

Table 1.3.2 (7/12) Water Level in Meghna River at Daudkandi Station

July

Year	1st 10 Daily Average			2nd 10 Daily Average			3rd 10 Daily Average			Monthly Average			Unit : meter in PWD					
	H L R			M H L			R M H			L R M			Max	Min.				
	H	L	R	M	H	L	R	M	H	L	R	M	H	L	R	M		
1960	3.63	3.46	0.17	3.55	4.10	3.97	0.13	4.04	4.85	4.75	0.10	4.80	4.22	4.08	0.14	4.15	5.07	3.28
1961	3.70	3.51	0.19	3.61	3.93	3.76	0.17	3.85	4.19	4.08	0.11	4.14	3.95	3.79	0.16	3.87	4.24	3.35
1962	4.61	4.27	0.34	4.44	4.86	4.65	0.21	4.76	4.65	4.43	0.22	4.54	4.70	4.45	0.25	4.58	4.91	3.84
1963	4.45	4.29	0.16	4.37	4.66	4.48	0.18	4.57	5.03	4.77	0.26	4.90	4.73	4.52	0.21	4.63	5.09	4.18
1964	4.48	4.01	0.47	4.25	4.68	4.30	0.38	4.49	5.07	4.61	0.46	4.84	4.75	4.32	0.43	4.54	5.36	3.70
1965																		
1966																		
1967																		
1968	4.62	4.37	0.25	4.50	5.10	4.90	0.20	5.00	5.39	5.24	0.15	5.32	5.04	4.84	0.20	4.94	5.66	4.17
1969	4.30	4.12	0.18	4.21	4.59	4.42	0.17	4.51	5.04	4.93	0.11	4.99	4.66	4.50	0.16	4.58	5.21	3.99
1970	4.57	4.25	0.32	4.41	4.59	4.28	0.31	4.44	5.27	4.96	0.31	5.12	4.81	4.50	0.31	4.66	5.53	4.13
1971	4.38	4.04	0.34	4.21	4.84	4.46	0.38	4.65	5.13	4.79	0.34	4.96	4.80	4.44	0.36	4.62	5.21	3.87
1972	4.00	3.75	0.25	3.88	4.45	4.33	0.12	4.39	4.36	4.28	0.08	4.32	4.27	4.12	0.15	4.20	4.68	3.22
1973	5.01	4.81	0.20	4.91	4.67	4.53	0.14	4.60	4.41	4.33	0.08	4.37	4.69	4.55	0.14	4.62	5.09	4.11
1974	4.72	4.51	0.21	4.62	4.99	4.70	0.29	4.85	5.47	5.32	0.15	5.40	5.07	4.86	0.21	4.97	5.65	4.28
1975	3.78	3.64	0.14	3.71	4.42	4.29	0.13	4.36	4.84	4.73	0.11	4.79	4.36	4.24	0.12	4.30	5.15	3.55
1976	4.62	4.45	0.17	4.54	5.10	5.06	0.04	5.08	4.82	4.69	0.13	4.76	4.84	4.73	0.11	4.79	5.14	4.05
1977	4.45	4.32	0.13	4.39	4.46	4.27	0.19	4.37	4.95	4.86	0.09	4.91	4.63	4.49	0.14	4.56	5.03	4.02
1978	4.55	4.40	0.15	4.48	4.52	4.37	0.15	4.45	4.80	4.58	0.22	4.69	4.62	4.45	0.17	4.54	4.88	4.30
1979																		
1980																		
1981	4.29	3.88	0.41	4.09	4.65	4.34	0.31	4.50	4.96	4.63	0.33	4.80	4.63	4.28	0.35	4.46	5.30	3.20
1982	4.41	4.17	0.24	4.29	4.73	4.52	0.21	4.63	4.73	4.58	0.15	4.66	4.63	4.42	0.21	4.53	4.80	4.09
1983	4.44	3.97	0.47	4.21	4.80	4.50	0.30	4.65	4.62	4.46	0.16	4.54	4.62	4.31	0.31	4.47	4.90	3.75
1984	4.57	4.39	0.18	4.48	4.88	4.69	0.19	4.79	5.14	5.01	0.13	5.08	4.88	4.71	0.17	4.80	5.25	4.19
1985	4.23	4.09	0.14	4.16	4.41	4.32	0.09	4.37	4.50	4.35	0.15	4.43	4.38	4.26	0.12	4.32	4.65	3.96
1986	4.40	4.15	0.25	4.28	4.60	4.38	0.22	4.49	5.05	4.90	0.15	4.98	4.70	4.49	0.21	4.60	5.11	3.97
1987	4.40	4.25	0.15	4.33	4.69	4.58	0.11	4.64	4.86	4.75	0.11	4.81	4.66	4.53	0.13	4.60	5.31	3.79
1988	4.92	4.76	0.16	4.84	5.42	5.30	0.12	5.36	5.40	5.28	0.12	5.34	5.25	5.12	0.13	5.19	5.55	5.48
Ave.	4.40	4.16	0.24	4.28	4.67	4.48	0.20	4.57	4.90	4.72	0.18	4.81	4.66	4.46	0.20	4.56	5.66	3.20

Note; H: High Water Level, L: Low Water Level, M: Mean Water Level, R: Range (High water level - Low water level.)

Table 1.3.2 (8/12) Water Level in Meghna River at Daudkandi Station

August		Unit : meter in PWD											
Year	1st 10 Daily Average			2nd 10 Daily Average			3rd 10 Daily Average			Monthly Average			Max Min.
	H	L	R	M	H	L	R	M	H	L	R	M	
1960	4.97	4.88	0.09	4.93	4.85	4.75	0.10	4.80	4.74	4.65	0.09	4.70	4.81 5.05 4.57
1961	4.13	3.99	0.14	4.06	4.44	4.33	0.11	4.39	4.82	4.74	0.08	4.78	4.43 4.94 3.96
1962	4.68	4.52	0.16	4.60	4.93	4.77	0.16	4.85	5.33	5.23	0.10	5.28	4.92 5.67 4.39
1963	5.11	4.90	0.21	5.01	5.10	4.92	0.18	5.01	5.15	4.98	0.17	5.07	5.03 5.21 4.85
1964	5.60	5.32	0.28	5.46	5.70	5.52	0.18	5.61	5.41	5.08	0.33	5.25	5.43 5.93 4.88
1965													
1966													
1967													
1968	5.53	5.41	0.12	5.47	5.23	5.09	0.14	5.16	5.02	4.88	0.14	4.95	5.19 5.69 4.81
1969	5.06	4.91	0.15	4.99	4.91	4.77	0.14	4.84	5.26	5.14	0.12	5.20	5.02 5.43 4.66
1970	5.74	5.56	0.18	5.65	5.75	5.64	0.11	5.70	5.51	5.36	0.15	5.44	5.56 5.83 5.07
1971	5.20	4.88	0.32	5.04	5.43	5.11	0.32	5.27	5.60	5.44	0.16	5.52	5.29 5.65 4.81
1972	4.88	4.84	0.04	4.86	4.79	4.73	0.06	4.76	4.44	4.32	0.12	4.38	4.66 5.07 4.25
1973	4.94	4.82	0.12	4.88	5.30	5.19	0.11	5.25	5.19	5.08	0.11	5.14	5.09 5.46 4.74
1974	5.89	5.84	0.05	5.87	5.94	5.86	0.08	5.90	5.39	5.30	0.09	5.35	5.70 6.05 5.17
1975	5.24	5.15	0.09	5.20	4.94	4.83	0.11	4.89	4.70	4.60	0.10	4.65	4.90 5.27 4.53
1976	4.63	4.44	0.19	4.54	4.78	4.62	0.16	4.70	4.89	4.82	0.07	4.86	4.70 5.04 4.31
1977	5.07	4.96	0.11	5.02	5.07	4.96	0.11	5.02	5.25	5.16	0.09	5.21	5.08 5.33 4.88
1978	4.88	4.75	0.13	4.82	5.13	5.04	0.09	5.09	5.12	5.00	0.12	5.06	4.99 5.03 4.54
1979													
1980													
1981	5.47	5.30	0.17	5.39	5.48	5.35	0.13	5.42	5.29	5.12	0.17	5.21	5.33 5.55 5.00
1982	5.10	4.98	0.12	5.04	4.89	4.87	0.02	4.88	4.95	4.69	0.26	4.82	4.90 5.20 4.57
1983	4.95	4.73	0.22	4.84	5.07	4.86	0.21	4.97	5.11	4.90	0.21	5.01	4.94 5.30 4.47
1984	5.39	5.28	0.11	5.34	4.94	4.82	0.12	4.88	4.56	4.41	0.15	4.49	4.89 5.52 4.22
1985	4.81	4.70	0.11	4.76	4.46	4.33	0.13	4.40	4.45	4.34	0.11	4.40	4.51 4.95 4.18
1986	5.24	5.12	0.12	5.18	5.30	5.17	0.13	5.24	5.03	4.88	0.15	4.96	5.12 5.40 4.72
1987	5.53	5.44	0.09	5.49	5.90	5.74	0.16	5.82	5.85	5.69	0.16	5.77	5.70 6.06 5.30
1988	5.38	5.29	0.09	5.34	5.33	5.23	0.10	5.28	5.65	5.49	0.16	5.57	5.40 6.27 5.08
Ave.	5.143	5	0.142	5.071	5.152	5.021	0.132	5.087	5.113	4.971	0.142	5.042	5.131 4.997 0.134 5.064 6.27 3.96

Note: H: High Water Level, L: Low Water Level, M: Mean Water Level, R: Range (High water level - Low water level)

Table 1.3.2 (10/12) Water Level in Meghna River at Daudkandi Station

October		Unit : meter in PWD																	
Year	1st 10 Daily Average				2nd 10 Daily Average				3rd 10 Daily Average				Monthly Average				Max Min.		
	H	L	R	M	H	L	R	M	H	L	R	M	H	L	R	M			
1960	4.81	4.71	0.10	4.76	4.24	4.12	0.12	4.18	3.52	3.33	0.19	3.43	4.17	4.03	0.14	4.10	5.00	2.85	
1961	4.28	4.15	0.13	4.22	4.22	4.08	0.14	4.15	3.86	3.74	0.12	3.80	4.11	3.98	0.13	4.05	4.42	3.20	
1962	4.64	4.52	0.12	4.58	4.05	3.88	0.17	3.97	3.35	3.10	0.25	3.23	3.99	2.81	1.18	3.40	4.85	2.93	
1963	4.43	4.22	0.21	4.33	3.90	3.67	0.23	3.79	3.58	3.36	0.22	3.47	3.96	3.74	0.22	3.85	4.57	3.26	
1964	4.97	4.62	0.35	4.80	4.60	4.26	0.34	4.43	4.11	3.80	0.31	3.96	4.55	4.21	0.34	4.38	5.17	3.51	
1965																			
1966																			
1967																			
1968	4.58	4.44	0.14	4.51	4.35	4.22	0.13	4.29	3.76	3.54	0.22	3.65	4.21	4.07	0.14	4.14	4.69	3.01	
1969																			
1970	5.04	4.84	0.20	4.94	4.81	4.60	0.21	4.71	4.23	4.06	0.17	4.15	4.69	4.50	0.19	4.60	5.13	3.79	
1971	4.91	4.76	0.15	4.84	4.68	4.48	0.20	4.58	4.30	4.00	0.30	4.15	4.62	4.40	0.22	4.51	4.97	3.82	
1972	3.70	3.59	0.11	3.65	3.10	2.91	0.19	3.01	2.99	2.66	0.33	2.83	3.26	3.04	0.22	3.15	3.86	2.26	
1973	4.62	4.53	0.09	4.58	4.52	4.36	0.16	4.44	3.80	3.67	0.13	3.74	4.30	4.17	0.13	4.24	4.88	3.26	
1974	4.78	4.70	0.08	4.74	4.20	4.11	0.09	4.16	3.52	3.40	0.12	3.46	4.15	4.05	0.10	4.10	4.97	3.31	
1975	4.34	4.26	0.08	4.30	4.10	4.00	0.10	4.05	3.65	3.54	0.11	3.60	4.02	3.92	0.10	3.97	4.40	3.40	
1976	3.88	3.74	0.14	3.81	3.20	3.02	0.18	3.11	3.31	2.88	0.43	3.10	3.46	3.20	0.26	3.33	4.42	2.45	
1977	4.08	3.88	0.20	3.98	4.19	3.94	0.25	4.07	3.57	3.30	0.27	3.44	3.93	3.70	0.23	3.82	4.31	3.11	
1978	4.46	4.25	0.21	4.36	3.84	3.59	0.25	3.72	3.11	2.90	0.21	3.01	3.69	3.58	0.11	3.64	4.66	2.59	
1979																			
1980																			
1981	4.20	3.93	0.27	4.07	4.04	3.73	0.31	3.89	3.21	2.97	0.24	3.09	3.82	3.54	0.28	3.68	4.66	2.71	
1982	4.40	4.27	0.13	4.34	3.65	3.49	0.16	3.57	2.98	2.82	0.16	2.90	3.68	3.53	0.15	3.61	4.75	2.76	
1983	5.17	5.05	0.12	5.11	4.44	4.31	0.13	4.38	4.09	3.97	0.12	4.03	4.55	4.43	0.12	4.49	5.37	3.59	
1984	4.89	4.71	0.18	4.80	4.18	4.04	0.14	4.11	3.61	3.39	0.22	3.50	4.32	4.15	0.17	4.24	5.20	2.98	
1985	4.24	4.08	0.16	4.16	4.62	4.36	0.26	4.49	4.24	4.08	0.16	4.16	4.36	4.17	0.19	4.27	4.95	3.67	
1986	4.94	4.77	0.17	4.86	4.86	4.74	0.12	4.80	4.31	4.16	0.15	4.24	4.69	4.54	0.15	4.62	4.98	3.84	
1987	5.08	4.98	0.10	5.03	4.31	4.12	0.19	4.22	3.68	3.57	0.11	3.63	4.33	4.20	0.13	4.27	5.23	3.21	
1988			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00			
Ave.	4.565	4.409	0.156	4.487	4.186	4.001	0.185	4.094	3.672	3.465	0.206	3.569	4.13	3.907	0.223	4.019	5.37	2.26	

Note; H: High Water Level, L: Low Water Level, M: Mean Water Level, R: Range (High water level - Low water level)

Table 1.3.2 (11/12) Water Level in Meghna River at Daudkandi Station

November

Year	Unit : meter in PWD											
	1st 10 Daily Average			2nd 10 Daily Average			3rd 10 Daily Average			Monthly Average		
	H	L	R	M	H	L	R	M	H	L	R	Max Min.
1960	2.96	2.53	0.43	2.75	2.50	2.00	0.50	2.25	2.34	1.87	0.47	2.37 3.28 1.58
1961	3.03	2.87	0.16	2.95	2.66	2.38	0.28	2.52	2.36	1.95	0.41	2.54 3.23 1.65
1962	3.06	2.69	0.37	2.88	2.80	2.44	0.36	2.62	2.16	1.82	0.34	2.49 3.38 1.74
1963	3.32	3.07	0.25	3.20	2.74	2.52	0.22	2.63	2.40	2.07	0.33	2.69 3.54 1.92
1964	3.65	3.34	0.31	3.50	2.97	2.69	0.28	2.83	2.79	2.40	0.39	2.98 3.73 1.95
1965												
1966												
1967												
1968	2.98	2.69	0.29	2.84	2.48	2.13	0.35	2.31	2.53	2.05	0.48	2.48 3.19 1.69
1969												
1970	3.58	3.41	0.17	3.50	3.34	2.89	0.45	3.12	2.52	2.17	0.35	2.99 3.94 2.07
1971												
1972	2.40	2.10	0.30	2.25	2.09	1.85	0.24	1.97	2.29	1.86	0.43	2.10 2.65 1.62
1973	3.17	2.98	0.19	3.08	3.13	2.85	0.28	2.99	2.70	2.46	0.24	2.88 3.47 2.37
1974	3.32	3.11	0.21	3.22	2.99	2.69	0.30	2.84	2.48	2.13	0.35	2.79 3.54 2.04
1975	3.66	3.42	0.24	3.54	2.94	2.76	0.18	2.85	2.76	2.55	0.21	3.03 3.96 2.33
1976	2.62	2.35	0.27	2.49	2.21	1.95	0.26	2.08	2.51	2.12	0.39	2.30 2.73 1.74
1977	2.88	2.54	0.34	2.71	3.01	2.62	0.39	2.82	2.67	2.32	0.35	2.68 3.35 2.01
1978	2.93	2.66	0.27	2.80	2.67	2.34	0.33	2.51	2.43	2.08	0.35	2.52 3.05 1.92
1979												
1980												
1981	2.85	2.53	0.32	2.69	2.68	2.38	0.30	2.53	2.94	2.59	0.35	2.77 2.82 2.50 3.20 2.22
1982	2.83	2.69	0.14	2.76	2.31	2.18	0.13	2.25	1.94	1.83	0.11	1.89 2.36 2.23 0.13 2.30 2.92 1.72
1983	3.18	2.96	0.22	3.07	2.82	2.72	0.10	2.77	2.64	2.37	0.27	2.51 2.88 2.68 0.20 2.78 3.35 1.75
1984	2.88	2.74	0.14	2.81	2.44	2.26	0.18	2.35	2.64	2.03	0.61	2.34 2.53 2.34 0.19 2.44 3.08 1.86
1985	3.39	3.07	0.32	3.23	2.82	2.34	0.48	2.58	2.30	1.83	0.47	2.07 2.84 2.41 0.43 2.63 3.85 1.78
1986	4.02	3.73	0.29	3.88	3.46	3.29	0.17	3.38	2.98	2.80	0.18	2.89 3.49 3.27 0.22 3.38 4.18 2.63
1987	3.14	3.05	0.09	3.10	2.81	2.73	0.08	2.77	2.61	2.50	0.11	2.56 2.85 2.76 0.09 2.81 3.36 2.09
1988												
Ave.	3.136	2.882	0.253	3.009	2.756	2.477	0.279	2.616	2.523	2.181	0.342	2.352 2.8 2.513 0.287 2.656 4.18 1.58

Note; H: High Water Level, L: Low Water Level, M: Mean Water Level, R: Range (High water level - Low water level)

Table 1.3.2 (12/12) Water Level in Meghna River at Daudkandi Station

Year	December																Unit : meter in PWD	
	1st 10 Daily Average				2nd 10 Daily Average				3rd 10 Daily Average				Monthly Average					
	H	L	R	M	H	L	R	M	H	L	R	M	H	L	R	M	Max	Min.
1960	2.25	1.78	0.47	2.02	1.91	1.37	0.54	1.64	1.90	1.29	0.61	1.60	2.02	1.47	0.55	1.75	2.38	1.10
1961	1.90	1.50	0.40	1.70	1.90	1.45	0.45	1.68	1.63	1.27	0.36	1.45	1.81	1.40	0.41	1.61	2.23	1.10
1962	2.00	1.60	0.40	1.80	2.13	1.64	0.49	1.89	1.91	1.38	0.53	1.65	2.01	1.54	0.47	1.78	2.26	1.34
1963	2.24	1.90	0.34	2.07	2.24	1.73	0.51	1.99	2.18	1.66	0.52	1.92	2.22	1.76	0.46	1.99	2.44	1.52
1964	2.41	1.96	0.45	2.19	1.99	1.46	0.53	1.73	1.96	1.33	0.63	1.65	2.11	1.57	0.54	1.84	2.47	1.10
1965																		
1966																		
1967																		
1968	2.09	1.59	0.50	1.84	1.93	1.32	0.61	1.63	1.91	1.33	0.58	1.62	1.98	1.41	0.57	1.70	2.18	0.94
1969																		
1970	2.57	2.18	0.39	2.38	2.31	1.82	0.49	2.07	1.90	1.49	0.41	1.70	2.25	1.82	0.43	2.04	2.68	1.33
1971																		
1972	1.95	1.43	0.52	1.69	1.80	1.32	0.48	1.56	1.77	1.32	0.45	1.55	1.84	1.36	0.48	1.60	2.16	1.05
1973	2.44	2.02	0.42	2.23	2.54	2.21	0.33	2.38	2.18	1.72	0.46	1.95	2.38	1.97	0.41	2.18	3.20	1.66
1974	2.51	1.99	0.52	2.25	2.11	1.76	0.35	1.94	1.82	1.45	0.37	1.64	2.14	1.72	0.42	1.93	2.96	1.34
1975	2.88	2.26	0.62	2.57	2.06	1.92	0.14	1.99	2.32	1.89	0.43	2.11	2.42	2.02	0.40	2.22	3.03	1.68
1976	2.23	1.82	0.41	2.03	2.04	1.67	0.37	1.86	2.19	1.74	0.45	1.97	2.15	1.74	0.41	1.95	2.35	1.52
1977	2.06	1.63	0.43	1.85	2.39	1.81	0.58	2.10	2.04	1.53	0.51	1.79	2.16	1.65	0.51	1.91	2.56	1.43
1978	2.93	1.96	0.97	2.45	1.91	1.55	0.36	1.73	1.60	1.27	0.33	1.44	2.15	1.59	0.56	1.87	2.35	1.16
1979																		
1980																		
1981	2.66	2.31	0.35	2.49	2.50	2.08	0.42	2.29	2.07	1.66	0.41	1.86	2.49	2.01	0.48	2.25	3.44	1.49
1982	1.68	1.56	0.12	1.62	1.45	1.34	0.11	1.40	1.37	1.22	0.15	1.30	1.50	1.37	0.13	1.44	1.81	1.17
1983	1.99	1.80	0.19	1.90	1.53	1.22	0.31	1.38	1.72	1.35	0.37	1.54	1.75	1.45	0.30	1.60	2.06	1.00
1984	2.01	1.84	0.17	1.93	2.25	1.86	0.39	2.06	2.22	1.87	0.35	2.05	2.16	1.86	0.30	2.01	2.40	1.72
1985	2.00	1.57	0.43	1.79	2.20	1.56	0.64	1.88	1.85	1.28	0.57	1.57	2.01	1.46	0.55	1.74	2.43	1.22
1986	2.90	2.63	0.27	2.77	2.55	2.25	0.30	2.40	2.35	2.04	0.31	2.20	2.59	2.30	0.29	2.45	3.07	1.85
1987			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00		
1988																		
Ave.	2.285	1.867	0.419	2.076	2.087	1.667	0.42	1.877	1.945	1.505	0.44	1.724	2.107	1.673	0.434	1.89	3.44	0.94

Note: H: High Water Level, L: Low Water Level, M: Mean Water Level, R: Range (High water level - Low water level)

Table 1.3.3

Mean Daily Discharge of Gumti River at
Jibanpur Station (1965 - 1988)

Year :	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1965 :				10	16	87	167	179	120	63	32	21
1966 :	17	12	10	12	19	58	124	132	191	114	37	37
1967 :	19	13	15	26	40	49	104	80	63	95	21	13
1968 :	9	8	8	35	44	157	184	140	88	37	18	12
1969 :	10	8	9	20	15	130	112	145	112	40	17	12
1970 :	9	8	7	11	13	44	96	120	69	66	27	12
1971 :	8	7	4									
1972 :				9	13	41	68	103	48	23	10	8
1973 :	6	4	7	9	106	121	99	102	66	52	49	28
1974 :	13	7	7	23	51	139	206	181	124	82	30	19
1975 :	12	11	6	9	20	75	105	146	151	93	41	19
1976 :	9	6	7	9	42	152	204	133	83	47	23	14
1977 :	20	16	10	69	90	152	146	117	108	68	35	17
1978 :	16	14	12	23	108	244	165	144	126	72	32	24
1979 :	22	21	19	13	20	41	109	119	115	64	23	28
1980 :	22	20	20	18	86	81	73	88	140	80	39	29
1981 :	27	23	42	50	63	65	148	94	72	35	26	22
1982 :	24	21	17									
1983 :				60	167	92	89	119	91	84	62	35
1984 :	23	23	22	20	98	69	100	123	99	74	43	38
1985 :	26	22	20	40	81	107	115	94	72	47	32	34
1986 :	30	23	21	28	42	20	69	58	88	99	-	29
1987 :	23	13	18	22	32	40	94	102	99	72	37	31
1988 :	27	25	32									
Mean :	18	14	15	25	56	93	123	120	101	67	30	23

Table 1.6.1 Soil Associations in the Project Area

Mapping Units		Daudkandi		Homna	
Legend No	Soil Associations	ha	%	ha	%
	Old Brahmapara Flood-Plain	18,782	50	-	-
11	Jalkandi-Godnail-Burichang	12,680	34	-	-
27a	Burichang-Silmondi	6,124	16	-	-
	Middle Meghna Flood-Plain	15,598	41	-	-
28	Borda-Fuldi	8,715	23	1,259	7
29	Borda-Silmandi	-	-	4,087	23
30	Manikandi-Fuldi-Borda	1,158	3	251	1
31	Tangerchar-Borda	5,725	15	6,771	38
32	Tangerchar-Fuldi	-	-	2,265	13
	Water(River)	3,120	9	3,267	18
	Total	37,500	100	17,900	100

Source : Soil Survey information, Department of Soil Survey,
Chittagong Division Office Comilla, 1981.

