	Malke Branch	Distributary	36,113	61,574	25,461	1993	1994	Concrete Lining	4.92
14	ADP	Kirana	Lalian	Distributary	179,200	184,000	4,800	1991	1992	Brick Lining	0.70
15	ADP	Kirana	Lalian	Distributary	160,000	179,200	19,200	1993	1994	Concrete Lining	4.57
16	ADP	Kirana	Kirana	Distributary	176,100	206,542	30,442	1993	1994	Concrete Lining	6.89
16	ADP	Kirana	Hujjian	Distributary	109,000	111,473	2,473			Brick Lining	-
17	ADP	Salgodha	Aamir	Distributary	0	19,300	19,300	1994	1995	Concrete Lining	4.60
18	ADP	Salgodha	Sobhi	Distributary	28,000	44,150	16,150	1992	1993	Concrete Lining	2.58
19	ADP	Salgodha	Naurang	Distributary	97,300	133,000	35,700	1992	1995	Concrete Lining	6.42
20	ADP	Salgodha	Ramdene	Distributary	0	18,600	18,600	1994	1995	Concrete Lining	3.75
					Sub-total		184,146				36.31
			TOTAL COST OF CANAL LINING				330,316				51.13

Note: ISRP: Irrigation System Rehabilitation Project, financed by World Bank, USAID and Government of Netherlands.
ADP: Annual Development Program, by Government of Punjab. M&R: Maintenance and Repair Programme, by Government of Punjab.
CWMP: Command Water Management Program SCARP: Khushab Salinity Control and Reclamation Project

Table A.1.9-2 (3/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
1	ISRP Phase I	East	Ghour Dour	Distributary	48,800	67,919	19,119	-	-	Brick Lining	4.50
2	ISRP Phase I	East	Lagar	Distributary	44,000	62,218	18,218	-	-	Brick Lining	4.30
3	ISRP Phase I	East	Tarkhani	Distributary	134,500	153,033	18,533	-	-	Brick Lining	4.00
4	ISRP Phase I	East	No.1	Minor	20,400	26,760	6,360	-	-	Brick Side Protection	
5	ISRP Phase I	East	Mungi	Distributary	108,300	121,278	12,978	-	-	Brick Lining	0.55
6	ISRP Phase I	East	Khatwan	Distributary	23,100	32,600	9,500	-	-	Brick Side Protection	
7	ISRP Phase I	East	Debora	Distributary	42,700	49,100	6,400	-	-	Brick Lining	1.50
8	ISRP Phase I	East	Tandlianwala	Distributary	60,500	66,000	5,500	-	-	Brick Side Protection	
9	ISRP Phase I	West	Chiniot	Distributary	151,462	161,153	9,691	-	-	Brick Lining	1.14
10	ISRP Phase I	East	Sultan Pakhra	Distributary	172,000	180,466	8,466	-	-	Brick Lining	1.80
11	ISRP Phase I	West	Jhang	Minor	0	28,063	28,063	1985	1986	Brick Lining	1.98
12	ISRP Phase I	West	Ghaggi	Minor	0	2,685	2,685	1985	1986	Brick Lining	0.40
					Sub-total		145,513				20.17
13	ISRP Phase II	East	Shark Pur	Distributary	155,275	172,426	17,151	-	1994	Brick Lining	10.90
14	ISRP Phase II	East	Nankana	Minor	54,500	64,105	9,605	-	1993	Brick Lining	2.77
15	ISRP Phase II	East	Mundi (sub)	Minor	0	6,000	6,000	-	1994	Brick Lining	8.38
16	ISRP Phase II	East	Tash Pur	Minor	10,500	18,125	7,625	-	1994	Brick Lining	〃
17	ISRP Phase II	East	Khar Kalal	Minor	0	4,918	4,918	-	1994	Brick Lining	〃
18	ISRP Phase II	East	Kawanwali	Minor	0	16,125	16,125	-	1994	Brick Lining	〃
19	ISRP Phase II	East	Thatta Isa	Minor	0	5,320	5,320	-	1994	Brick Lining	〃
20	ISRP Phase II	East	Jodhke	Minor	5,300	6,500	1,200	-	1994	Brick Lining	5.89
21	ISRP Phase II	East	Jodhke	Minor	21,500	53,856	32,356	-	1994	Brick Lining	〃
22	ISRP Phase II	East	No.2(Pauliani D)	Minor	0	18,000	18,000	-	1993	Concrete Lining	2.70
23	ISRP Phase II	East	Khanuana	Distributary	44,700	49,000	4,300	-	1995	Brick Lining	4.50
24	ISRP Phase II	East	No.1	Minor	6,142	6,242	100	-	1995	Brick Lining	〃
25	ISRP Phase II	East	No.2	Minor	15,000	16,650	1,650	-	1995	Brick Lining	〃
26	ISRP Phase II	East	Kaluana	Distributary	4,000	16,310	12,310	-	1992	Concrete Lining	2.50
27	ISRP Phase II	East	Tarkhani	Distributary	124,597	134,500	9,903	-	1994	Brick Lining	8.37
28	ISRP Phase II	East	Sarwali	Minor	0	33,600	33,600	-	1993	Brick Lining	8.59
29	ISRP Phase II	East	Kaluka	Minor	0	18,870	18,870	-	1994	Brick Lining	4.10

