

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (26/42)

No.	Name of Division	Table-14B					Table-15	
		Moulvibazar O&M Division (11 Projects)					Sirajganj O&M Division	
A	Name of Project	Tarapasha-Prempagar Flood Control Project	Manu River FCD Sub-project	Janbamichara FCD Sub-project	Shanipur FCD Project	Manu River FCD Sub-project	River Bank Protection Project	
	B	Reported by	Kazi Abu Bakar Siddique, Md Shafiq Huda Khan	Kazi Abu Bakar Siddique, Md Shafiq Huda Khan	Kazi Abu Bakar Siddique, Md Rafique Ullah	Kazi Abu Bakar Siddique, Md Rafique Ullah	Kazi Abu Bakar Siddique, Md Rafique Ullah	Md. Abdul Hamid, Md. Nazamul Haque Bhuiyan, Tanan Kumar Saha
Implementation & OM								
E-1	Const. Period	1994/95-1995/96 (2yr)	1993/94-1997/98 (4yr)	1989-1991 (2yr)	1994-1999 (5yr)	1989-1994 (5yr)	1995/96-1999/00 (4yr)	
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed	Completed	
E-3	Const. Cost(lac Taka)	Lac Taka 211.50	10.36	149.10	145.00	159.00	75,536.00	
E-4	Financial source	BWDB	BWDB 10.56+4567 wheat	BWDB, CIDA	BWDB 145 / WFP 1100	BWDB 159 / WFP 1180	RPA 529.08 / GOB 224.28	
E-5	Operation	Year to start 1997	1999	1992	1999	1995	1999	
E-6	Annual operation cost	Cost in Taka 34	40	5	25.5	51.3	2000	
E-7	Annual maintenance	Work items	Re-sectioning & Retired of embankment	Re-sectioning & Retired of embankment	Breach closing, R/S and retired of embankment	R/S & retired of embankment	Breach closing, R/S & retired of embankment	CC Block, Geo Bag, earth work, gunny / synthetic bags, geotextile filter
E-8	Period	Nov-Mar	Nov-Mar	Nov-Apr	Nov-Apr	Nov-Apr	Round the year	
E-9	Cost in Lac Taka	34.00	40.00	20.00	25.80	81.30	162.50	
E-10	Rate of annual OM	% 16.00%	10.00%	14.00%	12.00%	16.00%	0.50%	
E-11	Emergency maintenance / Repair	Period	Slope protection by palasiding & gunny bags	Slope protection by palasiding & gunny bags	Breach closing, slope protection by gunny bags and bamboo walling, ghogs repair and	R/S & retired of embankment	Breach closing, slope protection by gunny bags and bamboo walling, ghogs repair and	CC Block manufacturing & dumping, supplying and placing / dumping geo tex tile & sand fill
E-12	Cost	Lac Taka 7.0	5.0	10.0	10.0	50.0	2.5	
E-13	Financing							
E-14	Major Rehabilitation repair conducted / required	Case-1	NA	NA	NA	NA	80m Sirajganj hard point with cost of 5lac in 1999/00	
E-15		Case-2					Stock pile for Sirajganj hard point	
E-16		Case-3						
F	Actions at Flood Time							
F-1	Flood Warning	?	Received	?	?	?	Received	
F-2	Operation manual for	?	None	?	?	?	Ready	
F-3	Actions at Flood Time		Monitoring different weak point of flood embankment, remove nearby inhabitants to the safer place and inform the local adm. and public representative to save the infrastructure and other valuable property of the people of the area	Monitoring different weak point of flood embankment, remove nearby inhabitants to the safer place and inform the local adm. and public representative to save the infrastructure and other valuable property of the people of the area	To monitor the different vulnerable points of flood embankment, to communicate local adm. And public representatives regarding the incoming flood to take safety measures for inhabitants, movable / immovable properties	To monitor the different vulnerable points of flood embankment, to communicate local adm. And public representatives regarding the incoming flood to take safety measures for inhabitants, movable / immovable properties	To monitor the different vulnerable points of flood embankment, to communicate local adm. And public representatives regarding the incoming flood to take safety measures for inhabitants, movable / immovable properties	Flood forecasting from past record and current international bulletins through telecommunication media
F-4	FFWS Requirement	?	Necessary	?			Necessary	
F-5	Problems if no FFWS		Water level of Manu river rises suddenly and damage / breached the flood embankment at different locations of the project and damage the crops, infrastructure, etc.	Water level of Manu river rises suddenly and damage / breached the flood embankment at different locations of the project and damage the crops, infrastructure, etc.	Damage of properties and loss of life will be more	Damage of properties and loss of life will be more	Damage of properties and loss of life will be more	Appropriate and timely preventive work may not be taken
F-6	Benefit attributable for FFWS	% of total damage	40%	30%	30%	?	50%	
F-7	Comments by respondent		For flushy river water level rises suddenly and damage flood embankment and other infrastructures instantly. Flood warning is urgently	For flushy river water level rises suddenly and damage flood embankment and other infrastructures instantly. Flood warning is urgently				Lives and movable properties may be saved up to 90% but immovable properties, infrastructure, standing crops may be damaged

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (27/42)

No.	Name of Division		Table-17		Table-18		Table-19			
			Noakhali O&M Division (2 Projects)		Nilphamari O&M Division (2 Projects)		Thakurgaon O&M Division (4 Projects)			
A	Name of Project		Coastal Embankment Project (Folder 73/T.A.B)	Coastal Embankment Project (Folder 73/Z)	Buri Teesta Left & Right Embankment Project	latif Chaper Water Control structure	Bhuly Bunder Irrigation Project	Buri Bunder Irrigation Project	Rahmatpur FCDI Project	Tegaria-Gobindapur FCDI Project
	Reported by		S.M.Amar Rahman	S.M.Amar Rahman	No name mentioned	No name mentioned	Md. Shahid Hossain Chowdhury	Md. Shahid Hossain Chowdhury	Md. Anwar Hossain	Md. Anwar Hossain
B	Project Component		Flood Control, Drainage, Saline water intrusion Control	Flood Control, Drainage, Saline water intrusion Control	Flood Control & Drainage	Irrigation and drainage	Irrigation	Irrigation	Flood control, drainage and Irrigation Project	Flood control, drainage and Irrigation Project
B-1	Location	Zone	South-Eastern Zone	North-Eastern Zone	North-Western Zone	North-Eastern Zone	Northern Zone	Northern Zone	Northern Zone	Northern Zone
B-2	Location	Upa-zilla / District	Dist. Noakhali, Upa Zila Hatiya	Dist. Noakhali, Upa Zila Hatiya	Map showing the location	Dist. Nilphamari, Upazila Nilphamari	Map showing	Map showing		
B-3	Objectives		Protection from cyclonic surge, flood & storm control of flooding & salinity	Protection from cyclonic surge, flood & storm control of flooding & salinity	To mitigate flood water & remove drainage congestion	Irrigation during the period Robi & Drainage in rainy season	To grow more food, supplemental irrigation	To grow more food, supplemental irrigation, and flood control	To grow more food, flood control, drainage and irrigation	To grow more food, flood control, drainage and irrigation
B-4	Implementing agency		BWDB	BWDB	BWDB	BWDB	BWDB	BWDB	BWDB	BWDB
B-5	Existing structure at implementation									
B-6	Beneficiaries	Number	200000	100000	6000 HH	12500	1000	2000	2000	1000
B-7	Beneficiaries	Occupation	Agriculture	Agriculture	Farmer	Cultivator	Farmer	Farmer	Farmer	Farmer
C	Project features									
C-1	Total Project area	ha	18,072	11,239	25,000	NA	1,000	1,720	5,400	1,012
C-2	Irrigation area	ha	NA	NA	NA	40	800	1,500	5,400	1,000
C-3	Flood affected area	ha	17,415	9,859	15,000	NA	NA	500	5,400	500
C-4	Drainage area	ha	16,726	9,477	15,000	NA	NA	1,000	5,000	1,000
C-5	Others	ha	13,178	9,477	NA	NA	NA	NA	5,000	?
D	Structural Details									
D-1	Embankment	Length km	89.50	47.90	25.56	?	3.50	5.05	13.00	9.26
D-2		Height	3.5m-3.8m	3.5m(marginal)/3.8m(sea)	4.5m	2.5m	6.0m	5.0m	6m	6m
D-3		Crest width	4.25-2.44m	2.44m/4.25m	4.27m	6m	4.26m	5.0m	4.26m	4.23m
D-4		Slope	1:2, 1:3, 1:7 / 1:2, 1:2, 1:3	1:2, 1:7 / 1:2, 1:5	1:2 / 1:2	1:2 / 1:1.5	1:3 / 1:5	1:3 / 1:5	1:2 / ?	1:2 / 1:3
D-5		Free Board	0.94 / 0.94 / 1.24m	0.94m / 1.24m	1.0m	1.0m	1.0m	1.0m	1.0m	1.0m
D-6		Design Flood	20yr	20yr	? (708 cms)	1998 flood (55cms)	?	?	?	?
D-7	Sluice gate									
D-8	Others for embankment				Sod / lawn facing					
D-9	Drainage canal	Length			?		16km	1km	2km	1.0km
D-10		Depth			?		3.0m	2m	2m	2m
D-11		Bottom			?		3.0m	20m	20m	20m
D-12		Structure-1		Gates: 25 units, H=1.22-1.50m, W=1.22-1.8m	?	Gates: 4 units, H=2.44m, W=1.52m			Gates: 6units, H=1.5m W=1.5m	Gates: 62 units, H=1.5m W=1.5m
D-13	Structure-2									
D-14	Irrigation canal	Length				Main: 11.65km	Main: 11.65km	?	?	
D-15	Intake structure	Type			Concrete barrage, L=91m, 14 vent(6.1m*2.13m) 19.52 cms	Concrete barrage with 3 radial gates H=6.0m, W=9m	Concrete barrage with 3 radial gates H=6.0m, W=9m			
D-16		Size/Capacity								
D-17	Intake gates	Size								
D-18		Number								
D-19	Bank Protection	Type	NA			Concrete block		Concrete block	Concrete block	
D-20		Length								
D-21	Size of Concrete block				40*40*20cm, 35*35*35cm, 30*30*30 cm	40*40*20cm		40*40*20cm	40*40*20cm	
D-22	Dredging	Length			NA					
D-23		Depth								
D-24		Volume								
D-25	Notes, Problems and Further requirement, etc.		1.			Embankment partially damaged flood in 2002-03, structure to be modified				
D-26			2.							
D-27			3.							