Table 1.6.2 (1/7) Soil Series in Each Soil Association

11. Jalkundi-Godnail-Burichang association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper slope of low ridges; medium low land	4	Grey, light silt loam	Sonatala	Mixed aus and aman-rabi crops	Moderately deep flooding	Provide field drain permit earlier sowing of rabi crops
Upper slope of low ridges; medium low land	3	Grey, silt loam to silty clay loam	Silmondi	Mixed aus and aman-rabi crops	Moderately deep flooding	Provide field drain permit earlier sowing of rabi crops
Upper slope of low ridges; low land	30	Grey, silt loam with dark grey coating	Jalkundi, deeply flooded phase	Mixed aus and aman-rabi crops	Moderately deep flooding	Provide field drain permit earlier sowing of rabi crops
Upper slope of low ridges; low land	22	Olive grey-grey, silt loam to silty clay loam	Godnail, deeply flooded phase	Mixed aus and aman/jute/broadcast aman-rabi crops	Deep flooding	With irrigation, improved boro
Edges of broad basins; lowland	2	Grey, clay	Borda	Deep water aman	Very droughty at the end of the dry season	With irrigation, improved boro
Bottom of broad basins; lowland	20	Dark grey, silty clay with dark grey coating	Burichang, deeply flooded phase boro	Broadcast aman/or boro season, deep	Very wet in early dry season, deep flooding end of the dry season	With irrigation, improved boro
Bottom of broad basins; lowland	4	Dark grey, clay	Siddhirganj	Broadcast aman/or boro season, deep	Very droughty at end of dry season, very permeable heavy consistence, deep flooding season, deep flooding end of the dry season	With irrigation, improved boro
	8		Settlements			
	7		Water bodies			

Table 1.6.2 (2/7) Soil Series in Each Soil Association

27. Burichang-Silmondi association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper middle slopes of ridges; medium lowland	10	Mixed grey and brown, silt loam and silty clay loam	Fuldi, moderately deeply flooded phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, moderately deep flooding	Provide field drain to permit early sowings of rabi crops; balance use of fertilizer
Level to very gently undulating smoothed out levee medium lowland	13	Grey, heavy silt loam and silty clay loam, greyer than Tippera	Silmondi, moderately deeply flooding phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, moderately deep flooding	Provide field drain to permit early sowings of rabi crops; balance use of fertilizer
Level to very gently undulating smoothed out leveelowlowland	12	Grey, heavy silt loam and silty clay loam, greyer than Tippera	Silmondi, deeply flooded phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, moderately deep flooding	Provide field drain to permit early sowings of rabi crops; balance use of fertilizer
Middle to lower slopes or ridges; lowland	4	Grey, silt loam with dark grey coating	Jalkundi, deeply flooded phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, deep flooding	Provide field drain to permit early sowings of rabi crops; balance use of fertilizer
Middle to lower slopes or ridges; lowland	8	Olive grey to grey, silt loam to silty clay	Godnail, deeply flooded phase	Broadcast aman/boro	Wet in the early in dry season, deep flooding	With irrigation and modern managements improve boro
Bottom of broad basin; lowland	35	Dark grey, silty clay with dark grey coating	Burichang, deeply flooded phase	Broadcast aman/boro	Wet in the early in dry season, deep flooding	With irrigation and modern managements improve boro
Bottom of broad basin; lowland	3	Dark grey, clay	Siddirganj	Broadcast aman/boro	Very droughty at the end of dry season, im-permeable heavy consistence, deep flooding	With irrigation and modern managements improve boro
	8		Settlements			
	7		Water bodies			

Table 1.6.2 (3/7) Soil Series in Each Soil Association

28. Borda-Fuldi association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper to middle slopes of ridges, medium lowland	25	Mixed grey and brown, silt loam and silty clay loam	Fuldi, moderately deeply flooded phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, moderately deep flooding	Provide fields drain to permit early sowing of rabi crops, balance use of fertilizers
Slopes of ridges; lowland	5	Greyish brown, sand with very compact topsoil	Tangerchar	Broadcast aman	Very droughty in dry season, compact topsoil, deep flooding	Drought resistant crops
Level to very gently undulating levee; lowland	5	Grey, light silt loam, greyer than Jalkundi	Sonatala	Mixed aus and aman-rabi crops	Droughty in dry late dry season, deep flooding	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
Nearly flat to gently undulating edge of broad basin; lowland	48	Grey, clay	Borda	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence	With irrigation improved boro
Nearly flat to very gently undulating infilled channel; lowland	10	Stratified dark coloured deposits, variable in texture	Kalia-Daudkandi complex	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence, but variable consistence	With irrigation improved boro
	4		Settlements			
	3		Water bodies			

Table 1.6.2 (4/7) Soil Series in Each Soil Association

29. Borda-Silmondi association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper slope of very gently undulating old levee; lowland	5	Grayish brown sand with very compact topsoil	Ter epochp	Broadcast aman	Very droughty in dry season, compact topsoil, deep flooding	Drought resistant crops
Very gently undulating levee; lowland	10	Pale brown, silt loam with very compact topsoil	Honna	Broadcast aman/mixed aus and aman-rabi crops	Droughty in dry season, compact topsoil deep flooding	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
Middle to lower slopes of ridges; lowland	8	Gray, silt loam with dark grey coating	Jalkundi, deeply flooded phase	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, deep flooding	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
Level to very gently undulating levee; lowland	5	Grey, light silt loam, greyer than Jalkundi	Sonatala	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, deep flooding	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
Level to very gently undulating levee; lowland	25	Grey heavy, wilt loam and silty clay loam, greyer than Tippera	Silmondi	Mixed aus and aman-rabi crops/fallow	Droughty in late dry season, deep flooding	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
Nearly flat to very gently undulating edge of broad basin; lowland	40	Grey, clay	Borda	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence	Provide field drain to permit early sowing of rabi crops, balance use of fertilizers
	5		Settlements			
	2		Water bodies			

Table 1.6.2 (577) Soil Series in Each Soil Association

30. Manikandi-Fuldi-Borda association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper to middle slopes of ridge; medium to land	20	Mixed gray silt brown, silty loam and silty clay loam	Fuldi, moderately deeply flooded phase	Mixed aus and aman-rabi crop	Droughty in late dry season, moderately deep flooding	Provide field drain to permit early sowing of rabi crops; balance use of fertilizer
Slope of ridges; lowland	5	Greyish brown and with very compact topsoil	TanGerchar	Broadcast aman	Very droughty in dry season, compact topsoil deep flooding	Drought-resistant crops
Middle to lower slope of ridge; lowland	5	Grey, silty loam with dark grey coatings	Jalkundi, deeply flooded phase	Mixed aus and aman-rabi crops	Droughty in late season, deep flooding	Provide field drains to permit early sowing of rabi crops; balance use of fertilizer
Lower slopes of low ridges and edges of basins; lowland	35	Grey, silty clay loam and silty clay with grey coating	Manikandi	Mixed aus and aman-rabi crops	Droughty in late season, deep flooding	With irrigation and modern management improved horo
Nearly flat to gently undulating edges of broad basins; lowland	20	Grey, clay	Borda	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence	With irrigation and modern management improved horo
Nearly flat to very gently undulating in filled channel; lowland	5	Stratified dark coloured deposits, variable in texture	Kalata-Daudkandi, complex	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence, but variable consistence	With irrigation and modern management improved horo
	5		Settlements			
	5		Water bodies			

Table 1.6.2 (6/7) Soil Series in Each Soil Association

31. Tangerchar-Borda association

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper to middle slopes of ridges; medium lowland	5	Mixed grey, and brown, silt loam and silty clay loam	Fuldi, moderately deeply flooded phase	Mixed aus and aman-fallow	Droughty in late dry season, moderately deep flooding	Provide field drains to permit early sowings of rabi crops, balance use of fertilizer
Slope of ridges; lowland	40	Greyish brown sand with very compact topsoil	Tangerchar	Broadcast aman	Very droughty in dry season, compact topsoil, deep flooding	Drought resistant crops
Level to very undulating smoothed out levee; lowland	8	Brey, heavy silt loam and silty clay loam, greyer than Tippera	Silmondi, deeply flooded phase	Mixed aus and aman-fallow	Droughty in dry season, deep flooding	Provide field drains to permit early sowing of rabi crops, balance use of fertilizer
Nearly flat to gently undulating edge of broad basin; lowland	30	Grey, clay	Borda	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence	With irrigation and management improved boro
Nearly flat to very gently undulating infilled channel; lowland	10	Stratified, dark coloured deposits variable texture	Kalaita-Daudkandi complex	Broadcast aman	Very droughty at the end of dry season, very deep flooding, heavy consistence, but variable consistence	With irrigation and management improved boro
	5		Settlements			
	2		Water bodies			

Table 1.6.2 (7/7) Soil Series in Each Soil Association

32. Tangerchar-Fuldi associations

Position	Approx. Percent of Unit	Subsoil Characteristics	Soil Series, Phase or Land Types	Present Main Land Use	Limitations	Possible Improvements
Upper to middle slopes of ridges; medium lowland	25	Mixed grey and brown, silt loam silt loam and silty clay loam	Fuldi, moderately deeply flooded phase	Mixed aus and aman-rabi crops, fallow	Droughty in late dry season, moderately deep flooding	Provide field drains to permit early sowing of rabi crops, balance use of fertilizer
Slopes of ridges; lowland	35	Greyish brown, sand with very compact topsoil	Tangerchar	Broadcast aman	Very droughty in dry season, compact topsoil, deep flooding	Droughty-resistant crops
Very gently undulating levee; lowland	10	Pale brown, silt loam with very compact topsoil	Homna	Broadcast aman	Droughty in dry season, compact topsoil, deep flooding	Provide field drains to permit early sowings of rabi crops, balance use of fertilizer
Level to very gently undulating levee; lowland	3	Grey, light silt loam, greyer than Jalkundi	Silmondi	Broadcast aman	Droughty in dry season, compact topsoil, deep flooding	Provide field drains to permit early sowings of rabi crops, balance use of fertilizer
Level to very gently undulating levee; lowland	15	Grey, heavy silt loam and silty clay loam, greyer than Tippera	Silmondi	Broadcast aman	Droughty in dry season, compact topsoil, deep flooding	Provide field drains to permit early sowings of rabi crops, balance use of fertilizer
Nearly flat to very gently undulating infilled channel; lowland	2	Stratified dark coloured deposits variable texture	Kalata-Daudkandi compact	Broadcast aman	Very droughty at the end of dry season, very deep flooding	With irrigation and modern management improved boro
	5		Settlements			
	5		Water bodies			

Table 1.6.3

Soil Texture and Land Potentiality in the Project Area

Item	Daudkandi		Homna	
	Area(ha)	%	Area(ha)	%
Soil Texture				
Sandy soils	2,782	7	3,781	21
Loamy soils	17,639	47	5,431	30
Clayey soils	9,964	27	4,321	24
Land Potentiality				
Good agricultural land	-	-	-	-
Moderate agricultural land	25,179	68	8,256	46
Poor agricultural land	4,920	13	5,277	30
Very poor or non-agricultural land	-	-	-	-
Homestead land	2,194	6	719	4
Water bodies (Tank+River)	4,900	13	3,648	20
Total	37,193	100	17,900	100

Source: Soil Survey Information, D.S.S., C.D.O., Comilla, 1981

Table 1.6.4 (1/2) Suitability of Soils for Wetland Crops
(Daudkandi)

Series, phase land type	Without irrigation										With irrigation									
	1	2	3	4	5	6	7	8	9	10	B. Aus-Local	B. Aus-HYV	T. Aus-Local	T. Aus-HYV	B. Aman	T. Aman-Local	T. Aman-HYV	Boro-local	Boro-HYV	Jute
Borda, L	3	4	4	4	2	4	4	4	4	4	3	3	3	4	2	4	4	2	2	4
Burichang, L	3	4	4	4	2	4	4	4	4	4	3	3	3	4	1	4	4	1	1	4
Fuldi, ML	2	2	4	4	1	4	4	4	4	2	2	2	3	3	2	4	4	2	2	2
Godnail, L	2	4	4	4	2	4	4	4	4	4	2	4	4	4	1	4	4	1	1	4
Jalkundi, L	1	4	4	4	1	4	4	4	4	2	2	2	4	4	1	4	4	1	1	2
Kalata-Daudkandi	4	4	4	4	1	4	4	4	4	4	4	4	4	4	2	4	4	2	2	4
Complex	1	4	4	4	1	4	4	4	4	4	1	4	4	4	1	4	4	1	1	4
Manikandi, L	4	4	4	4	2	4	4	4	4	4	3	4	4	4	1	4	4	1	1	4
Siddirganj, L	1	2	4	4	1	4	4	4	4	2	1	1	3	3	1	4	4	1	1	2
Silmondi, ML	1	2	4	4	1	4	4	4	4	4	1	1	4	4	1	4	4	1	1	4
Silmondi, L	1	2	4	4	1	4	4	4	4	2	1	1	3	3	2	4	4	2	2	2
Sonatala, ML	1	2	4	4	1	4	4	4	4	4	1	1	3	3	2	4	4	2	2	4
Sonatala, L	1	2	4	4	1	4	4	4	4	4	1	1	3	3	2	4	4	2	2	4
Tangerchar, L	4	4	4	4	3	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4

Notes: ML = Medium Lowland phase
L = Low Land phase

Source : Soil Survey Information D.S.R. , C.D.O, 1982

Crops

B. Aus = Broadcast aus
T. Aus = Transplanted aus
B. Aman = Broadcast aman
T. Aman = Transplanted aman
HYV = High yielding variety

Table 1.6.4 (2/2) Suitability of Soils for Wetland Crops
(Homna)

Series, phase land type	Without irrigation										With irrigation									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
	B. Aus-Local, LIV	B. Aus-HYV	T. Aus-Local, LIV	T. Aus-HYV	B. Aman	T. Aman-Local, LIV	T. Aman-HYV	Boro-local	June		B. Aus-Local, LIV	B. Aus-HYV	T. Aus-Local, LIV	T. Aus-HYV	B. Aman	T. Aman-Local, LIV	T. Aman-HYV	Boro-local	Boro-HYV	June
Borda, L	3	4	4	4	2	4	4	4	4		3	3	3	4	2	4	4	2	2	4
Fuldi, ML	2	3	4	4	1	4	4	3	2		2	2	3	3	1	4	4	2	2	2
Homna, I	2	4	4	4	1	4	4	4	2		2	4	4	4	1	4	4	2	2	2
Jalkundi, L	1	4	4	4	1	4	4	4	2		2	2	4	4	1	4	4	1	1	2
Kalaia-Daudkandi																				
Complex	1	4	4	4	1	4	4	4	4		1	4	4	4	1	4	4	2	2	4
Manikandi, L	4	4	4	4	1	4	4	3	4		4	4	4	4	1	4	4	1	1	4
Silmondi, L	1	2	4	4	1	4	4	4	4		1	1	4	4	1	4	4	1	1	4
Sonatala, L	1	2	4	4	1	4	4	4	4		1	1	3	3	1	4	4	2	2	4
Tangerchar, L	4	4	4	4	3	4	4	4	4		4	4	4	4	3	4	4	4	4	4

Source : Soil Survey Information D.S.R. , C.D.O, 1982

Table 1.6.5 (2/2) Suitability of Soils for Dryland Crops
(Homna)

[illegible]

Table 1.6.5 (1/2) Suitability of Soils for Dryland Crops
(Daudkandi)

Series, phase land type	Annual Dryland Crops														Perennial Crops														
	Without irrigation							With irrigation							Without irrigation						With irrigation								
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	8	9	10	11	12					
Borda, L Burichang, L Fuldi, ML Godnail, L Jalkundi, L Kalaita-Daudkandi Complex, Manikandi, L Siððirganj, L Silmondi, ML Silmondi, L Sonatala, ML Sonatala, L Tangerchar, L	3	4	4	3	3	4	4	3	4	4	2	2	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	
	4	4	3	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	2	2	1	1	1	4	4	2	2	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	4	4	3	3	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	2	2	2	3	4	4	4	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	3	2	3	3	4	4	4	3	2	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	4	4	2	2	4	4	4	4	4	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	2	2	1	1	1	4	4	2	2	1	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	2	2	1	1	1	4	4	2	2	1	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	1	1	1	1	1	2	4	1	1	1	1	1	1	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	1	1	1	1	1	2	4	1	1	1	1	1	1	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Source : Soil Survey Information D.S.R. , C.D.O, 1982

Table 2.1.1

Main Institutions Concerned with
Rural Development Program

Institution	Rural Development Program
1. Bangladesh Academy For Rural Development (BARD), Comilla	Action Research and Training Programmes for Rural Development Workers.
2. Rural Development Academy Board	Action Research and Training Programmes for Rural Development Workers (Including Irrigation)
3. Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), Dhaka	Regional Centre for Asia and the Pacific for Students and Training on Rural Development
4. Co-operative College (With 8 zonal institutes) C/O BARD, Comilla	Training of Functionaries/ Members of Co-operative Societies.
5. Bangladesh Rural Development Board (BRDB)	Implementation of Rural Development Programmes and Projects, Administrative Infrastructure, Training of Functionaries.
6. Local Government Institute 59 New Eskaton, Dhaka	Training for Rural Development Programmers
7. Rural Development Institute BRDB Khadim Nagar, Sylhet	Training for Rural Development Programmers
8. Rural Development and Co-operatives Concerned Departments in the Ministry of LGRD and Co-operatives	1. Co-operative Dept : Regulation, Registration and Inspection 2. Work Programmes : Development Projects, Rural Infrastructures 3. Public Health Engg Dept : Rural Water Supply Sanitation
9. Local Government Engineering Bureau (LGEB)	Implementation of Rural Development Programmes and Projects : Infrastructure Aspects Training of Functionaries

Table 2.1.2 Basic Information for Land and Population

Name of Union	Area (ha)	Population			Density (persons/sq km)	Household	
		Total	Male	Female		Number	Size
Daudkandi							
1. Balarampur North	1,084	15,748	7,907	7,841	1,453	2,618	6.0
2. Balarampur South	1,149	13,847	6,770	7,077	1,205	2,354	5.9
3. Barakanda	3,475	17,536	8,837	8,699	505	3,103	5.7
4. Bitikandi	2,287	27,196	13,150	14,046	1,189	4,736	5.7
5. Daudkandi North	1,542	16,488	8,158	8,330	1,069	2,773	5.9
6. Daudkandi South	1,824	21,768	11,907	9,861	1,193	3,503	6.2
7. Elliotgonji North	1,415	13,398	6,785	6,613	947	2,239	6.0
8. Elliotgonji South	1,396	15,428	7,952	7,476	1,105	2,802	5.5
9. Goalmari	1,959	27,209	13,442	13,767	1,389	4,726	5.8
10. Gobindapur	1,448	25,380	12,504	12,876	1,753	4,311	5.9
11. Gouripur East	1,365	14,448	7,317	7,131	1,058	2,367	6.1
12. Gouripur West	964	16,859	8,839	8,020	1,749	2,750	6.1
13. Jagathpur North	1,063	12,060	5,762	6,298	1,135	2,119	5.7
14. Jagathpur South	1,407	16,357	8,124	8,233	1,163	2,903	5.6
15. Maruka	3,001	27,571	13,731	13,840	919	4,422	6.2
16. Mazdpur	2,022	22,734	11,240	11,494	1,124	3,880	5.9
17. Mohammedpur	2,762	27,334	13,425	13,909	990	4,724	5.8
18. Narayenda	2,042	24,142	12,107	12,035	1,182	3,899	6.2
19. Panchgachia East	1,454	16,752	8,391	8,361	1,152	2,540	6.6
20. Panchgachia West	1,717	12,467	6,141	6,326	726	2,080	6.0
21. Sundalpur East	1,688	13,994	7,095	6,899	829	2,246	6.2
22. Sundalpur West	491	16,144	8,131	8,013	3,288	2,705	6.0
Daudkandi Total	37,555	414,860	207,715	207,145		69,800	
Daudkandi Average	1,707	18,857	9,442	9,416	1,105	3,173	5.9
Homna							
1. Bhasania	1,904	25,094	12,656	12,438	1,318	4,361	5.8
2. Chandanpur	3,199	20,227	10,317	9,910	632	3,419	5.9
3. Chanderchar East	1,610	20,984	10,866	10,118	1,303	3,574	5.9
4. Chanderchar West	1,181	18,517	9,428	9,089	1,568	3,253	5.7
5. Ghagutia East	1,138	19,058	9,760	9,298	1,675	3,443	5.5
6. Ghagutia West	1,300	18,325	9,213	9,112	1,410	3,384	5.4
7. Homna North	1,718	15,470	7,878	7,592	900	2,815	5.5
8. Homna South	1,163	12,850	6,224	6,626	1,105	2,329	5.5
9. Nilakhi	2,414	26,726	13,486	13,240	1,107	4,904	5.4
10. Radha Nagar	2,244	21,852	10,848	11,004	974	3,817	5.7
Homna Total	17,871	199,103	100,676	98,427		35,299	
Homna Average	1,787	19,910	10,068	9,843	1,114	3,530	5.6

Source : BBS, Bangladesh Population Census 1981 (Thana series)

Table 2.6.1 (1/2) Major Indicator and Targets

Sl No.	Health Indicator	Unit	1979-80 (Actual)	1984-85 (Actual)	1989-90 (Target)
<u>Health Status</u>					
1.	Infant mortality	per 1,000 live births	140	125	100
2.	Child mortality	per 1,000 (1 to 5 yrs)	24	22	12
3.	Maternal mortality	per 1,000 live births	7	64	
4.	Crude birth rate	per 1,000 population	43.25	39.00	31.00
5.	Crude death rate	per 1,000 population	16.75	15.00	13.00
6.	Population growth	% per year	2.65	2.40	1.80
7.	Live expectancy at birth	in year	47	50	54
<u>Health Care Delivery</u>					
8.	Hospital beds:	cumulative number	21,141	27,637	40,734
(a)	Health services	cumulative number	15,343	19,661	29,534
(b)	Other ministries, NGOs and private sector	cumulative number	5,798	7,976	11,200
9.	Population per hospital bed	cumulative number	4,168	3,589	2,712
10.	Upazila health complexes	one in each rural upazila	290	341	397
11.	(a) Union health & family welfare centres (UHFWC)	one in each union	1,773	2,329	4,500
(b)	Health post for community based services (self financing)	One for about 5,000 people	-	-	397
12.	Immunization against:				
(a)	Tuberculosis	% under 15 years covered	50	60	90
(b)	Diphtheria, whooping cough and tetanus	% under 2 years immunized	1	2	80
(c)	Measles	% coverage	-	0.8	80
(d)	Poliomyelitis	% coverage	-	2	80
13.	Control of diarrhoeal diseases	% coverage of ORS distribution	5	50	90
14.	Control of tuberculosis	% case finding and treatment of estimated total diseased	10	13	35
15.	Delivery by trained midwife/birth attendant	% deliveries attended	2	5	50
16.	Ante-natal care	% pregnant women given care at least once	10	15	50
17.	Blindness prevention	% children under 6 receiving vit A capsule	60	75	90
18.	Goiter control	% covered for protection	20	30	100
19.	Nutrition services	% of 2nd/3rd degree malnutrition cases found	5	5	30
20.	Coverage of population by primary health care services	% of population	20	30	65
<u>Supportive Services</u>					
21.	Essential drugs and vaccines	Availability for public health services (% of total required)	10	25	60
22.	Production of essential drugs, vaccines, ORS & I.V. fluids	Value in million Taka	15	80	300

Data Source: TFYP, November, 1985.

Table 2.6.1 (2/2) Major Indicator and Targets

SI No.	Health Indicator	Unit	1979-80 (Actual)	1984-85 (Actual)	1989-90 (Target)
23.	Health laboratory services:				
(a)	Simpler clinical diagnostic lab. facilities at UHCs	% of coverage	20	25	100
(b)	District laboratory facilities	% of coverage	20	25	60
(c)	Simple tests in UHFWCs	% of coverage	-	5	25
24.	X-ray facilities in the UHCs	% of coverage	10	20	60
25.	Blood transfusion services in district hospitals	Cumulative numbers	-	20	64
<u>Health Manpower</u>					
26.	Graduate doctor	Cumulative numbers	11,000	16,000	22,500
27.	Post-graduate doctor	Cumulative numbers	631	1,050	2,100
28.	Dentist	Cumulative numbers	262	510	750
29.	Basic nurse/midwife	Cumulative numbers	2,700	6,500	10,200
30.	Medical assistant	Cumulative numbers	450	3,600	4,600
31.	Laboratory technician	Cumulative numbers	1,100	1,350	2,000
32.	Radiographer	Cumulative numbers	190	350	70
33.	Pharmacist (Diploma)	Cumulative numbers	5,200	5,800	8,500
34.	Health sanitary inspector	Cumulative numbers	930	1,265	1,500
35.	Assistant health inspector	Cumulative numbers	1,350	1,870	4,500
36.	Health assistant	Cumulative numbers	12,300	1,500	23,000

Data Source: TFYP, November, 1985.

Table 2.6.2 Health Indicators

Health Indicators	Unit	Comilla		Daudkandi		Homna	
		in '81	in '88	in '81	in '88	in '81	in '88
<u>Health Status</u>							
1. Infant Mortality	per 1,000 births						
2. Crude Birth Rate	per 1,000						
3. Crude Death Rate	per 1,000						
4. Population Growth	% per year						
<u>Health Care Delivery</u>							
5. Upazila Health Complexes (Hospital)	Places			3		1	
6. Union Sub-Centres	" (Parademic)			12		243	
7. Health & Family Welfare Centres	" (Clinic)			6		4	
8. Hospital Beds	Numbers			31		31	
9. Coverage of Population by PHC Services	%						
<u>Health Manpower</u>							
10. Graduate Doctor	Numbers			20		10	
11. Post Graduate-Doct.	"						
12. Dentist	"						
13. Basic Nurse/Midwife	"						
14. Pharmacist	"						
15. Health Assistant Per Population	"						
16. Doctor				20,743		19,910	
17. Bed				3,383		6,423	
18. Parademic				34,572		819	
19. Clinic				69,143		49,776	

Data Source : Bangladesh Popula Census, July, 1985.
Upazila Information, November, 1988.

Table 2.7.1 Enrollment Targets for the Third Five Year Plan

Level of Education	1983	1980	(Unit: 000 students)	
			1985 (Benchmark)	1990 (Target)
1. Primary Education	6,000	8,286	8,920	11,600
2. Secondary Education	1,700	2,000	2,483	2,750
3. College Education	338	396	428	440
4. University Education 1/	21	30	35	39
A. General:	19	26	32	35
a. Science	6	7	9	11
b. Arts and others	13	18	23	24
B. Engineering	2	2	3	4
5. Technical Education	15.7	20.3	20.0	22.0
A. Engineering	1.1	2.1	3.1	3.4
B. Technician	10.1	11.8	12.8	13.3
C. Vocational	3.7	6.4	4.5	5.3
6. Commercial Education	2.6	2.7	3.3	3.6
7. Madrasha Education	-	-	319	350
8. Non-formal Vocational Training (including Community Schools) Training (inc	-	-	554	756

Note: 1/ Excluding Agricultural University.
Data Source: TFYP (1985-90)

Table 2.7.2 Literacy Rate and Educational Institution in the Study Area

Description		Greater Comilla District		Daudkandi		Homna	
		(in 1981)	(in 1988)	(in 1981)	(in 1988)	(in 1981)	(in 1988)
Literacy Rate (percents) (5 years & over)							
Total :	Both Sex	23.7	23.8	19.8	20.8	14.7	18.6
	Male	30.7	31.0	26.8	27.3	20.9	13.5
	Female	216.6	16.0	12.8	13.2	8.3	4.8
Urban :	Both Sex	40.3	40.7	37.5	32.0	26.8	N.A.
	Male	48.3	48.6	44.4	45.0	35.4	N.A.
	Female	30.4	30.3	24.6	25.0	17.3	N.A.
Rural :	Both Sex	22.2	20.6	19.5	20.0	14.4	N.A.
	Male	28.9	27.3	26.4	27.0	20.6	N.A.
	Female	15.5	13.7	12.7	13.0	8.1	N.A.
Educational Institution (places)							
	Primary School	2,793	44,000	171	201	92	91
	Junior/High School	441	9,000	27	31	12	12
	college	42	600	3	4	1	3
	Madrasha	N.A.	N.A.	9	31	2	50
	Vocational Institute	N.A.	N.A.	N.A.	1	N.A.	1
	Population ('000 persons)	6,881	87,120	415	520	199	249
Number of Students (persons)							
Primary :	Total	N.A.	N.A.	46,000	50,223	17,093	13,202
	Male	-	-	25,500	26,901	12,570	11,215
	Female	-	-	21,500	23,322	4,593	6,987
High School :	Total	-	-	11,500	13,007	2,374	3,915
	Male	-	-	7,350	8,548	2,333	2,953
	Female	-	-	3,750	4,459	546	962

Source: Bangladesh Population Census In 1981
Upazila Information in 1988

Table 2.8.1 Projected Population Size, Birth, Death and Growth Rates for the TFYP along with Required Contraceptive Practices

Year	Mid-year Population (million)	Population at the beginning of the Year (million)	Mid-year CBR	Mid-year CDR	Average Growth Rate	Contraceptive Practice Rate	Numbers of EC Using (000)
1974	-	71.5	-	-	-	-	-
1985	100.5	99.2	39	15.0	2.4	25.0	41.95
1986	102.9	101.7	37.6	14.4	2.3	28.0	49.10
1987	105.2	104.1	36.2	14.1	2.3	31.0	56.51
1988	107.4	106.3	33.8	13.9	2.0	34.0	64.44
1989	109.5	118.5	32.4	13.7	1.9	37.0	72.80
1990	111.5	110.5	31.0	13.4	1.8	40.0	81.59

CBR : Crude Birth rate
 CDR : Crude Death Rate
 EC : Eligible Couples

Note: Growth rate between 1961 and 1974 was 2.7% and 1974 to 1981 was 2.37%

Table 2.8.2 Year-wise Mix of Different Contraceptives under TFYP

Method	1983	1985-86	1986/87	1987/88	1988/89	1989/90
Sterilization	40.0	40.6	41.2	41.8	42.4	43.0
Oral Pills	15.2	15.5	16.0	16.5	17.0	17.5
Condom	12.4	13.0	13.0	13.0	13.0	13.0
IUD	4.6	7.5	9.0	10.5	12.0	14.0
Injectables	1.0	1.3	1.6	1.9	2.2	2.5
Others	26.8	22.1	19.2	16.3	13.4	10.0

IUD : Intra Uterine Device (for male)
 Data Source: TFYP, Nov. 1988.