Table A.1.9-2 (4/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
30	ISRP Phase II	East	Tandlianwala	Distributary	96,000	103,000	7,000	1993	1994	Brick Lining	3.83
31	ISRP Phase II	East	Tandlianwala	Distributary	103,000	119,873	16,873	1993	1994	Concrete Lining	〃
32	ISRP Phase II	East	Bahlak Branch	Distributary	126,582	129,800	3,218	-	1994	Brick Lining	5.90
33	ISRP Phase II	East	Bahlak Branch	Distributary	129,800	136,586	6,786	-	1994	Concrete Lining	〃
34	ISRP Phase II	East	Bahlak Branch	Distributary	136,586	147,568	10,982	-	1994	Brick Lining	〃
35	ISRP Phase II	East	Killianwala	Distributary	100,000	151,586	51,586	-	1993	Brick Lining	19.43
36	ISRP Phase II	East	No.7	Minor	0	13,715	13,715	-	1993	Brick Lining	4.67
37	ISRP Phase II	East	No.8	Minor	0	8,600	8,600	-	1993	Brick Lining	〃
38	ISRP Phase II	East	Samundri	Distributary	22,000	27,000	5,000	-	1992	Brick Lining	1.50
39	ISRP Phase II	East	Samundri	Distributary	47,333	62,228	14,895	-	1992	Concrete Lining	3.61
40	ISRP Phase II	East	Pathana	Minor	14,976	21,980	7,004	-	1994	Brick Lining	1.27
41	ISRP Phase II	East	Hotar	Minor	30,336	54,000	23,664	-	1994	Brick Lining	1.92
42	ISRP Phase II	East	Hotar Sub	Minor	0	6,200	6,200	-	1994	Brick Lining	〃
43	ISRP Phase II	West	Burali	Distributary	29,000	35,980	6,980	-	1995	Brick Side Protection	2.99
44	ISRP Phase II	East	Chouri	Minor	0	5,820	5,820	-	1995	Brick Side Protection	1.50
45	ISRP Phase II	East	Kot Wala	Minor	11,000	11,710	710	-	1993	Brick Lining	0.23
46	ISRP Phase II	West	Kot Ahmad Yar	Minor	33,000	47,710	14,710	-	1993	Concrete Lining	3.69
47	ISRP Phase II	West	Kot Wasawa	Minor	19,000	28,452	9,452	-	1993	Concrete Lining	2.08
48	ISRP Phase II	West	Rasalu	Minor	7,000	10,410	3,410	-	1992	Brick Lining	1.33
49	ISRP Phase II	West	Thatta Fateh Ali	Minor	3,000	5,982	2,982	-	1992	Brick Lining	〃
50	ISRP Phase II	East	Sarang Wala	Distributary	10,000	11,000	1,000	-	1995	Brick Side Protection	2.70
51	ISRP Phase II	East	Lodhran	Minor	0	7,250	7,250	-	1995	Brick Side Protection	〃
52	ISRP Phase II	West	Gugiana	Distributary	15,000	26,100	11,100	-	1995	Brick Side Protection	4.80
53	ISRP Phase II	West	Ghannu	Distributary	42,600	94,709	52,109	-	1994	Concrete Lining	6.00
54	ISRP Phase II	West	Nurka	Minor	0	18,702	18,702	-	1994	Concrete Lining	3.00
55	ISRP Phase II	West	Faqir Sar	Distributary	3,900	5,151	1,251	-	1995	Brick Lining	3.80
56	ISRP Phase II	West	Faqir Sar	Distributary	22,400	24,400	2,000	-	1995	Brick Lining	〃
57	ISRP Phase II	West	Faqir Sar	Distributary	42,780	44,300	1,520	-	1995	Brick Lining	〃
58	ISRP Phase II	West	Khand	Minor	16,650	29,650	13,000	-	1995	Brick Lining	5.90
59	ISRP Phase II	West	Khansar	Minor	0	1,000	1,000	-	1992	Brick Lining	1.05

Table A.1.9-2 (5/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
60	ISRP Phase II	West	Khansar	Minor	25,000	29,095	4,095	-	1992	Brick Lining	〃
61	ISRP Phase II	West	Mochi Wala	Distributary	10,500	32,500	22,000	-	1995	Brick Side Protection	2.70
62	ISRP Phase II	West	Mochi Wala	Distributary	51,065	54,230	3,165	1992	1993	Brick Lining	1.91
63	ISRP Phase II	West	Akil	Distributary	5,000	10,000	5,000	-	1995	Brick Side Protection	2.28
64	ISRP Phase II	West	Akil	Distributary	29,500	30,000	500	-	1995	Brick Side Protection	〃
65	ISRP Phase II	West	Arbi	Distributary	0	11,600	11,600	-	1995	Brick Side Protection	3.10
66	ISRP Phase II	West	Arbi	Distributary	16,000	18,500	2,500	-	1995	Brick Side Protection	〃
67	ISRP Phase II	West	Tul Wala	Distributary	150	2,227	2,077	-	1992	Concrete Lining	3.35
68	ISRP Phase II	West	Tul Wala	Distributary	7,750	13,488	5,738	-	1992	Concrete Lining	〃
69	ISRP Phase II	West	Tul Wala	Minor	0	1,500	1,500	-	1992	Brick Lining	1.48
70	ISRP Phase II	West	Tul Wala	Minor	7,500	9,000	1,500	-	1992	Concrete Lining	〃
71	ISRP Phase II	East	Gharak	Distributary	0	6,896	6,896	-	-	Brick Lining	0.82
72	ISRP Phase II	East	Kamalia	Distributary	31,830	40,200	8,370	-	-	Brick Lining	1.41
73	ISRP Phase II	East	Kanjwani	Distributary	30,000	36,000	6,000	-	-	Brick Lining	1.75
74	ISRP Phase II	East	Azmat Shah	Distributary	0	7,263	7,263	-	-	Brick Lining	
75	ISRP Phase II	West	Batara	Minor	13,780	16,280	2,500	-	-	Brick Lining	
76	ISRP Phase II	West	Lakhis	Minor	12,859	19,473	6,614	-	-	Brick Lining	
77	ISRP Phase II	West	Khair Ali	Distributary	23,288	41,000	17,712	1993	1994	Brick Lining	5.14
78	ISRP Phase II	West	Sir Wala	Distributary	0	33,562	33,562	-	-	Brick Side Protection	
79	ISRP Phase II	West	Kalangri	Minor	9,000	19,445	10,445	1993	1994	Brick Side Protection	1.70
80	ISRP Phase II	West	Uddoki No.1	Distributary	26,175	32,132	5,957	-	1995	Brick Side Protection	3.05
81	ISRP Phase II	West	Uddoki No.2	Distributary	15,000	24,622	9,622	-	1995	Brick Side Protection	3.52
82	ISRP Phase II	West	Ratteki	Minor	31,470	38,470	7,000	-	1995	Brick Side Protection	3.87
83	ISRP Phase II	West	Fatheki	Minor	16,000	23,320	7,320	-	1995	Brick Side Protection	1.77
84	ISRP Phase II	West	Ratti	Distributary	0	11,152	11,152	-	1995	Brick Side Protection	1.01
85	ISRP Phase II	West	Mukhian	Distributary	19,200	30,204	11,004	-	1995	Brick Side Protection	2.79
86	ISRP Phase II	West	Lakhuana	Distributary	47,607	59,205	11,598	-	1995	Brick Side Protection	2.34
87	ISRP Phase II	West	Gatti	Distributary	0	500	500	1993	1994	Brick Side Protection	0.68
88	ISRP Phase II	West	Junian Wala	Distributary	24,000	26,500	2,500	-	1995	Brick Lining	0.93
89	ISRP Phase II	West	Annan	Distributary	27,000	28,766	1,766	-	1994	Brick Side Protection	0.49