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (28/42)

No.	Name of Division	Table-17		Table-18		Table-19				
		Neakhal O&M Division (2 Projects)		Nupurhat O&M Division (2 Projects)		Thakurgaon O&M Division (4 Projects)				
A	Name of Project	Coastal Embankment Project (Folder: 73/1.A.F)	Coastal Embankment Project (Folder: 73/2)	Buri Teesta Left & Right Embankment Project	Latif Chhpra Water Control structure	Plutly Bundh Irrigation Project	Buri Bundh Irrigation Project	Rahmatpur FCDI Project	Tangaria-Gabodapur FCDI Project	
	Reported by	S.M.Ataur Rahman	S.M.Ataur Rahman	No name mentioned	No name mentioned	Md. Shahid Hossain Chowdhury	Md. Shahid Hossain Chowdhury	Md. Anwar Hossain	Md. Anwar Hossain	
E Implementation & OM										
E-1	Const. Period	1963-1978 (16yr)	1964-1978 (15yr)	?-1982	1980-1981 (1yr)	1957/58-1959/60 (1yr)	1951/52-1952/53 (1yr)	1996/97-1998/99 (3yr)	1984-1987 (4yr)	
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	
E-3	Const. Cost(lac Taka)	1,710.50	603.00	972.00	9.78	347.11	347.11	102.66	80.50	
E-4	Financial source	USAID	USAID		GOB				GOB: 11.65, IDA: 68.84	
E-5	Operation	Year to start	?	1983	1981	1998/99	1982	1999/00	1984	
E-6	Annual operation cost	Cost in Taka	60	5	1	12	10	10	10	
E-7	Annual maintenance	Work items	Earth work, turfing, repair & maintenance gate and apron	Earth work, turfing, repair & maintenance of gate and apron	Earth work and reetment works	Earth work	Re-sectioning of cross bundh, irrigation canal / dike & structure	Re-sectioning of cross bundh, re-exavation of irrigation canal, rehabilitation of bridge/ culvert, etc.irrigation canal / dike & structure	Re-sectioning of emb. repair & rehab of structures, protective works	Re-sectioning of emb. repair & rehab of structures, emergency works
E-8		Period	Nov-May	Nov-May	Jan-Jun	3 months	Dec-Jun	Dec-Jun	Dec-Jun	
E-9		Cost in Lac Taka	6.60	20.00	45.00	1.00	30.00	10.00	10.00	
E-10	Rate of annual OM	%	3.50%	3.33%	5.15%	10.00%	10.00%	10.00%	10.00%	
E-11	Emergency maintenance / Repair	Period	?	Earth work and ancillary gate works, incl. re-sectioning of emb.	barboo spur, barboo pin bank piling, tarja walling, sand filling	Sand fill ganay bag placing / dumping for side slope protection	?	Cross bundh, barrage gates, irrigation canal	protection of flood control embankment	protection of flood control embankment
E-12	Cost	Lac Taka	10.0	4.0	12.0	0.5	2.0	2.0	1.0	
E-13	Financing									
E-14	Major Rehabilitation repair conducted / required	Case-1	Due to severe river erosion every year some where of the polder is rehabilitated		Yr 2002/03: earth work 25.5 lac-bank reetment 47 lac, 1.5km rehab. for embankment &	NA	Yr 2001/02: Earth work L=1km with cost of 3.0 lac	Yr 1999/00, 2001/02, 2002/03: Earth work L=13km with cost of 4.0 lac	Yr 1999/00, 2001/02, 2002/03: Earth work L=4.5km with cost of 19.2 lac=150 MT of wheat	Yr 2000/02, 2001/02, 2002/03: Rehabilitation of Emb. L=4.5km with cost of 1100 lac
E-15		Case-2	NA				Yr 1999/00, 2001/02, 2002/03: Earth work L=4.5km with cost of 3.0 lac	Yr 1999/00, 2001/02, 2002/03: Earth work L=4.5km and others with cost of 3.0 lac	Yr 2001/02, 2002/03: Rehabilitation of structures, loose apron of regulator, pipe outlet, etc. with cost of 5.0 lac	Yr 2002/03: Rehabilitation of structures, loose apron of regulator, etc. with cost of 11.2 lac
E-16		Case-3	NA							
F Actions at Flood Time										
F-1	Flood Warning		Received sometime	Received	?	Not received	Not received	Not received	Not received	
F-2	Operation manual for		None	None	?	None	None	None	None	
F-3	Actions at Flood Time		Aware the people of the project area for the safety of lives and wealth, alert the concerned officials for special attention to the infrastructure of the project	Aware the people of the project area for the safety of lives and wealth, alert the concerned officials for special attention to the infrastructure of the project	To alert the surrounding people for flood damage, record WL, identify the affected portion of flood embankment, report to flood situation to higher authority	Open the fall boards	Frequent watch of barrage, cross dam, irrigation canal, dyke, etc. Aware local people	Frequent watch of barrage, cross dam, irrigation canal, dyke, etc. Aware local people	Frequent watch of flood embankment, Aware local people	Frequent watch of flood embankment, Aware local people
F-4	FFWS Requirement		Necessary	Necessary	?	?	Necessary	Necessary	Necessary	Necessary
F-5	Problems if no FFWS		More damage of lives, wealth and infrastructure of the project	?	NA	Fail the communication & irrigation facilities	Precautionary measures may not be taken, structural gates cannot be opened or closed as required	Precautionary measures may not be taken, structural gates cannot be opened or closed as required	Precautionary measures may not be taken, structural gates cannot be opened or closed as required	Precautionary measures may not be taken, structural gates cannot be opened or closed as required
F-6	Benefit attributable for FFWS	% of total damage	55%	55%	60%	?	30%	25%	25%	25%
F-7	Comments by respondent						It is necessary to receive the correct flood warning information	It is necessary to receive the correct flood warning information	It is necessary to receive the correct flood warning information	It is necessary to receive the correct flood warning information

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (29/42)

No.	Name of Division		Table-29				
			Panchagarh O&M Division (5 Projects)				
A	Name of Project		Versha Irrigation Project	Bhabang-Duikuta Irrigation Project	Tirmari-ranachandi-Tulshia Irrigation Project	Pathraj-Bandh Irrigation Project	Tangon Barrage Irrigation Project
	Reported by		Md. Masur Rahman	Md. Masur Rahman	Md. Masur Rahman	Prakash Krishna Sarkar	Prakash Krishna Sarkar
B	Project Component		Irrigation Project	Irrigation Project	Drainage	Irrigation	Drainage
B-1	Location	Zone	Northern Zone	Northern Zone	Northern Zone	Northern Zone	Northern Zone
B-2	Location	Upa-zilla / District	Tennulia, Panchagarh	Panchagarh Sadar, Panchagarh	Tennulia, Panchagarh	Bola & Atwari, Panchagarh	Thakurgaon, Thakurgaon
B-3	Objectives		To provide supplementary irrigation	To retain rain water in required depth within the project area for T.Aman	To provide supplementary irrigation for T.Aman	To provide Supplemental irrigation for T.Aman	To provide Supplemental irrigation for T.Aman
B-4	Implementing agency		BWDB	BWDB	BWDB	BWDB	BWDB
B-5	Existing structure at Implementation						
B-6	Beneficiaries	Number	10,500	3,400	5,000	3,500	27,500
B-7	Beneficiaries	Occupation	Cultivation	Cultivation	Cultivation	Cultivation	Cultivation
C	Project features						
C-1	Total Project area	ha	567	607	1,200	2,145	6,070
C-2	Irrigation area	ha	417	540	891	1,414	4,450
C-3	Flood affected area	ha	NA	NA	NA	NA	NA
C-4	Drainage area	ha	NA	NA	NA	NA	NA
C-5	Others	ha	NA	NA	NA	NA	NA
D	Structural Details						
D-1	Embankment	Length km	2.83	13.59	1.83	2.56	3.50
D-2		Height	3.35m	2.5m	4.57m	2m	3.5
D-3		Crest width	4.88m	4.3m	4.3m	4m	4.4
D-4		Slope	1:2 / 1:2	1:2 / 1:2	1:2 / 1:3	1:2 / 1:2	1:2 / 1:2
D-5		Free Board	1.5m	0.6m	1.5m	0.9m	1.0m
D-6		Design Flood	89.35 yr (32cms)	81.5 yr (?)	92 yr (32.5 cms)	67.1yr (?)	64 yr (?)
D-7	Sluice gate						
D-8	Others for embankment						
D-9	Drainage canal	Length					
D-10		Depth					
D-11		Bottom					
D-12		Structure-1					
D-13	Structure-2						
D-14	Irrigation canal	Length	14km		Main:2.52 2nd & 3rd:14.13km	Main:9.12km	Main: 3.7km, 2nd & 3rd: 62km
D-15	Intake structure	Type	Concrete barrage with two gate H=2.75m W=2.9m		Concrete barrage with 2 radial gates H=2.75m W=2.9m	Concrete barrage with 9 fall board gates H=1.52m W=2.13m	Concrete barrage with 5 radial gates H=6.0m W=4.5m
D-16	Intake gates	Size/Capacity					
D-17		Size					
D-18		Number					
D-19	Bank Protection	Type					
D-20		Length					
D-21	Size of Concrete block						
D-22	Dredging	Length					
D-23		Depth					
D-24		Volume					
D-25	Notes, Problems and Further requirement, etc.		1.				
D-26			2.				
D-27			3.				

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (30/42)

No.	Name of Division	Table-20				
		Panchagarh O&M Division (5 Projects)				
A	Name of Project	Versha Irrigation Project	Bhabnang-Dudhara Irrigation Project	Tinari-ranachandi-Tulshia Irrigation Project	Pathraj Bundh Irrigation Project	Tangor Barage Irrigation Project
	Reported by	Md. Matur Rahman	Md. Matur Rahman	Md. Matur Rahman	Prakash Krishna Sarkar	Prakash Krishna Sarkar
E	Implementation & OM					
E-1	Const. Period	1983/84-1987/88 (3yr)	1984/85-1985/86 (1yr)	1985/86-1987/88 (3yr)	1955/56-1959/60 (5yr)	1984/85-1992/93 (9yr)
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed
E-3	Const. Cost (lac Taka)	Lac Taka	73.00	30.60	132.00	12.00
E-4	Financial source	ADB	?	ADB & IDA	GOB	GOB:238.13, ADB: 1244.64
E-5	Operation	Year to start	1989	1986	1989	1962
E-6	Annual operation cost	Cost in Taka	0.5	0.5	0.5	0.25
E-7	Annual maintenance	Work items	Repair of emb. loose apron of barrage & regulator	Repair of emb. and closing of breach	Repair of emb. loose apron of barrage & regulator	Repair of emb., irrigation canal dyke & loose barrage & head regulator
E-8		Period	Dec.-Jun	Dec.-Jun	Dec.-Jun	Dec.-Jun
E-9		Cost in Lac Taka	1.50	2.50	0.75	0.50
E-10	Rate of annual OM	%	2.36%	8.33%	2.20%	4.00%
E-11	Emergency maintenance / Repair	Period	Repair of emb. closing of breach	Repair of emb. and closing of breach	Repair of emb. and closing of breach	Repair of emb., Closing breach
E-12	Cost	Lac Taka	1.5	?	3.0	0.3
E-13	Financing					
E-14	Major Rehabilitation repair conducted / required	Case-1		?	?	?
E-15		Case-2		?	?	?
E-16		Case-3		?	?	?
F	Actions at Flood Time					
F-1	Flood Warning		Not received	Not received	Not received	Not received
F-2	Operation manual for		Ready	Ready	Ready	Ready
F-3	Actions at Flood Time		?	?	?	?
F-4	FFWS Requirement		Necessary	Necessary	Necessary	Necessary
F-5	Problems if no FFWS		Precautionary measures could not be taken	Precautionary measures could not be taken	Precautionary measures could not be taken	Precautionary measures could not be taken
F-6	Benefit attributable for FFWS	% of total damage	?	?	?	?
F-7	Comments by respondent			?	?	?

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (31/42)

No.	Name of Division	Table-21							
		Natore O&M Division (7 Projects)							
A	Name of Project	Chalan Beer Project Folder A	Chalan Beer Project Folder B	Chalan Beer Project Folder C	Barnai Project FCD-4	Barnai River Sub-Project	Nagor River Embankment Sub-Project	Batal Basin Development Project	
	Reported by	Md. Samaulik, Md. Montazer Rahman	Md. Samaulik, Md. Montazer Rahman	Md. Samaulik, Md. Montazer Rahman	Md. Samaulik, Md. Montazer Rahman, Samir Kumar Saha	Md. Samaulik, Md. Montazer Rahman	Md. Samaulik, Samir Kumar Saha	Md. Samaulik, Md. Montazer Rahman	
B	Project Component	Flood Control & Drainage	Flood Control & Drainage	Flood Control & Drainage	Flood Control and Drainage	Flood Control and Drainage	Flood Control and Drainage	Flood Control, Irrigation & Drainage	
B-1	Location	Zone	North-Western Zone	North-Western Zone	North-Western Zone	North-Western Zone	North-Western Zone	North-Western Zone	
B-2	Location	Upa-zilla / District	Attached location map	Attached location map	Attached location map	Attached location map	Attached location map	Attached location map	
B-3	Objectives		Flood control and drainage of Project area & increase of production	Flood control and drainage & crop production	Flood control and drainage & crop production	Flood control and drainage & crop production	Flood Control and Drainage	To enhance drainage facilities and agricultural production	
B-4	Implementing agency		BWDB	BWDB	BWDB	BWDB	BWDB	BWDB	
B-5	Existing structure at implementation								
B-6	Beneficiaries	Number	40,000	?	200,000	60,000	70,000	18,000	500,000
B-7	Beneficiaries	Occupation	Farmer	Farmer	Farmer	Farmer	Farmer	Agriculture	Farmer
C	Project features								
C-1	Total Project area	ha	24,392	33,166	?	63,100	5,081	5,000	109,000
C-2	Irrigation area	ha	NA	NA	?	48,300	NA	NA	20,000
C-3	Flood affected area	ha	24,392	25,860	?	63,100	5,081	3,000	109,000
C-4	Drainage area	ha	24,392	25,860	?	48,300	3,950	3,000	30,000
C-5	Others	ha	NA	73067	?	NA	NA	NA	NA
D	Structural Details								
D-1	Embankment	Length km	17.00	35.00	147.00	44.00	14.21	25.00	?
D-2		Height	4.5	4.5	4m	5m	4.5m	5m	?
D-3		Crest width	4.27	4.27	4.27m	4.27m	4.27m	4.27	?
D-4		Slope	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	?
D-5		Free Board	1.5m	1.5m	1.5m	1.5m	1.0m	1.0m	?
D-6		Design Flood	?	?	?	?	?	1998 flood 791.82 cms	?
D-7	Sluice gate								
D-8	Others for embankment								
D-9	Drainage canal	Length	48	27	121	221	19.15	141	157
D-10		Depth	4m	4m	4.7m	4m	4m	5m	4m
D-11		Bottom	6-10m	3-14m	6-10m	3-10m	3-4.5m	5m	5-10m
D-12		Structure-1	Vertical gate: 3 units 0.91m*1.08m, & 1 unit 1.52m*1.82m	Vertical roller gates: 13 units of 0.91m*1.08m, 5 units of 1.51m * 1.3m	Vert: 18 units of 1.52m*1.83m, 9 units of 2.44m*2.74m	Gates: 14 units 1.52m*1.82m, 1 unit 1252m*1.09m, 1 unit 1m*1m	Gates: 4 units 1.83m*1.52m	Gates: 1 unit 1.5m*1.5m	11 regulators, 3 regulators+ bridge and 10 flashing sluice
D-13	Structure-2								
D-14	Irrigation canal	Length							
D-15	Intake structure	Type							
D-16	Intake gates	Size/Capacity							
D-17		Size							
D-18	Bank Protection	Number							
D-19		Type			Concrete block 30cm*30cm*30cm				
D-20		Length							
D-21	Size of Concrete block								
D-22	Dredging	Length							
D-23		Depth							
D-24		Volume							
D-25	Notes, Problems and Further requirement, etc.	1.							
D-26		2.							
D-27		3.							