Table 3.1.1 Present Land Use

Land Use	Daudkandi		Homna		(Unit: ha) Total	
	1981	1988	1981	1988	1981	1988
1. Total area	37,555		17,871		55,426	
2. Water body	4,900		6,500		6,500	
3. Agricultural land	29,102	28,839	14,674	14,415	43,776	43,254
4. Fish pond	741	741	312	312	1,053	
5. Infrastructure	732	751	348	357	1,080	1,108
6. Homestead	2,030	2,324	937	1,187	3,017	3,511

Note: 1) Agricultural Land

1981: Average area of 1979/80 - 81/81 quoted from "Comilla District Statistics" in 1983.

1988: From Upazila Information

2) Infrastructure

1981: 1.95% of the total area

1983: 2.00% of the total area

3) Homestead

1981: Computed as follows:

Dwelling = 0.0243 (ha) x Nos. of household

Institution = 1.0 (ha) x Nos. of institution

Business and Industries

= 0.0243 (ha) x Nos.

Quoted from "The Bangladesh Census of Agriculture and Livestock in 1983/84".

Table 3.2.1 Crop Production in Daudkandi

Sl. No.	Crop	1985-86			1986-87			1987-88		
		Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)	Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)	Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)
1.	Aus. HYV	93	2.50	233	54	1.75	95	140	2.20	308
	LV	3,915	0.65	2,545	3,764	0.68	2,560	3,004	1.00	3,004
2.	B.Aman. LV	20,600	1.23	25,235	17,604	0.98	17,252	16,807	1.15	19,328
3.	T.Aman. HYV	210	2.78	584	188	2.70	508	42	0.63	26
	Pajam	596	1.43	852	600	1.58	948	116	0.73	85
	LV	260	0.85	221	282	0.83	234	118	0.48	57
4.	Boro HYV	6,246	2.90	18,113	7,872	3.65	28,733	9,514	3.85	36,629
	Pajam	320	1.90	608	419	2.60	1,089	280	2.63	736
	LV	374	1.23	460	286	1.40	400	334	1.45	484
5.	Wheat Irri.	2,400	2.38	5,712	1,420	2.50	3,550	1,024	1.63	1,669
	Non-Irri.	7,800	2.05	15,990	7,600	1.95	14,820	5,066	1.25	6,333
6.	Jute. Oil	7	3.73	26	24	1.68	40	11	1.80	20
	Cap	1,717	2.80	4,808	1,227	1.58	1,939	1,620	1.55	2,511
7.	Mustard HYV	94	0.68	64	30	0.80	24	63	1.90	120
	LV	2,520	0.55	1,386	1,666	0.50	833	1,149	0.78	896
8.	Patato HYV	2,500	15.00	37,500	3,676	15.25	56,059	5,600	19.50	109,200
	LV	100	5.00	500	28	5.50	154	58	5.50	319
9.	Sweet Potato	400	12.50	5,000	278	13.08	3,636	238	0.38	90
10.	Ground nut	51	1.50	77	91	1.50	137	84	1.70	143
11.	Chilly	1,680	1.13	1,898	1,263	1.40	1,768	1,282	1.45	1,859
12.	Pulses	616	0.65	400	596	0.65	387	644	0.75	483
13.	Kakn & Cina	368	0.95	350	286	0.95	272	92	0.98	90
14.	Til	600	0.73	438	500	0.85	425	5,412	0.93	5,033
15.	Water melon	392	30.58	11,987	376	30.00	11,280	370	30.00	11,100
16.	S.Vegetables	160	9.55	1,528	164	9.75	1,599	280	10.25	2,870
17.	W.Vegetables	680	10.55	7,174	888	10.50	9,324	464	10.78	5,002
18.	Tobacco	16	6.50	104	9	6.25	56	3	6.50	20
19.	Garlic & Onion	315	9.33	2,939	218	9.38	2,045	338	9.40	3,177
20.	Maize	-	-	-	2	4.63	9	4	4.63	19
21.	Mashkalai	-	-	-	-	-	-	-	-	-
22.	Others	200	6.25	1,250	200	6.25	1,250	200	6.25	1,250
Total		55,230			51,611			54,357		

Table 3.2.2 Crop Production in Homna

Sl. No.	Crop	1985-86			1986-87			1987-88		
		Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)	Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)	Achieved Area (ha)	Average Yield (t/ha)	Total Production (ton)
1.	Aus. HYV LV	1,600	1.27	2,032	1,800	0.82	1,476	1,928	1.80	3,470
2.	B.Aman. LV	10,800	1.40	15,120	11,000	1.45	15,950	9,230	0.91	8,399
3.	T.Aman. HYV Pajam LV	-	-	-	-	-	-	-	-	-
4.	Boro HYV Pajam LV	2,800	3.18	8,904	2,880	3.27	9,418	2,080	1.91	3,973
5.	Wheat Irri. Non-Irri.	200	1.04	208	200	1.09	218	200	1.09	218
6.	Jute. Oil Cap	3,200	2.06	6,592	4,200	2.00	8,400	3,960	1.32	5,227
7.	Mustard HYV LV	32	1.63	52	7	1.63	11	10	1.45	15
8.	Patato HYV LV	1,400	1.36	1,904	800	1.36	1,088	720	1.27	914
9.	Sweet Potato	64	9.90	634	60	10.90	654	88	16.91	1,488
10.	Ground nut	28	5.00	140	30	5.45	164	66	7.30	482
11.	Chilly	640	10.90	6,976	720	11.36	8,179	200	10.90	2,180
12.	Pulses	60	1.09	65	64	1.09	70	10	0.90	9
13.	Kakn & Cina	920	1.09	1,003	960	1.14	1,094	310	1.13	350
14.	Til	-	-	-	-	-	-	-	-	-
15.	Water melon	200	1.09	218	200	1.09	218	100	1.02	102
16.	S.Vegetables	40	9.09	364	280	10.00	2,800	20	9.05	181
17.	W.Vegetables	440	10.00	4,400	480	10.45	5,016	480	10.91	5,237
18.	Tobacco	-	-	-	-	-	-	-	-	-
19.	Garlic & Onion	-	-	-	-	-	-	-	-	-
20.	Maize	-	-	-	-	-	-	-	-	-
21.	Mashkalai	-	-	-	-	-	-	-	-	-
22.	Others	-	-	-	-	-	-	-	-	-
Total		22,424			23,681			19,402		

Table 3.2.3 Average Crop Production in both Upazila

Crops	Daudkandi			Homna		
	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)	Production (t)
Rice						
Aus						
HYV	100	2.21	221	-	-	-
LV	3,560	0.76	2,706	1,770	1.31	2,319
T&A	3,660	0.80	2,927	1,770	1.31	2,319
T. Aman						
HYV	150	2.54	381	-	-	-
LV	650	1.22	793	-	-	-
T&A	800	1.47	1,174	-	-	-
B. Aman						
LV	18,340	1.12	20,541	10,340	1.27	13,132
Boro						
HYV	7,880	3.53	27,816	2,590	3.14	8,133
LV	670	1.88	1,260	200	1.07	214
T&A	8,550	3.40	29,076	2,790	2.99	8,347
(Sub-total)	(31,350)	(1.71)	(53,718)	(14,900)	(1.59)	(23,798)
Rabi Crops						
HYV						
Wheat						
Irri.	1,620	2.26	3,661	-	-	-
Non-Irri.	6,820	1.76	12,003	3,780	1.78	6,728
T&A	8,440	1.85	15,664	3,780	1.78	6,728
Oilseed (Mustard)						
HYV	60	1.13	68	-	-	-
LV	1,780	0.58	1,032	880	0.60	528
T&A	1,840	0.60	1,100	880	0.60	528
Potato						
HYV	3,930	17.22	67,675	70	13.03	912
LV	60	5.23	314	40	6.39	256
T&A	3,990	17.04	67,989	110	10.62	1,168
Winter Vegetables	1,270	11.46	14,581	990	10.80	10,692
Pulses	620	0.68	442	-	-	-
(Sub-total)	(16,160)			(5,760)		
Kharief Crops						
Jute						
Oil	10	2.07	21	20	1.62	32
Cap	1,520	2.03	3,085	970	1.34	1,300
T&A	1,530	2.03	3,106	990	1.34	1,332
Oilseed (Sesame)	620	0.92	570	210	1.07	225
Pulses	-	-	-	-	-	-
Summer Vegetable	580	23.20	13,455	110	9.86	1,085
Chilli	1,410	1.31	1,847	730	1.12	818
(Sub-total)	(4,140)			(2,040)		
Total	51,650			22,700		
(Crop Intensity)	(179%)			(157%)		

Table 3.2.4 Amount of Fertilizer and Seed Rate

	Present (kg/ha)			Proposed (kg/ha)			
	Urea	TSP	MP	Urea	TSP	MP	Seed Rate
Aus	120	90	55	175	130	77	30
T. Aman	135	100	65	190	140	90	30
B. Aman	20	-	-	90	50	-	75
Boro	175	130	70	240	170	90	30
Wheat	105	95	42	130	125	60	150
Potato	320	220	320	385	260	385	1,800
Oilseed	95	95	50	135	135	65	10
Pulses	-	50	20	35	125	50	25
Chilli	75	150	50	95	194	65	30
Jute	105	25	45	150	37	65	10
Vegetables	310	110	110	405	140	140	-

Note: TSP Triple Super Phosphate
MP Muriate of Potash

Table 4.2.1 Marketing Prices of Agricultural Products by Stage

Daudkandi

	TK/100kg			
	Farm Gate	1st Whole Sale	2nd Whole Sale	Retail
Paddy	500	550		600
Rice	900	1,000		1,100
Jute	500	550	600	650
Mustard	750	800		850
Potato	125	150		200
Wheat	450	500		550

Source : Upazila Imformation 1988

Homna

	TK/100kg			
	Farm Gate	1st Whole Sale	2nd Whole Sale	Retail
Paddy	530	580		650
Rice	1,050	1,065		1,100
Jute	550	575		700
Mustard	900	950		1,200
Potato	250	275	300	800
Wheat	500	520		600
Chillies	2,000	2,100		2,800
Peanuts	1,000	1,100		

Source : Upazila Imformation 1988

Table 4.2.2 Marketing Measures and Its Fees

Measures	Cost		Remarks
	Daudkandi	Homna	
Truck	1,500		5 ton /100 km
Rickshaw	45	120	225 kg /10 km
Boat	575	900	5 ton /10 km
Engine Boat	500	800	5 ton /100 km
Auto-Rickshaw		100	5 ton /100 km

Source : Upazila Imformation 1988

Table 4.3.1 Added Value of Agriculture, Livestock, Fisheries and Forest

Bangladesh

Year	Agriculture mil. Tk.	Livestock & Poultry mil. Tk.	Fisheries mil. Tk.	Forestry mil. Tk.	Total mil. Tk.	Per Capita Tk.
1981-82	94,922	12,713	7,654	650	115,939	1,340
1982-83	103,950	14,925	8,008	8,928	135,811	1,457
1983-84	127,171	16,794	11,413	12,418	167,796	1,756
1984-85	152,477	36,822	14,427	14,069	217,795	2,121
1985-86	147,259	32,110	17,219	15,155	211,743	2,108

Comilla

Year	Agriculture mil. Tk.	Livestock & Poultry mil. Tk.	Fisheries mil. Tk.	Forestry mil. Tk.	Total mil. Tk.	Per Capita Tk.
1981-82	6,778	1,032	978	12	8,800	1,226
1982-83	7,231	1,159	762	16	9,368	1,273
1983-84	7,009	1,325	1,408	22	11,764	1,559
1984-85	10,634	2,053	1,657	26	14,370	1,897
1985-86	10,251	2,434	2,004	40	14,729	1,856

Source : Year Book Agricultural Statistics of Bangladesh

Table 4.3.2 Yield, Production Cost and Benefit of Major Crops

	1981-82			1982-83			1983-84		
	Yield ton	Cost TK	Benefit TK	Yield ton	Cost TK	Benefit TK	Yield ton	Cost TK	Benefit TK
Aus				1.78	7,020	-722	1.95	7,937	-315
T. Aman	1.72	3,818	2,163	2.28	6,380	1,924	2.31	8,565	467
Boro	3.72	10,780	2,190	2.97	10,492	687	3.46	14,920	-1,391
Wheat	1.45	5,857		2.21	7,202	1,707	2.81	9,057	2,183
Jute				1.42	7,962	-612	1.88	9,335	4,980

Source: Agricultural Statistics of Bangladesh

Table 4.3.3 Yield, Benefit and Productivity per Upazila

Daudkandi

	Yield	Production	Production Cost	Benefit	Input	Productivity
	ton/ha	ton	Tk/ton	Tk/ton	man.day	Benefit/input
Aus	0.80	4,000	6,740	-2,740	168	-16.3
T. Aman	1.12	5,600	5,870	-270	139	-1.9
B. Aman	1.34	6,700	11,090	-4,390	244	-18.0
Boro	3.40	17,000	15,810	1,190	291	4.1
Wheat	1.90	8,550	7,180	1,370	124	11.0
Jute	2.03	10,150	8,440	1,710	212	8.1
Oil seed	0.61	4,575	4,490	85	83	1.0
Potato	17.03	21,287	34,886	-13,599	270	-50.4
Chilli	1.81	3,620	11,390	-7,770	203	-38.3
Vegetable	10.37	62,220	19,000	43,220	285	151.6

Source: Upazila Imformation 1988

Homna

	Yield	Production	Production Cost	Benefit	Input	Productivity
	ton/ha	ton	Tk/ton	Tk/ton	man.day	Benefit/input
Aus	1.31	6,943	6,740	203	168	1.2
T. Aman	1.27	6,731	5,870	861	139	6.2
Boro	2.74	14,522	15,810	-1,288	291	-4.4
Wheat	1.78	8,900	7,180	1,720	124	13.9
Jute	1.34	7,370	8,440	-1,070	212	-5.0
Potato	10.60	26,500	34,886	-8,386	270	-31.1
Chilli	1.12	2,240	11,390	-9,150	203	-45.1
Vegetable	10.32	51,600	19,000	32,600	285	114.4

Table 4.4.1 Cooperative Activities

(1) Co-operatives (Nos.)		Daudkandi		Homna	
		Established	Registered	Established	Registered
Farmers' cooperative	(KSS)	484	410	248	221
Landless farmers' cooperative	(BSS)	53	37	71	52
Women cooperative	(MSS)	0	0	0	0
Landless women cooperative	(MBSS)	22	11	16	10

(2) Members (person)		Daudkandi		Homna	
		Established	Registered	Established	Registered
Farmers' cooperative	(KSS)	14,249	35	12,362	56
Landless farmers' cooperative	(BSS)	1,532	41	2,311	44
Women cooperative	(MSS)	0	0	0	0
Landless women cooperative	(MBSS)	454	41	349	35

(3) Members' Deposits (Taka)		Daudkandi		Homna	
		Saving	Initial	Saving	Initial
Farmers' cooperative		1,298,324	940,720	736,148	659,680
Landless farmers' cooperative		127,544	77,260	160,562	88,860
Women cooperative		0	0	0	0
Landless women cooperative		56,463	16,600	51,205	27,890
caáv		1,482,331	1,034,580	947,915	776,430
					1,724,345

(4) Credits (Taka)		Daudkandi		Homna	
		Investment	Realization	Investment	Realization
Long term		24,634,866	18,418,671	18,560,775	16,084,718
Short term		1,225,460	297,378	1,201,084	247,574
Rural poor programme		1,071,417	519,263	1,261,000	657,009
					585,097
					18,894

Source: Upazila information 1988

Table 5.1.1 Irrigation Area by Union

(Daudkandi Upazila)

Union Name	Area of Union	Irrigated Area by				Total Irrigated Area	Percentage of Irrigated Area
		LLP	DTW	STW	HTW		
1. Balarampur North	1,082	61	16	125	5	207	19.1
2. Balarampur South	1,147	99	-	16	19	134	11.7
3. Barakanda	3,470	81	-	14	7	102	2.9
4. Bitikandi	2,284	275	-	23	18	316	13.8
5. Daudkandi North	1,540	987	-	3	-	990	64.3
6. Daudkandi South	1,821	421	-	6	5	432	23.7
7. Elliotgonji North	1,413	194	18	-	0	212	15.0
8. Elliotgonji South	1,394	615	255	10	-	880	63.1
9. Goalmari	1,956	728	36	3	5	772	39.5
10. Gobindapur	1,446	405	-	33	11	449	31.1
11. Gouripur East	1,363	453	145	10	-	608	44.6
12. Gouripur West	963	178	73	6	2	259	26.9
13. Jagathpur North	1,061	34	-	6	4	44	4.1
14. Jagathpur South	1,405	178	-	42	19	239	17.0
15. Maruka	2,997	482	61	10	-	553	18.5
16. Mazdpur	2,019	939	-	16	17	972	48.1
17. Mohammedpur	2,758	73	190	10	0	273	9.9
18. Narayenda	2,040	279	-	49	61	389	19.1
19. Panchgachia East	1,452	316	-	3	5	324	22.3
20. Panchgachia West	1,714	178	-	6	8	192	11.2
21. Sundalpur East	1,686	36	146	13	5	200	11.9
22. Sundalpur West	489	142	85	10	4	241	49.3
Total	37,500	7,154	1,025	233	70	8,788	23.4

Table 5.1.2 Irrigation Area by Union

(Homna Upazila)

Union Name	Area of Union	Irrigated Area by				Total Irrigated Area	Percentage of Irrigated Area
		LLP	DTW	STW	HTW		
1. Bhasania	1,900	81	-	23	36	140	7.4
2. Chandanpur	3,212	80	-	7	30	117	3.6
3. Chanderchar East	1,611	39	-	-	30	69	4.3
4. Chanderchar West	1,182	65	-	4	30	99	8.4
5. Ghagutia East	1,139	51	-	11	36	98	8.6
6. Ghagutia West	1,309	49	-	15	36	100	7.6
7. Homna North	1,720	28	-	11	30	69	4.0
8. Homna South	1,164	84	-	-	30	114	9.8
9. Nilakhi	2,417	194	-	42	49	285	11.8
10. Radha Nagar	2,246	36	-	42	49	127	5.7
Total	17,900	707	0	155	356	1,218	6.8

Note: LLP: Low Lift Pump, DTW: Deep Tube-well
STW: Shallow Tube-well, HTW: Hand Tube-well
RP: Roar Pump

Source Upazila Information, Dec. 1988

Table 5.2.2 (1/2) Road Inventory Daudkandi Upazila

No.	Class	Name of Road	Length km	Width m	Pavement km	Bridge Nos.	Remarks
1.	F.A. *	Gouripur Batakandi	13.30	7.32	H.B.B 12.00	14 2-Ferries	Connecting Homna Upazila
2.	R ***	Gouripur Ashmania	8.00	4.88	Earthen 8.00	6	Connecting Ashmania New Growth Centre
3.	F.B **	Gouripur Kachua	12.00	4.88	Earthen 12.00	4	Connecting Upazila Kachua
4.	-do-	Pannai-Sree Rayer Char	16.00	4.88	Earthen 16.00	8	Connecting Gouripur Narayanpur Bazar
5.	R	Batakandi Raipur	14.50	4.88	Earthen 13.25	7	Connecting Batakandi Machinpur, Raipur
6.	-do-	Batakandi Kalir	6.50	4.88	Earthen 6.50	3	Connecting Goalmari
7.	-do-	Shahadnipur Goalmari	13.00	7.32	Earthen	2	
8.	F.B	Daudkandi Goalmari	6.50	7.32	Earthen	5	
9.	-do-	Elliotgonj Mohammadpur	6.00	4.88	Earthen	10	Connecting Elliotgonj Growth Centre
10.	R	Elliotgonj Barakota	7.00	4.88	Earthen	5	
11.	F.B	Elliotgonj Pachpukuria	5.00	4.88	Earthen 5.00	5	
12.	R	Goalmari Mollakandi	6.50	4.88	Earthen 6.50	3	Connecting Goalmari Growth Centre
13.	R	Shanud Ruhulanin	3.00	4.88	Earthen 3.00	1	Connecting Daudkandi Growth Centre
14.	-do-	Hassanpur Collage Hassanpur	4.00	4.88	Earthen 4.00	1	-Dit-
15.	F.B	Daudkandi Mohanpur	7.00	4.88	Earthen 7.00	4	-Dit-
16.	R	Goalmari Sreerayerchar	8.00	4.88	Earthen 8.00	6	Connecting Goalmari Growth Centre
17.	F.B	Batakandi Ranpur Launch Ghat	13.00	4.88	Earthen 13.00	10	Connecting Batakandi Growth Centre
18.	R	Gouripur Lalpur	4.00	4.88	Earthen 4.00	3	Connecting gouripur Growth Centre
Total			152.00				

Note : * F.A = Feeder road A ** F.B = Feeder road B *** R = Rural road
Source : Upazila Information Nov. 1988

Table 5.2.2 (2/2) Road Inventory Homna Upazila

Sl. No.	Class	Name of Road	Length km	Width m	Pavement km	Bridge Nos.	Remarks
1.	F.B *	Homna Gouripur	5.00	7.32	H.B.B 6.00	9	Main road connecting national high way with Homna Upazila
2.	F.B **	Homna Daulatpur	7.30	7.32	Earthen	4	Connecting Daulatpur Growth Centre with Upazila HQ
3.	-do-	Homna Manikerchar	9.28	7.32	Earthen	6	Connecting Maniker Growth Centre Upazila HQ Ferry service required
4.	-do-	Sreemoddi Ragunathpur	16.125	4.88	H.B.B 0.50	9	Ferr platform Connecting with Muradnagar Upazila
5.	R ***	Ghagutia Baluakandi	13.65	4.88	Earthen	7	
6.	-do-	Bagmara Sovarampur	10.88	4.88	Earthen	9	
7.	-do-	Operchar Manipur	7.51	4.88	Earthen	7	
8.	-do-	Operchar Mahishmari	7.00	4.88	Earthen	5	
9.	-do-	Chandanpur Manikchar	4.60	4.88	Earthen	3	
10.	-do-	Daulatpur Ramkrishnapur	4.25	4.88	Earthen	5	
Total			86.595				

Note : * FA = Feeder RoadA, ** FB = Feeder RoadB, *** R = Rural Road

Source : Upazila Information Nov. 1988

Table 5.2.3 (1/2) Monthly Records of Water Level in Meghna Gumti River at Daudkandi Station

Unit : meter in PWD

Year	Mon.		Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1960											2.90	1.13	3.45	1.92	5.09	3.28
1961	2.13	0.82	1.86	0.55	2.50	0.48	1.98	0.64	3.29	1.65	3.84	2.62	4.24	3.35		
1962	0.07	0.94	2.07	0.91	2.07	0.85	2.26	1.19	3.14	1.45	4.11	2.83	4.91	3.84		
1963							2.44	1.04	2.59	1.40	4.42	1.98	5.09	4.18		
1964	2.32	0.88	1.86	0.88	1.84	0.91	3.23	1.09	3.26	1.71	4.27	2.44	5.36	3.70		
1965	1.95	0.79	1.72	0.64	1.77	0.76	2.68	1.04								
1966																
1967																
1968							2.61	1.25	3.10	1.48	4.38	2.49	5.66	4.17		
1969	0.86	1.79	1.74	0.73	2.13	0.70	2.41	1.04	3.13	1.19	4.15	2.65	5.21	3.99		
1970							2.38	1.37	3.51	1.77	4.46	2.87	5.53	4.13		
1971	2.16	1.62	2.26	0.76	2.23	0.76	2.23	1.28	3.69	1.49	4.34	2.87	5.21	3.87		
1972					2.07	0.76	2.59	1.07	3.14	1.80	5.07	2.68	4.68	3.22		
1973					1.84	0.87	2.65	0.93	3.40	2.24	4.95	3.00	5.09	4.11		
1974	2.33	1.01	1.94	0.88	2.23	0.82	2.59	1.33	3.32	2.13	4.40	2.96	5.65	4.28		
1975	2.21	0.98	2.03	0.37	2.01	0.99	2.70	1.22	2.97	1.65	3.79	2.44	5.15	3.55		
1976	2.27	1.33	2.24	1.14	2.12	0.94	2.50	1.08	2.87	1.65	4.21	2.44	5.14	4.05		
1977	2.04	0.91	2.07	1.13	2.29	1.13	3.20	1.34	3.51	2.32	4.48	3.02	5.03	4.02		
1978	2.13	1.07	1.71	0.69	1.89	0.69	2.44	0.88	3.57	1.06	4.48	3.05	4.88	4.30		
1979	2.10	0.61	1.89	0.64	2.06	0.76										
1980																
1981							2.59	0.94	2.86	1.71	3.69	2.44	5.30	3.20		
1982	1.91	1.43	1.83	0.88	1.94	0.84	2.88	1.56	2.91	1.76	4.30	2.04	4.80	4.09		
1983	2.05	1.11	1.98	0.91	2.55	1.11	2.75	1.18	3.30	2.15	4.40	2.40	4.90	3.75		
1984	1.72	0.80	1.52	0.22	2.20	0.32	2.84	1.35	3.60	2.07	4.75	3.20	5.25	4.19		
1985	1.70	0.65	1.95	0.60	1.95	0.80	2.82	1.07	2.77	1.30	4.21	2.50	4.65	3.96		
1986	2.02	0.87	1.84	0.66	2.38	0.86	3.08	1.13	3.28	1.98	4.23	2.18	5.11	3.97		
1987	2.80	0.96	1.88	0.84	2.29	0.80	2.55	1.20	2.65	1.80	3.73	2.09	5.31	3.79		
1988							2.46	1.32	3.43	1.96	4.21	3.48	5.55	5.48		

Table 5.2.3 (2/2) Monthly Records of Water Level in Meghna Gumti River at Daudkandi Station