Table A.1.9-2 (6/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD) From	To	Distance	Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
90	ISRP Phase II	West	Satiana	Minor	0	1,300	1,300	-	1994	Brick Side Protection	0.55
91	ISRP Phase II	West	Netheri	Minor	0	1,300	1,300	-	1994	Brick Side Protection	0.54
92	ISRP Phase II	West	Doomra	Minor	15,000	18,069	3,069	-	1994	Brick Side Protection	0.91
93	ISRP Phase II	West	Pindori	Minor	0	14,720	14,720	1990	1991	Brick Lining	0.95
94	ISRP Phase II	West	Khanara	Minor	24,255	30,778	6,523	1990	1991	Brick Lining	1.25
95	ISRP Phase II	West	Nilla No.1	Distributary	11,515	12,636	1,121	1991	1992	Brick Lining	0.77
96	ISRP Phase II	West	Nilla No.2	Distributary	3,745	5,310	1,565	1992	1993	Brick Lining	0.68
97	ISRP Phase II	West	Bure Wala	Minor	0	6,176	6,176	1992	1993	Brick Lining	1.91
98	ISRP Phase II	West	Mustan Pur	Minor	0	9,435	9,435	1992	1993	Brick Lining	^
99	ISRP Phase II	West	Guddian	Distributary	10	22,900	22,890	1995	1996	Brick Lining	3.33
100	ISRP Phase II	West	Gilotram	Distributary	0	50,948	9,548	1995	1996	Brick Side Protection	2.83
101	ISRP Phase II	West	Shikar	Distributary	0	20,153	8,778	1994	1995	Brick Side Protection	1.55
102	ISRP Phase II	West	Sultan Pakhra	Distributary	150,000	180,000	10,000	-	-	Brick Side Protection	
103	ISRP Phase II	West	Noorka	Minor	0	18,702	18,702	-	-	Concrete Lining	
104	ISRP Phase II	West	Gojra	Distributary	28,500	49,414	5,414	1991	1992	Brick Lining	2.86
105	ISRP Phase II	West	Zeera	Minor	8,397	8,897	500	1991	1992	Brick Lining	^
106	ISRP Phase II	West	Nawab Wala	Minor	0	10,380	8,580	1991	1992	Brick Lining	0.74
107	ISRP Phase II	West	Amin Pur	Distributary	0	9,432	9,432	1995	1996	Brick Lining	0.92
108	ISRP Phase II	West	Gunnu	Distributary	42 tail	-		1993	1994	Concrete Lining	
109	ISRP Phase II	West	Khand	Minor	0 tial	-		1993	1994	Brick Lining	
110	ISRP Phase II	West	Khewara	Distributary	91,820	124,000	32,180	1991	1992	Brick Lining	9.95
					Sub-total		926,241				215.73
111	CWMP	East	Shah Kot	Distributary	45,000	57,000	12,000	-	-	Concrete Lining	3.30
112	CWMP	East	Shah Kot	Distributary	71,000	153,515	82,515	-	-	Concrete Lining	22.70
113	CWMP	East	Pandwan	Distributary	0	4,908	4,908	-	-	Concrete Lining	
114	CWMP	East	Khurrianwala	Distributary	91,850	99,900	8,050	-	-	Concrete Lining	
115	CWMP	East	Khurrianwala	Distributary	100,000	123,498	23,498	-	-	Concrete Lining	
116	CWMP	East	Chutala	Minor	0	7,700	7,700	-	-	Concrete Lining	
117	CWMP	East	Runwala	Minor	0	9,650	9,650	-	-	Concrete Lining	
118	CWMP	East	Chukeri	Minor	0	34,930	34,930	-	-	Concrete Lining	

Table A.1.9-2 (7/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
119	CWMP	East	Rajewala	Minor	0	15,000	15,000	-	-	Concrete Lining	
		East			Sub-total		198,251				26.00
120	S.T.P.P.	East	Jurrian	Distributary	50,356	65,000	14,644	-	-	Brick Lining	
121	S.T.P.P.	East	Shamir	Minor	0	9,030	9,030	-	-	Brick Lining	
122	S.T.P.P.	East	Wachhoki	Minor	0	21,000	21,000	-	-	Brick Lining	
123	S.T.P.P.	East	Salar	Minor	0	11,734	11,734	-	-	Brick Lining	
124	S.T.P.P.	East	Bath	Distributary	0	15,974	15,974	-	-	Brick Lining	
					Sub-total		72,382				0.00
125	ADP	East	Jalaliana	Distributary	100	10,500	10,400	-	-	Brick Lining	
126	ADP	East	Jalaliana	Distributary	15,000	18,900	3,900	-	-	Brick Lining	
127	ADP	East	Meluana	Minor	0	8,000	8,000	-	-	Brick Lining	
128	ADP	East	Bijwana Sub	Minor	0	2,000	2,000	-	-	Brick Lining	
129	ADP	East	Mangat	Minor	6,650	10,021	3,371	-	-	Brick Lining	
130	ADP	East	Dulchi	Distributary	0	9,000	9,000	1992	1993	Brick Lining	2.00
131	ADP	East	Drawan	Distributary	0	629	629	1992	1993	Brick Lining	0.70
132	ADP	East	Nawrang	Distributary	0	7,500	7,500	1992	1993	Brick Lining	2.00
133	ADP	East	No.3(Tandlianwara)	Minor	0	13,000	13,000	1992	1993	Brick Lining	0.70
134	ADP	East	No.4(Tandlianwara)	Minor	0	12,818	12,818	1992	1993	Brick Lining	2.58
135	ADP	East	No.1(Bhalak Br Dy)	Minor	0	8,640	8,640	1992	1993	Brick Lining	1.00
136	ADP	East	Jhoke	Distributary	0	4,000	4,000	1992	1993	Brick Lining	0.80
137	ADP	East	Perrez(Mehdi)	Distributary	0	12,000	12,000	1992	1993	Brick Lining	3.20
138	ADP	East	Haryal (Girja Dy)	Minor	0	5,000	5,000	-	-	Brick Lining	0.40
139	ADP	East	Russiana	Distributary	7,430	43,200	35,770	-	1991	Brick Lining	4.29
140	ADP	East	No.2,Tarkhani	Minor	0	33,600	33,600	-	-	Brick Lining	
141	ADP	East	No.3,Tarkhani	Minor	0	18,870	18,870	-	-	Brick Lining	
142	ADP	East	Rajiana	Distributary	24,000	37,400	13,400	-	-	Brick Lining	
143	ADP	East	Khikhi	Distributary	40,000	142,870	102,870	1989	1991	Brick Lining	17.75
144	ADP	East	Bachhrianwala	Distributary	0	23,000	23,000	-	-	Brick Lining	