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (32/42)

No.	Name of Division	Table-21							
		Nature O&M Division (7 Projects)							
A	Name of Project	Chalan Beel Project, Folder 'A'	Chalan Beel Project, Folder 'B'	Chalan Beel Project, Folder 'C'	Barnai Project, FCD-4	Barnai River Sub-Project	Nagar River Embankment Sub-Project	Barnai Basin Development Project	
	Reported by	Md. Sanullah, Md. Montazer Rahman	Md. Sanullah, Md. Montazer Rahman	Md. Sanullah, Md. Montazer Rahman	Md. Sanullah, Md. Montazer Rahman, Samir Kumar Saha	Md. Sanullah, Md. Montazer Rahman	Md. Sanullah, Samir Kumar Saha	Md. Sanullah, Md. Montazer Rahman	
E	Implementation & OM								
E-1	Const. Period	1973-1985 (7yr)	1973-1985 (7yr)	1974-1983 (9yr)	1986/87-1994/95 (9yr)	1983-1986 (4yr)	1983-1986 (3yr)	1994/95-03	
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed	Completed	On-going	
E-3	Const. Cost (Lac Taka)	2,587.80	3,039.50	8,292.73	8,344.32	293.17	217.00	35.45	
E-4	Financial source	GOB, WFP, CIDA	FFW, WFP, CIDA	WFP, GOB, CIDA	GOB, IDA, EEC	?	GOB, Netherland	GOB	
E-5	Operation	Year to start	1986	1986	1984	1995/96	1987	1986	NA
E-6	Annual operation cost	Cost in Taka	?	?	?	10	?	10	NA
E-7	Annual maintenance	Work items	Re-sectioning of flood control emb. Repair & maintenance of regulator & W.C.S. Re-excavation of drainage canal	Re-sectioning of flood control emb. Repair & maintenance of regulator & W.C.S. Re-excavation of drainage canal	Earth work	Re-sectioning of emb., repair & maintenance of regulator & WCS, ex-excavation of drainage canal	Re-sectioning of emb., repair & maintenance of regulator & WCS, ex-excavation of drainage canal	Earth work	NA
E-8		Period	Apr-Jul	Apr-Jul	Apr-Jul	Apr-Jul	Apr-Jul	Apr-Jul	NA
E-9		Cost in Lac Taka	?	?	?	16.00	4.91	15.00	NA
E-10	Rate of annual OM	%	?	?	?	0.19%	1.67%	7.00%	NA
E-11	Emergency maintenance / Repair	Period	Bamboo piling, tajrah, sand filling gunny bags, brush wood, rain cut &	Bamboo piling, Tajrah, sand filling gunny bags, brush wood, rain cut &	Bamboo piling, sand filling gunny bags, tarja & rain cut, ghogs repair	Bamboo piling, sand filling gunny bags, tarja & rain cut, ghogs repair	Bamboo piling, sand filling gunny bags, tarja & rain cut, ghogs repair	Bamboo piling, gunny bag filling nd Tarja	NA
E-12	Cost	Lac Taka	?	?	8.1	5.9	1.7	5.0	NA
E-13	Financing								
E-14	Major Rehabilitation repair conducted / required	Case-1	?	Flood damage	Flood damage	Flood damage	Flood damage?	6.75km earth work with cost 132 lac in 2000/01	Flood damage?
E-15		Case-2	?	?	?	?	?	?	
E-16		Case-3	?	?	?	?	?	?	
F	Actions at Flood Time								
F-1	Flood Warning	Received	Received	Received	Received	Received	Received	Received	
F-2	Operation manual for	None	None	None	None	None	None	None	
F-3	Actions at Flood Time	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	Emergency protection works where very necessary & request the public to go to the safe places	?
F-4	FFWS Requirement	Necessary	Necessary	Necessary	Necessary	Necessary	Necessary	Necessary	Necessary
F-5	Problems if no FFWS	Emergency protection measures may not be taken	Emergency protection measures may not be taken	Emergency protection measures may not be taken	Emergency protection measures may not be taken	Emergency protection measures may not be taken	Emergency protection measures may not be taken	Emergency protection measures may not be taken	?
F-6	Benefit attributable for FFWS	% of total damage	50%	80%	30%	50%	80%	50%	?
F-7	Comments by respondent	?	?	?	?	?	?	?	

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (33/42)

No.	Name of Division		Table-22A			
			Bagerhat O&M Division			
A	Name of Project		Coastal Embankment Project (polder 34/1)	Coastal Embankment Project (polder 34/2)	Coastal Embankment Project (polder 35/1)	Coastal Embankment Project (polder 35/3)
	Reported by		Rezaul Mustafa Ashrafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashrafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashrafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashrafuddola, Md. Abdul Quddus
B	Project Component		Flood Control & Drainage	Flood Control & Drainage	Flood Control & Drainage	Flood Control & Drainage
B-1	Location	Zone	South-Western Zone	South-Western Zone	South-Western Zone	South-Western Zone
B-2	Location	Upa-zilla / District	Bagerhat Sadar, Bagerhat	Bagerhat Sadar, Bagerhat	Saporkeola & Momelgonj, Bagerhat	Bagerhat Sadar & Rampal, Bagerhat
B-3	Objectives		To protect saline water intrusion, flood protection & drainage	To protect saline water intrusion, flood protection & drainage	To protect the project area from cyclone, saline water intrusion, flood protection and drainage	To protect the project area from cyclone, saline water intrusion, flood protection and drainage
B-4	Implementing agency					
B-5	Existing structure at implementation					
B-6	Beneficiaries	Number	16,000	33,500	200,000	47,000
B-7	Beneficiaries	Occupation	Farmer, Fisherman, small trader, etc.	Farmer, Fisherman, small trader, etc.	Farmer, Fisherman, small trader, etc.	Farmer, Fisherman, small trader, etc.
C	Project features					
C-1	Total Project area	ha	2,212	3,656	13,058	6,790
C-2	Irrigation area	ha	NA	NA	NA	NA
C-3	Flood affected area	ha	2,212	3,656	13,058	6,790
C-4	Drainage area	ha	1,660	2,742	9,790	5,097
C-5	Others	ha	NA	NA	NA	NA
D	Structural Details					
D-1	Embankment	Length km	10.46	16.56	62.72	40.35
D-2		Height	4.27 PWD	3.96 PWD	4.87m PWD	3.96m PWD
D-3		Crest width	4.3m	3.3m	4.3m	4.3m
D-4		Slope	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2
D-5		Free Board	?	?	?	0.9m
D-6		Design Flood	?	?	?	?
D-7	Sluice gate					
D-8	Others for embankment					
D-9	Drainage canal	Length				
D-10		Depth				
D-11		Bottom				
D-12		Structure-1	Flushing sluice, lift & flap gates, 1.5m*1.5m 8units	Flushing sluice, lift & flap gates, 1.5m*1.5m 11units	Flushing sluice, lift & flap gates, 1.5m*1.5m 70units	Flushing sluice, lift & flap gates, 1.5m*1.5m 17units
D-13	Structure-2					
D-14	Irrigation canal	Length				
D-15	Intake structure	Type				
D-16		Size/Capacity				
D-17	Intake gates	Size				
D-18		Number				
D-19	Bank Protection	Type		NA	Concrete block, brick block	Concrete block
D-20		Length				
D-21	Size of Concrete block			Variable	40*40*20, 30 & 35 cm cube	
D-22	Dredging	Length		NA	NA	NA
D-23		Depth				
D-24		Volume				
D-25	Notes, Problems and Further requirement, etc.	1.	Large number of Khals inside Polder	Large number of Khals inside Polder	Large number of Khals inside Polder	Large number of Khals inside Polder
D-26		2.				
D-27		3.				

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (34/42)

No.	Name of Division	Table-22A			
		Bagerhat O&M Division			
A	Name of Project	Coastal Embankment Project (polder 34/1)	Coastal Embankment Project (polder 34/2)	Coastal Embankment Project (polder 35/1)	Coastal Embankment Project (polder 35/2)
	Reported by	Rezaul Mustafa Ashafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashafuddola, Md. Abdul Quddus	Rezaul Mustafa Ashafuddola, Md. Abdul Quddus
E	Implementation & OM				
E-1	Const. Period	1966-1965 (3yr)	1978-1981 (4yr)	1965-1967 (4yr)	1981-1986 (6yr)
E-2	Construction stages	Completed	Completed	Completed	Completed
E-3	Const. Cost (lac Taka)	18.85	137.43	216.89	559.21
E-4	Financial source	USAID	Dutch Swedish EIP	USAID	Dutch Swedish EIP
E-5	Operation	Year to start	1969	1982	1970
E-6	Annual operation cost	Cost in Taka	4	4	10
E-7	Annual maintenance	Work items	Re-sectioning of emb., Re-emb. of khal, repair of gates	Re-sectioning of emb., Re-emb. of khal, repair of gates	Re-sectioning of emb., retire emb., breach closing, Re-emb. of khal, repair of gates & sluice
E-8		Period	Oct-May	Oct-May	Oct-May
E-9		Cost in Lac Taka	20.00	30.00	125.00
E-10	Rate of annual OM	%	105.00%	22.00%	57.00%
E-11	Emergency maintenance / Repair	Period	Breach closing, repair of gates, re-sectioning of emb.	Breach closing, repair of gates, re-sectioning of emb.	Re-emb., protection work, breach closing, repair and replacement of gate
E-12	Cost	Lac Taka	Variable	Variable	Variable
E-13	Financing				
E-14	Major Rehabilitation repair conducted / required	Case-1	NA	NA	Rehabilitation work for bank erosion, Permanent protection work of 3.11km, & retired emb. of 2.4km
E-15		Case-2			
E-16		Case-3			
F	Actions at Flood Time				
F-1	Flood Warning		Sometimes	Sometimes	Sometimes
F-2	Operation manual for		None	None	None
F-3	Actions at Flood Time		Alert all concerned officials-Alert the public on danger- tale necessary measures - co-ordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures	Alert all concerned officials-Alert the public on danger- tale necessary measures - co-ordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures	Alert all concerned officials-Alert the public on danger- tale necessary measures - co-ordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures
F-4	FFWS Requirement		Necessary	Necessary	Necessary
F-5	Problems if no FFWS		Damage may occur on human lives, domestic animals, movable properties and BWDB structures	Damage may occur on human lives, domestic animals, movable properties and BWDB structures	Damage may occur on human lives, domestic animals, movable properties and BWDB structures
F-6	Benefit attributable for FFWS	% of total damage	30%	30%	30%
F-7	Comments by respondent				