Mon.	Aug.		Sep.		Oct.		Nov.		Dec.		Amount		Remarks	
Year	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1960	5.05	4.57	5.3	4.54	5	2.58	3.28	1.58	2.38	1.1	5.3	1.1		
1961	4.94	3.96	4.31	4.27	4.42	3.2	3.23	1.65	2.23	1.1	4.94	0.55		
1962	5.67	4.39	5.76	4.69	4.85	2.93	3.38	1.74	2.26	1.34	5.76	0.85		
1963	5.21	4.85	5.38	4.27	4.57	3.26	3.54	1.92	2.44	1.52	5.38	1.04		
1964	5.93	4.88	5.35	4.48	5.17	3.15	3.73	1.95	2.47	1.1	5.93	0.88		
1965												0.64		
1967														
1968	5.69	4.81	5.02	4.11	4.69	3.01	3.19	1.69	2.18	0.94	5.69	0.79		
1969	5.43	4.66	5.46	4.66							5.46	0.7		
1970	5.83	5.07	5.22	4.55	5.13	3.79	3.94	2.07	2.68	1.33	5.83	1.33		
1971	5.65	4.81	5.65	4.74	4.97	3.82					5.65	0.76	Order in large	
1972	5.07	4.25	4.74	4.01	3.86	2.26	2.65	1.62	2.16	1.05	5.07	0.76		
1973	5.46	4.74	5.06	4.33	4.88	3.26	3.47	2.37	3.2	1.66	5.46	0.87	1st	6.34
1974	6.05	5.17	5.43	4.85	4.97	3.31	3.54	2.04	2.96	1.34	6.05	0.82	2nd	6.06
1975	5.27	4.53	4.95	4.36	4.4	3.4	3.96	2.33	3.03	1.68	5.27	0.31	3rd	6.05
1976	5.04	4.31	5.04	4.25	4.42	2.45	2.73	1.74	2.35	1.52	5.14	0.94	4th	5.93
1977	5.33	4.88	5.39	4.3	4.31	3.11	3.35	2.01	2.56	1.48	5.33	0.91	5th	5.76
1978	5.03	4.54	4.85	4.02	4.66	2.59	3.05	1.97	2.33	1.16	5.03	0.67		
1979												0.61		
1980														
1981	5.55	5	5.39	2.22	4.66	2.71	3.2	2.22	3.44	1.49	5.55	0.94		
1982	5.2	4.59	4.9	4.59	4.75	2.76	2.92	1.72	1.81	1.17	5.2	0.84		
1983	5.3	4.47	5.53	5	5.37	3.59	3.35	1.75	2.06	1	5.53	0.91		
1984	5.52	4.22	5.46	4.47	5.2	2.98	3.08	1.86	2.4	1.72	5.52	0.22		
1985	4.95	4.18	4.71	4.08	4.95	3.67	3.85	1.78	2.43	1.22	4.95	0.6		
1986	5.4	4.72	5.32	4.74	4.98	3.84	4.18	2.63	3.07	1.85	5.4	0.66		
1987	6.06	5.3	5.57	5.24	5.23	3.21	3.36	2.09			6.06	0.8		
1988	6.27	5.08	6.34	4.4							6.34			
Form 1960 to 1988 for 29 years											6.34	0.22		

Remarks : This table is compiled based on the record of Water level BWDB

Table 5.3.1 Existing Condition of Growth Center

Item		Daudkandi					Homna		
		Daud-kandi	Gouripur	Elliotganj	Batakandi	Goalmari	Homna	Daulatpur	Manik char
Area	(ha)	2.01	2.32	2.01	1.27	0.24	2.86	1.21	2.22
Market day in a week		2	1	2	1	2	2	2	
Rice shed	sq.m	134	208	167	100				
Fish shed	sq.m	89	130	70	104	89	111	100	111
Meat shed	sq.m	30	-	-	56		42	22	9
Vegitable shed	sq.m	67	100	145	78				
Cloth shed	sq.m	-	232	93			111	111	
Godown	Nos	2	2	1	1	1			
Hand Tube well	Nos	2	4	12	2	1	1	1	1
Latirn	Nos	1	2	2	1		3	2	2
Electricity									
Post Office	Nos	1	1	1	1				
Banks	Nos	4	3	1	1				
Veterinary Hospital			1						
Dispensary			1						
Garbage pit			4				1	1	1
Rice mill	Nos	2	1		1				
Number of									
Buyers & Sellers	(1000)	15	20	25	15	8	25-30	15-20	8-10
Gross sales per annum (Tk 10 million)		25	25	40	26	0.02	0.4	0.2	0.15
Cattle market	sq.m			74	5574				
Telephone	No			1					
Telegram					1				
Mosque					1				
Slaugh fer shed	sq.m						33	33	

Table 5.3.2 Existing Hat Market in the Study Area

No.	Name	Location	Area (ha)	Market Days in a week
1.	Rampur Bazar	Barakanda	0.67	2
2.	Khirachalk Bazar	Barakanda	0.29	3
3.	Baiddhanstpur Bazar	Barakanda	0.06	1
4.	Sheennagar Bazar	Gobindapur	0.14	1
5.	Mohammadpur Bazar	Gobindapur	0.40	1
6.	Gobindapur Bazar	Gobindapur	0.16	1
7.	Uzirakandi Bazar	Jagathpur(S)	0.12	1
8.	Kalir Bazar	Jagathpur(N)	0.18	1
9.	Karikandi Bazar	Balarampur(S)	0.11	1
10.	Machimpur Bazar	Bhitikandi	0.18	1
11.	Dashkandi Bazar	Bhitikandi	0.55	1
12.	Asmania Bazar	Narandia	0.50	1
13.	Lalpur Bazar	Mazidpur	0.35	1
14.	Hasnabad Bazar	Daudkandi(N)	0.18	1
15.	Sree Raiyerchar Bazar	Panchgachia(W)	0.39	1
16.	Paler Bazar	Panchgachia(E)	0.59	1
17.	Kawadi Bazar	Panchgachia(E)	0.11	1
18.	Naiyer Bazar	Maruka	0.17	1
19.	Barkota Bazar	Maruka	0.58	2
20.	Sundalpur Bazar	Sundulpur(W)	0.26	1
21.	Raypur Bazar	Gouripur(E)	0.19	2
22.	Shahidnagar Bazar	Sundulpur(W)	0.06	2
23.	Jagathpur Bazar	Jagathpur(s)	0.19	1
24.	Hatkholra Bazar	Mohammedpur	0.35	2
25.		Mohammedpur	0.16	1
26.	Mohammedpur Bazar	Mohammedpur	0.17	1
27.	Juranpur Bazar	Goalmari	0.40	7
1.	Chandanpur Bazar	Chandanpur	N.A.	2
2.	Taker Bazar	Homna(N)	N.A.	1
3.	Taltali Bazar	Radanagar	N.A.	2
4.	Ramkrishnpur Bazar	Chanderchar(E)	N.A.	1
5.	Chatpur Bazar	Nilakhi	N.A.	1
6.	Kashipur Bazar	Bhashania	N.A.	2
7.	Miras Bazar	Nilakhi	N.A.	7

Note: N.A.= not available

Source : Upazila information 1989

Table 5.4.1 (1/3) Existing High Schools and Colleges

Sl. No.	Name of the Educational Institution	No. of Teacher		No. of Students	
		Male	Female	Male	Female
Daudkandi Upazila					
High School					
1.	Daudkandi Model High School under Daudkandi(S) U.P.	17	-	975	-
2.	Gouripur Subal Aftab High School Gouripur(W), U.P.	20	-	1,050	350
3.	Daudkandi Begum Amena Sultan Girls High School under Daudkandi(South),U.P.	8	5	500	500
4.	Barapara Girl's High School under Sundalpur(E), U.P.	3	6	-	227
5.	Raipur K.C. High School under Elliotgonj(N), U.P.	11	2	300	200
6.	Elliotgonj Rabi High School under Elliotgonj(S), U.P.	16	-	625	325
7.	Sundalpur High School under Sundalpur(West), U.P.	12	-	371	232
8.	Hatkholra High School under Mohammadpur U.P.	12	-	162	75
9.	Barkota High School under Mohammadpur U.P.	12	-	305	145
10.	Chinamura High School under Maruka Union Parishad.	10	-	386	130
11.	Chargoali Khandaker Nazir Uddin Ahmed High School under Sundalpur(W) Union Parishad.	9	-	206	75
12.	Panchgachia Union High School under Panchgachia(E) U.P.	12	-	830	195
13.	Al-Haj K.K. Girls High School under Panchgachia(E) U.P.	8	3	-	150
14.	Kawadi High School under Panchgachia(E) U.P.	14	3	241	122
15.	Mollakandi Lal Maih High School under Goalmar U.P.	11	-	238	119
16.	Jamalkandi Osmania High School under Goalmar U.P.	10	-	327	112

Table 5.4.1 (2/3) Existing High Schools and Colleges

Sl. No.	Name of the Educational Institution	No. of Teacher		No. of Students	
		Male	Female	Male	Female
17.	Goalmari Hazrat Abdul Qadir Jalani(R:) High School under Goalmari U.P.	8	-	208	101
18.	Sree-Rayerchar Serajul Islam Memorial High School Under Panchgachia(W) U.P.	5	2	106	32
19.	Chasai High School under Maruka Union Parishad.	12	-	200	125
20.	Mozaffar Ali High School under Barkanda Union Parishad	8	-	209	81
21.	Daulat Hossain High School under Gobindapur Union Parishad	10	-	200	75
22.	Sonarchar High School under Gobindapur Union Parishad.	8	-	210	75
23.	Jagatpur Sadhana High School under Jagatpur (S) U.P.	10	-	185	75
24.	Batakandi High School under Balarampur (N) U.P.	9	-	170	105
25.	Gazipur High School under Balarampur (N) U.P.	16	-	300	175
26.	Mozidpur High School under Mozidpur Union Parishad.	9	-	135	70
27.	Narandia Kalimia High School under Narandia Union Parishad	11	-	286	182
28.	Baherchar Fazlul Hoque High School under Daudkandi (N.) Union Parishad	5	-	118	22
29.	Machimpur R.R. Institute under Bhitikandi Union Parishad	8	-	215	72
30.	Juranpur Karimunnassa Girl's High School under Goalmari Union Parishad	6	-	-	162
31.	Mohammadpur Junior High School under Mohammadpur Union Parishad	4	4	-	150
<u>College</u>					
32.	Akbar Ali Khan Technical & Commerce College	50	7	350	290
33.	Begum Rabeya Girl's College	10	4	-	250

Table 5.4.1 (3/3) Existing High Schools and Colleges

Sl. No.	Name of the Educational Institution	Location in Union
Homna Upazila		
<u>High School</u>		
1.	Government High School	North Homna
2.	Homna Kabildin Girl's High School	North Homna
3.	Mathabangha High School	South Homna
4.	Manikerchar High School	Radha Nagar
5.	Chandanpur High School	Chand Pur
6.	Dalalpur High School	Chand Pur
7.	Danlatpur High School	East Ghagutia
8.	Baher Kalmina High School	East Ghagutia
9.	Kalagchia High School	West Chander Char
10.	Ramkrishnapur High School	East Chander Char
11.	Ramkrishnapur Girl's High School	East Chander Char
12.	Kashipur High School	Rhasania
<u>Colleges</u>		
1	Homna College	North Homna

FIGURES

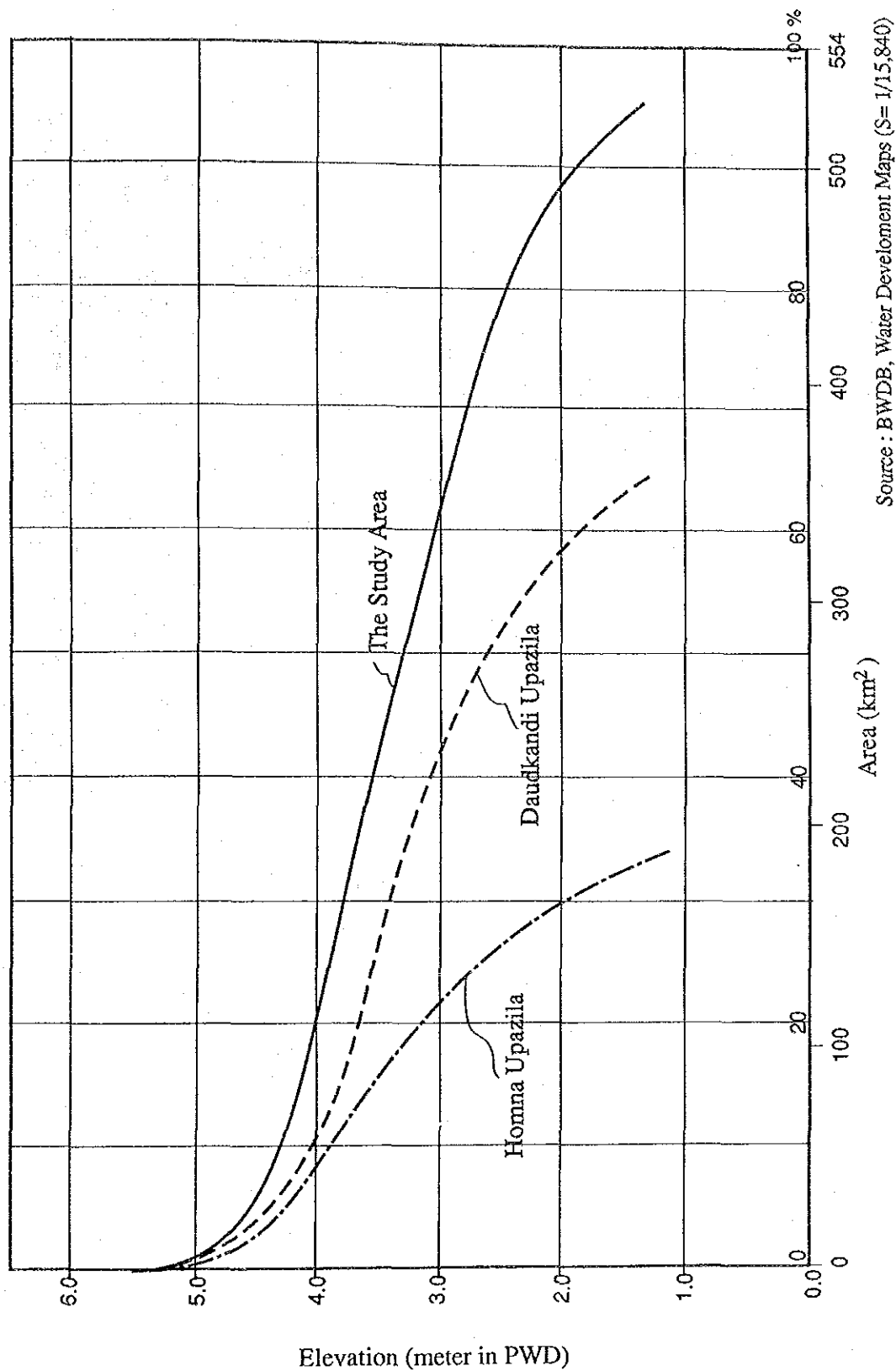


Figure 1.1.1 Relation between Ground Elevation and Land Area

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 MODEL RURAL DEVELOPMENT PROJECT PLAN
 FOR
 HOMNA AND DAUDKANDI UPAZILA
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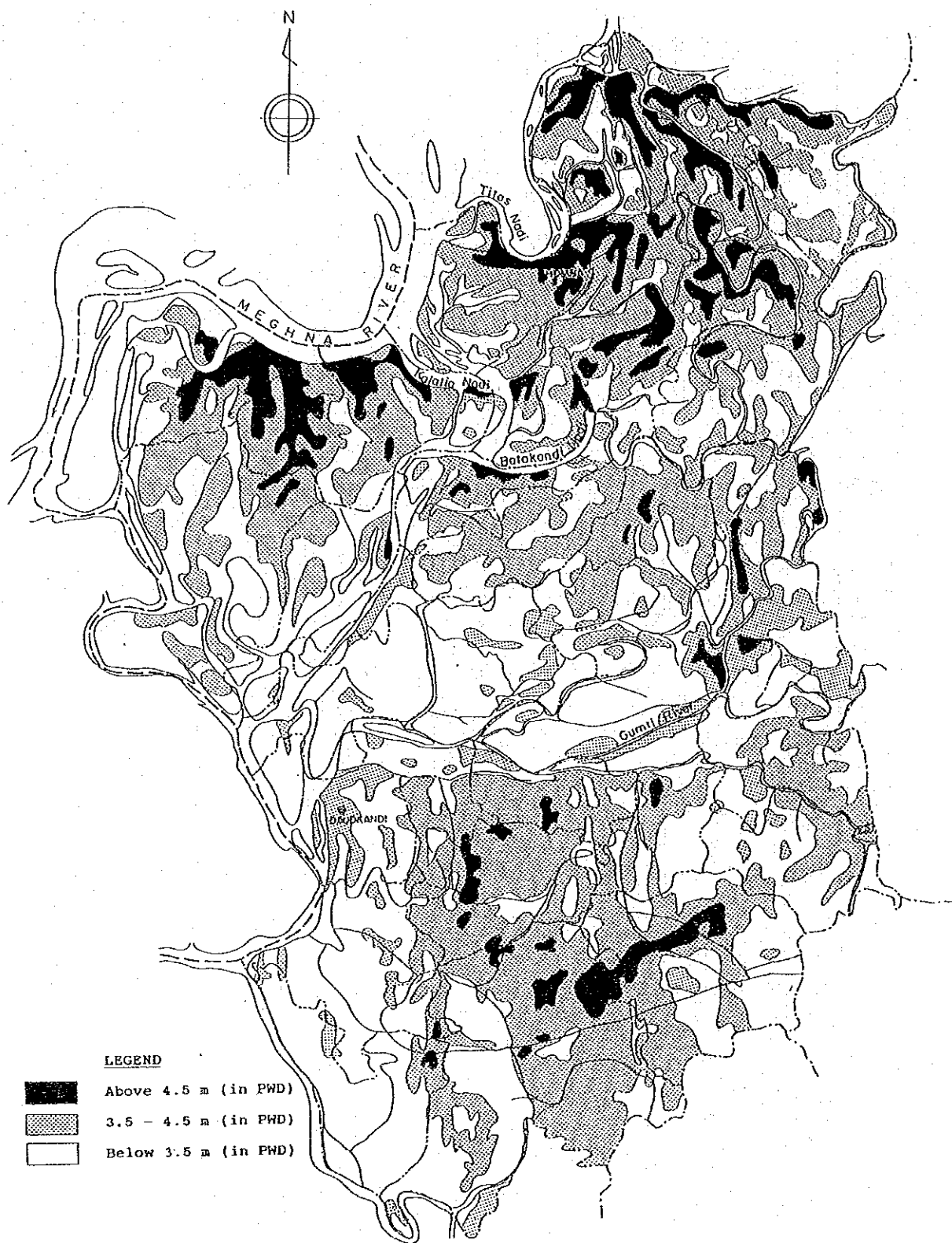
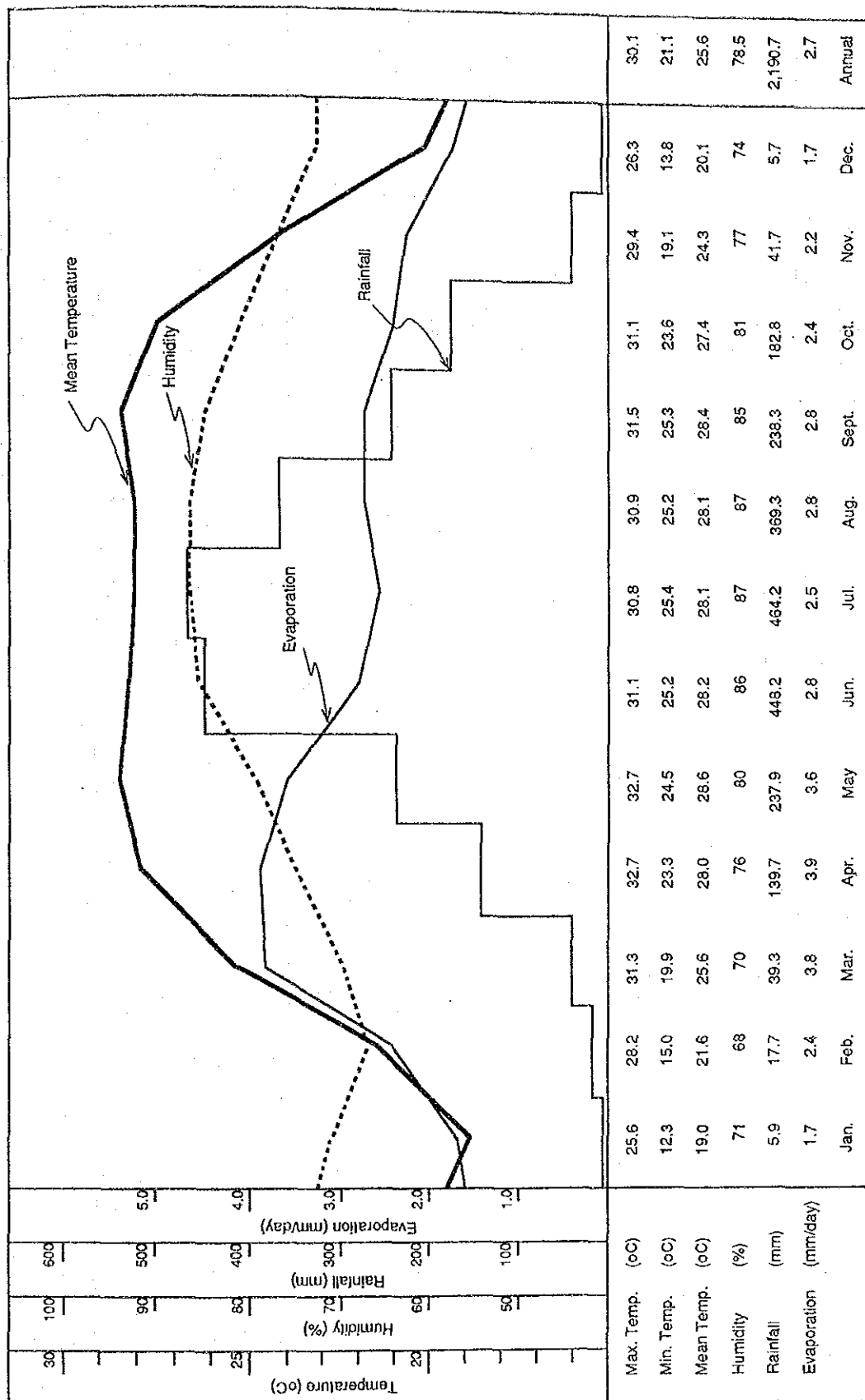


Figure 1.1.2 Topographic Feature

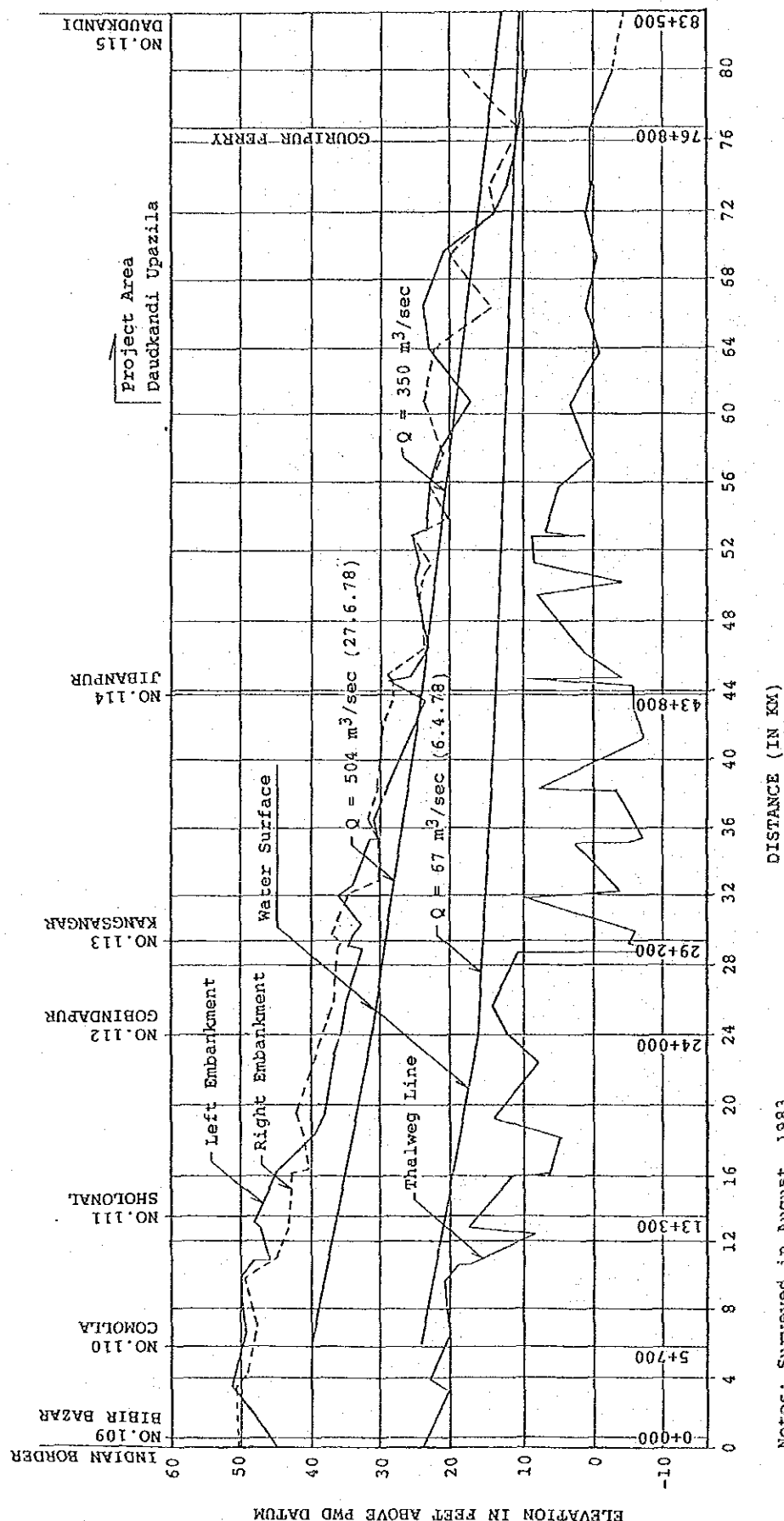
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Source : Bangladesh Meteorological Department

Figure 1.2.1 Meteorology at Comilla
(Average: 1961-80)