Table A.1.9-2 (8/10)

List of Canal Lining Works Performed in Lower Chenab Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD) From	To	Distance	Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
145	ADP	West	Chheni	Distributary	15,500	33,400	17,900	-	1994	Brick Lining	5.90
146	ADP	West	Moran Wala	Distributary	1,200	17,023	15,823	1992	1993	Brick Lining	4.01
147	ADP	West	Dabora	Distributary	39,500	42,500	3,000	1992	1993	Brick Lining	0.50
148	ADP	West	Burali	Distributary	36,000	42,014	6,014	-	1993	Brick Lining	0.98
149	ADP	West	Majeed	Minor	0	8,780	8,780	-	1993	Brick Lining	1.15
150	ADP	West	Kangra	Distributary	0	6,130	6,130	-	1993	Brick Lining	0.90
151	ADP	West	Guggiana	Distributary	33,114	38,304	5,190	-	1993	Brick Lining	1.00
152	ADP	West	Rewazabad	Minor	0	6,920	6,920	-	1993	Brick Lining	0.96
153	ADP	West	Pinde Rhattian	Distributary	0	4,000	4,000	-	-	Brick Lining	1.47
154	ADP	West	Narwala(Nasrana D)	Minor	16,900	19,103	2,203	-	1991	Brick Lining	1.38
155	ADP	West	Khai	Distributary	57,690	76,456	18,766	-	1991	Brick Lining	3.35
156	ADP	West	Thatha Riaka	Distributary	0	12,630	12,630	-	1993	Brick Lining	0.45
157	ADP	West	Teku	Distributary	29,000	45,600	16,600	1991	1992	Brick Lining	2.58
158	ADP	West	Seowal	Minor	13,655	27,200	13,545	1991	1992	Brick Lining	1.99
159	ADP	West	Naugle	Minor	0	10,000	10,000	1991	1992	Brick Lining	1.20
160	ADP	West	Choti	Distributary	2,500	4,346	1,846	1992	1993	Brick Lining	1.00
161	ADP	West	Kathore	Distributary	0	7,032	7,032	1992	1993	Brick Lining	1.00
					Sub-total		484,147				65.24
162	MPA Grant	East	Khus Pur	Distributary	0	2,446	2,446	-	-	Brick Lining	
163	MPA Grant	East	Nasri	Distributary	0	5,170	5,170	-	1993	Brick Lining	1.16
164	MPA Grant	East	Nasri	Minor	0	1,100	1,100	-	1993	Brick Lining	0.19
165	MPA Grant	East	Gill	Distributary	0	6,770	6,770	-	-	Brick Lining	
					Sub-total		15,486				1.35
			TOTAL COST OF CANAL LINING				1,842,020				328.49

Note: ISRP: Irrigation System Rehabilitation Project, financed by World Bank, USAID and Government of Netherlands.
ADP: Annual Development Program, by Government of Punjab. M&R: Maintenance and Repair Programme, by Government of Punjab.
CWMP: Command Water Management Program, financed by ADB SCARP: Khushab Salinity Control and Reclamation Project
S.T.P.P.: SCARP Transition Pilot Project MPA Grant:

Table A.1.9-2 (9/10)

List of Canal Lining Works Performed in C.B.D. Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
1	ISRP Phase II	Lahore	Khaira	Distributary	55,000	77,790	22,790	1992	1994	Brick Lining	7.92
2	ISRP Phase II	Lahore	Lower Buchar	Minor	11,700	24,354	12,654	1991	1993	Brick Lining	2.90
3	ISRP Phase II	Lahore	Lower Buchar	Minor	2,280	9,070	1,070	1991	1993	Brick Side Protection	^
4	ISRP Phase II	Lahore	Julke	Minor	0	8,500	8,500	1991	1992	Brick Lining	1.50
5	ISRP Phase II	Lahore	Baddoki	Minor	13,000	34,730	21,730	1991	1993	Brick Lining	4.52
6	ISRP Phase II	Lahore	Baddoki	Minor	3,100	9,000	4,000	1991	1993	Brick Side Protection	^
7	ISRP Phase II	Lahore	Shalamar	Distributary	0	26,000	26,000	1991	1993	Brick Lining	8.34
8	ISRP Phase II	Lahore	Kingra	Minor	0	38,047	14,460	1995	1995	Brick Side Protection	2.60
9	ISRP Phase II	Lahore	Vahn	Distributary	31,000	47,000	1,300	1995	1995	Brick Side Protection	0.32
10	ISRP Phase II	Lahore	Risa	Minor	0	13,000	4,500	1995	1995	Brick Side Protection	0.94
11	ISRP Phase II	Lahore	Rosa Sub. No.1	Minor	0	10,000	2,200	1995	1995	Brick Side Protection	0.36
					Sub-total		96,744				25.18
12	ADP	Lahore	Niaz Beg	Distributary	0	76,000	76,000	-	-	Brick Lining	26.60
13	ADP	Lahore	Rai	Minor	0	10,250	10,250	-	-	Brick Lining	1.86
14	ADP	Lahore	Pull	Distributary	0	5,352	5,352	-	-	Brick Lining	1.32
15	ADP	Lahore	Gov't House	Distributary	0	7,000	7,000	-	-	Brick Lining	1.50
16	ADP	Lahore	Khamba	Distributary	0	22,456	22,456	-	-	Brick Lining	5.50
17	ADP	Lahore	Buchar Kahna	Distributary	190,000	219,000	29,000	-	-	Brick Lining	10.15
18	ADP	Lahore	Ditch	Distributary	40,000	45,752	5,752	-	-	Brick Lining	2.13
19	ADP	Lahore	Raiwind No.2	Distributary	0	6,120	6,120	-	-	Brick Lining	1.87
20	ADP	Lahore	Babliana	Minor	0	6,018	6,018	-	-	Brick Lining	1.73
21	ADP	Lahore	Hunjra	Minor	0	23,325	23,325	-	-	Brick Lining	5.93
22	ADP	Lahore	Thatta Bulera	Minor	0	13,139	13,139	-	-	Brick Lining	2.62
23	ADP	Lahore	Maujoki	Distributary				-	-	Brick Lining	
24	ADP	Lahore	Turkwind	Distributary				-	-	Brick Lining	
					Sub-total		204,412				61.21