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (35/42)

No.	Name of Division		Table-22B				
			Bagerhat O&M Division				
A	Name of Project		Coastal Embankment Project (polder 36A)	JO-Khali Sub-Project	Gabkhali Sub-Project	Protection of Saline Water Intrusion to Nazirpur & Adjacent area	Daibogoyhat Sub-Project
	Reported by		Rezaul Mustafa Ashrafuddin, Md. Abdul Qudus	Rezaul Mustafa Ashrafuddin, Md. Abdul Qudus	Rezaul Mustafa Ashrafuddin, Md. Abdul Qudus	Rezaul Mustafa Ashrafuddin, Md. Abdul Qudus	Rezaul Mustafa Ashrafuddin, Md. Abdul Qudus
B	Project Component		Flood Control & Drainage	Flood Control, Irrigation and Drainage	Flood Control, Irrigation and Drainage	Flood Control, Irrigation and Drainage	Flood Control, Irrigation and Drainage
B-1	Location	Zone	South-Western Zone	South-Western Zone	South-Western Zone	South-Western Zone	South-Western Zone
B-2	Location	Upa-zilla / District	Bagerhat Sadar, Fakirhat, Mollahat & Chitalmani, Bagerhat & Rupsa, Khulna	Bagerhat Sadar, Fakirhat, & Rampal, Bagerhat	Fakirhat, Bagerhat	Nazirpur, Pettipur & Bagerhat Sadar, Kachua & Chitalmani, Bagerhat	Monelgonj, Bagerhat
B-3	Objectives		To protect saline water intrusion, flood protection & drainage	To protect saline water intrusion, flood protection, drainage & irrigation	To protect saline water intrusion, flood protection, drainage & irrigation	To protect saline water intrusion, flood protection, drainage & irrigation	To protect saline water intrusion, flood protection, drainage & irrigation
B-4	Implementing agency						
B-5	Existing structure at implementation						
B-6	Beneficiaries	Number	300,000	96,000	47,500	195,000	42,000
B-7	Beneficiaries	Occupation	Farmer, Fisherman, small traders, etc.	Farmer, Fisherman, small traders, etc.	Farmer, Fisherman, small traders, etc.	Farmer, Fisherman, small traders, etc.	Farmer, Fisherman, small traders, etc.
C	Project features						
C-1	Total Project area	ha	40,343	14,430	5,100	25,950	9,362
C-2	Irrigation area	ha	NA	NA	1,000	5,000	2,500
C-3	Flood affected area	ha	40,343	14,430	5,100	20,564	9,362
C-4	Drainage area	ha	28,290	8,720	3,850	8,000	7,490
C-5	Others	ha	NA	NA	NA	NA	NA
D	Structural Details						
D-1	Embankment	Length km	95.00	57.00	18.00	14.52	15.00
D-2		Height	4.28-4.88m PWD	4.58-4.48m PWD	4.28m PWD	4.0m PWD	4.3m PWD
D-3		Crest width	4.3m	3.0m	4.27m	4.3m	4.3m
D-4		Slope	1:3 / 1:2	1:3 / 1:2	1:3 / 1:2	1:2 / 1:2	1:3 / 1:2
D-5		Free Board	0.9m	?	?	0.9m	?
D-6		Design Flood	?	?	?	?	?
D-7	Sluice gate						
D-8	Others for embankment						
D-9	Drainage canal	Length					
D-10		Depth					
D-11		Bottom					
D-12		Structure-1	Flushing sluice, lift & flap gates, 1.8m*1.5m 100units	Flushing sluice, lift & flap gates, 1.8m*1.5m 25units	Flushing sluice, lift & flap gates, 1.8m*1.5m 10units	Flushing sluice, lift & flap gates, 1.8m*1.5m 57units	Flushing sluice, lift & flap gates, 1.8m*1.5m 29units
D-13	Structure-2						
D-14	Irrigation canal	Length					
D-15	Intake structure	Type					
D-16	Intake gates	Size/Capacity					
D-17		Size					
D-18		Number					
D-19	Bank Protection	Type	Concrete block	NA		Temporary protection work	
D-20	Size of Concrete block	Length					
D-21			40*40*20cm	NA			
D-22	Dredging	Length	NA	NA		NA	
D-23		Depth					
D-24		Volume					
D-25	Notes, Problems and Further requirement, etc.	1.	Large number of Khals inside Polder	Large number of Khals inside Polder	Large number of Khals inside Polder	Large number of Khals inside Polder	
D-26		2.					
D-27		3.					

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (36/42)

No.	Name of Division	Table-22B				
		Bagerhat O&M Division				
A	Name of Project	Coastal Embankment Project (polder 36/T)	JO-Khali Sub-Project	Gabkhali Sub-Project	Protection of Saline Water Intrusion to Nazirpur & Adjacent area	Daibagoyhati Sub-Project
	Reported by	Rezaul Mostafa Ashafuddula, Md. Abdul Qudus	Rezaul Mostafa Ashafuddula, Md. Abdul Qudus	Rezaul Mostafa Ashafuddula, Md. Abdul Qudus	Rezaul Mostafa Ashafuddula, Md. Abdul Qudus	Rezaul Mostafa Ashafuddula, Md. Abdul Qudus
E	Implementation & OM					
E-1	Coast. Period	1967-1972 (6yr)	1993-1995 (3yr)	1989-1994 (6yr)	1994/95-2004 (10yr)	1998-
E-2	Construction stages	Completed	Completed	Completed	on-going	on-going
E-3	Const. Cost(Lac Taka)	291.32	792.96	159.36	1,975.75	1,192.65
E-4	Financial source	USAID	IDA	IDA	GOB	GOB
E-5	Operation	Year to start	1975	1996	1995	NA
E-6	Annual operation cost	Cost in Taka	20	10	40	
E-7	Annual maintenance	Work items	Re-sectioning of emb., retire emb., breach closing, Re-emb. of khal, repair of gates & sluice	Re-sectioning of emb., re-emb. of Khal, repair & replacement of gates, repair sluice etc. retire emb., breach closing, Re-emb. of khal, repair of gates & sluice	Repair of sluice gate, re-emb. of Khal, re-sectioning of emb. etc.	
E-8		Period	Oct-May	Oct-May	Oct-May	
E-9		Cost in Lac Taka	110.00	60.00	35.00	
E-10	Rate of annual OM	%	38.00%	7.50%	22.00%	
E-11	Emergency maintenance / Repair	Period	Protection works, breach closing, re-sectioning of emb., repair of gates, etc.	Breach closing, repair & replacement of gates, re-sectioning of emb., re-embankment of Khal	Repair of gate, breach closing, re-sectioning of emb., re-embankment of Khal, etc.	
E-12	Cost	Lac Taka	Variable	Variable	Variable	
E-13	Financing					
E-14	Major Rehabilitation repair conducted / required	Case-1	Bank protection work of 0.648km with cost of 650 lac in 1999/00/01	NA	NA	
E-15		Case-2				
E-16		Case-3				
F	Actions at Flood Time					
F-1	Flood Warning		Sometimes	Sometimes	Sometimes	Sometimes
F-2	Operation manual for		None	None	None	None
F-3	Actions at Flood Time		Alert all concerned officials. Alert the public on danger- take necessary measures - coordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures	Alert all concerned officials. Alert the public on danger- take necessary measures - coordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures	Alert all concerned officials. Alert the public on danger- take necessary measures - coordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures	Alert all concerned officials. Alert the public on danger- take necessary measures - coordinate with the adm. And other department - preparation for damage assessment - reporting & emergency protection measures
F-4	FFWS Requirement		Necessary	Necessary	Necessary	Necessary
F-5	Problems if no FFWS		Damage may occur on human lives, domestic animals, movable properties and BWDB structures	Damage may occur on human lives, domestic animals, movable properties and BWDB structures	Damage may occur on human lives, domestic animals, movable properties and BWDB structures	Damage may occur on human lives, domestic animals, movable properties and BWDB structures
F-6	Benefit attributable for FFWS	% of total damage	30%	30%	30%	30%
F-7	Comments by respondent					

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (37/42)

No.	Name of Division	Table-23A						
		Barguna O&M Division						
A	Name of Project	Coastal Embankment Project (1st phase Folder No. 30-1A)	Coastal Embankment Project (1st phase Folder No. 39-2A)	Coastal Embankment Project (1st phase Folder No. 39-1D)	Coastal Embankment Project (1st phase Folder No. 40-1)	Coastal Embankment Project (1st phase Folder No. 40-2)	Coastal Embankment Project (1st phase Folder No. 41-4)	
	Reported by	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Abdul Malek Mia, SD	
B	Project Component	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	
B-1	Location	Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone	
B-2	Location	Upa-zilla / District	Patharghata, Barguna	Barua, Barguna Bishkhali river / Halsa river / Khaspata Khal	Barua and Patharghat, Barguna: Bishkhali river / Kholpata Khal / Halsa river / Kakchira Khal	Barua and Patharghat, Barguna: Bishkhali river / Kholpata Khal / Halsa river / Kakchira Khal	Barua and Patharghat, Barguna: Bishkhali river / Kholpata Khal / Halsa river / Kakchira Khal	Barguna / Barguna, Bishkhali river, Nalirdor, Dalbianga Khal
B-3	Objectives		Flood control, drainage, irrigation & protection of cultivable land from salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	
B-4	Implementing agency							
B-5	Existing structure at implementation							
B-6	Beneficiaries	Number	90,846	52,313	15,630	33,820	32,376	
B-7	Beneficiaries	Occupation	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture	
C	Project features							
C-1	Total Project area	ha	11,740	5,080	5,000	2,105	4,453	
C-2	Irrigation area	ha	8,300	1,000	1,380	700	1,500	
C-3	Flood affected area	ha	11,550	4,800	5,000	2,105	4,453	
C-4	Drainage area	ha	3,000	3,100	1,000	1,500	3,300	
C-5	Others	ha	NA	NA	NA	NA	NA	
D	Structural Details							
D-1	Embankment	Length km	58.00	32.00	23.55km	23.45km	35.53km	
D-2		Height	3.58-2.97	2.8m	2.9-3.38m	3.58-2.97m	3.58-2.97	
D-3		Crest width	4.27-2.44	3.6-2.44m	4.27-2.44m	4.27-2.44m	4.27-2.44	
D-4		Slope	1:7-1:2 / 1:2-1:2	1:3-1:2 / 1:2-1:2	1:7-1:3-1:2 / 1:2-1:2-1:2	1:7-1:2 / 1:2-1:2	1:7-1:2 / 1:2-1:2	
D-5		Free Board	1.0m	1.0m	1.0m	1.0m	1.0m	
D-6		Design Flood	3.57 yr ?	3.57 yr ?	3.57 yr ?	3.57 yr ?	5.51 yr?	
D-7	Sluice gate							
D-8	Others for embankment							
D-9	Drainage canal	Length	204km	99km	60	35	40	
D-10		Depth	2.2m	2.5m	2.5m	2.2m	2.2m	
D-11		Bottom	3.05m	3.0m	3.0m	5.05m	3.05m	
D-12		Structure-1	Sluice: 9 nos of flap gate system, 24 units of gates 1.52*1.53m & 1.50*1.60m			Sluice: 4 nos of flap gate system with 8 unit of flap gates, size of 0.9m-3ru * 1.22m	Sluice: 10nos of flap gate system with 25 units of flap / lift gates, size 0.6-1.83*1.22-1.82m	
D-13	Structure-2	Flushing inlet: 41 units with size of 0.6m dia, Flap /vertical			Flush inlet: 24 units (0.9m*1.22m)	Flush inlet: 21 units (0.9m*1.22m)		
D-14	Irrigation canal	Length					60kru (Main)	
D-15	Intake structure	Type						
D-16		Size/Capacity						
D-17	Intake gates	Size						
D-18	Bank Protection	Number						
D-19		Type	Concrete block	Concrete block	Concrete block	Concrete block	Concrete block	
D-20		Length						
D-21	Size of Concrete block		40*40*20cm	40*40*20cm	40*40*20cm	40*40*20cm	40*40*20cm	
D-22	Dredging	Length						
D-23		Depth						
D-24		Volume						
D-25	Notes, Problems and Further requirement, etc.	1.						
D-26		2.						
D-27		3.						