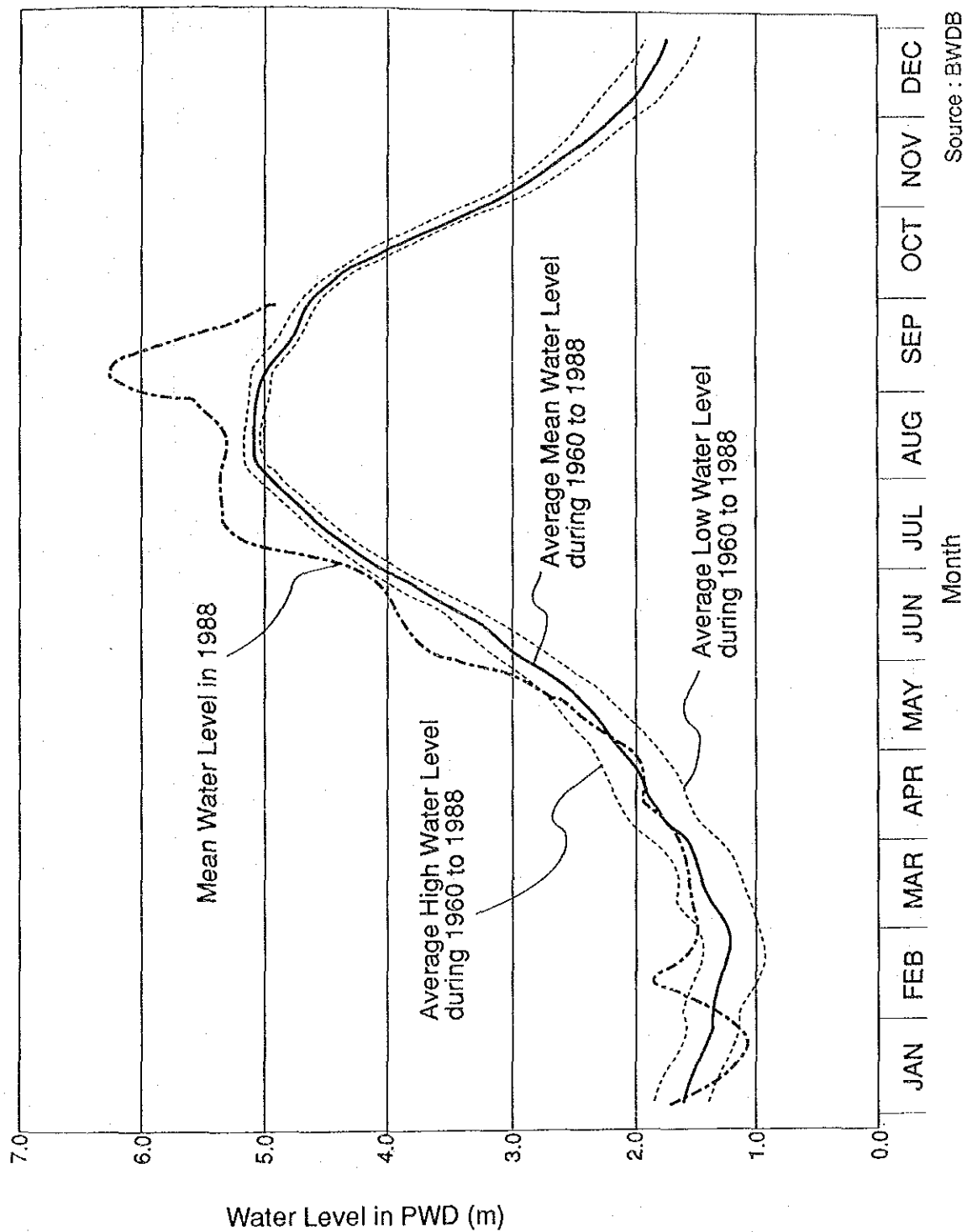
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Notes: Surveyed in August, 1983

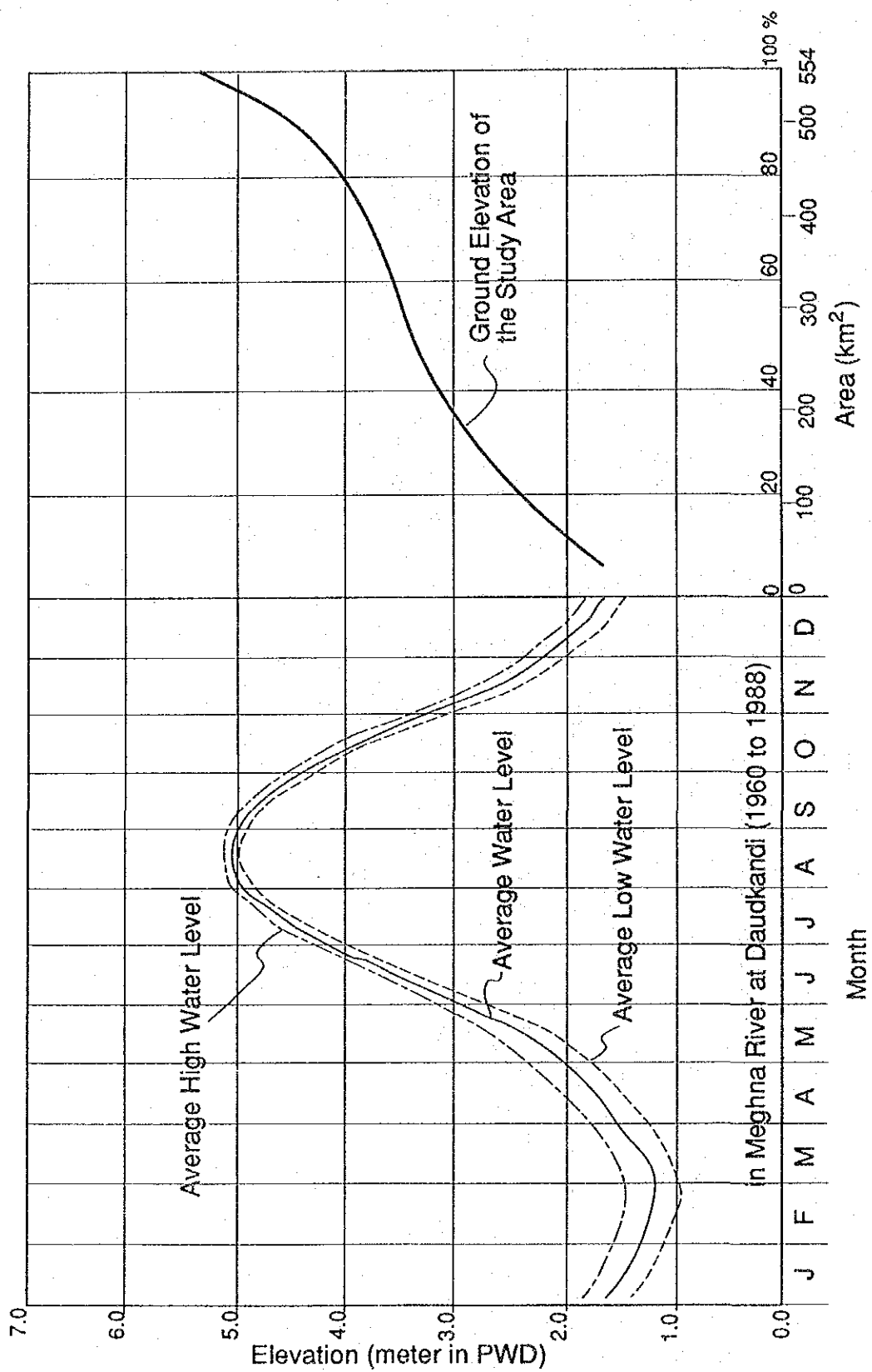
SOURCE: Feasibility Report on the Gumti-South Project (BWDDB)

Figure 1.3.1 Longitudinal Profile of Gumti River



Source : BWDB

Figure 1.3.2 Water Level of Meghna River at Daudkandi Station



Source : BWDB, Water Development Maps (S= 1/15,840)

Figure 1.3.3 Relation between Water Level and Inundation Area

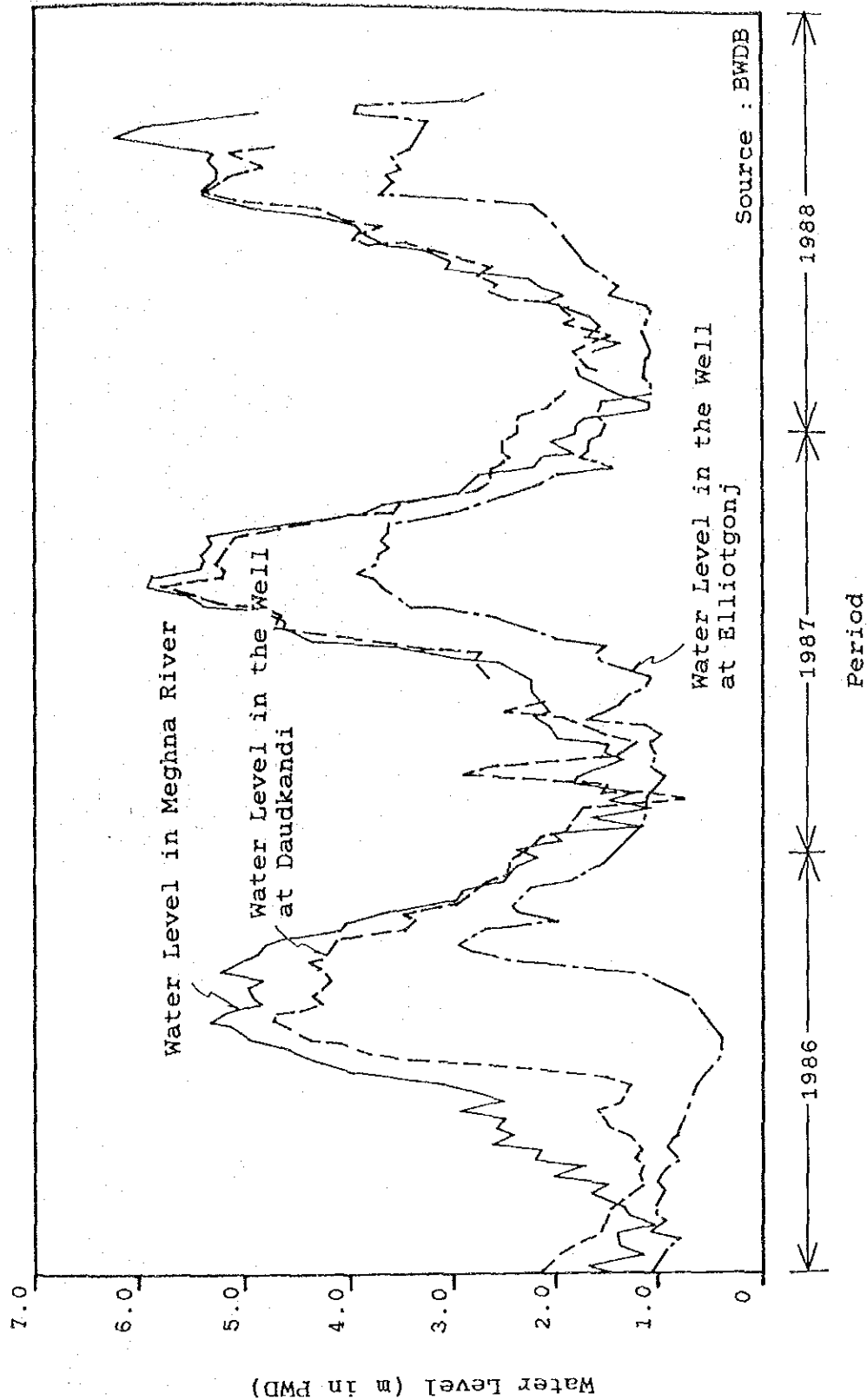
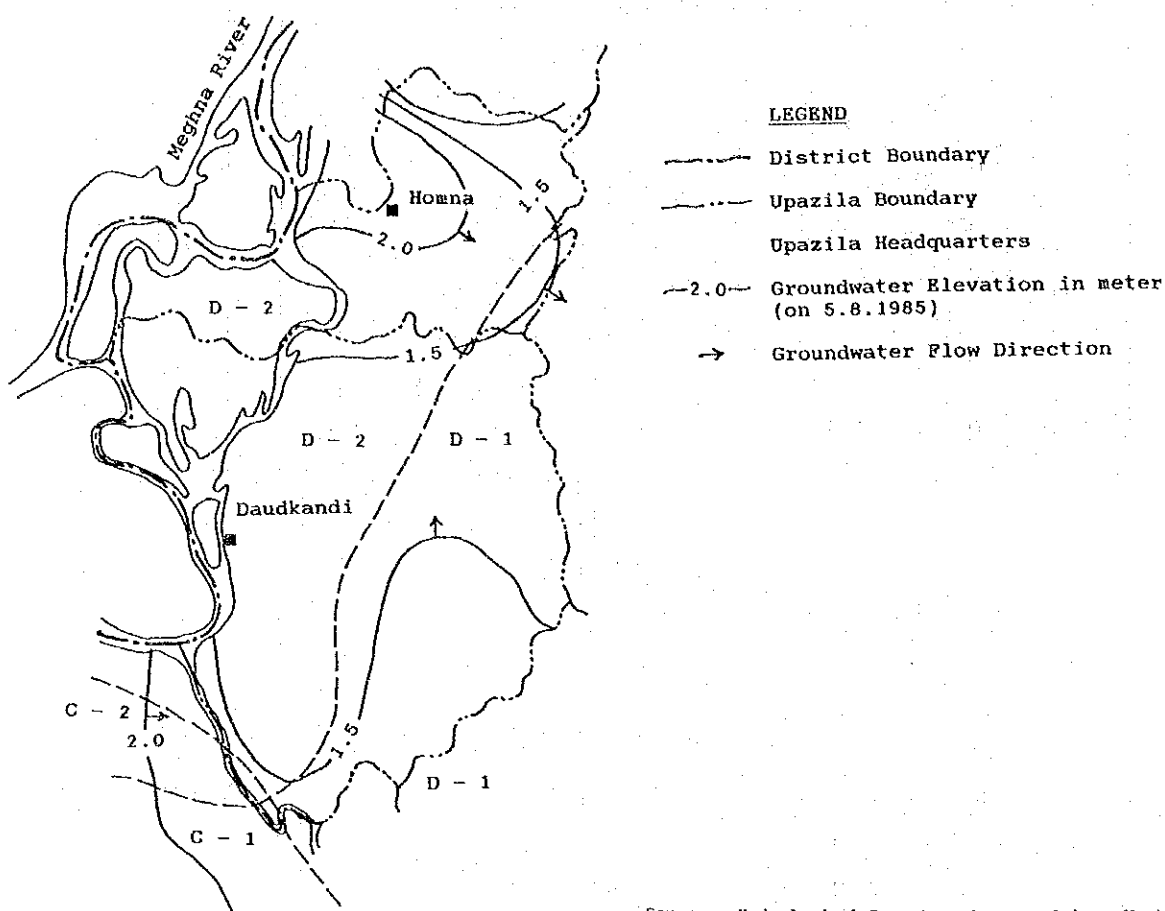


Figure 1.4.1 Relation between Water Level in River and Wells

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN FOR HOMNA AND DAUDKANDI UPAZILA
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Source : Hydrological Report on Barura, Laksan West, Saharasti, Haziganj, Chandpur, Matlab, Homna & Daudkandi South Especially for Water Quality Problems, May 1987, BWDB

Characteristics	C - 1	C - 2	D - 1	D - 2
- Percentage of coarser materials (Study depth : 107 m)	25 - 50 %		0 - 25 %	
- Maximum depth to groundwater table from land surface	2.64-4.43 m	3.77-4.92 m	2.50-4.29 m	4.15-4.99 m
- Water table fluctuation	2.05-3.98 m	2.91-4.19 m	2.31-3.04 m	3.67-4.17 m
- Groundwater resources				
Potential recharge	291.0 mm	254.3 mm	206.0 mm	209.0 mm
Available recharge	174.6 mm	152.6 mm	123.6 mm	125.4 mm
- Thickness of upper silt and clay	2.44-9.45 m	3.75-27.0 m	3.00-8.23 m	2.44-11.28 m
- Depth to top of main aquifer	56.0-69.0 m	60.0-66.0 m	56.0-69.0 m	60.0-66.0 m
- Thickness of the main aquifer at various depth	27.0-49.0 m	27.0-62.0 m	3.0-38.0 m	3.0-27.0 m
- Chemical qualities				
Iron	0.22-7.80 ppm	0.26-9.00 ppm	0.22-7.28 ppm	2.7-7.28 ppm
Chloride	20.0-610.0 ppm	12.0-610.0 ppm	8.0-595.0 ppm	12.0-275.0 ppm
Total dissolved solids	80.4-2080.0 ppm	80.4-1570.0 ppm	182.6-1105.0 ppm	162.8-1235.0 ppm
- Development potentials	Area is moderately suitable for further development of deep or shallow tubewell. Sinking of shallow & deep tubewell side by side within the same area is not advisable from 30 m to 106 m.		Area is moderate to poor for further development for deep or shallow tubewell	

Figure 1.4.2 Ground Water in The Study Area

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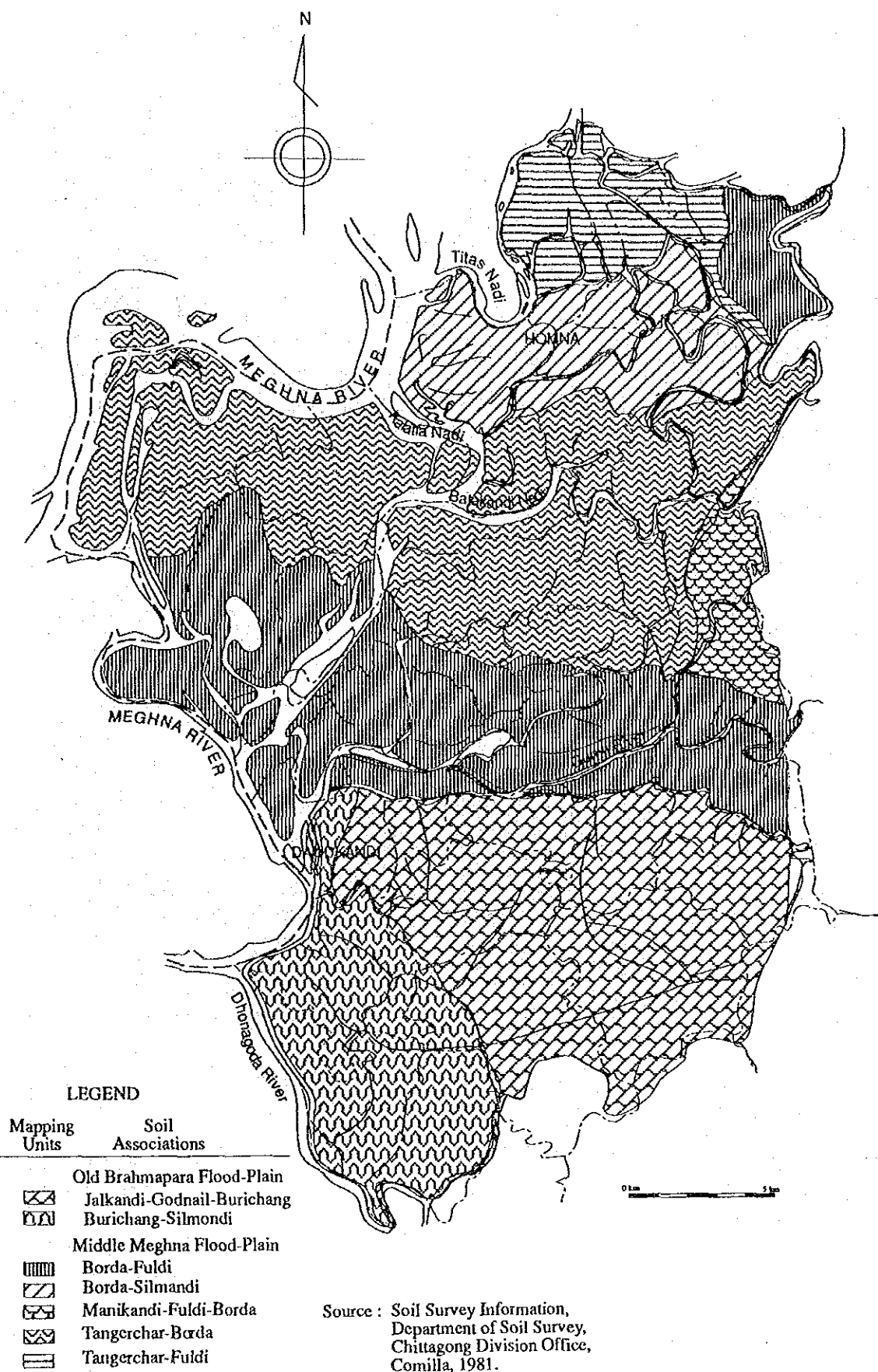


Figure 1.6.1 Soil Map

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN
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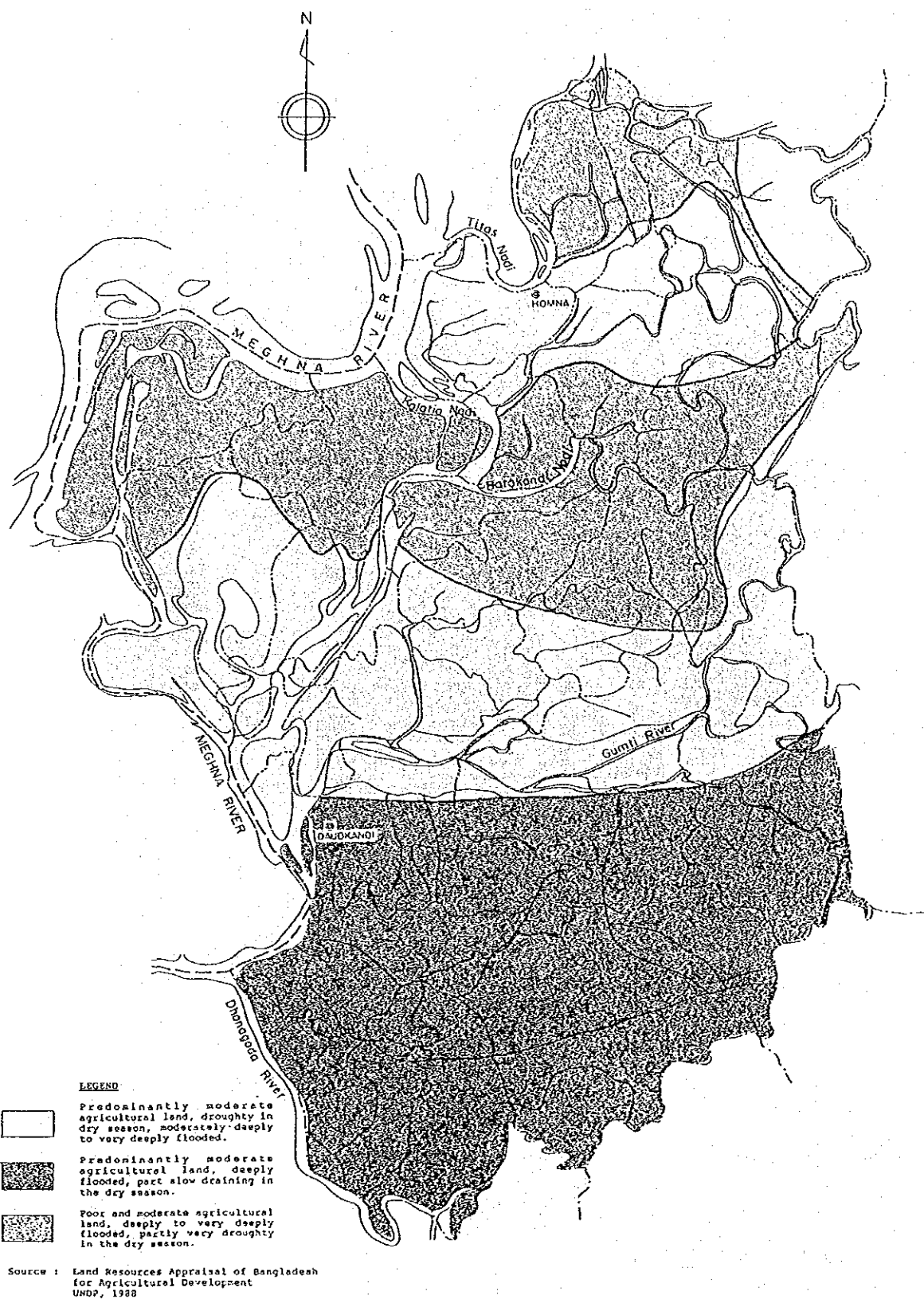


Figure 1.6.2 Land Capability in the Study Area

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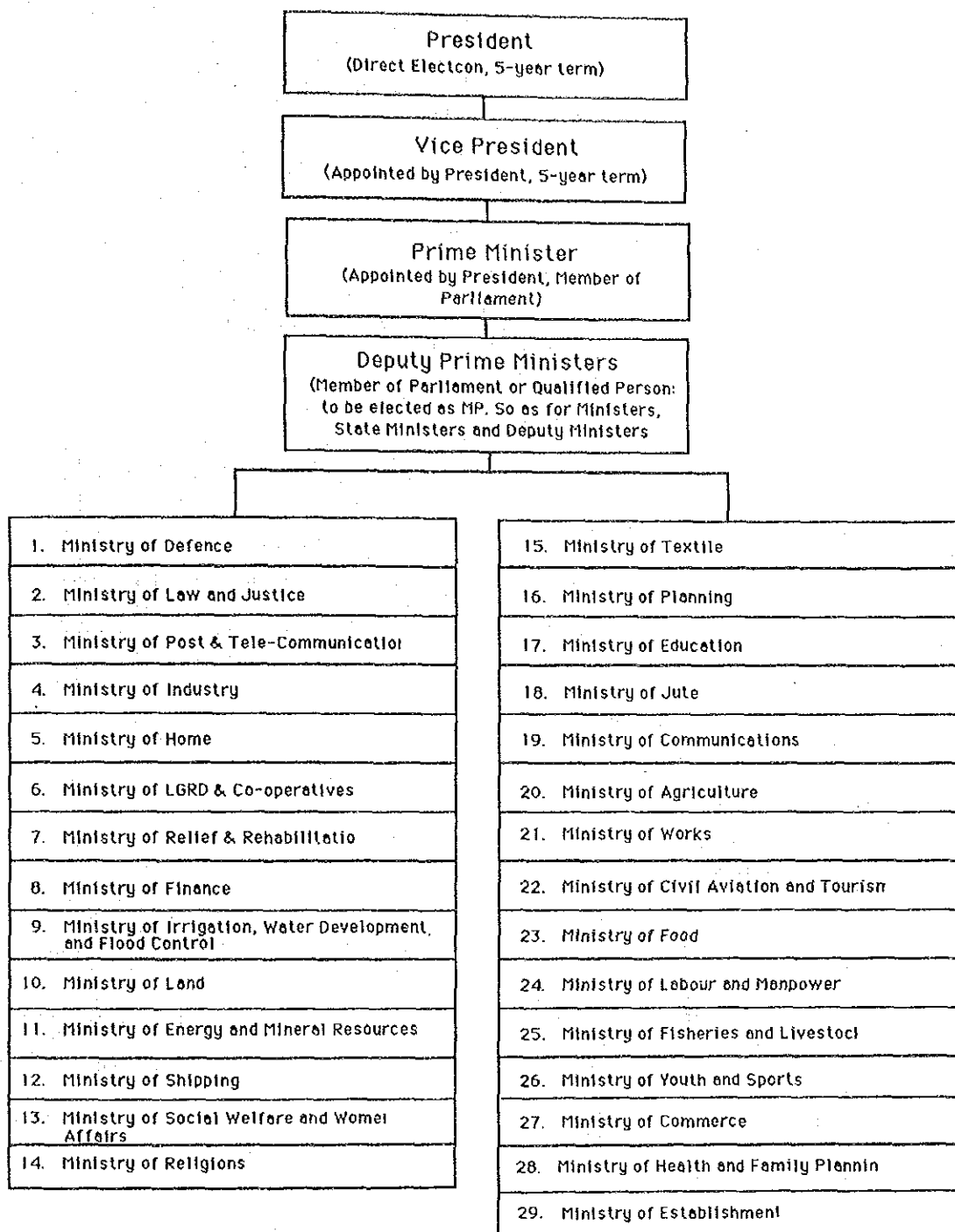
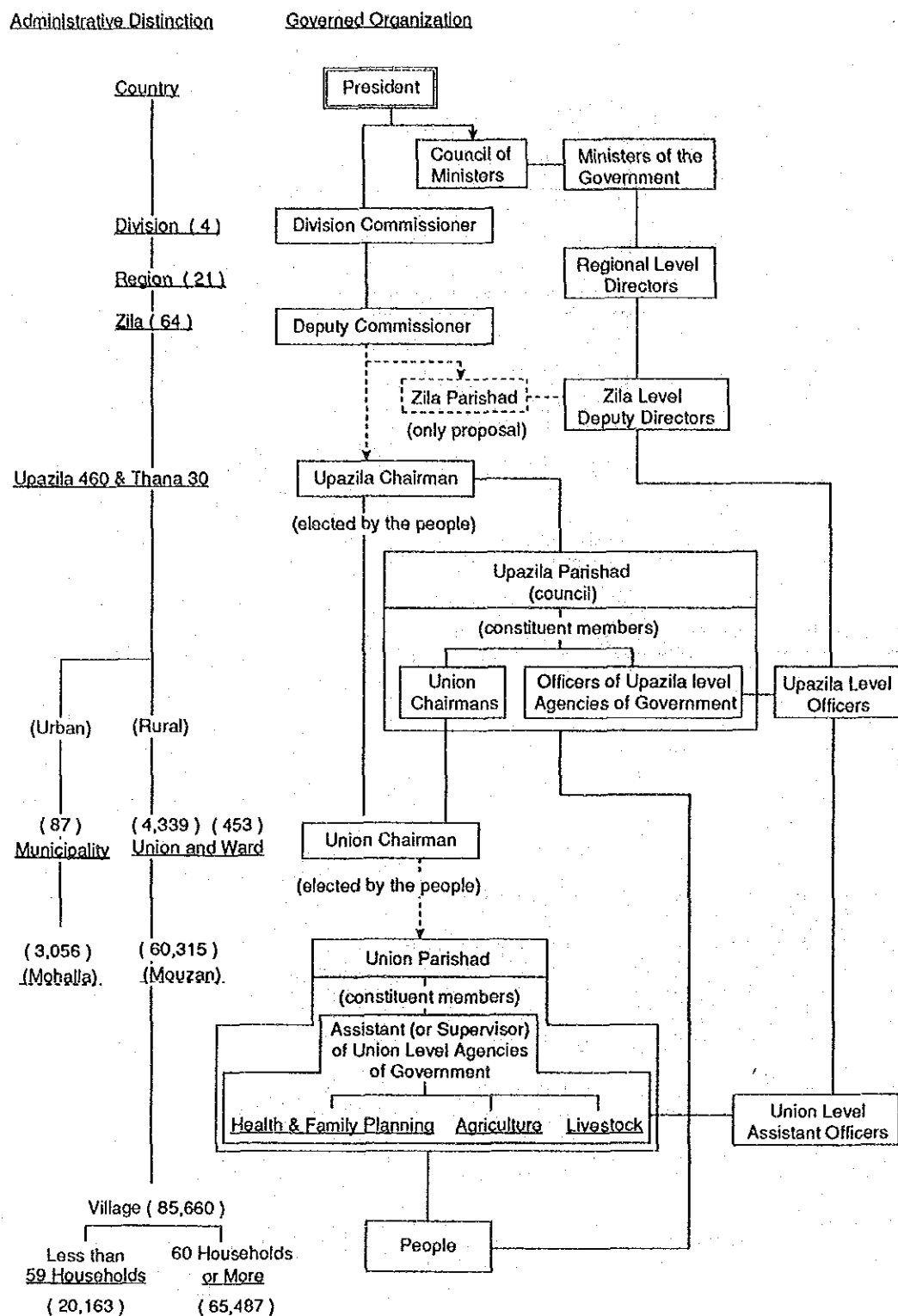