Table A.1.9-2 (10/10)

List of Canal Lining Works Performed in C.B.D. Canal System

No.	Name of Program	Name of Division	Name of Canal	Kind of Canal	Lining Section (in RD)			Year of Start	Year of Comp.	Kind of Lining	Cost (Mil. Rs)
					From	To	Distance				
25	ADP(FG)	Lahore	Thaman	Distributary	56,000	66,000	10,000	-	-	Brick Lining	
26	CWMP	Lahore	Niaz Beg	Distributary	76,000	185,240	109,240	-	-	Concrete Lining	19.66
27	CWMP	Lahore	Kamogil	Minor	0	15,985	15,985	-	-	Concrete Lining	3.75
28	CWMP	Lahore	Thatta Uttar	Minor	0	9,667	9,667	-	-	Concrete Lining	1.89
29	CWMP	Lahore	Turkwind	Distributary	56,000	84,158	28,158	-	-	Concrete Lining	3.07
30	CWMP	Lahore	Rekh	Distributary	81,180	101,000	19,820	-	-	Concrete Lining	5.49
31	CWMP	Lahore	Warrior	Minor	0	24,465	24,465	-	-	Concrete Lining	5.47
32	CWMP	Lahore	Halla	Minor	0	12,540	12,540	-	-	Concrete Lining	2.17
33	CWMP	Lahore	Montgomery	Minor	0	5,800	5,800	-	-	Concrete Lining	1.11
34	CWMP	Lahore	Ghuman	Minor	0	5,223	5,223	-	-	Concrete Lining	0.93
35	CWMP	Lahore	Pattoki	Minor	0	9,905	9,905	-	-	Concrete Lining	2.82
					Sub-total		240,803				46.36
			TOTAL COST OF CANAL LINING				551,959				132.75

Note: ISRP: Irrigation System Rehabilitation Project, financed by World Bank, USAID and Government of Netherlands.
ADP(FG): Annual Development Program, by Government of Punjab(by Federal Government). M&R: Maintenance and Repair Programme, by Government of Punjab.
CWMP: Command Water Management Program, financed by ADB SCARP: Khushab Salinity Control and Reclamation Project

Table A.1.9-3 (1/3) Present Situation of Structures for LJC Area

No.	Name of Distributry 1	Name of Minor 2	Outlet(Nos) Total nos	Type of Outlet A	B	C	D	E	Superannuation A	B	C/D	Drop(Nos) Total nos	Type A	B	C	Superannuation A	B	C/D	E	Total nos	Bridge(Nos) Type of Bridge AR All	AR A	AR B	AR C/D	DR All	DR A	DR P	DR C/D	VR All	VR A	VR B	VR C/D	FP All	FP A	FP B	FP C/D	RW	Step Total nos	Superannuation A	B	C/D	Aqui-duct	Water Course Cross	Pipe Culvert	Escape	total
1	Pindi		10		4		6			10		2	1	1		1	1			4					1		1		3	1	2															16
2	Hujan		68	5	39		24			35	33	8	6	2			4	4		33	1	1			1			1	21		3	18	10		4	6		23		7	16			1		133
3	Hujan	Arian	6		2		4			6		1		1				1		7									7		5	2													14
4	Hujan	Kot Momin	12		2		10			12		3	1	2			3			8	1	1			3		3		3		3		1		1			2		1	1		1		26
5	Hujan	Kot Raja	5		1		4		3	2										3									3		2	1													8
6	Hujan	Bhikhi	9		5		4			9		1		1			1			4									4		3	1													14
7	Hujan	Sahowai	7	1	4		2		2	4	1									12									11		6	5	1			1		4		4					23
8	Hujan	M.Wala	5		2		3			5										7					1		1		3		3		3		3			2		1	1				14
9	Hujan	Tangu	5		3		2			5		1		1			1			4					1	1			3		2	1													10
10	Hujan	Jaspal	14		7		7		1	14		2	1	1			2			9					1	1			7		5	2	1		1			1							26
	sub-total		131	6	65		60		5	92	34	16	8	8			11	5		87	2	2			7	2	4	1	62		32	30	16		9	7		31		9	22	1		2		268
11	Kirana		103	7	44		46	6	18	80	5	13			13	13				36	1		1		4		3	1	22	4	12	6	8	2	4	2	1	21	3	18		1		1		175
12	Kirana	Saruli	2				2			2										3									3		1	2													5
13	Kirana	Hadda	8		1		7			8		1			1		1			3									3		3														12
14	Kirana	Malkana	18	1	7		9	1		17	1									9					2		2		6	1	5		1		1								1		28
15	Kirana	Wasuana	8		3		5		1	7										4					1	1			1		1		2		2										12
16	Kirana	Tandallan	9		5		4			9										13					1	1			11	4	7						1								22
17	Kirana	Rodion	12		7		5		3	9		1		1			1			8									5	2	2	1	1			1	2					1			22
18	Kirana	Hunde	10	1	6		3			9	1	1	1				1			9					1	1			5		1	4	1		1		2								20
19	Kirana	Killa	8		5		3		4	2	2									8									8	2	3	3													16
20	Kirana	Dhabian	9		6		3			9										4									4		4														13
	sub-total		187	9	86		87	7	26	152	9	16	1	1	14	13	3			97	1		1		9	3	5	1	68	13	39	16	13	2	6	5	6	21	3	18		2		2		325
	Grand Total		328	15	153		153	7	31	254	43	34	10	10	14	14	15	5		188	3	2	1		17	5	10	2	133	14	73	46	29	2	15	12	6	52	3	27	22	3		4		609