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (38/42)

No.	Name of Division	Table-23A					
		Barguna O&M Division					
A	Name of Project	Coastal Embankment Project (1st phase Polder No. 39-1A)	Coastal Embankment Project (1st phase Polder No. 39-2A)	Coastal Embankment Project (1st phase Polder No. 39-1D)	Coastal Embankment Project (1st phase Polder No. 40-1)	Coastal Embankment Project (1st phase Polder No. 40-2)	Coastal Embankment Project (1st phase Polder No. 41-1)
	Reported by	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Shajahan, SD	Md. Abdul Malek Mia, SD
E	Implementation & OM						
E-1	Const. Period	1966-1991 (25yr)	1993-1999 (6yr)	1990-1994 (4yr)	1962-1966 (4yr)	1962-1966 (4yr)	1962-1967 (2yr)
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed	Completed
E-3	Const. Cost (lac Taka)	552.00	1,169.72	735.00	173.36	261.43	58.46
E-4	Financial source	USAID	USAID	USAID / IDA	USAID / IDA	USAID / IDA	USAID
E-5	Operation	Year to start	1992	2000	1995	1967	1967
E-6	Annual operation cost	Cost in Taka	135	60	60	60	70
E-7	Annual maintenance	Work items	Repair of structure re-sectioning emb., re-excavation of drainage Khal	Repair of structures, re-sectioning emb., re-excavation of drainage channel	Repair of structure. Re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel
E-8		Period		6 months	6 months	6 months	6 months
E-9		Cost in Lac Taka	138.00	60.00	60.00	60.00	70.00
E-10	Rate of annual OM	%	25.00%	5.00%	8.00%	35.00%	26.00%
E-11	Emergency maintenance / Repair	Period	Repair work temporary protection work	Repair of emb., protection work of bank erosion and structure repair	Repair of emb., protection work of bank erosion and structure repair	Repair of emb., protection work of bank erosion and structure repair	Repair of emb., protection work of bank erosion and structure repair
E-12	Cost	Lac Taka	50.0	50.0	40.0	10.0	15.0
E-13	Financing						
E-14	Major Rehabilitation repair conducted / required	Case-1	Need rehabilitation	Need rehabilitation	Need rehabilitation	Need rehabilitation	Need rehabilitation
E-15		Case-2					
E-16		Case-3					
F	Actions at Flood Time						
F-1	Flood Warning		Received	Received	Received	Received	Received
F-2	Operation manual for		None	None	None	None	None
F-3	Actions at Flood Time		All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works
F-4	FFWS Requirement		Necessary	Necessary	Necessary	Necessary	Necessary
F-5	Problems if no FFWS		No action taken rapidly, damages to important official document, much people in danger	No action taken rapidly, damages to important official document, much people in danger	No action taken rapidly, damages to important official document, much people in danger	No action taken rapidly, damages to important official document, much people in danger	No action taken rapidly, damages to important official document, much people in danger
F-6	Benefit attributable for FFWS	% of total damage	80%	50%	50%	50%	50%
F-7	Comments by respondent						

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (39/42)

No.	Name of Division		Table-23B					
			Barguna O&M Division					
A	Name of Project		Coastal Embankment Project (1st phase Polder No. 41-E)	Coastal Embankment Project (1st phase Polder No. 42)	Coastal Embankment Project (1st phase Polder No. 41-7A)	Coastal Embankment Project (1st phase Polder No. 41-7B)	Coastal Embankment Project (1st phase Polder Bibichini)	Coastal Embankment Project (2nd phase Polder No. 43-1)
	Reported by		Md. Abdul Malek, M.A. SD	Md. Abdul Malek, M.A. SD	Md. Abdul Malek, M.A. SD	Md. Abdul Malek, M.A. SD	Md. Abdul Malek, M.A. SD	Md. Abdul Malek, M.A. SD
B	Project Component		Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage
B-1	Location	Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone
B-2	Location	Upa-zilla / District	Barguna / Barguna, Buriswar river / Bay of Bengal, Dalbhangha, Khatibishali river, Mahadzor, Dalbhangaha	Barguna / Barguna, Nalidon, Bay of Bengal, Bishikali	Belagi / Barguna	Belagi / Barguna	Belagi / Barguna	Anstali / Barguna, Para river, Tiakhali, Dhankhali river, Nilgongj Barani
B-3	Objectives		Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity
B-4	Implementing agency							
B-5	Existing structure at implementation							
B-6	Beneficiaries	Number	?	?	?	?	?	?
B-7	Beneficiaries	Occupation	Agriculture	Agriculture	Farmer	Farmer	Farmer	Agriculture
C	Project features							
C-1	Total Project area	ha	3,880	2,750	6,220	5,510	2,700	16,275
C-2	Irrigation area	ha	1,200	850	2,000	1,375	750	15,000
C-3	Flood affected area	ha	3,880	2,750	6,220	5,200	2,700	16,000
C-4	Drainage area	ha	2,500	1,950	5,500	4,400	1,500	10,000
C-5	Others	ha	NA	NA	NA	NA	NA	NA
D	Structural Details							
D-1	Embankment	Length km	50.00	29.11	40.60	28.66	26.70	86.00
D-2		Height	5.18-4.57m	5.18m	4.3m	4.3m	4.3m	5.18-4.57
D-3		Crest width	4.27-2.44m	4.27m	3.6-2.44m	3.6-2.44m	3.6-2.44m	4.27-2.44m
D-4		Slope	1:7-1:2 / 1:2-1:2	1:3 / 1:2	1:3-1:2 / 1:2-1:2	1:3-1:2 / 1:2-1:2	1:3-1:2 / 1:2-1:2	1:5-1:3 / 1:2-1:2
D-5		Free Board	1.0m	1.0m	1.0m	1.0m	1.0m	1.0m
D-6		Design Flood	?	?	?	?	?	?
D-7	Sluice gate							
D-8	Others for embankment							
D-9	Drainage canal	Length	?	?	45km	10km	25km	?
D-10		Depth	2.3m	2.3m	2.2m	2.5m	2.5m	?
D-11		Bottom	4.0m	4.0m	3.0m	3.0m	3.0m	?
D-12		Structure-1						
D-13	Structure-2							
D-14	Irrigation canal	Length	90km (Main)	80km (main)				
D-15	Intake structure	Type						
D-16	Intake gates	Size/Capacity						
D-17		Size						
D-18	Bank Protection	Number						
D-19		Type			Concrete block			
D-20		Length						
D-21	Size of Concrete block			40*40*20cm				
D-22	Dredging	Length						
D-23		Depth						
D-24		Volume						
D-25	Notes, Problems and Further requirement, etc.		1.					
D-26			2.					
D-27			3.					

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (40/42)

No.	Name of Division	Table-23B						
		Barguna O&M Division						
A	Name of Project	Coastal Embankment Project (1st phase Polder No. 41-5)	Coastal Embankment Project (1st phase Polder No. 42)	Coastal Embankment Project (1st phase Polder No. 41-7A)	Coastal Embankment Project (1st phase Polder No. 41-7B)	Coastal Embankment Project (1st phase Polder Bibichan)	Coastal Embankment Project (2nd phase Polder No. 43-1)	
	Reported by	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	
E	Implementation & OM							
E-1	Const. Period		1961-1993 (32 yr)	1962-1966 (4yr)	1993-1999 (6yr)	1993-	1989-1993 (4yr)	1966-1992 (26yr)
E-2	Construction stages		Completed	Completed	Completed	On-going	Completed	Completed
E-3	Const. Cost(lac Taka)	Lac Taka	130.00	140.96	1,530.00	733.00	575.00	306.00
E-4	Financial source		USAID / IDA	USAID / IDA	?	?	?	USAID / IDA
E-5	Operation	Year to start	1994	1967	2000	2000	1994	?
E-6	Annual operation cost	Cost in Taka	50	35	60	30	30	50
E-7	Annual maintenance	Work items	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel
E-8		Period	6 months	6 months	6 months	6 months	6 months	6 months
E-9		Cost in Lac Taka	50.00	35.00	60	30.00	30.00	50.00
E-10	Rate of annual OM	%	35.00%	25.00%	?	?	?	20.00%
E-11	Emergency maintenance / Repair	Period	Repair of emb., hydraulic structure and gates	Repair of emb., hydraulic structure and gates	Repair of emb., hydraulic structure and gates	Repair of emb.	Repair of emb.	Repair work: repair of emb., hydraulic structure and gates
E-12	Cost	Lac Taka	?	?	?	?	?	?
E-13	Financing							
E-14	Major Rehabilitation repair conducted / required	Case-1	Need rehabilitation	Need rehabilitation	?	?	?	Need rehabilitation
E-15		Case-2						
E-16		Case-3						
F	Actions at Flood Time							
F-1	Flood Warning		Received	Received	Received	Received	Received	Received
F-2	Operation manual for		None	None	None	None	None	None
F-3	Actions at Flood Time		All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	All official document to be saved, flood warning message to be supplemented, watching the polder and structures, & emergency flood protection works	Announcement of flood & warning signal, keep women & children in cyclone shelter, preventive work of emb., closing gates and sluice	Announcement of flood & warning signal, keep women & children in cyclone shelter, preventive work of emb., operationalizing gates and sluice	Announcement of flood & warning signal, keep women & children in cyclone shelter, preventive work of emb., operationalizing gates and sluice	Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work
F-4	FFWS Requirement		Necessary	Necessary	?	?	?	Necessary
F-5	Problems if no FFWS		No action taken rapidly, damages to important official document, much people in danger	No action taken rapidly, damages to important official document, much people in danger	?	?	?	No emergency action can be taken, damages to official document, mass people in danger
F-6	Benefit attributable for FFWS	% of total damage	80%	80%	?	80%	80%	80%
F-7	Comments by respondent							

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (41/42)

No.	Name of Division	Table-23C					No of Div	29	
		Barguna O&M Division							
A	Name of Project	Coastal Embankment Project (2st phase Polder No.43-1A)	Coastal Embankment Project (2st phase Polder No.43-2F)	Coastal Embankment Project (2st phase Polder No.44)	Coastal Embankment Project (2st phase Polder No.45)	Coastal Embankment Project (2st phase Polder No.54-B)	No of Pjt	112	
	Reported by	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD			
B	Project Component	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage	Flood Control, Irrigation & Drainage			
B-1	Location	Zone	Southern Zone	Southern Zone	Southern Zone	Southern Zone			
B-2	Location	Upa-zilla / District	Amali / Barguna, Gulishakhali Dore, Chawra river, Sakhatem Dore	Amali / Barguna, Paia river, Chawra & Kukra rivers	Amali / Barguna, Arpagashia Khal, Andhamnik river, Bay of Bengal, Padishan river	Amali / Barguna, Burishar river, Bay of Bengal, Bogidon & Burishar/Amagesoni	Amali / Barguna, Nilgoj Barani, Pann river		
B-3	Objectives		Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity	Flood control, drainage, irrigation and protect salinity			
B-4	Implementing agency								
B-5	Existing structure at Implementation								
B-6	Beneficiaries	Number	?	?	136,654	35,650	?	Total 21,061,814	
B-7	Beneficiaries	Occupation	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture		
C	Project features								
C-1	Total Project area	ha	3,000	4,453	17,530	4,049	5,348	Total 2,379,789	
C-2	Irrigation area	ha	750	1,500	5,500	3,290	2,300	Total 414,223	
C-3	Flood affected area	ha	2,700	4,400	NA	NA	5,100	Total 1,719,847	
C-4	Drainage area	ha	2,250	3,300	12,500	1,250	5,000	Total 1,278,526	
C-5	Others	ha	NA	NA	NA	NA	NA	Total 40,717	
D	Structural Details								
D-1	Embankment	Length km	26.76	52.10	81.56	26.56	78.00	Total 3,563	
D-2		Height	4.57	4.3	5.15-4.57	5.15	4.57		
D-3		Crest width	4.27-2.44m	4.27-2.44m	4.27	4.27	4.27-2.44m		
D-4		Slope	1:3-1:2 / 1:2-1:2	1:3-1:2 / 1:2-1:2	1:7-1:2 / 1:2-1:3	1:7-1:2 / 1:3-1:2	1:3-1:2 / 1:2-1:2		
D-5		Free Board	1.0m	1.0m	1.0m	1.0m	1.0m		
D-6		Design Flood	?	?	?	4.18 yr?	?		
D-7	Sluice gate								
D-8	Others for embankment								
D-9	Drainage canal	Length	?	?	?	?	?		
D-10		Depth		2.3m	2.3m	2.3m	2.3m		
D-11		Bottom		3.0m	4.0m	4.0m	3.0m		
D-12		Structure-1							
D-15	Structure-2								
D-14	Irrigation canal	Length	33km (Main)		130km (Main)	102km (Main)	16km (Main)		
D-15	Intake structure	Type			?				
D-16	Intake gates	Size/Capacity							
D-17		Size							
D-18	Bank Protection	Number							
D-19		Type							
D-20	Size of Concrete block	Length							
D-21									
D-22	Dredging	Length							
D-23		Depth							
D-24		Volume							
D-25	Notes, Problems and Further requirement, etc.	1.							
D-26		2.							
D-27		3.							