Figure 2.1.1 Government Organization People's Republic of Bangladesh

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN
FOR
HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY



Source: 1986 Statistical Yearbook of Bangladesh and others

Fig. 2.1.2 Administrative Chart of Bangladesh

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN FOR HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY

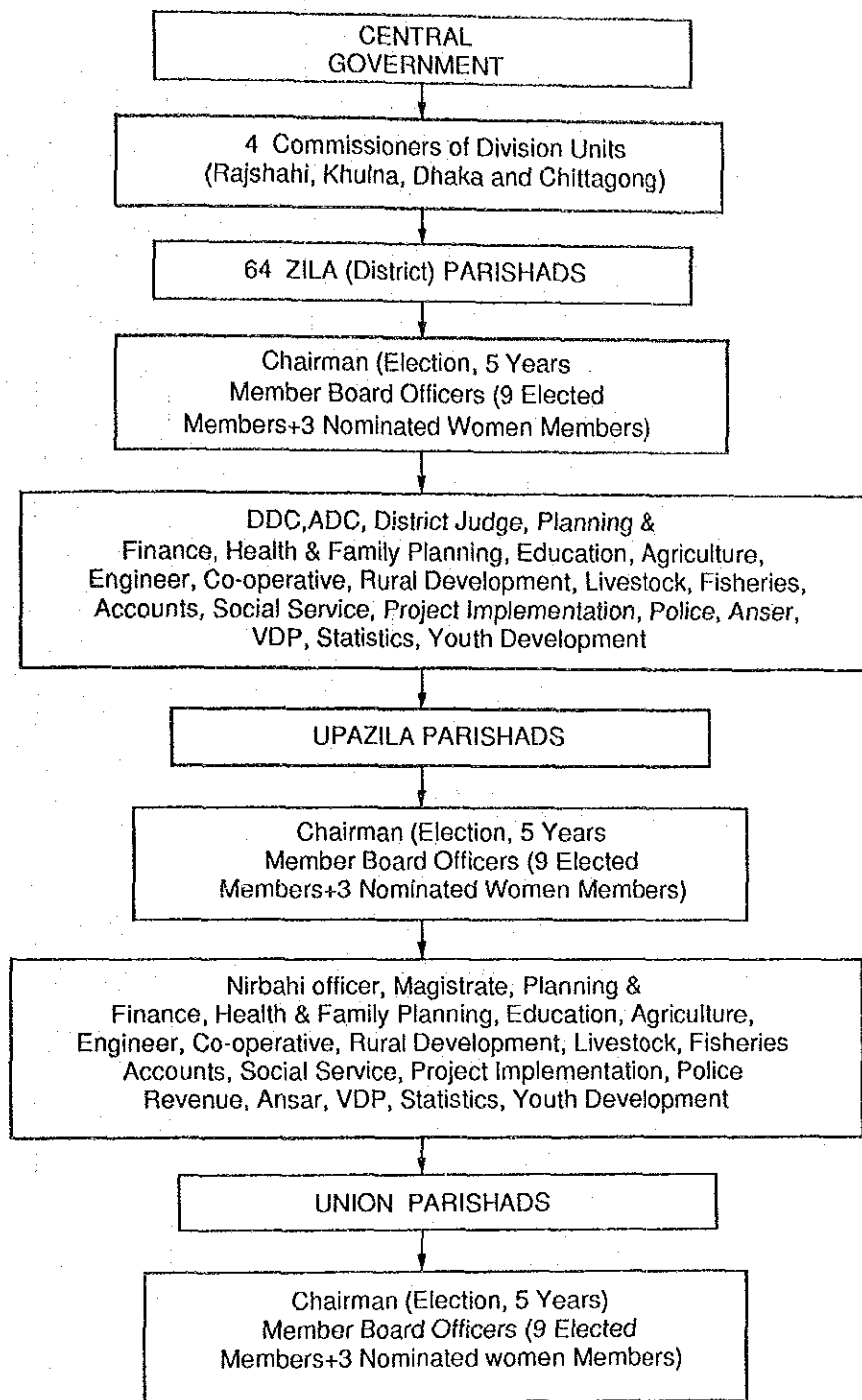


Figure 2.1.3 From Central Government to Local Government

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN
FOR
HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY

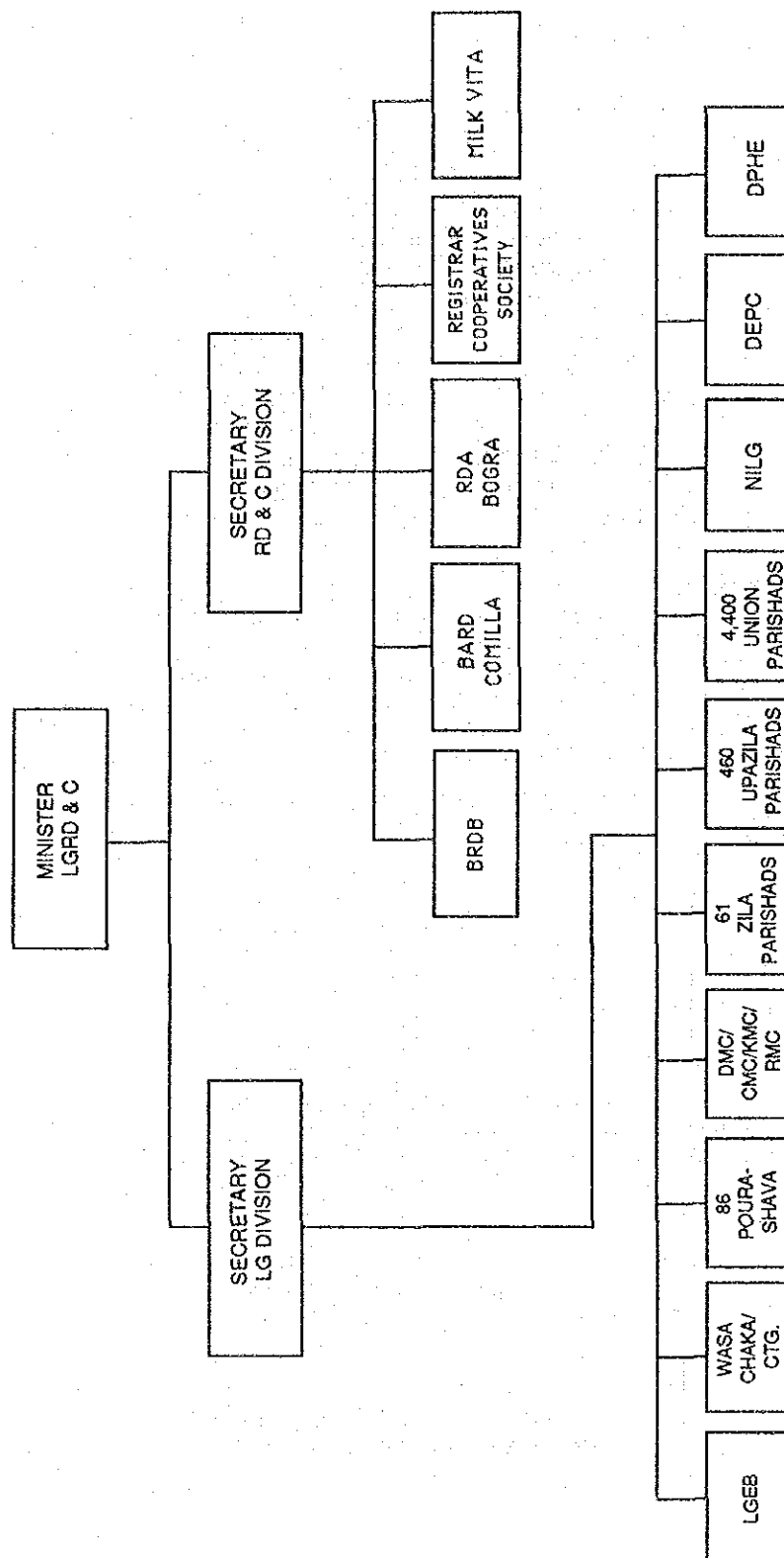


Figure 2.1.4 Organization of Ministry of Local Government, Rural Development and Cooperatives

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN FOR HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY

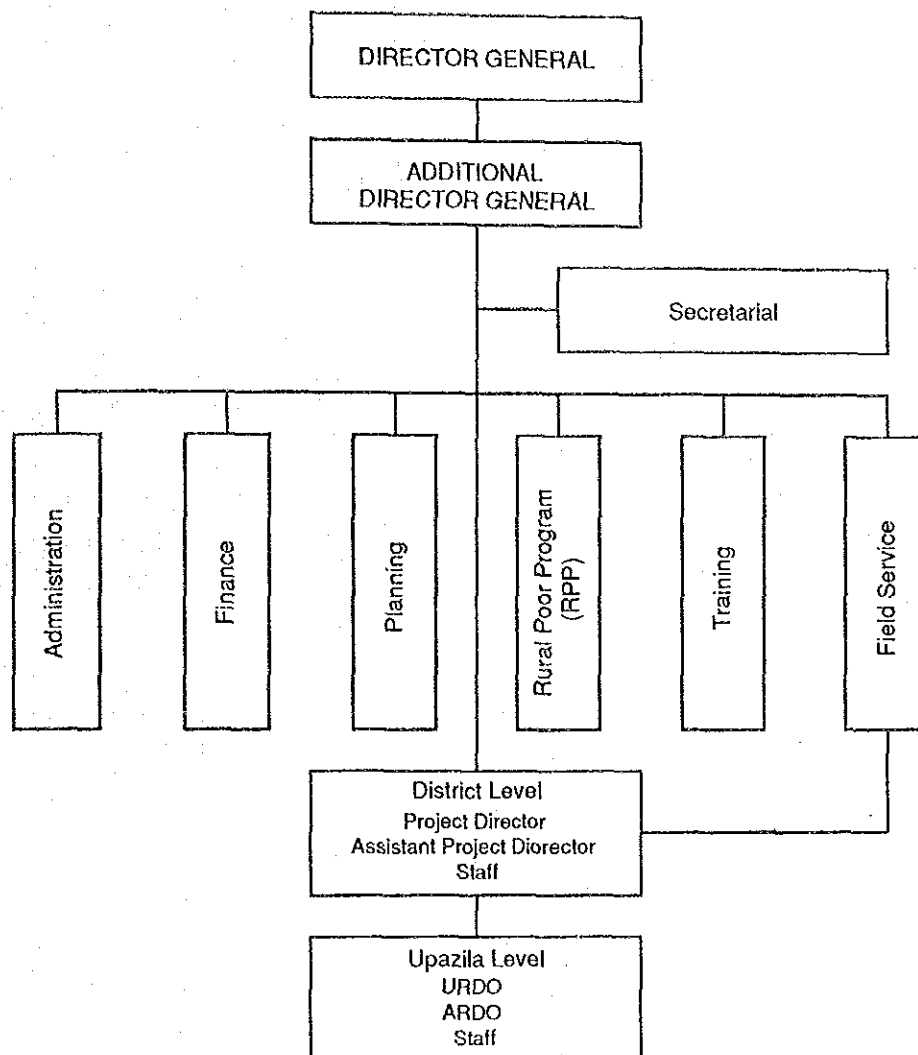


Figure 2.1.5 Organization Chart of BRDB
(Bangladesh Rural Development Board)

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MODEL RURAL DEVELOPMENT PROJECT PLAN FOR HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY

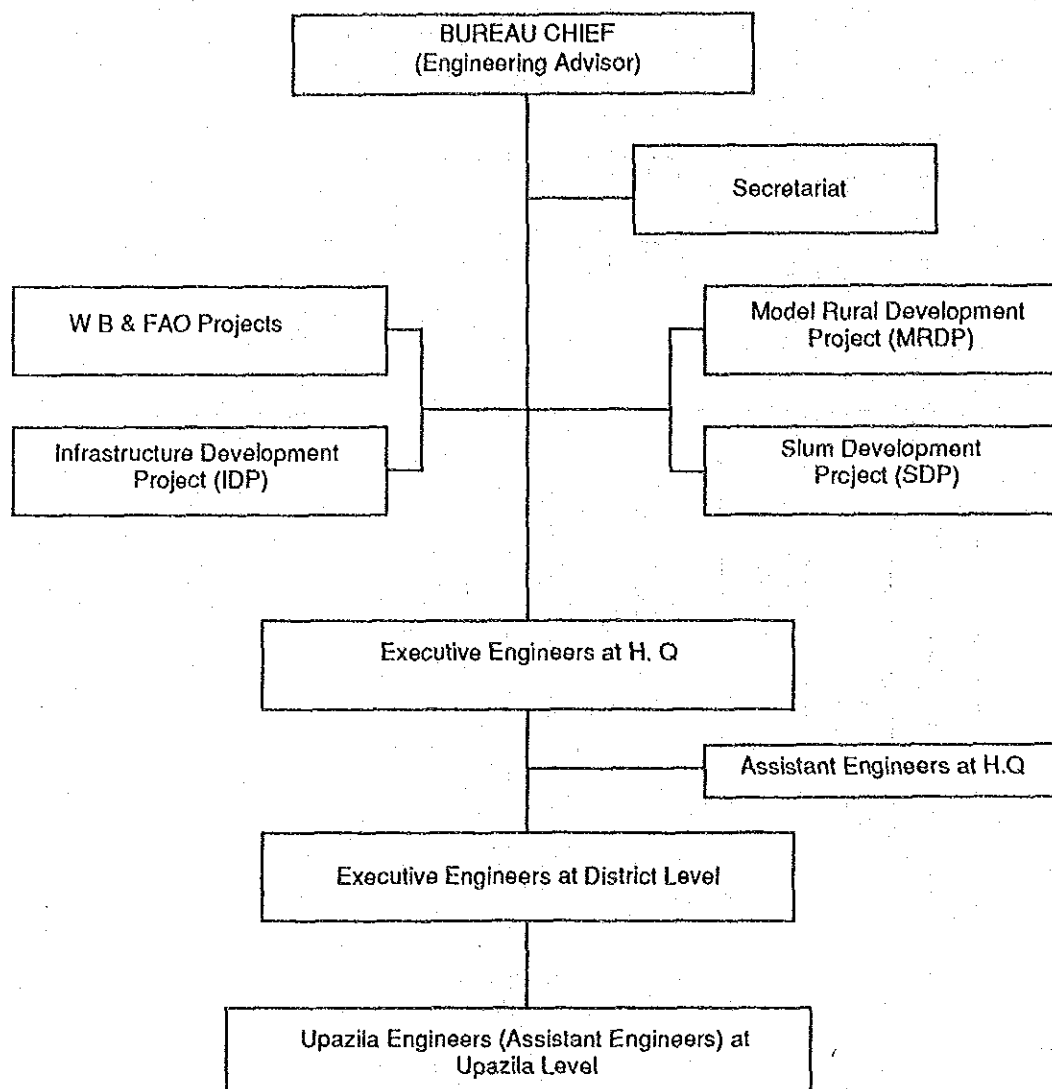
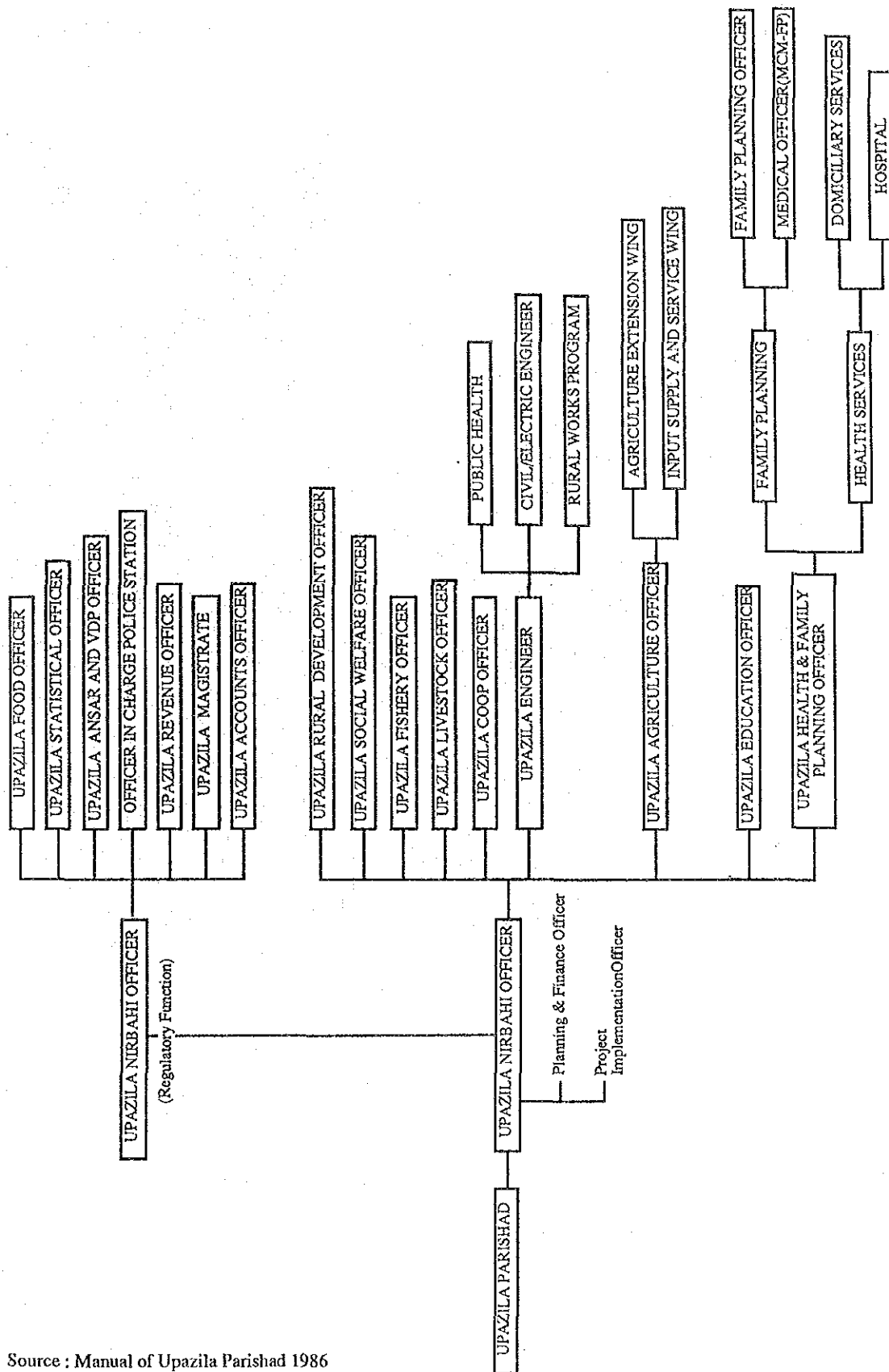


Figure 2.1.6 Organization Chart of LGEB
(Local Government Engineering Bureau)

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN FOR HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY



Source : Manual of Upazila Parishad 1986

Figure 2.1.7 Upazila Organizational Chart

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN
FOR
HOMNA AND DAUDKANDI UPAZILA
JAPAN INTERNATIONAL COOPERATION AGENCY

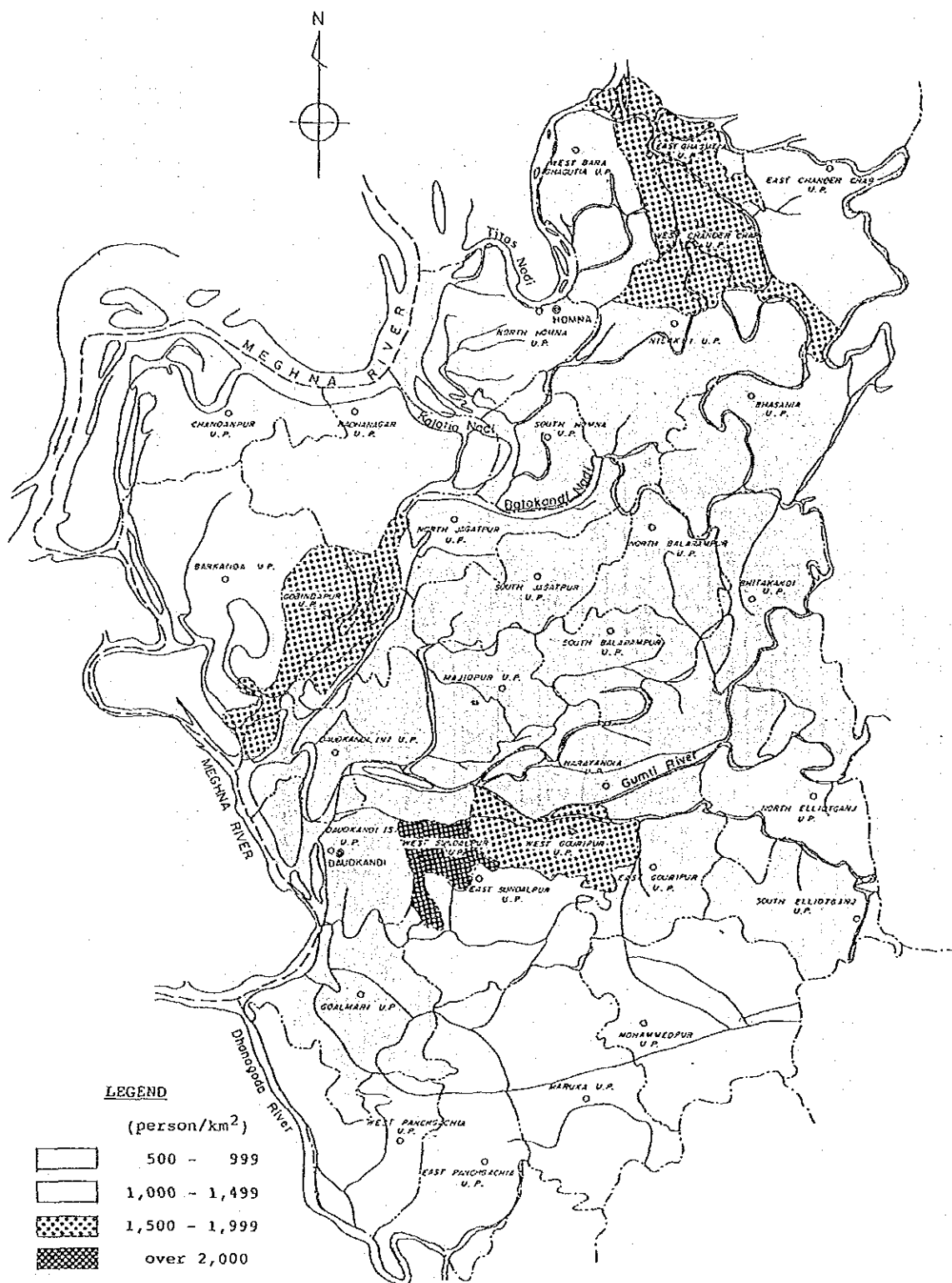


Figure 2.1.8 Population Density in the Study Area by Union

THE PEOPLE'S REPUBLIC OF BANGLADESH
MODEL RURAL DEVELOPMENT PROJECT PLAN
FOR
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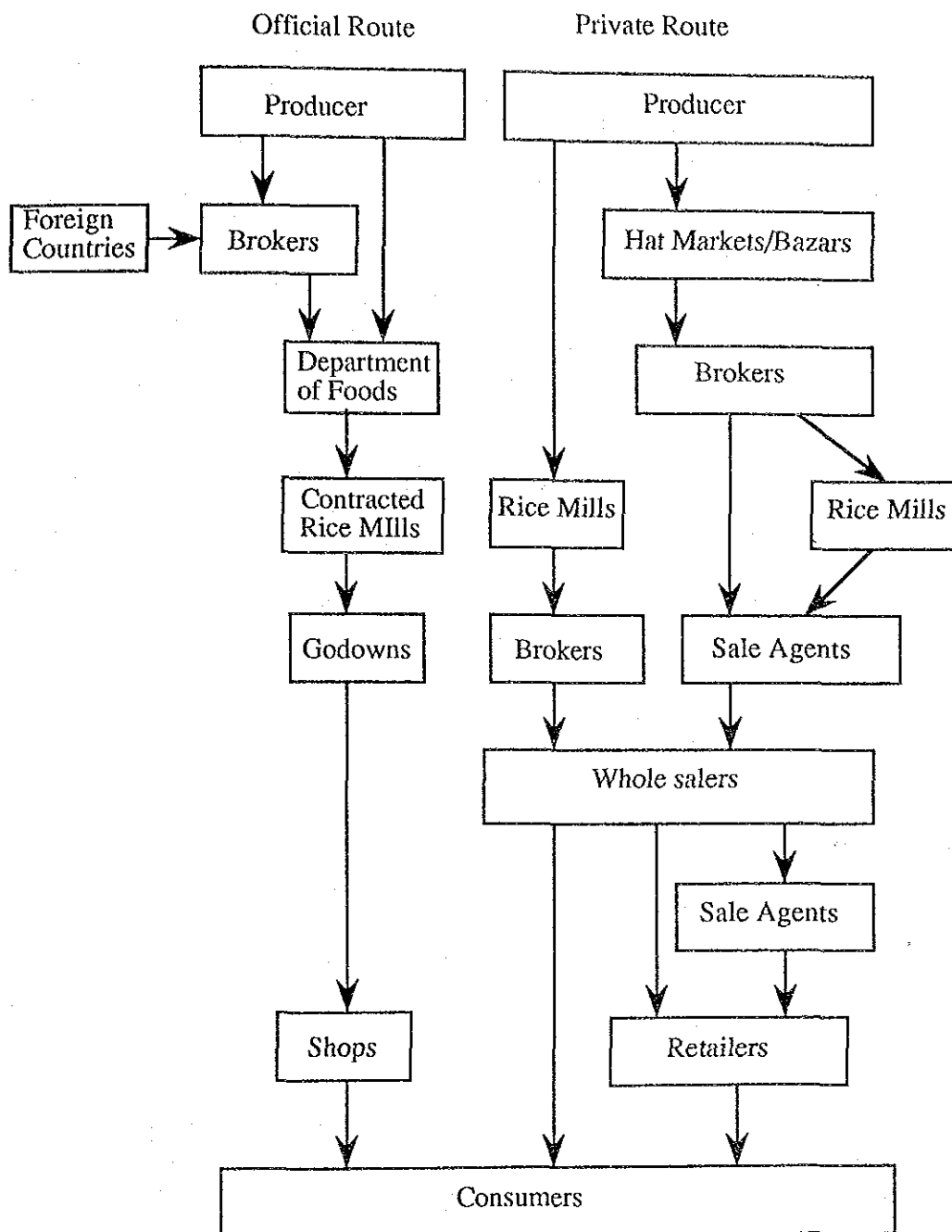