Table A.1.9-3 (2/3) Present Situation of Structures for LCC Area

No	Name of Distributry	Name of Minor	Outlet(Nos)								Drop(Nos)								Bridge(Nos)																		Step				Aqua-duct	Water Course Cross	Pipe Culvert	Escape	total
			Total	Type of Outlet					Superannuation		Total	Type			Superannuation				Total	Type of Bridge																		Total	Superannuation							
																				AR				DR				VR				FP			RW										
			nos	A	B	C	D	E	A	B	C/D	nos	A	B	C	A	B	C/D	E	nos	All	A	B	C/D	All	A	B	C/D	All	A	B	C/D	All	A	B	C/D		nos	A	B	C/D					
1	SAKANG WALA		56	4	41		11		2	51	3	4			4	2	2			26				2		2		16	1	13	2	8	1	5	2		12			12	1				99
2	NASRANA		130	9	93		35	3	2	120	8	15	6	2	7	4	8		3	37				4		4		26	1	23	2	6		6		1	1			1	2		1		186
3	NASRANA	SAIDUANA	2				2			2										7								5		5		2		2											9
4	NASRANA	KHILLJANA	5		2		3			3	2									2								2		1	1										1				8
5	NASRANA	NARWALA	3		3					3		1		1						5				1		1		4	1	1	2														9
6	NASRANA	SATIANA	7	1	1		5			7		1		1			1			3								3		2	1														11
7	NASRANA	NATHERI	9	1	7		1			9		1		1			1			8								7	3	4					1										18
8	NASRANA	DOOMRA	11		3		8			11		2			2				2	9								6	1	4	1	2	1	1		1									23
	Sub-total		147	11	99		54	3	2	155	10	20	6	3	9	4	11		5	71				5		5		53	6	40	7	10	1	9		3	1			1	3		2		264
9	GOJRA		41	5	25		11			30	11	12			12			6	6	8				3			3	4		1	3				1									61
10	GOJRA	ZEERA	4				4			4		1						1		2				1		1		1			1														7
	Sub-total		45	5	25		15			34	11	13			13			7	7	10				4		1	3	5		1	4					1									68
11	MUNGI		95	3	78		11	3		74	21	4			1	3	2	1	1	15				4			4	6	1	2	3	5			5						1				115
12	MUNGI	MUNGI	10		4		6			4	6	2			2			2		6				1	1			5		4	1									1				19
	Sub-total		105	3	82		17	3		78	27	6			3	3	2	1	3	21				5	1		4	11	1	6	4	5			5						1		1		134
13	JANIWALA/HAMZA		25	4	15		6			15	10	5	3	2			3	2		5								5	1	2	2														35
14	JANIWALA	AMIRWALA	11	1	8		2			10	1	1		1			1			2								2		2															14
	Sub-total		36	5	23		8			25	11	6	3	3			4	2		7								7	1	4	2														49
15	PIR MAHAL		51	4	31		16			19	32	9		4	5	1	2	4		25				6	1	3		10		10	6	5	1		4						5	2		11	93
16	PIR MAHAL	THERA	5		3		2		1	4										2								2			2														7
17	PIR MAHAL	MEGNEJA	13		9		4			6	7	1		1			1			7				1		1		4		3	1	1		1		1									21
18	PIR MAHAL	JUNEJWALA	24	1	13		10			19	5	1		1				1		8				4		1	3	3			3	1			1									33
19	PIR MAHAL	JANDWALA	3				3			2	1									3								3		2	1	0													6
	Sub-total		96	5	56		35		1	50	45	11		6	5	1	3	5		45				9	1	5	3	28		15	13	7	1	1	5	1					5	2	1	160
20	KILIANWALA		68	6	55		6	1		46	22	1			1	1				17				4	1	2	1	7		3	4	6		3	3		1		1						87
22	KILIANWALA	MINOR #3	13		9		4			13		1			1		1			4								3		3		1	1												18
	Sub-total		81	6	64		10	1		59	22	2			2	1	1			21				4	1	2	1	10		6	4	7	1	3	3		1		1						105
	Total		586	39	390		150	7	5	452	129	62	9	30	23	12	28	17	5	201				29	3	15	11	130	9	85	36	37	4	18	15	5	14		1	13	5	5	5	1	879

Table A.1.9-3 (3/3) Present Situation of Structures for CBDC Area

No.	Name of Distributary 1	Name of Minor 2	Outlet(Nos) Total nos	Type of Outlet A	B	C	D	E	Superannuation A	B	C/D	Drop(Nos) Total nos	Type A	B	C	Superannuation A	B	C/D	E	Bridge(Nos) Total nos	Type of Bridge AR All	AR A	AR B	AR C/D	DR All	DR A	DR B	DR C/D	VR All	VR A	VR B	VR C/D	FP All	FP A	FP B	FP C/D	RW	Sipn Total nos	Superannuation A	B	C/D	Aqui-duct	Water Course Cross	Pipe Culvert	Escape	total
1	Thaman		60	15	38		6	1		15	45	9		9			3	6		22					1		1		19		8	11	1		1		1	15		4	11	2				108
2	Theman	Saharan	22		10		10	2			22									9									8			8	1		1											31
	sub-total		82	15	48		16	3		15	67	9		9			3	6		31					1		1		27		8	19	2		2		1	15		4	11	2				139
3	China		65	3	52		10			4	61	3		3			1	2		19									12		3	9	7			7		4			4	1				92
4	China	Kala	24		23		1				24									6									6			6														30
	sub-total		89	3	75		11			4	85	3		3			1	2		25									18		3	15	7			7		4			4	1				122
	Grand Total		171	18	123		27	3		19	152	12		12			4	8		56					1		1		45		11	34	9		2	7	1	19		4	15	3				261