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

Table-2. Brief Features of the Completed and On-going Projects (Based on the information responding to the Questionnaire Survey) (42/42)

No.	Name of Division	Table-23C					No of Div	29
		Barguna O&M Division						
A	Name of Project	Coastal Embankment Project (2st phase Folder No.43-1A)	Coastal Embankment Project (2st phase Folder No.43-2F)	Coastal Embankment Project (2st phase Folder No.44)	Coastal Embankment Project (2st phase Folder No.45)	Coastal Embankment Project (2st phase Folder No.4-B)	No of Pjt.	112
	Reported by	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD	Md. Abdul Malek Mia, SD		
E	Implementation & OM							
E-1	Const. Period	1960-1985 (25yr)	1989-1997 (8yr)	1962-1965 (6yr)	1962-1991 (29yr)	1960-1967 (7yr)		
E-2	Construction stages	Completed	Completed	Completed	Completed	Completed		
E-3	Const. Cost (lac Taka)	125.00	896.00	399.00	130.00	150.00	Total	333.980
E-4	Financial source	USAID	Dutch AID	USAID & IDA	USAID & IDA	USAID		
E-5	Operation	Year to start	?	?	1992?	1994	?	
E-6	Annual operation cost	Cost in Lac Taka	25	50	119	75	10	Avr. 69.3
E-7	Annual maintenance	Work items	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	Repair of structure, re-sectioning of emb., re-excavation of drainage channel	
E-8		Period	6 months	6 months	6 months	6 months	6 months	
E-9		Cost in Lac Taka	25.00	?	119.00	75.00	10.00	Avr. 52.93
E-10	Rate of annual OM	%	20.00%	10.00%	30.00%	57.00%	20.00%	Avr. 10.9%
E-11	Emergency maintenance / Repair	Period	Repair work: repair of emb., hydraulic structure and gates	Repair work: repair of emb., hydraulic structure and gates	Repair work: repair of emb., hydraulic structure and gates	Repair work: repair of emb., hydraulic structure and gates	Repair work: repair of emb., hydraulic structure and gates	
E-12	Cost	Lac Taka	?	?	?	?	?	Avr. 9.5
E-13	Financing							
E-14	Major Rehabilitation repair conducted / required	Case-1	Need rehabilitation	Need rehabilitation	Need rehabilitation	Need rehabilitation	Need rehabilitation	
E-15		Case-2						
E-16		Case-3						
F	Actions at Flood Time							
F-1	Flood Warning		Received	Received	Received	Received	Received	
F-2	Operation manual for		None	None	None	None	None	
F-3	Actions at Flood Time		Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work	Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work	Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work	Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work	Official document to be saved, saving water and food under ground, keep women and children in cyclone shelter, flood warning announcement, gates to be closed, employ labor for emergency work	
F-4	FFWS Requirement		Necessary	Necessary	Necessary	Necessary	Necessary	
F-5	Problems if no FFWS		No emergency action can be taken, damages to th official document, mass people in danger	No emergency action can be taken, damages to th official document, mass people in danger	No emergency action can be taken, damages to th official document, mass people in danger	No emergency action can be taken, damages to th official document, mass people in danger	No emergency action can be taken, damages to th official document, mass people in danger	
F-6	Benefit attributable for FFWS	% of total damage	80%	80%	80%	80%	80%	Avr. 34.37%
F-7	Comments by respondent							

Notes: NA- Not Available or Not Applicable ?- No answer to the Questionnaire

ANNEX-IV

DOCUMENTS RELATED TO INTERNATIONAL RIVER ISSUES

(1) Statute of the Indo-Bangladesh Joint Rivers Commission

Statute of the Indo-Bangladesh Joint Rivers Commission

Signed at Dacca, 24 November 1972

CHAPTER I

The Contracting Parties

Pursuant to the relations of friendship and cooperation that exist between India and Bangladesh,

DESIROUS of working together in harnessing the rivers common to both the countries for the benefit of the peoples of the two countries,

DESIROUS of specifying some questions relating to these matters,

HAVE AGREED AS FOLLOWS:

CHAPTER II

Article 1

There shall be established an Indo-Bangladesh Joint Rivers Commission, hereinafter referred to as the Commission.

Article 2

(i) The Commission shall be constituted by each participating Government appointing a chairman and three members; of these two shall be engineers. The chairman and the three members shall ordinarily hold office for a period of three years.

(ii) Each participating Government may also appoint such experts and advisers as it desires.

Article 3

The Chairmanship of the Commission shall be held annually in turn by Bangladesh and India.

Article 4

(i) The Commission shall have the following functions, in particular:

(a) to maintain liaison between the participating countries in order to ensure the most effective joint efforts in maximising the benefits from common river systems to both the countries,

(b) to formulate flood control works and to recommend implementation of joint projects,

(c) to formulate detailed proposals on advance flood warnings, flood forecasting and cyclone warnings,

(d) to study flood control and irrigation projects so that the water resources of the region can be utilized on an equitable basis for the mutual benefit of the peoples of the two countries, and

(e) to formulate proposals for carrying out coordinated research on problem of flood control affecting both the countries.

(ii) The Commission shall also perform such other functions as the two Governments may, by mutual agreement, direct it to do.

CHAPTER III

Supporting Staff and Secretariat Assistance

Article 5

Each Government will provide appropriate supporting staff and Secretariat assistance to its

representatives in the Commission to enable them to discharge their functions in an effective manner.

CHAPTER IV Sessions

Article 6

- (i) Subject to the provisions of this Statute, the Commission shall adopt its own rules of procedure.**
- (ii) Meetings may generally take place alternately in the two countries, subject to the convenience of the two Governments.**
- (iii) Special meetings of Working Groups or Ad-Hoc Expert Groups duly nominated by the respective Governments may be arranged, as required, by the mutual consultation of the Members.**

CHAPTER V Rules of Procedure

- (iv) The ordinary sessions of the Commission shall be held as often as necessary, generally four times a year. In addition special meetings may be convened any time at the request of either Government.**

Article 7

All meetings shall be closed meetings unless the Commission desires otherwise.

CHAPTER VI General Provisions

Article 8

The Commission shall submit confirmed minutes of all meetings to the two Governments. The Commission shall also submit its annual report by the 31st January, next year.

Article 9

Decisions of the Commission shall be unanimous. If any differences arise in the interpretation of this Statute, they shall be referred to the two Governments to be dealt with on a bilateral basis in a spirit of mutual respect and understanding.

(2) The 1972 Agreement on Flood Related Data Sharing between India and Bangladesh

Arrangements for transmission of water level and discharge and rainfall data to Bangladesh during the monsoon season (15th May to 15th October)

1972

A. CENTRES AND PARTICULARS OF DATA TO BE COMMUNICATED

Annexure to the Record of the discussion

Sl. No.	Name of Centre/River and Stations	Particulars of data to be communicated	Remarks
I.	Patna Centre		
i)	Ganga at Farakka	Actual & forecast levels and daily discharge.	To be communicated when either the actual or the forecast level is at or above the warning stage.
II.	Guwahati Centre		
i)	Brahmaputra at Pandu	Daily discharge	- do -
ii)	Brahmaputra at Goalpara	Actual and forecast levels	- do -
iii)	Brahmaputra at Dhubri	- do -	- do - (In addition the daily rainfall data of Goalpara, Dhubri and Tura are to be included in the message if rainfall exceeds 50 mm.)
iv)	Barak at Silchar	- do -	- do -
III.	Jalpaiguri Centre		
i)	Teesta at Domohoni	Actual and forecast levels and discharge	To be communicated when either the actual or the forecast level is at or above the warning stage. In addition the daily rainfall data of Coochbehar, Jalpaiguri and Siliguri are to be included in the message if rainfall exceeds 50 mm.
IV.	Tripura State		
i)	* Gumti at Amarpur	Actual levels	To be communicated when the level is at or above the warning stage. In addition the daily rainfall data of Agartala is to be included in the message if rainfall exceeds 50 mm.
ii)	Gumti at Sonamura	Actual levels	
iii)	Khowai at Khowai town	- do -	
iv)	* Manu at Kailashar	- do -	
v)	Juri at Dharamnagar	- do -	

* Till such time direct point-to-point exchange of data begins between India and Bangladesh (Reference - Item V below)

V. Direct Point-to-Point exchange of data

- i) Gumti at Amarpur Actual levels To be communicated when the level is at or above the warning stage
- ii) Manu at Kailashar - do -

B. FREQUENCY OF TRANSMISSION

- I. Levels of 2100 hrs., 2400 hrs., of the previous day and of 0300 hrs. and 0600 hrs., of the days of report to be transmitted at 0800 hrs.
- II. Levels of 0900 hrs., 1200 hrs., 1500 hrs. and 1800 hrs., of the day of report to be transmitted at 2000 hrs. This transmission will also contain discharge data and weather forecast received from IMD and rainfall data (when it exceeds 50 mm.).

JRC

- (3) The 1996 Proposal on Improvements of Arrangements of Flood Related Data Sharing Prepared by the Bangladesh Side

Proposed Improvements of Arrangements between India and Bangladesh on Flood Forecasting and Warning

14-16 Sept.
#96

1. The existing arrangements of data availability from stations in India does not permit to provide lead time of more than 24 - 30 hours for the central part of Bangladesh while it does not exceed even four hours for some areas near the border. Proposed arrangements are expected to provide substantial help in making reliable forecasts with additional lead time.

Expert-level
meeting
BGD. proposal

- i) Three hourly real time and daily forecast level need to be transmitted during monsoon irrespective of warning stage (May to October).
- ii) In order to increase the forecast lead time in Bangladesh, real time and forecast data from further upstream stations such as Farakka, Monghyr, Patna and Allahabad on the Ganges, Dhubri, Goalpara, Guwahati, Tejpur and Dibrugarh on the Brahmaputra, Silchar on the Barak and Tista Bazar, Gajoldoba, Domohani and Jalpaiguri on the Teesta may be included in the data transmission arrangement.
- iii) In case of flashy rivers, transmission of data should commence from 1st April as flash floods occur in these rivers from April.

Mr Alan Mia
Director
Surface Water
Hydrology
BWDB.

2. Following is the data checklist with schedule of data transmission needed for model development and operation.

- i) River cross-section data at intervals of one section per 10-50 km (as per need) up to Allahabad on the Ganges and Dibrugarh on the Brahmaputra, Silchar on the Barak and Tista Bazar on the Tista. The cross section data may be updated before monsoon each year.
- ii) Three hourly water levels and daily forecasts for the following river stations

Ganges at - Allahabad
- Patna
- Monghyr
- Farakka

Brahmaputra - Dibrugarh
- Tejpur
- Guwahati
- Goalpara
- Dhubri

Barak at - Silchar

Tista at - Tista Bazar
- Gajoldoba
- Domohoni
- Jalpaiguri

- iii) Daily discharge data :

- At Allahabad, Patna and Farakka on the Ganges;
- Of Kosi, Gandak and Ghagra at their outfall;
- At Pandu, Dibrugarh, Tejpur and Pancharatna over the Brahmaputra;
- Of Manas, Kopili, Jai Bhorelli, Dhansiri, Subansiri and Buri Dihang at their outfall;
- At Silchar on the Barak; and
- At Gajoldoba and Domohoni on the Tista.