Figure 4.2.1 Rice Marketing System

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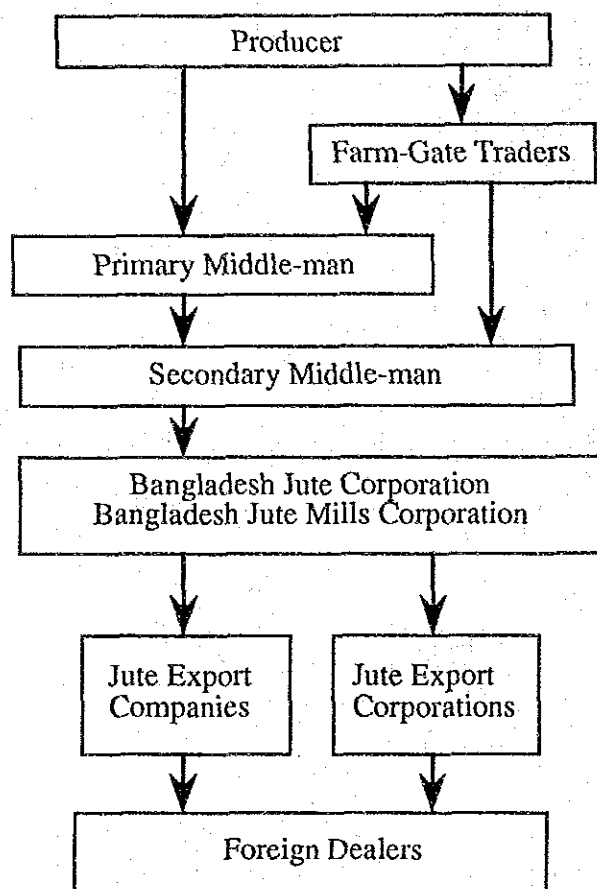


Figure 4.2.2 Jute Marketing System

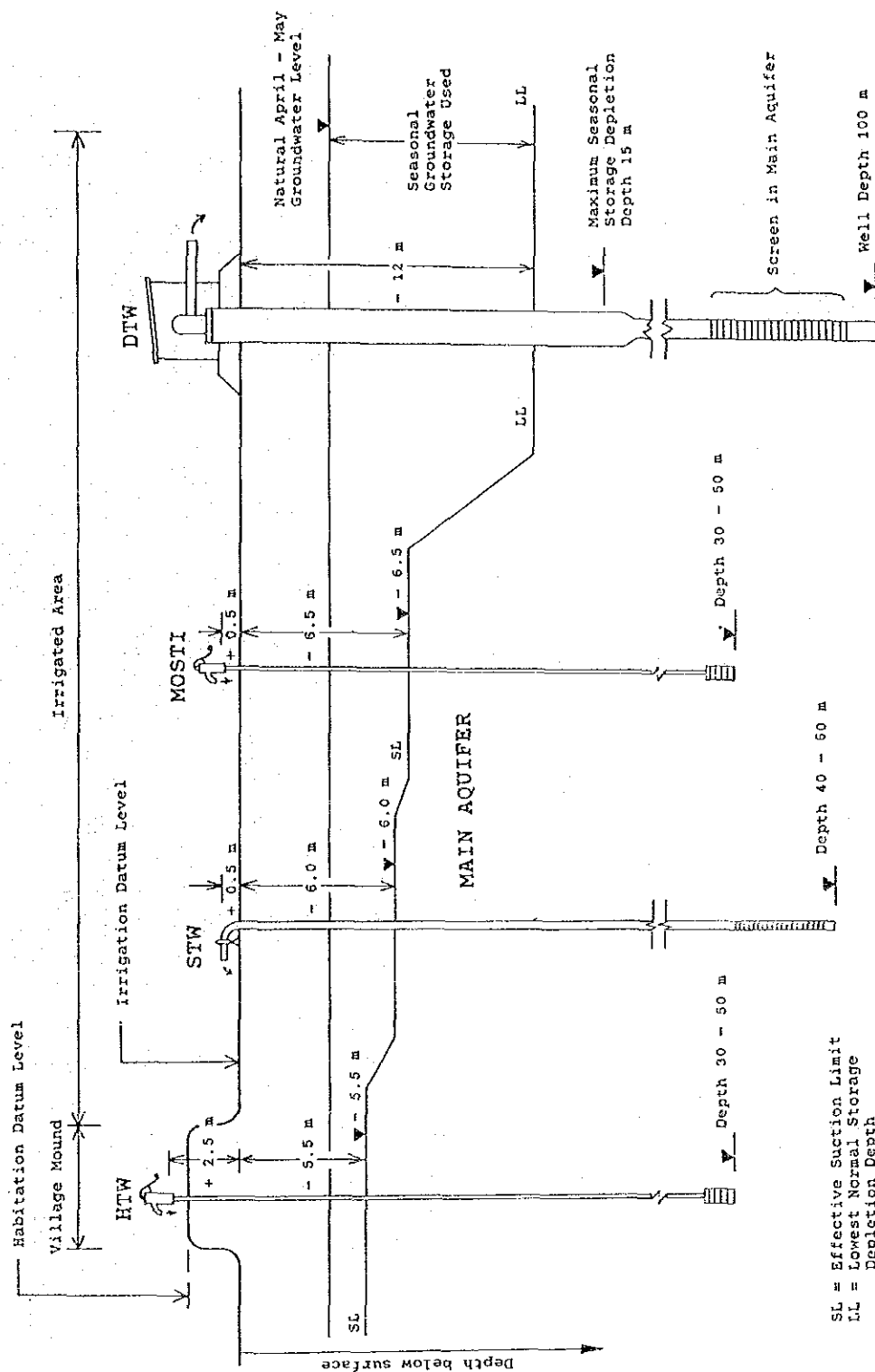


Figure 5.1.1 Pumping Lift Capability of Different Pumps

ANNEX B
MODEL RURAL DEVELOPMENT PROJECT PLAN
(MRDPP)

ANNEX B

MRDPP

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1. Objectives and Methodology

To formulate the MRDPP, following objectives and methodology mentioned in "Strategy for Rural Development Projects, Bangladesh Planning Commission in 1984" were referred.

To develop a strategy for Rural Development Projects as they are known in this country without taking into consideration the rural development in its totality we shall concentrate here only on the development of physical infrastructure, agricultural and employment opportunities for the low-income class. The programs for the social sectors will continue as normal programs of the concerned ministries for which appropriate strategies will be drawn separately.

In an agrarian economy, priority for agricultural development must remain. Infrastructure like communication links, storage markets are needed for agricultural development as well. The planned efforts so far undertaken have mostly covered only these two components. But along with agricultural production and development of physical infrastructure rural poverty has also increased in the process. The reasons are: benefit of agricultural development has mainly gone to farmers who have land and development of infrastructure has benefitted those more who have access to means of production. The low-income class have received marginal benefit in the form of temporary employment but as the real wage for agriculture labour has gone down, their conditions have deteriorated. The two programs for development of agriculture and rural infrastructure are thus primarily for the benefit of the richer section of the rural community with necessary but only marginal benefit to the low-income class unless appropriate programs for the rural low-income class are also taken up simultaneously.

The situation thus calls for a change of redirection of the strategy for rural development. The purchasing power of all the rural people must go up, they must have sustained source of income, opportunity for self employment either as individuals or as viable groups. They must access to production of goods and services needed by the society and also some excess money in their hands to purchase those by themselves.

In search of such opportunities to provide the low-income class with assured sources of income on continuing basis care must be taken in selecting the programs and the activities.

Most of the individual rural families have very high consumption needs. A small amount of money laced at the disposal of such family or individual with great hopes vanishes in no time because the family spends away this to meet the consumption needs or distress time needs. To guard against this the question of joint and mutual responsibility and support is therefore

of vital importance. This can be done through formation of groups or cooperatives with necessary guidance and assistance. Institution building is thus a primary requirement to help the low-income class for their collective security confidence and progress.

Once the low-income class is organized into groups or cooperatives, they must either possess certain skill or acquire it to be able to produce goods and services required by the community. Availability of skill or development of it is thus another requirement in the process. Next comes the question of capital in the form of soft credit to be made available to them. Now when they are organized into groups, they either have or have acquired skill, have capital, they will need the raw materials and other impulse to produce the goods and services. Thus availability of other inputs form the fourth component for a viable program for production and employment. Finally once goods have been produced or services made available they must find market. Of the five components mentioned above needed for viable production programs for the low-income class, Credit and Market, to start with occupy a unique position and even with only these two components the programs can move to a point. To summarize, the package of components needed for effective production and employment programs for the low-income class are:

- i. The Institution
- ii. Skill and technology
- iii. Credits
- iv. Other inputs and
- v. Market

2. Production Sectors

2.1 Agriculture

2.1.1 Land use plan

Concerning the land use plan in the Study Area, in proportion to the increase of population, areas for homestead and infrastructures will be increased. Accordingly, 2.4% (equivalent to 1,054 ha) of agricultural land will be slightly decreased.(See Table 2.1.1)

Proposed agricultural lands may be mainly distributed in 3 land types,ie. medium highland (F1), medium lowland(F2) and lowland(F3) as shown below.

	Daudkandi ha	Hompa ha
Medium highland(F1)	5,400	3,900
Medium lowland(F2)	14,500	6,200
Lowland(F3)	8,300	3,900
Total	28,200	14,000

Based on present land use and flood condition, agricultural land use plan is projected as follows:.

	Land type	Crop season			Area	
		Rabi	Kharief-I	Kharief-II	Daud. ha	Hompa ha
Triple Cropping	F1	Non-Rice Crop	T.Aus Rice	T.Aman Rice	1,080	585
Double Cropping	F1	Non-Rice Crop	Non-Rice Crop	-	4,320	3,315
"	F2	"	"	-	5,800	2,480
"	F2	Boro Rice		B. Aman Rice	8,700	3,720
"	F3	"		"	4,150	1,560
"	F3	Non-Rice Crop		B. Aman Rice	4,150	2,340
Total					28,200	14,000

2.1.2 Plan of crop production

(1) Proposed cropping pattern

Proposed cropping patterns by land type and Upazila in the Study Area are projected based on land use plan, crop season, present cropping pattern and flood condition, as shown in Figures 2.1.1 and 2.1.2.

1) The medium highland (F1)

T. Aman can be grown in the area where flood level is less than 1 m. Then, triple cropping of T. Aman with a Rabi crop and T. Aus is introduced in this land. Triple cropping of rice is not introduced because year round cultivation of rice causes soil deterioration and incidence of disease and insect pest.

Tossa jute should be harvested before flood comes for better quality and yield of fibre. Double cropping of jute with potato is introduced in the area where earlier harvesting of potato and earlier seeding of jute may be possible for escape of flooding.

Double cropping of winter and summer vegetable may be suitable in the land under the condition of appropriate rotation, adequate irrigation and highly intensive management practices. Summer pulses are also introduced with the combination of wheat.

2) The medium low land (F2)

T. Aus, chilli and oilseed (sesame) are introduced in the Kharief-I season for the double cropping with Rabi crops in the half area of this land. As there are much more crops to be grown in Rabi season, chilli and sesame are introduced in Kharief season, though they are mostly grown in Rabi season in the Study Area. In the remaining half of the land, double cropping of Boro and B. Aman rice are introduced, which is the popular cropping pattern in the Study Area. Mixed cropping of Aus and Aman is not introduced because such a mixed crop has no yield advantage as mentioned above.

3) The low land (F3)

Double cropping of Boro and B. Aman is suitable in this land except for the area where flood duration is long and growth duration of Boro is restricted. More than 150 days of growth duration is necessary to produce higher yield of Boro. Then, short-term Rabi crops are introduced in the area instead of Boro.

Crop intensities in the proposed cropping patterns are achieved to more than 200% in both Upazila, which are 25-44% higher than the present crop intensities.

(2) Target yield

Target yields of major crops in both Upazila are shown in Tables 2.1.2 and 2.1.3

HYV are partly adopted in present crop production in which some extent of higher yields are achieved in comparison with the yield of LV. However, HYV can not fully display its ability under unfavourable cultural conditions such as deficit of soil moisture or plant nutrient and less intensive management. In the project implementation, adoption of HYV along with supply of adequate irrigation water, application of appropriate fertilizer and practices of intensive management such as land preparation, weeding, pest control, etc. may be necessary for high target yield. Amounts of fertilizer application and labour requirement in crop cultivation are proposed accordingly. (See Table 2.1.4 and Table 2.1.5)

1) Target yield of rice

Target yields of various type of rice except B. Aman are anticipated based on present yield of HYV and its yield potential.

- a) Yield potential of irrigated T. Aus (HYV) is more than 4 ton/ha, but present average yield of HYV in Daudkandi is 2.2 ton/ha without irrigation. There may be some climatic hazard other than flood during growing season of Aus, therefore, intensive management with much input will not be expected. Target yield of T. Aus (HYV) in both Upazila is estimated at 3.0 ton/ha with irrigation, 40% higher than present yield of HYV.
- b) T. Aman is usually grown in areas where there is no risk of a high flood. However, late planting and drought after flood recedes reduce the yield.

Yield potential of HYV grown in optimum time may be 5 ton or more per hectare. Present yield of T. Aman (HYV) in Daudkandi is 2.5 ton/ha without irrigation. Target yield in both Upazila, therefore, may be estimated at 3.5 ton/ha (40% higher than present) under supplemental irrigation and improved cultural practices.

- c) Boro is usually grown with irrigation and HYV are widely disseminated in the Study Area. Due to favourable climate condition and low pest and disease incidence, yields of Boro are relatively stable and higher. Present average yields of Boro (HYV) are 3.5 ton/ha in Daudkandi and 3.1 ton/ha in Homna. Depending on sampling survey by Union in the Study Area in 1988, yield of Boro including LV and HYV ranged from 2.2 to 6.0 ton/ha in Daudkandi and 1.1 to 5.6 ton/ha in Homna. Then, target yields of Boro (HYV) are estimated at 5.0 ton/ha in Daudkandi and 4.8 ton/ha in Homna under the condition of improved water management and cultural practices.

2) Target yield of B. Aman and non-rice crops

Site Specific Research on Cropping Pattern (SSR) has been conducted by BRRI from 1989-81 to 1982/83 at Daudkandi site. The site represents the agro-climatic situation of the deep water rice area (flood depth 1.5-2.5 m) having no winter irrigation. Yields of crops in farmers' cropping pattern of SSR are shown below:

Crops	(Unit: ton/ha)			
	1980-81	1981-82	1982-83	Average
B. Aman	3.07	2.83	2.81	2.90
Wheat	1.93	2.98	2.84	2.58
Potato	34.5	37.6	25.9	32.7
Mustard	0.88	0.94 (HYV 1.61)	0.88	0.90
Sesame	0.56	0.66	0.70	0.64
Jute	1.77	2.39	1.89	2.01
Chilli	0.46	1.46	-	0.96

- a) B. Aman (DWR) can produce up to 3.0 ton/ha of yield with good management as shown in SSR and other data. Average present yields of B. Aman are 1.12 ton/ha in Daudkandi and 1.27 ton/ha in Homna. Low average yield of B. Aman may be partly attributed to mixed cropping with

Aus in which each yield data per mixed area are reported separately. Constraints of B. Aman are moisture stress at the early stage, weed competition including wild DWR and flood risk. Stand reduction due to poor germination and careless weeding are the important factors for explaining low yield of B. Aman. Target yields of B. Aman are estimated at 2.2 ton/ha in Daudkandi and 2.5 ton/ha in Homna.

- b) Average present yield of irrigated wheat in Daudkandi is 2.2 ton/ha which is 28% higher than that of non-irrigated, while yields of non-irrigated wheat are 1.9-2.9 ton/ha in SSR. Yield potential of irrigated wheat is reported as 4.0 ton/ha by BARI. Target yield of irrigated wheat in both Upazila is estimated at 2.5 ton/ha through more intensive management and input.
- c) Average present yields of potato (HYV) are 17.2 ton/ha in Daudkandi and 13.0 ton/ha in Homna, while yield of HYV in SSR is 33 ton/ha in average.

Low yields in Upazila may be attributed to diseases caused by continuous cropping and less intensive management. Target yields of potato (HYV) in Daudkandi and Homna are estimated at 20.0 ton/ha, and 16.0 ton/ha, respectively through irrigation and more intensive management, particularly control of diseases by means of introduction of rotation and excellent seed potato.

- d) Mustard is the main oilseed crop in the Rabi season. Average yield of mustard in Bangladesh is 0.60 ton/ha, same as present LV yield in the Study Area. Present average yield of mustard (HYV) is 1.1 ton/ha in Daudkandi and 1.6 ton/ha in SSR. Yield potential is 2.0-2.5 ton/ha in some districts. Target yields of mustard (HYV) are estimated at 1.2 ton/ha in Daudkandi and 1.1 ton/ha in Homna under the conditions of irrigation and increased application of fertilizer.

The main oilseed crop in Kharief-I season is sesame in the Study Area. Present average yields of sesame in both Upazila are 0.9-1.0 ton/ha, though yields in Bangladesh and SSR are 0.5-0.6 ton/ha. Target yields in both Upazila are estimated at 1.1 ton/ha with improved varieties and cultural practices.

- e) Present average yield of pulses is very low (0.68 ton/ha). The reasons for low yield are low productivity of LV, low input and less intensive management. Yield ranges of major pulses both in LV and HYV are shown below:

(Unit: ton/ha)

	Yield	
	LV	HYV
Lentil	0.3 - 1.0	-
Check peas	0.7 - 0.8	1.6
Mungbean	0.3 - 0.6	1.1 - 1.5
Blackgram	0.6 - 0.7	1.1 - 1.3

Depending on adoption of HYV, proper application of fertilizer and more intensive management for land preparation and weeding, target yields of pulses in both Upazila may be estimated at 1.0 ton/ha (50% higher than present yield).

- f) Present average yields of chilli are 1.3 ton/ha in Daudkandi and 1.1 ton/ha in Homna, which are higher than the country level (0.6 ton/ha). Yield achieved in SSR is 1.46 ton/ha in 1981-82. The crop may be suitable in the Study Area and grown under relatively intensive management with and without irrigation. Target yields of chilli are estimated at 1.5 ton/ha in Daudkandi and 1.3 ton/ha in Homna (20% higher than present yield) depending on improvement of varieties and management practices as well as supplementary irrigation.
- g) Present average yields of tossa jute are 2.0 ton/ha in Daudkandi and 1.6 ton/ha in Homna. Yields in SSR ranged from 1.8 to 2.4 ton/ha. Yield potential is 3.5-5 ton/ha by BJRI.

Jute cultivation should be restricted in area and growing season, so that the plants are not submerged by flooding, as submerging reduce the quality and yield of fibre.

Target yields of jute are estimated at 2.2 ton/ha in Daudkandi and 2.0 ton/ha in Homna (10-20% higher than present yield).

- h) Present yields of winter and summer vegetables are average of several crops as described before. Future yields of each crop included in winter or summer vegetables are estimated at about 10% higher than present. Target yields of winter and summer vegetables are calculated from totals of production and area of each crop as an examples below.

An example for Estimation of Target Yield of Summer Vegetables in Daudkandi

	Present			Target		
	area ha	yield t/ha	production t	area ha	yield t/ha	production t
Common summer veg.	201	9.55	1,999	1,300	11.0	14,300
Watermelon	379	30.22	11,456	860	30.0	25,800
Summer veg (total)	580	23.2	13,455	2,160	19.0	41,100

(3) Target production

Target production of major crops in both Upazila are shown in Tables 2.1.2 and 2.1.3. Based on these tables, total target area and production of each crop in the Study Area in comparison with present situation are summarized in Table 2.1.6.

1) Production of rice

As seen in Table 2.1.6 target areas of Aus and B. Aman decrease 18-14% and that of T. Aman and Boro increase 100-60%, then total rice area increase only 5% comparing with present area. Nevertheless, all types of rice increase in target production due to increase in yield per hectare or both in yield and areas. As a result, total rice production increases to twice of the present one.

2) Production of non-rice crops

There are also increases in target production of non-rice crops, especially of pulses, 6 times and of vegetables and oilseed more than twice of present production. These rises in target production are achieved not only due to increase in area but also on account of increase in per hectare yield except for wheat. Wheat decrease 20% in area but increase 8% in production. The other crops increase 40-80% in production with increases of 18-59% in area.

2.2 Livestock

(1) Objectives

Livestock is a production sector to be promoted intensively after agriculture and fishery for following purposes:

- i) Generating family-incomes
- ii) Supplying nutritional foods (animal protein)
- iii) Providing cattle for farming labour and balancing the organic agriculture

(2) Development directives

Following directives are considered as the fundamental basis for livestock development.

- i) Promotion under the framework of UCCA in corporation with Upazila livestock office.
- ii) Household basis is the main program with UCCA assistances.
- iii) Small animals (poultry, duck and goat) are main livestock with a proper amount of cattle for mainly farming purpose.

(3) Development plan

i) Household basis

Targets at the project-completion in 1999 are on the equivalent basis for both Upazilas which average heads per household are envisaged as 5 for poultry, one for goats, one for sheep and one for cattle.

On this basis and with the household numbers projected in 1999, total livestock heads would be estimated as follows:

Item	Daudkandi	Homna	Total
No. of households	112,200	53,800	166,000
Poultry	561,000	269,000	830,000
(No. per household)	(5.0)	(5.0)	
Goat	112,200	53,800	166,000
(No. per household)	(1.0)	(1.0)	
Sheep	112,200	53,800	166,000
(No. per household)	(1.0)	(1.0)	
Cattle	112,200	53,800	166,000
(No. per household)	(1.0)	(1.0)	

These animals will be raised on the kitchen garden ground of each household with assistances from UCCA-Upazila Livestock Office for farm installation and supply of credits, small chicks, basic technical materials, vaccines and supplement feeds.

Basic feeds for these animals are from farm by-products produced at each household and remaining foodstuffs.

Supplement feeds to be sold at UCCA offices will be made under contract(s) between supplier(s) and UCCA for supporting this program.

(4) Supporting system

The supporting system for this development plan is made by UCCA activities in cooperation with Upazila Livestock Office.

- 1) This development plan needs proper finances for strengthening the Upazila Livestock Office in equipments, materials and staff.
- 2) UCCA allocates a financial portion for supporting this development plan in part of UCCA's management, technical service and distribution (Training Section and Marketing Section).
- 3) Credits with a special interest should be offered to distress families engaged in livestock development.

For the marketing distribution of livestock products, the following is basically considered.

- UCCA channel from Union Branches to UCCA Center (Marketing Section) makes a distribution route of household produces including livestock products for sales to members at the Market or Bazaar or UCCA Center.
- Local bazaars and Growth Centers also serve the distribution route as up to now.
- Self-consumption

2.3 Inland Fishery

(1) Inland fishery project in Comilla district

The Inland Fisheries Project of the Rotary Club of Comilla is only of its kind in the region and the success of the project attracted many other people to start the project in their own areas.

The Inland Fisheries Project was started in 1984 with the assistance of the Rotary Foundation of the Rotary International with a view to activating the rural economy and enhancing fish supply by establishing union fish nurseries in each union of Comilla district. This has created employment scope for the rural population.

In implementing the Inland Fisheries Project, 250 Union Fish Nurseries (UFN) were set up including 208 in Comilla and 42 others in Chittagong, Brahmanbaria, Feni and Habiganj districts. Each of the UFNs is managed by a union fish culturist who was trained at Raipur Fish Hatchery and Training Center on modern scientific pisciculture. The Union Fish culturists are provided with funds for the development of nurseries in their respective unions. Loans are provided for installation of deep tubewells where necessary.

During the period from 1984-1986 about 1,500 ponds covering about 1,483 acres of water area were brought under pisciculture. A total of 30.51 crores fries weighing about 4,568 kilograms were disposed of. The total production was about 3.76 lakh tons worth about Taka 170 crores.

The project has provided opportunities for employment of a large number of persons, both directly and indirectly. The union fish culturists are engaged full time beside their family members. The total beneficiaries with the implementation of the project are about 3.37 lakh people in the production and marketing as fish hawkers, fish traders and 50 lakh consumers.

The project is managed by a host of experienced officers under the supervision of Project Steering Committee. It also has an advisory Committee.

The Rotary Club of Comilla will sponsor a three-year plan. It will extend the project to the adjacent districts who are keen on the project. (quoted from Newspaper dated on Feb. 7, 1989)

Shrimp Culture

1) Introduction

According to the Scientists, shrimp is not included in fish-group, but "Fish Resources" shrimp is boneless, full of meat and very tested to all. It is very remarkable in our export commodities. Maximum quantity of shrimp is being expected from our collection. so, good shrimp is not being seen in the market.