Table A.2.1-1 SUMMARY TABLE OF CANAL LENGTH IN THE STUDY AREA

1. LOWER JHELUM CANAL CIRCLE
2. LOWER CHENAB CANAL CIRCLE
3. CENTRAL BARI DOAB CANAL CIRCLE

Zone	Circle	Division	Distributaries						Minors						Irrigation Canal System
			Number	Length (canal miles)					Number	Length (canal miles)					
				Total	Lined**	Un-Lined	Perennial	Non-Perennial		Total	Lined**	Un-Lined	Perennial	Non-Perennial	
1. Sargodha Irrigation Zone, Sargodha	1. Lower Jhelum Canal Circle, Sargodha	1. Kirana Canal Division, Sargodha	18	265.64	24.99	240.65	265.64	-	54	183.54	16.92	166.62	183.54	-	Lower Jhelum
		2. Rasul Headworks Division, Rasul	15	122.60	-	122.60	122.60	-	11	26.00	-	26.00	26.00	-	Lower Jhelum
		3. Sargodha Canal Division, Sargodha	33	327.09	17.95	309.14	327.09	-	27	92.73	-	92.73	92.73	-	Lower Jhelum
		4. Shahpur Canal Division, Shahpur	21	150.24	-	150.24	-	150.24	37	130.94	-	130.94	-	130.94	Lower Jhelum
Sub-total			87	865.57	42.94	822.63	715.33	150.24	129	433.21	16.92	416.29	302.27	130.94	
(Sub-total, km)				(1,320)						(661)					
2. Faisalabad Irrigation Zone, Faisalabad	1. Lower Chenab Canal, (West) Circle, Faisalabad	1. Faisalabad Canal Division, Faisalabad	23	206.98	17.15	189.83	206.98	-	33	69.31	14.90	54.41	69.31	-	Lower Chenab
		2. Hafizabad Canal Division, Faisalabad	25	177.37	37.14	140.23	177.37	-	24	73.67	6.24	67.43	73.67	-	Lower Chenab
		3. Jhang Canal Division, Jhang	30	309.38	38.35	271.03	309.38	-	42	136.15	26.39	109.76	136.15	-	Lower Chenab
		4. Khanki Headworks Division, Khanki	16	163.10	3.58	159.52	93.22	69.88	25	65.87	1.82	64.05	18.79	47.08	Lower Chenab
	West Summary		94	856.83	96.22	760.61	786.95	69.88	124	345.00	49.35	295.65	297.92	47.08	
	2. Lower Chenab Canal, (East) Circle, Faisalabad	1. Burala Canal Division, Faisalabad	31	299.77	38.74	261.03	299.77	-	33	128.35	19.73	108.62	128.35	-	Lower Chenab
		2. Lower Gupera Canal Division, Faisalabad	27	295.85	48.34	247.51	295.85	-	33	124.37	26.83	97.54	124.37	-	Lower Chenab
		3. Upper Gupera Canal Division,	26	305.77	45.09	260.68	305.77	-	31	127.67	39.73	87.94	127.67	-	Lower Chenab
	East Summary		84	901.39	132.17	769.22	901.39	0.00	97	380.39	86.29	294.10	380.39	0.00	
Sub-total			178	1,758.22	228.39	1,529.83	1,688.34	69.88	221	725.39	135.64	589.75	678.31	47.08	
(Sub-total, km)				(2,681)						(1,106)					
3. Lahore Irrigation Zone, Lahore	1. Depalpur Canal Circle, Lahore	3. Lahore Canal Division, Lahore	33	329.14	69.24	259.90	329.14	-	68	221.37	41.09	180.28	221.37	-	C. B. D
			1	5.10	-	5.10	5.10	-	-	-	-	-	-	-	B. S. Link
Sub-total			34	334.24	69.24	265.00	334.24		68	221.37	41.09	180.28	221.37		
(Sub-total, km)				(510)						(337)					
Total			299	2,958.03	340.57	2,617.46	2,737.91	220.12	418	1,379.97	193.65	1,186.32	1,201.95	178.02	
(Total, km)				(4,511)	(519)					(2,104)					

**: Updated by the JICA Study Team, 1996.

Table A.2.1-2 (1/3) List of Selected Canals for LJC Area

No.	Name of Distributary 1	Name of Minor 2	Length (km) 3	Outlet (Nos.) 4	Authorize Discharge (m3/s) 5	Design Discharge (m3/s) 6	Command Area (ha) 7	WUA (Nos.) 8	Length of trace by ground Water Quality (km) > 3,000 PPM Length 9	> 3,000 PPM Location 10	3,000 - 1,000 PPM Length 11	3,000 - 1,000 PPM Location 12	< 1,000 PPM Length 13	< 1,000 PPM Location 14	Seepage Rate (%) 15	Lining (unit :km) from (RD) 16	To (RD) 17	Distance 18	Kind 19	Remarks 20
1	Pindi		6.86	10	0.46	0.54	2,285	0			2.34	Tail	4.52	Head	11.60					
2	Hujan		33.98	59	5.16	6.46	11,329	30	4.27	Tail	21.38	T,M	8.33	Head	13.33	109,000	111,473	0.75	Brick	
3	Hujan	Arian	5.43	6	0.28	0.33	1,392	4			3.21	Tail	2.22	Head	9.84					
4	Hujjan	Kot Moman	6.78	12	0.54	0.63	2,668	9			4.73	Tail	2.05	Head	9.54					
5	Hujjan	Kot Raja	2.81	5	0.17	0.20	866	2					2.81	Full	8.24					
6	Hujjan	Bhikhi	6.34	9	0.39	0.46	1,974	3			0.90	Tail	5.44	Head	10.62					
7	Hujjan	Sahowal	5.76	7	0.31	0.37	1,575	6			5.76	Full			11.05					
8	Hujjan	M.Wala	5.87	5	0.26	0.31	1,311	3			5.87	Full			10.44					
9	Hujjan	Tangu	4.84	5	0.29	0.34	1,470	2	4.84	Full					9.49					
10	Hujjan	Jaspal	8.32	14	0.54	0.63	2,651	7	8.32	Full					10.71					
	sub-total		80.13	122	5.16	6.46	25,236	66	17.43		41.85		20.85					0.75		
11	Kirana		62.95	112	10.52	12.86	21,374	48	20.13	T,M	29.97	T,M	12.85	Head	14.26(p)	176,100	206,542	9.19	Concrete	
12	Kirana	Saruli	1.59	2	0.12	0.14	606	0					1.59	Full		(160350-176100 of Kirana are within urgent				
13	Kirana	Hadda	4.11	8	0.36	0.41	1,639	5					4.11	Full		programme by PID)				
14	Kirana	Malkana	10.16	16	0.73	0.87	3,548	11	7.32	Middle	2.84	T,H								
15	Kirana	Wasuana	6.89	8	0.34	0.41	1,731	3			6.28	Head	0.61	Tail						
16	Kirana	Tandalian	3.96	10	0.28	0.32	1,304	1			3.96	Full								
17	Kirana	Rodian	6.04	11	0.49	0.57	2,374	6			2.11	Tail	3.93	Head						
18	Kirana	Hunde	4.92	10	0.37	0.43	1,778	7			4.92	Full								
19	Kirana	Killa	4.10	7	0.23	0.27	1,147	3			4.10	Full								
20	Kirana	Dhabian	2.41	4	0.16	0.19	822	3			2.41	Full			14.62					
	(Chokera and Minors)		30.95				14,441													*1
	sub-total		138.08	188	10.52	12.86	50,765	87	27.45		56.59		23.09					9.19		
	Total		225.07	320	16.14	19.86	78,286	153	44.88		100.78		48.45					9.94		