JRC

iv) Daily rainfall :

Brahmaputra Basin	:	Dhubri, Goalpara, Tura, Guwahati, Tezpur, Dibrugarh.
Ganges Basin	:	Monghyr, Gorakpur, Champaran, Patna, Allahabad, Darbanga.
Teesta, Dharla and Dudhkumar	:	Jalpaiguri, Siliguri, Darjeeling, Kalimpong, Coochbehar.
Eastern Region	:	Karimganj, Amarpur, Agartala, Kailashar, Silchar, Khowai Town.

v) Medium and flashy rivers : The following medium and flashy rivers will be modelled. Hydrodynamic/rainfall-runoff model for water level, discharge and rainfall data will be required from a number of representative stations :

- Mohananda
- Dharla (Jaldhaka)
- Dudhkumar (Torsa)
- Nitai
- Bhogai
- Someswari
- Kangsha
- Manu
- Khowai
- Dhalai
- Gumti
- Muhuri

- (4) Treaty between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on Sharing of the Ganga/Ganges Waters at Farakka

**TREATY BETWEEN THE GOVERNMENT OF THE PEOPLE'S REPUBLIC
OF BANGLADESH AND THE GOVERNMENT OF THE REPUBLIC OF
INDIA ON SHARING OF THE GANGA/GANGES WATERS AT FARAKKA**

**THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
AND THE GOVERNMENT OF THE REPUBLIC OF INDIA,**

DETERMINED to promote and strengthen their relations of friendship and good neighbourliness,

INSPIRED by the common desire of promoting the well-being of their peoples,

BEING desirous of sharing by mutual agreement the waters of the international rivers flowing through the territories of the two countries and of making the optimum utilisation of the water resources of their region in the fields of flood management, irrigation, river basin development and generation of hydro-power for the mutual benefit of the peoples of the two countries,

RECOGNISING that the need for making an arrangement for sharing of the Ganga/Ganges waters at Farakka in a spirit of mutual accommodation and the need for a solution to the long-term problem of augmenting the flows of the Ganga/Ganges are in the mutual interests of the peoples of the two countries,

BEING desirous of finding a fair and just solution without affecting the rights and entitlements of either country other than those covered by this Treaty, or establishing any general principles of law or precedent,

HAVE AGREED AS FOLLOWS:

ARTICLE - I

The quantum of waters agreed to be released by India to Bangladesh will be at Farakka.

ARTICLE - II

i) The sharing between India and Bangladesh of the Ganga/Ganges waters at Farakka by ten day periods from the 1st January to the 31st May every year will be with reference to the formula at Annexure I and an indicative schedule giving the implications of the sharing arrangement under Annexure I is at Annexure II.

ii) The indicative schedule at Annexure II, as referred to in sub para (i) above, is based on 40 years (1949-1988) 10-day period average availability of water at Farakka. Every effort would be made by the upper riparian to protect flows of water at Farakka as in the 40-years average availability as mentioned above.

iii) In the event flow at Farakka falls below 50,000 cusecs in any 10-day period, the two Governments will enter into immediate consultations to make adjustments on an emergency basis, in accordance with the principles of equity, fair play and no harm to either party.

ARTICLE - III

The waters released to Bangladesh at Farakka under Article I shall not be reduced below Farakka except for reasonable uses of waters, not exceeding 200 cusecs, by India between Farakka and the point on the Ganga/Ganges where both its banks are in Bangladesh.

ARTICLE - IV

A Committee consisting of representatives nominated by the two Governments in equal numbers (hereinafter called the Joint Committee) shall be constituted following the signing of this Treaty. The Joint Committee shall set up suitable teams at Farakka and Hardinge Bridge to observe and record at Farakka the daily flows below Farakka Barrage, in the Feeder Canal, and at the Navigation Lock, as well as at the Hardinge Bridge.

ARTICLE - V

The Joint Committee shall decide its own procedure and method of functioning.

ARTICLE - VI

The Joint Committee shall submit to the two Governments all data collected by it and shall also submit a yearly report to both the Governments. Following submission of the reports the two Governments will meet at appropriate levels to decide upon such further actions as may be needed.

ARTICLE - VII

The Joint Committee shall be responsible for implementing the arrangements contained in this Treaty and examining any difficulty arising out of the implementation of the above arrangements and of the operation of Farakka Barrage. Any difference or dispute arising in this regard, if not resolved by the Joint Committee, shall be referred to the Indo-Bangladesh Joint Rivers Commission. If the difference or dispute still remains unresolved, it shall be referred to the two Governments which shall meet urgently at the appropriate level to resolve it by mutual discussion.

ARTICLE - VIII

The two Governments recognise the need to cooperate with each other in finding a solution to the long-term problem of augmenting the flows of the Ganga/Ganges during the dry season.

ARTICLE - IX

Guided by the principles of equity, fairness and no harm to either party, both the Governments agree to conclude water sharing Treaties/Agreements with regard to other common rivers.

ARTICLE - X

The sharing arrangement under this Treaty shall be reviewed by the two Governments at five years interval or earlier, as required by either party and needed adjustments, based on principles of equity, fairness, and no harm to either party made thereto, if necessary. It would be open to either party to seek the first review after two years to assess the impact and working of the sharing arrangement as contained in this Treaty.

ARTICLE - XI

For the period of this Treaty, in the absence of mutual agreement on adjustments following reviews as mentioned in Article X, India shall release downstream of Farakka Barrage, water at a rate not less than 90% (ninety percent) of Bangladesh's share according to the formula referred to in Article II, until such time as mutually agreed flows are decided upon.

ARTICLE - XII

This Treaty shall enter into force upon signature and shall remain in force for a period of thirty years and it shall be renewable on the basis of mutual consent.

IN WITNESS WHEREOF the undersigned, being duly authorised thereto by the respective Governments, have signed this Treaty.

**DONE at New Delhi on 12th December, 1996 in Hindi, Bangla and English languages.
In the event of any conflict between the texts, the English text shall prevail.**

Signed

**(SHEIKH HASINA)
PRIME MINISTER,
PEOPLE'S REPUBLIC OF
BANGLADESH.**

Signed

**(H.D.DEVE GOWDA)
PRIME MINISTER,
REPUBLIC OF INDIA.**

ANNEXURE - I

Availability at Farakka	Share of India	Share of Bangladesh
70,000 cusecs or less	50%	50%
70,000 cusecs -75,000 cusecs	Balance of flow	35,000 cusecs
75,000 cusecs or more	40,000 cusecs	Balance of flow

Subject to the condition that India and Bangladesh each shall receive guaranteed 35,000 cusecs of water in alternate three 10-day periods during the period March 11 to May 10.

ANNEXURE - II

Schedule

(Sharing of waters at Farakka between January 01 and May 31 every year.)

If actual availability corresponds to average flows of the period 1949 to 1988, the implication of the formula in Annex-I for the share of each side is:

	Period	Average of total flow 1949-88 (cusecs)	India's share (cusecs)	Bangladesh's share (cusecs)
January	01-10	1,07,516	40,000	67,516
	11-20	97,673	40,000	57,673
	21-31	90,154	40,000	50,154
February	01-10	86,323	40,000	46,323
	11-20	82,859	40,000	42,859
	21-28/29	79,106	40,000	39,106
March	01-10	74,419	39,419	35,000
	11-20	68,931	33,931	35,000 *
	21-31	64,688	35,000 *	29,688
April	01-10	63,180	28,180	35,000 *
	11-20	62,633	35,000 *	27,633
	21-30	60,992	25,992	35,000 *
May	01-10	67,351	35,000 *	32,351
	11-20	73,590	38,590	35,000
	21-31	81,854	40,000	41,854

(* Three ten day periods during which 35,000 cusecs shall be provided.)

- (5) Agreement between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on Sharing of the Ganges Waters at Farakka and on Augmenting Its Flows

**AGREEMENT BETWEEN THE GOVERNMENT OF THE
PEOPLE'S REPUBLIC OF BANGLADESH AND THE GOVERNMENT
OF THE REPUBLIC OF INDIA ON SHARING
OF THE GANGES WATERS AT
FARAKKA AND ON AUGMENTING
ITS FLOWS**

THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH AND THE GOVERNMENT OF THE REPUBLIC OF INDIA,

DETERMINED to promote and strengthen their relations of friendship and good neighbourliness,

INSPIRED by the common desire of promoting the well-being of their peoples,

BEING desirous of sharing by mutual agreement the waters of the international rivers flowing through the territories of the two countries and of making the optimum utilisation of the water resources of their region by joint efforts,

RECOGNISING that the need of making an interim arrangement for sharing of the Ganges waters at Farakka in a spirit of mutual accommodation and the need for a solution of the long-term problem of augmenting the flows of the Ganges are in the mutual interests of the peoples of the two countries,

BEING desirous of finding a fair solution of the question before them, without affecting the rights and entitlements of either country other than those covered by this Agreement, or establishing any general principles of law or precedent,

HAVE AGREED AS FOLLOWS:

A. Arrangements for sharing of the Waters of the Ganges at Farakka.

ARTICLE I

The quantum of waters agreed to be released by India to Bangladesh will be at Farakka.

ARTICLE II

- (i) The sharing between Bangladesh and India of the Ganges waters at Farakka from the 1st January to the 31st May every year will be with reference to the quantum shown in column 2 of the Schedule annexed hereto which is based on 75 percent availability calculated from the recorded flows of the Ganges at Farakka from 1948 to 1973.
- (ii) India shall release to Bangladesh waters by 10-day periods in quantum shown in column 4 of the Schedule:

Provided that if the actual availability at Farakka of the Ganges waters during a 10-day period is higher or lower than the quantum shown in column 2 of the Schedule it shall be shared in the proportion applicable to that period;

Provided further that if during a particular 10-day period, the Ganges flows at Farakka come down to such a level that the share of Bangladesh is lower than 80 percent of the value shown in column 4, the release of waters to Bangladesh during that 10-day period shall not fall below 80 percent of the value shown in column 4.

ARTICLE III

The waters released to Bangladesh at Farakka under Article I shall not be reduced below Farakka except for reasonable uses of waters, not exceeding 200 cusecs, by India between Farakka and the point on the Ganges where both its banks are in Bangladesh.

ARTICLE IV

A Committee consisting of the representatives nominated by the two Governments (*hereinafter called the Joint Committee*) shall be constituted. The Joint Committee shall set up suitable teams at Farakka and Hardinge Bridge to observe and record at Farakka the daily flows below Farakka Barrage and in the Feeder Canal, as well as at Hardinge Bridge.

ARTICLE V

The Joint Committee shall decide its own procedure and method of functioning.

ARTICLE VI

The Joint Committee shall submit to the two Governments all data collected by it and shall also submit a yearly report to both the Governments.

ARTICLE VII

The Joint Committee shall be responsible for implementing the arrangements contained in this part of the Agreement and examining any difficulty arising out of the implementation of the above arrangements and of the operation of Farakka Barrage. Any difference or dispute arising in this regard, if not resolved by the Joint Committee, shall be referred to a panel of an equal number of Bangladeshi and Indian experts nominated by the two Governments. If the difference or dispute still remains unresolved, it shall be referred to the two Governments which shall meet urgently at the appropriate level to resolve it by mutual discussion and failing that by such other arrangement as they may mutually agree upon.

B. Long-Term Arrangements

ARTICLE VIII

The two Governments recognise the need to cooperate with each other in finding a solution to the long-term problem of augmenting the flows of the Ganges during the dry season.

ARTICLE IX

The Indo-Bangladesh Joint Rivers Commission established by the two Governments in 1972

shall carry out investigation and study of schemes relating to the augmentation of the dry season flows of the Ganges, proposed or to be proposed by either Government with a view to finding a solution which is economical and feasible. It shall submit its recommendations to the two Governments within a period of three years.

ARTICLE X

The two Governments shall consider and agree upon a scheme or schemes, taking into account the recommendations of the Joint Rivers Commission, and take necessary measures to implement it or them as speedily as possible.

ARTICLE XI

Any difficulty, difference or dispute arising from or with regard to this part of the Agreement, if not resolved by the Joint Rivers Commission, shall be referred to the two Governments which shall meet urgently at the appropriate level to resolve it by mutual discussion.

C. Review and Duration

ARTICLE XII

The provisions of this Agreement will be implemented by both parties in good faith. During the period for which the Agreement continues to be in force in accordance with Article XV of the Agreement, the quantum of waters agreed to be released to Bangladesh at Farakka in accordance with this Agreement shall not be reduced.