2) Type

There are mainly two types of shrimp such as:

- Sweet Water Shrimp
- Sea Water Shrimp

For marking easy conception, Fisheries Experts has given named shrimp for sweet water shrimp and for sea water shrimp.

For sweet water, there are 10 (ten) types of shrimps. Such as Galda, Thangua, Shola, Chotka, Kathalia as Dinua, Kaina or Daina, Ghoda, Kunku, Lofia and Guara Shrimp.

Among the above mentioned types of shrimps are available in the sweet water. The "Galda" shrimps are very important in commercial sector. It can be seen almost all the rivers and canals of all districts, specially, southern districts of the country. It is bigger in size so it has enough demand in foreign countries. From June to December it is being caught enough. From Sep. to February it is being caught enough Daudkandi Upazila under Comilla District.

Shrimps moves in night and lines in the bottom of water. Organic substances, lower water weeds. Various water insects, mud farmed by and sand are its main food.

3) Future scope of shrimps

According to the experts, cultivation of shrimps have much prospect and chance in Bangladesh. Although the weather is good for shrimp cultivation.

4) Sources of shrimps

In many countries there are provision of Hatchery for producing shrimps artificially. In Bangladesh, the provision of Hatchery is being taken. For cultivation of shrimps in ponds, this could be collected from natural sources. From June to October "Dralda Shrimps" is being caught from rivers, and canals of the country. The probable places from where the shrimps may be available.

(2) Inland fishery development plan

1) Target production

Item		'000' ton	Ponds	Family
Open Water Fishery (OWF)				
Daudkandi	Fish	5.1		4,850
	Shrimp	1.0		
Homna	Fish	2.5		2,400
	Shrimp	0.5		
<u>Sub-total</u>		<u>9.1</u>		<u>7,250</u>
Pond Fishery (PF)				
Daudkandi	Fish	7.8	3,000	8,280
	Shrimp	3.9		
Homna	Fish	2.5	1,500	4140
	Shrimp	1.3		
<u>Sub-total</u>		<u>15.5</u>	<u>4,500</u>	<u>12,420</u>
Total		24.6		

2) Target benefit

Item		'000' ton	'000' Tk.	M. Tk.
Open Water Fishery (OWF)				
Daudkandi	Fish	5.1	15	76.5
	Shrimp	1.0	90	90.0
Homna	Fish	2.5	15	37.5
	Shrimp	0.5	90	45.0
<u>Sub-total</u>		<u>9.1</u>		<u>204.0</u>
Pond Fishery (PF)				
Daudkandi	Fish	7.8	15	117.0
	Shrimp	3.9	90	351.0
Homna	Fish	2.5	15	37.5
	Shrimp	1.3	90	117.0
<u>Sub-total</u>				<u>622.5</u>
<u>Total</u>				<u>826.5</u>

The benefits mentioned above will be born as follows:

Year	M.Tk.		Year	M. Tk.	
1	0	0	6	91.8	183.6
2	0	0	7	91.8	275.4
3	30.6	30.6	8	91.8	367.2
4	30.6	61.2	9	153.1	520.3
5	30.6	91.8	10	153.1	673.4
			11	153.1	826.5

3) Production cost

Open Water Fishery (OWF)	Fish	18,000 Tk./ton
	Shrimp	18,000 Tk./ton
Pond Fishery (PF)	Fish	10,000 Tk./ton
	Shrimp	60,000 Tk./ton

Production cost will be born according to the production schedule as follows:

Item		'000' ton	'000' Tk.	M. Tk.
Open Water Fishery (OWF)				
Daudkandi	Fish	5.1	18	91.8
	Shrimp	1.0	18	18.0
Homna	Fish	2.5	18	45.0
	Shrimp	0.5	18	9.0
Pond Fishery (PF)				
Daudkandi	Fish	7.8	10	78.0
	Shrimp	3.9	60	234.0
Homna	Fish	2.5	10	25.0
	Shrimp	1.3	60	78.0
Total		24.6		578.8

Production cost will be born according to the production schedule.

Year	M.Tk.		Year	M. Tk.		Year	M. Tk.	
1	0	0	4	21.4	42.8	8	64.3	257.1
2	0	0	5	21.4	64.2	9	107.2	367.3
3	21.4	21.4	6	64.3	128.5	10	107.2	471.5
			7	64.3	192.8	11	107.2	578.8

Production cost for fish and shrimp per OWF.

Auction fee	8,000 Tk./ton
Boat and net	2,000 Tk./ton
Labour	7,560 Tk./ton
Miscellaneous	440 Tk./ton
Total	18,000 Tk./ton

For professional fishermen, Upazila Parishad will make tender to share catching space of water bodies. This cost is assumed to be 20% of benefit.

$$622,500,000 \div 15,500 = 40,161 \text{ Tk./ton}$$

$$40,161 \times 0.05 = 8,000 \text{ Tk./ton}$$

Boat and Net

5% of benefit

$$40,161 \times 0.05 = 2,000 \text{ Tk./ton}$$

Labours

2 persons will be engaged as a common labour for catching fishes and shrimps per 1.0 ton for 6 months.

$$2 \times 30 \text{ Tk.} \times 6 \times 21 = 7,560 \text{ Tk./ton}$$

Production Cost per Pond Fishery

Production cost comprises as follows:

Fish seed	500 Tk./ton
Feeding & Chemicals	1,500 Tk./ton
Labour	4,930 Tk./ton
Water & Power	1,500 Tk./ton
Net & Boat	750 Tk./ton
Miscellaneous	820 Tk./ton
<hr/>	
Total	10,000 Tk./ton

Where,

Fish seed (2")

$$2 \text{ kg} \times 250 \text{ Tk./kg} = 500 \text{ Tk./ton}$$

Feeding and chemicals

10% of Market price

$$15,000 \times 0.1 = 1,500 \text{ Tk./ton}$$

Labour

3 persons per one ponds for 6 months one pond produces 2.3 ton/year of fish

$$3 \times 30 \text{ Tk.} \times 6 \times 21/2.3 = 4,930 \text{ Tk./ton}$$

Water and Power

10% of market price of fish

$$15,000 \times 0.1 = 1,500 \text{ Tk./ton}$$

Net and Boat

5% of market price of fish

$$15,000 \times 0.05 = 750 \text{ Tk./ton}$$

Consequently, production cost will be 67% of market price of fish. The same rate will be adopted to shrimp.

4) FIRR

From cost and benefit, 42.5% of FIRR could be obtained. (Refer to Table 4.2.3 cash flow of fishery production plan.)

5) Employment generation

a. Present

Item	Daudkandi	Homna	Total
Open Water Fishery	2,244	822	3,066 persons
Pond Fishery	3,010	1,145	5,155
Total	5,254	1,967	7,221
Man.day	1,314	492	1,805 '000\man.day

b. Plan

Item	Daudkandi	Homna	Total
Open Water Fishery	53.8	22.5	76.3 M.Tk.
Pond Fishery	131.0	43.3	174.3 M.Tk.
Total	184.8	65.8	250.6 M.Tk.
Man.day	6,160	2,193	8,353 '000\man.day

Where: Rates of labour cost in production cost are as follows:

OWF : 49% (Refer to production cost)
 PF : 42% (Refer to production cost)

6) Water management of pond fishery

To succeed pond fishery it is necessary to dry up the pond after flooding season. For draining and for filling water LLP should be used. Therefore, based on the capacity of LLP ($2\text{cus} = 0.054\text{ m}^3/\text{s}$) time required for draining and for filling were calculated as follows:

(i) Water volume per pond

Type A

$$V_A = (122 \times 12 + 114 \times 4) + 2 \times 2 = 1920\text{m}^3/\text{pond}$$

Type B

$$V_B = (77 \times 12 + 69 \times 4) + 2 \times 2 = 1200\text{m}^3/\text{pond}$$

Where : slope = 1 : 2.0 depth = 2.00m

(ii) Time required for draining and filling

$$T_A = 1920 / 0.054 \times 86400 = 0.041\text{ day}$$

$$T_B = 1200 / 0.054 \times 86400 = 0.026\text{ day}$$

(iii) Number of LLP required

All ponds will be filled within 30 days

$$\begin{aligned} & 1920 \times 3000 + 1200 \times 1500 / 0.054 \times 86400 \times 30 \\ & = 7,560,000 / 4666 \times 30 = 54\text{ pumps} \end{aligned}$$

(iv) discharge

$$0.054\text{ m}^3/\text{S} \times 54\text{ pumps} = 2.92\text{ m}^3/\text{S} / \text{day}$$

Consequently, above mentioned water and pumps shall be (19.8 m³/S) and pumps will be used for it.

where, irrigation water was calculated below

$$40,000\text{ha} \times 3\text{mm}/\text{day} \div 0.70 \div 86400 = 19.8\text{m}^3/\text{S}$$

7) Food for pond fishery

After dried up pond, compost or manure shall be put on the bed for producing plankton for fish feeding. Additionally kitchen waste or by-products of crops shall be used.

Target unit yield is still not so high compared with other Asian countries, Therefore further efforts for development of fishery will be expected.

2.4 Rural Industry

(1) General

The development of rural industries will be consisted of 2 following periods.

- 1) First Five-Year Period (1990-1994)
 - a. Strengthening and expansion of existing rural industries.
 - b. Training of landless people on potential rural/cottage industries for their self-reliant development through UCCA's training programs.
- 2) Second Five-Year Period (1995-1999)
 - a. Formation of simple industries in small scale for supporting the agro-fishery development.
 - b. Studies for implementing high graded industries such as:
 - Irrigation River Factory
 - Bicycle & Rickshaw Factory
 - Textile Factory
 - Fertilizer Factory
 - Fishery & Livestock Products Factory
 - Others
 - c. Setting up utilities facilities for supporting potential high graded industries subjected to implementation.

The 2 main elements, technical and financial, in the First Five-Year Plan will be mainly made up by local availabilities, while the Second Five-Year Plan should be mainly supported by foreign assistances.

- 3) Upon the industrial development program, an employment generating of approximately 12,000 persons or 3 million man.days would be obtained accordingly.

(2) Implementation

1) First Five-Year Plan (1990-1994)

- a. Funding existing rural industries with soft credit i.e interest of 6% per annum for the targets of double production and double labour force absorption.
- b. Increasing self-reliant employment for landless people by rural/cottage technical training and funding assistance.

Rural Industrial Employment	Daudkandi	Homna	Total
Present (person)	4,924	14,043	18,967
Targets in 1994 (person)	9,600	19,200	28,800
Employment generation (person)	4,676	5,157	9,832
Employment generation (man.days)	1,169,000	1,280,250	2,458,250

Costs for these above programs are included in UCCA activities: business profits to be revolved in these supporting programs.

A total of approximately 10,000 job opportunities would be generated in this sector (rural/cottage industries) during this period.

2) Second Five-Year Plan (1995-1999)

From the last phase (1995-1999), the establishment of new and high-grade rural industries is employed.

- a. Acquiring foreign assistance(s) for studying the establishment of new rural industrial factories for selecting priority projects for implementation.
- b. Setting up the capital procurement schedule for establishing factories of these priority projects. These capitals would be financed by soft-loans from foreign sources .
- c. Setting up a central complex of utilities (Generator, Boiler, Industrial Water, Waste-Treatment, Distribution Marketing Center, etc.) as basic

facilities for industrial development and facilities of source priority projects at each Upazila. Upon this plan an employment generation of approximately 2,000 persons (Daudkandi: 1,000 persons, Homna: 1,000 persons) or 5 million man.days would be performed accordingly.

(3) Supporting system

- 1) UCCA Activities are for programs of Financial and Technical Assistance in the First Five-Year Period and to be continuously carried out throughout afterwards.
- 2) As the technical and financial aspects in the plan of Last Phase, Second Five-Year Period will be mainly supported by foreign assistances, concerned ministries, i.e. Ministry of Industry, Ministry of Commerce, Ministry of Finance, etc. should be engaged in corresponding project(s) for a smooth cooperation.
- 3) In the Second Five-Year Plan (1995-1999), a large amount of investment is required but due to the industrial aspect, the employment generation is mainly aimed at a number of technicians concerned.

2.5 Rural Business

(1) General

- 1) Business shall be developed for employment generation.
- 2) With the completion of Meghna-Gumti Bridge and Feeder-A (Daudkandi-Homna), communication conveniences will support business development in this region.

(2) Development plan

- 1) Two (2) local development plans:

Daudkandi : Both sides of this highway starting from Meghna-Gumti to around the starting point of Feeder-A connecting to Homna.

Homna : Both sides of Feeder-A from Daudkandi to Homna.

- 2) Development as Shopping Business Central Parts for each Upazila.
- 3) Commercial Banks in cooperation with Upazila Parishad for supporting this program of small business/shop units> The target of business-employment are envisaged as follows:

Item	Daudkandi	Homna	Total
Present (persons)	13,181	8,345	21,526
Target in 1999	16,771	10,067	26,838
Employment Generation (persons)	3,590	1,722	5,312
Employment Generation (man.days)	897,500	430,500	1,828,000

Note: Targets of business/shop units are calculated on basis of 1 business/shop unit per 50 households (Daudkandi: 112,200, Homna: 53,800) and 1.6 employments per unit of business/shop.

Accordingly, a total of 5,312 persons or 1,328,000 man.days of employment generation in business are estimated upon the implementation of this program.

(3) Supporting system

- 1) Local Commercial Banks as main sponsor
- 2) Upazila Parishad as supporter
- 3) UCCA's activities as developer

3. Physical and Social Infrastructures

3.1 Irrigation Development Plan

3.1.1 Objectives

The main objectives of irrigation development plan are to increase the crop production and to accomplish the constant crop production through the year. Especially in the winter (dry) season, irrigation is indispensable procedure for the expansion of cultivated area, though some crops, such as potato or wheat of local varieties, can be grown without irrigation in the Study Area.

Secondary objective of irrigation development plan is the employment generation. The employment generation is expected through the execution of the irrigation development plan and the expansion of cultivated area.

3.1.2 Target of irrigation development

(1) Crops for irrigation development

Major crops for the irrigation development are Boro and Winter Vegetables in the winter season, T.Aman in the autumn season and T.Aus and Summer Vegetables in the summer season, and these crops are planned to be fully irrigated. Crops, such as Potato, Wheat, Chilli and Oilseeds (Sesame and Mustard), are planned to be irrigated supplementary to achieve the production increase by introduction of High Yield Variety (HYV).

(2) Expansion of irrigation area

According to the proposed cropping patterns by land type which was described in section 2.1.2, the total target area of each crop is shown below (Refer to Table 3.1.1).

Crop	Daudkandi	Homna	Total	Irrigation
Boro	12,850	5,280	18,130	Full
T.Aus	3,255	1,205	4,460	Full
T.Aman	1,080	585	1,665	Full
B.Aman	17,000	7,620	24,620	Rainfed
W.Vegetable	2,160	1,560	3,720	Full
S.Vegetable	2,160	1,560	3,720	Full
Potato	3,795	1,985	5,780	Supplemental
Wheat	6,655	3,420	10,075	Supplemental
Chili	2,175	1,240	3,415	Supplemental
Sesame	1,450	620	2,070	Supplemental
Mustard	1,660	1,170	2,830	Supplemental
Jute	1,620	1,365	2,985	Rainfed
Pulses	1,620	975	2,595	Rainfed
Total		57,480	28,585	86,065

Gross area for full irrigation is 31,695 ha (26,310 ha in net), gross area for supplemental irrigation is 24,107 ha (17,515 ha in net) and gross rainfed area is 30,200 ha. The total gross cultivated area is 86,065 ha.

3.1.3 Irrigation water requirement

In the planning of irrigation development, a full knowledge of irrigation requirements of crops from the time of seeding until harvest is needed. The peak irrigation requirements by crop must be known in order to determine the capacity of irrigation system. As there is no actual measurement of crop consumptive use in the Study Area, the water requirements are assumed using meteorology data at Comilla by following procedure.

(1) Evapotranspiration

Evapotranspiration (consumptive use) is the quantity of water transpired by plants during their growth, or retained in the plant tissue, plus the moisture evaporated from the surface of the soil and vegetation. The evapotranspiration can be calculated by the following formula (FAO, Irrigation and Drainage Paper No. 24, Crop Water Requirements).

$$ET_c = k_c \times ET_o$$

where, ET_c : evapotranspiration
 ET_o : reference crop evapotranspiration
 k_c : crop coefficient

1) Reference crop evapotranspiration (ET_o)

Reference crop evapotranspiration is defined as the rate of evapotranspiration from an extensive water surface covered by green grass of uniform height, completely shading the ground. The mean crop evapotranspiration in the Study Area is calculated using the meteorological data at Comilla by the modified Penman method. The followings are the calculated results.

(Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
85	106	149	165	177	133	135	133	123	117	96	80

2) Crop coefficient (K_c)

Crop coefficients are employed to relate the reference crop evapotranspiration to the evapotranspiration. Values of crop coefficients vary with the crop characteristics, time of planting and/or sowing and climatic conditions. The crop coefficients for various crops in Bangladesh are as follows:

Crop Coefficient	1st month	2nd month	3rd month	4th month	5th month
Boro	1.10	1.10	1.25	1.25	1.00
T.Aus	1.10	1.10	1.10	0.95	
T.Aman	1.10	0.10	1.10	0.95	
Vegetables	0.55	0.80	1.10	0.05	
Potato	0.55	0.91	1.15	0.07	
Wheat	0.48	0.02	1.15	0.79	
Mustard	0.55	0.93	1.10	0.85	
Sesame	0.65	0.10	1.08	0.65	
Chili	0.35	0.85	0.85	0.75	

Source: Irrigation Management Program, Manual for Upazila Officers, Jan. 1984
 Net Irrigation Requirement of Rice and ET of Wheat and Potato for Different Locations of Bangladesh, BARC, Dec. 1982
 Irrigation and Drainage Paper No.24, Crop Water Requirement, FAO

(2) Net irrigation water requirement

After knowing the evapotranspiration, net irrigation water requirement is calculated using the field water balance equation as follows:

$$In = a \times (ETc - Pe - Ge) + Pl$$

- where,
- a : crop intensity
 - In : net irrigation water requirement
 - ETc : evapotranspiration
 - Pl : percolation loss
 - Pe : effective rainfall
 - Ge : groundwater contribution, if any

The groundwater contribution is negligible when the water balance is considered for long period. Therefore, the net irrigation water requirement is calculated using evapotranspiration, percolation loss and effective rainfall. And Land preparation requirement is additionally considered for rice cultivation which includes water requirements for puddling and nursery work.

1) Effective rainfall

80 percent dependable rainfalls are considered as effective rainfalls in this Study for the convenience. 80 percent dependable rainfalls at Comilla station are shown below.

(Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
0	0	18	100	120	230	370	250	120	60	0	0

2) Percolation loss

The percolation loss for upland crops is considered to be zero as that is normally very small and is included in the irrigation efficiency. So only the percolation losses for rice were considered as follows:

- Boro : The percolation loss is assumed to be 1 mm/day as Boro is cultivated in the lower elevation area where the soil characteristic is rather fine.
- T. Aus : The percolation loss is assumed to be 3 mm/day as T.Aus is cultivated in the higher elevation area where the soil characteristic is rather coarse.

T. Aman : The percolation loss is assumed that 0 mm/day in the first half and 1 mm/day in the second half of cultivation period. Because the percolation loss is affected by the flood water though T.Aman is cultivated in the higher elevation area.

3) Land preparation requirement

This is the water requirement for puddling work and preparation of nursery bed for rice cultivation and assumed as follows:

Water requirement for puddling work	:	80 mm
Water requirement for nursery bed	:	20 mm
<hr/>		
Total		100 mm

4) Net water requirement for supplemental irrigation

The net water requirements for supplemental irrigation were assumed to be about half of net water net water requirement considering the recommendation of Bangladesh Agricultural Research Institute (BARI) (Refer to Table 3.1.2).

(3) Gross water requirement

Gross water requirements (irrigation diversion requirements) are calculated considering irrigation efficiency which includes conveyance loss and operation loss. The former loss occurs during conveyance of the irrigation water and the later occurs in the field. The irrigation efficiencies were assumed to be 65% for rice cultivation and 50% for upland crops without buried pipeline system, and 0.70% for winter and summer vegetables with buried pipeline system.

The calculation results of the net and gross water requirements for various crops are shown in Tables 3.1.3 to 3.1.12. The gross water requirements for supplemental irrigation are shown in Table 3.1.13.

3.1.4 Development plan

(1) Water resources development

Water resources are indispensable to accomplish the expansion of irrigation area. There are two kinds of water resources for the irrigation development in the Study Area, which are surface water and groundwater. However, according to the studies and analysis which were carried out by Bangladesh Water Development Board (BWDB), there is less potential for the groundwater development in the Study Area due to water quality and a lack of recharge amount. Therefore, the surface water will be the main water resources for the expansion of irrigation area.

Though there are so many rivers and tributaries in the Study Area, some of rivers and most of tributaries are dried up in the dry season. So the main rivers as the water resources are Meghna, Gumti, Kalatia, Titas, Batakandi, Dhanagoda rivers. Meghna river is the third river in Bangladesh and has numerous amount of water flow even in the dry season. Most rivers in the Study Area are tidal and some of them have certain amount of water at flood tide even in the dry season.

1) Re-excavation of irrigation canals

Low elevation areas are easily irrigated with LLP using water from the rivers, tributaries and irrigation canals which intake water from major rivers. However, as there are some irrigation canals which were silted up and have not enough flow capacity, re-excavation of irrigation canals are proposed as follows:

Priority No.	Name of Irrigation Canal	Excavation Depth (m)	Width (m)	Length (km)
<u>Daudkandi Upazila</u>				
1	Mazibari	1.0	11	8.0
2	Kari Kandi	1.0	22	8.0
3	Khirai	1.0	18	23.0
4	Kirtan Khola	1.0	15	8.0
5	Kalasona	1.0	22	4.0
6	Amtali	1.0	12	5.0
7	Hasnabad	1.0	12	6.0
8	Baranpar	1.0	22	4.0
9	Ashmania	1.0	15	12.9
10	Lalpur-Sundarpur	1.0	15	9.7
11	Daraj Khola	1.0	15	12.0
12	Gobindapur	1.0	18	5.0
13	Rampur	1.0	22	8.0
14	Noorpur	1.0	15	6.0
15	Satani-Krishnapur	1.0	18	5.8
	Total Length			125.4
<u>Homna Upazila</u>				
1	atia	1.0	8	2.4
2	athabanga	1.0	10	3.2
3	agnathpur	1.0	8	3.2
4	mrabad	1.0	8	1.6
5	hasania	1.0	13	2.4
6	handerchar	1.0	11	4.8
	Total Length			17.6

Locations of the above irrigation canals are shown in Figure 3.1.1.

2) Supply of floating pump

Although the most of the irrigation canals can intake water by gravity from rivers after the re-excavation, some irrigation canals will not be able to get enough water by gravity even after the re-excavation due to the high elevation. According to the site survey and information from Upazilas, there are five irrigation canals (three canals in Daudkandi and two canals in Homna) which will not be able to intake enough water by gravity.

It is recommended to introduce a floating pump for each canal as the water resource pump. There are more than ten floating pumps in Bangladesh and one of them is in Daudkandi Upazila already. The operation was started in 1988 under BADC. Recommended capacity of the floating pumps is 12.5 cusec (354 l/sec) and is same with the capacity of existing floating pump.

The floating pump has following merits.

- i) It can be used for river intake where the fluctuation of water level is very large or the silt problems occur easily.
- ii) Land acquisition for the pump station is not required.
- iii) Location of floating pump station is easily shifted by navigation and it can avert the flood damage

Though the cost of floating pump is rather high comparing with pump station, floating type pump is highly recommended because of its easy operation and maintenance.

Recommended locations for the floating pumps are tentatively mentioned in Figure 3.1.1. Detailed site surveys are indispensable for the final determination of the locations.

(2) On-farm irrigation plan

Recommendable on-farm level irrigation development practices in the Study Area are,

- i) DTW or STW using groundwater (existing),
- ii) LLP using surface water (existing and additional), and
- iii) combination of buried pipeline system with DTW or LLP.

LLP will be most effective irrigation practice for the further irrigation development in the Study Area, as the additional water resource is mainly surface water and gravity intake of irrigation water is very difficult due to the land shape in the Study Area. Buried pipeline system with DTW or LLP is very effective for the expansion of irrigation area especially for irrigation of upland crops. This system has the following advantages:

1. No right of way is necessary.
2. It is not necessary to follow plot boundaries, reducing conveyance length, cost and head loss.
3. The pump does not need to be located in the highest part of the command area.
4. Water can be conveyed to high blocks that cannot be reached by open channels.

5. Conveyance efficiency is nearly 100 % between pump and outlet with proper construction.
6. Maintenance for conveyance system is minimal.
7. Water control and measurement are simple.

The buried pipeline systems with DTW or LLP for winter and summer vegetables are proposed in the Study.

On-farm irrigation plan for the expansion of irrigation area is schemed by following procedure.

Basic condition :

- i) Plans are schemed for each Upazila.
- ii) Peak irrigation water requirement per month in each elevation area is adopted for the estimation of number of new irrigation pumps.
- iii) LLPs area adopted as the new irrigation pumps.

The peak irrigation water requirements in each elevation area in each Upazila are estimated using water requirement of each crop and proposed cropping pattern as follows:

(Unit: l/sec)

Ground Elevation	Daudkandi	Homna	Total
4 - 5 m	4,482 (Jan.)	3,454 (Jan.)	7,936
3 - 4 m	19,053 (Mar.)	8,004 (Mar.)	27,057
2 - 3 m	8,624 (Jan.)	4,018 (Jan.)	12,642
Total	32,159	15,476	47,635

Out of this water requirements, following amounts are available using existing irrigation pumps. (Average discharge of existing irrigation pumps are assumed as, 1.5 cusec for LLP, 2.0 cusec for DTW and 1 cusec for STW.)

Available Discharge with Existing Irrigation Pump

(Unit: l/sec)

Pump	Daudkandi		Homna		Total	
	No.	Discharge	No.	Discharge	No.	Discharge
LLP	455	19,451	76	3,249	531	22,700
DTW	57	3,249	-	-	57	3,249
STW	114	1,596	48	672	162	2,268
Total		24,296		3,921		28,217

From the above estimation, shortage of discharge and required Numbers of LLP are calculated as follows:

Item	Daudkandi	Homna	Total
Peak Irrigation			
Water Requirement (l/sec)	32,159	15,476	47,635
Available Discharge (l/sec)	24,296	3,921	28,217
Shortage of Discharge (l/sec)	7,863	11,555	19,418
Required Numbers of LLP (Average discharge: 57 l/sec)	138	203	341

LLP (Daudkandi: 138 Nos. and Homna: 203 Nos.) will be supplied to "Agricultural Modernization Center" in each Upazila and farmers will hire the LLP from the Center.

As the buried pipeline systems with DTW or LLP are recommended for winter and summer vegetables, number of proposed buried pipeline systems are calculated as follows:

Item	Daudkandi	Homna	Total
Peak Irrigation Water Requirement for Winter or Summer Vegetables (l/sec)	2,246 (Feb.)	1,622 (Feb.)	3,868
Required Numbers of Buried Pipeline System with DTW or LLP	40	29	69

Sixty-nine of buried pipeline systems (Daudkandi: 40 Units and Homna: 29 Units) are proposed to be constructed in the Study Area. The location of each pipeline system must be fixed after the detailed survey which includes available water resource, topography and land tenure.