Total length for LJC is 184.18 km. *1: not included for lining

Table A.2.1-2 (2/3) List of Selected Canals for LCC Area

No.	Name of Distributary	Name of Minor	Length (km)	Outlet (Nos.)	Authorize Discharge (m3/s)	Design Discharge (m3/s)	Command Area (ha)	WUA (Nos.)	Length of trace by ground Water Quality (km)						Seepage Rate (%)	Lining (unit :km)				Remarks
									> 3,000 PPM		3,000 - 1,000 PPM		< 1,000 PPM			from (RD)	To (RD)	Distance	Kind	
									Length	Location	Length	Location	Length	Location						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Sarangwala		25.04	56	1.99	2.46	6,627	6	7.63	Tail	17.41	Middle	0.00	Head	12.49	10,000	11,000	0.20	Side	
2	Nasrana		54.64	131	7.02	8.87	25,094	65	7.93	Tail	46.71	Head			10.99			0.00		
3	Nasrana	Saduana	2.76	3	0.12	0.14	720	2			2.76	Full			4.70			0.00		
4	Nasrana	Khilliana	4.43	5	0.26	0.30	1,293	3			4.43	Full			4.65			0.00		
5	Nasrana	Narwala	5.82	10	0.41	0.48	2,139	7			5.82	Full	0.00		5.64	16,900	19,103	0.67	Brick	
6	Nasrana	Satiana	3.66	6	0.20	0.23	1,015	6	0.61	Tail	3.05	Head			5.26	0	1,300	0.40	Side	
7	Nasrana	Nathen	4.60	8	0.38	0.44	1,800	6			4.60	Full	0.00		4.70	0	13,000	3.97	Side	
8	Nasrana	Domra	5.51	12	0.52	0.61	2,616	7			5.51	Full	0.00		4.79	15,000	18,069	0.94	Side	
	Sub-total		81.42	175	7.02	8.87	34,677	96	8.54		72.88		0.00					5.97		
9	Gojra		15.06	35	1.64	1.95	6,347	20	7.63	Tail	7.43	Middle				28,500	49,414	1.08	Brick	
10	Gojra	Zeera	2.71	4	0.22	0.25	1,193	3	2.71	Full						8,397	8,897	0.10	Brick	
	Sub-total		17.77	39	1.64	1.95	7,540	23	10.34		7.43		0.00					1.18		
11	Mungi		36.97	88	4.05	5.03	17,657	33	5.80	Head	31.17	Tail			12.96	108,300	121,278	3.96	Brick	
12	Mungi	Mungi	4.32	9	0.31	0.36	1,504	1			4.32	Full			5.37	0	6,000	1.83	Brick	
	Sub-total		41.29	97	4.05	5.03	19,161	34	5.80		35.49		0.00					5.79		
13	Janiwala/Hamza		10.96	21	1.31	1.59	4,360	11			10.96	Full	0.00					0.00		
14	Janiwala	Amirwala	7.62	10	0.43	0.51	2,153	7	2.14	Tail	5.48	Head	0.00					0.00		
	Sub-total		18.58	31	1.31	1.59	6,513	18	2.14		16.44		0.00					0.00		
15	Pir Mahal		47.57	51	3.88	5.24	9,902	9			31.07	Head	16.50	Tail	5.21			0.00		
16	Pir Mahal	Thera	4.85	5	0.19	0.23	1,012	0			4.85	Full			2.61			0.00		
17	Pir Mahal	Megneja	9.89	12	0.37	0.45	1,818	1			9.89	Full			4.03			0.00		
18	Pir Mahal	Junejwala	16.08	24	0.98	1.18	4,703	4			11.53	Head	4.55	M.T	7.50			0.00		
19	Pir Mahal	Jandwala	3.74	4	0.15	0.18	807	0			3.74	Full			2.53			0.00		
	Sub-total		82.13	96	3.88	5.24	18,242	14	0.00		61.08		21.05					0.00		
20	Killianwala		46.05	103	5.66	6.96	19,278	38			41.72	Head	4.33	Tail	12.73	100,000	151,586	15.73	Brick	
22	Killianwala	Minor #3	6.66	11	0.33	0.39	1,741	5			6.66	Full			8.66			0.00		
	(Kanjiwani and Minors	Minor #7 & #8)	4.46				6,779													*1
	Sub-total		57.17	114	5.66	6.96	27,798	43	0.00		48.38		4.33					15.73		
	Total		323.40	608	25.55	32.10	120,558	234	34.45		259.11		25.38					28.87		

Total length for LCC is 290.07 km.

*1: not included for lining (Length of Kanjiwalni Distributary System is not available thus not included herewith)

Table A.2.1-2 (3/3) List of Selected Canals for CBDC Area

No.	Name of Distributary 1	Name of Minor 2	Length (km) 3	Outlet (Nos.) 4	Authorize Discharge (m3/s) 5	Design Discharge (m3/s) 6	Command Area (ha) 7	WUA (Nos.) 8	Length of trace by ground Water Quality (km) > 3,000 PPM Length 9	> 3,000 PPM Location 10	3,000 - 1,000 PPM Length 11	3,000 - 1,000 PPM Location 12	< 1,000 PPM Length 13	< 1,000 PPM Location 14	Seepage Rate (%) 15	Lining (unit: km) from (RD) 16	To (RD) 17	Dist. 18	Kind 19	Remarks 20
1	Thamman		29.85	50	7.27	8.29	6.599	6	7.93	H.T	15.67	H.T	6.25	Middle		56.000	66.000	3.02	Brick	
2	Themman	Saharan	7.24	18	0.71	0.82	3.217	8			7.24	Full								
	(Athipur and Kasur)		27.45				16.061													*1
	sub-total		64.54	68	7.27	8.29	25.877	14	7.93		22.91		6.25					3.02		
3	China		25.46	63	3.60	4.33	12.664	19			14.63	Head	10.83	M.T	13.43					
4	China	Kale Minor	7.81	25	0.83	0.96	3.726	9			7.81	Full								
	sub-total		33.27	88	3.60	4.33	16.390	28			22.44		10.83							
	Total		97.81	156	10.87		42.267	42	7.93		45.35		17.08					3.02		

Total length for CBDC is 67.34 km. *1: not included for lining