ARTICLE XIII

The Agreement will be reviewed by the two Governments at the expiry of three years from the date of coming into force of this Agreement. Further reviews shall take place six months before the expiry of this Agreement or as may be agreed upon between the two Governments.

ARTICLE XIV

The review or reviews referred to in Article XIII shall entail consideration of the working, impact, implementation and progress of the arrangements contained in parts A and B of this Agreement.

ARTICLE XV

This Agreement shall enter into force upon signature and shall remain in force for a period of 5 years from the date of its coming into force. It may be extended further for a specified period by mutual agreement in the light of the review or reviews referred to in Article XIII.

IN WITNESS WHEREOF the undersigned, being duly authorised thereto by the respective Governments, have signed this Agreement.

Done in duplicate at Dacca on the 5th November, 1977 in the Bengali, Hindi and English languages. In the event of any conflict between the texts, the English text shall prevail.

Sd/-

REAR ADMIRAL MUSHARRAF HUSAIN KHAN,
*Chief of Naval Staff and
Member, President's Council of Advisers
in-charge of the Ministry of Communications,
Flood Control, Water Resources and Power,
Government of the People's Republic of
Bangladesh.*
FOR THE GOVERNMENT OF THE PEOPLE'S
REPUBLIC OF BANGLADESH.

Sd/-

SURJIT SINGH BARNALA
*Minister for Agriculture and
Irrigation, Government of the
Republic of India.*
FOR THE GOVERNMENT OF
THE REPUBLIC OF INDIA.

SCHEDULE

[Vide Article II (i)]

Sharing of waters at Farakka between the 1st January and the 31st May every year

Period	Flows reaching Farakka (based on 75% availability from observed data (1948-73))	Withdrawal by India at Farakka	Release to Bangladesh
1	2	3	4
	Cusecs	Cusecs	Cusecs
January	1—10	98,500	40,000
	11—20	89,750	38,500
	21—31	82,500	35,000
February	1—10	79,250	33,000
	11—20	74,000	31,500
	21—28/29	70,000	30,750
March	1—10	65,250	26,750
	11—20	63,500	25,500
	21—31	61,000	25,000
April	1—10	59,000	24,000
	11—20	55,500	20,750
	21—30	55,000	20,500
May	1—10	56,500	21,500
	11—20	59,250	24,000
	21—31	65,500	26,750

(6) Indo-Bangladesh Memorandum of Understanding
on the Ganges Water Sharing

INDO-BANGLADESH MEMORANDUM OF UNDERSTANDING

NEW DELHI, October 7, 1982.

During the visit of His Excellency Lieutenant General H. M. Ershad, ndc. psc, President of the Council of Ministers, Government of the People's Republic of Bangladesh and his meetings with Her Excellency Mrs. Indira Gandhi, Prime Minister of the Republic of India, the two Leaders discussed the actual experience by the two sides of the working of the 1977 Farakka Agreement, which would be coming to its end on the 4th November, 1982. They agreed that it had not proved suitable for finding a satisfactory and durable solution and that with its termination fresh efforts were necessary to arrive at such a solution.

The two Leaders recognised that the basic problem of inadequate flow of waters in the Ganga/Ganges available at Farakka imposed sacrifices on both countries and that it was necessary to arrive at an equitable sharing of the waters available at Farakka. They further agreed that the long term solution lay in augmenting the flow available at Farakka and to this end directed their experts concerned to expedite studies of the economic and technical feasibility of the schemes which had been proposed by either side in order to settle upon the optimum solution for urgent implementation. It was decided that the Joint Rivers Commission would complete the pre-feasibility study and decide upon the optimum solution within 18 months of the signing of this Memorandum, at the end of which the two Governments would immediately implement the augmentation proposal agreed upon by the Joint Rivers Commission. Meanwhile, the two Leaders agreed that the releases for sharing the flow available at Farakka for the next two dry seasons, and the joint inspection and monitoring arrangements for this purpose would be as in Annexure 'A'. It was further agreed that in the case of exceptionally low flows during either of the next two dry seasons, the two Governments would hold immediate consultations and decide how to minimise the burden to either country.

It was also agreed that a further and final sharing agreement would be reached immediately after the completion of the pre-feasibility study of augmentation; in the light of the decision on the optimum solution for augmentation that would be implemented following the pre-feasibility study.

Signed at New Delhi on the Seventh day of October, Nineteen hundred and eighty-two in two originals, in English, each of which is equally authentic.

For and on behalf
of the Government of
the Republic of India.

Sd/-

P. V. NARASIMHA RAO
Minister of External Affairs.

For and on behalf of the
Government of the People's
Republic of Bangladesh.

Sd/-

A. R. SHAMS-UD DOHA
Minister for Foreign Affairs.

ANNEXURE A

Sharing of waters at Farakka between the 1st January and the 31st May.

Period	Flows reaching Farakka (based on 75% availability from observed data (1948-73))	Withdrawal by India at Farakka.	Release to Bangladesh.
	cusecs	cusecs	cusecs
January	1—10	40,000	58,500
	11—20	38,000	51,750
	21—31	35,500	47,000
February	1—10	33,000	46,250
	11—20	31,250	42,750
	21—28/29	31,000	39,000
March	1—10	26,500	38,750
	11—20	25,500	38,000
	21—31	25,250	35,750
April	1—10	24,000	35,000
	11—20	20,750	34,750
	21—30	20,500	34,500
May	1—10	21,500	35,000
	11—20	24,250	35,000
	21—31	26,500	39,000

1. If the actual availability of waters at Farakka during a 10-day period is higher or lower than the quantum shown in column 2 of the schedule it shall be shared in the proportion applicable to that period.
2. The Joint Inspection and Monitoring of the above sharing arrangement shall be the responsibility of a Joint Committee consisting of an equal number of representatives of each side. The Joint Committee shall be constituted immediately and shall establish teams to be stationed at Farakka and Hardinge Bridge. These teams shall record at Farakka the daily flows below Farakka Barrage and in the feeder canal and the flows passing daily at Hardinge Bridge. The Joint Committee which shall decide its own procedures and method of functioning shall submit the data collected by it and its teams and a yearly report to both Governments.
3. The Joint Committee shall be responsible for implementing the sharing arrangement. Any difficulty arising out of the implementation of the above sharing arrangements and of the operation of the Farakka Barrage shall be examined urgently by this Joint Committee and any differences or disputes, if not resolved by the Committee, shall be considered by a Panel of an equal number of representatives of the two Governments to whom the Joint Committee shall refer the difference or dispute. If the difference or dispute remains unresolved by the Panel, it shall be referred to the two Governments for urgent discussion.

AGREEMENT ON SHARING OF EXCEPTIONALLY LOW FLOWS AT FARAKKA FOR 1983—1984.

As per Indo-Bangladesh Memorandum of Understanding of 7th October, 1982, it was agreed that in case of exceptionally low flows during either of the subsequent two dry seasons the two Governments would hold immediate consultations and decide how to minimise the burden of either country.

Since such exceptionally low flows were anticipated in the dry season of 1982-83, the Secretary, Ministry of Irrigation, Government of India and Secretary In-charge, Ministry of Irrigation, Water Development and Flood Control, Government of Bangladesh discussed this question during January and February 1983. These discussions were continued during July, 1983 also.

In case of exceptionally low flows at Farakka during 1983-84 it is now being agreed that :-

- (i) If the flow at Farakka is upto and above 75% of the standard flow for the corresponding ten-day period, the releases to Bangladesh would be pro-rata releases agreed to in the Memorandum of Understanding; (The flow reaching Farakka for the various 10-day periods which are incorporated in the Memorandum of Understanding of 7th October, 1982 will be termed as standard flow for the corresponding period);
- (ii) If the flow at Farakka is below 75% of the standard flow for the corresponding ten-day period, releases for Bangladesh would be calculated as below:-
 - (a) Calculate the pro-rata release for Bangladesh at 75% of the standard flow.
 - (b) Calculate pro-rata release for Bangladesh at the actual flow.
 - (c) '(a)' minus '(b)' would be termed as the burden.
 - (d) The burden would be shared by India and Bangladesh on 50 : 50 basis i. e. 50% of (c) would be added to (b).

Signed in two originals at Dhaka on 20th July, 1983.

Sd/-
(SYED SHAMIM AHSAN)
*Additional Secretary In-charge
Ministry of Water Development and
Flood Control,
Government of Bangladesh.*

Sd/-
(M. G PADHYE)
*Secretary,
Ministry of Irrigation,
Government of India.*

INDO-BANGLADESH MEMORANDUM OF UNDERSTANDING

NEW DELHI, AGRAHAYANA 1, 1907
NOVEMBER 22, 1985

In pursuance of the understanding reached between H. E. Lt. General H. M. Ershad, President of the People's Republic of Bangladesh and H. E. Shri Rajiv Gandhi, Prime Minister of the Republic of India during their recent meeting at Nassau, the Bahamas, the Irrigation Ministers of the two countries met at New Delhi from November 18 to 22, 1985 to set out the Terms of Reference of a joint study to be undertaken by experts of the two sides of the available river water resources common to both countries, with a view to identifying alternatives for the sharing of the same to the mutual benefit, including a long term scheme/schemes for augmentation of the flows of the Ganga/Ganges at Farakka and to sign a Memorandum of Understanding for the sharing of the Ganga/Ganges waters at Farakka for a period of three years commencing from the dry season of 1986 on the same terms as the 1982 Memorandum of Understanding.

2. It has already been recognised that the basic problem of inadequate flows of water in the Ganga/Ganges available at Farakka during the dry season imposes sacrifices on both countries, and that the long-term solution lies in augmenting these flows. At the same time, the need to arrive at an equitable sharing of the water available at Farakka has also been recognised.

3. Accordingly it is agreed to undertake a joint study with the following terms of reference:

- (i) The objective of the study will be (a) to work out a long-term scheme or schemes for the augmentation of the flows of the Ganga/Ganges at Farakka and (b) to identify alternatives for the sharing of the available river water resources common to both countries for mutual benefit.
- (ii) The study will be undertaken by a Joint Committee of Experts (JCE). The JCE will consist of the Secretaries concerned of the two Governments and the two Engineering Members of the Joint Rivers Commission from each side. The JCE will determine its own procedures and will take such other steps as may be necessary to ensure its completion within the time-frame of 12 months.
- (iii) The study will cover the following:

(A) Sharing the available river water resources common to India and Bangladesh.

- (a) Ascertaining the available river water resources common to both countries based on the collection, collation and analysis of available relevant hydro-meteorological data in both countries.
- (b) Study of alternatives for sharing the available river water resources to mutual benefit.
- (c) Identification of the locations of the points of sharing of the rivers, periods of sharing and schedule of sharing, where appropriate.

(B) Augmentation of the dry season flows of the Ganga/Ganges at Farakka.

Identification of scheme/schemes for the augmentation of the flows of the Ganga/Ganges at Farakka by the optimal utilization of the surface water resources of the region available to the two countries.

4. The study will start immediately and will be completed in 12 months from the date of the present Memorandum. There will be a review of the progress of the joint study at the Ministerial level at the end of six months from the date of the present Memorandum of Understanding. At the end of the 12-month period, a Summit Level meeting between the Leaders of the two countries will take place to take a decision on the scheme of augmentation of the flows of the Ganga/Ganges at Farakka and the long-term sharing of the rivers.

5. It is also agreed that on an interim basis, the releases of the Ganga/Ganges waters available at Farakka for the next three dry seasons and the joint inspection and monitoring arrangements for this purpose will be as in Annexure 'A'. It is further agreed that in the case of exceptionally low flows during any of the next three dry seasons, the two Governments will hold immediate consultations and decide how to minimise the burden to either country.

6. Signed at New Delhi on the twenty-second day of November, Nineteen hundred and eighty-five, in two originals in English, each of which is equally authentic.

For and on behalf of the
Government of the Republic
of India.

For and on behalf of the
Government of the People's
Republic of Bangladesh.

Sd/-
(B. SHANKARANAND)
Minister of Water Resources

Sd/-
(ANISUL ISLAM MAHMUD)
*Minister For Irrigation, Water
Development & Flood Control*

ANNEXURE — A

SCHEDULE

Period		Flows reaching Farakka (based on 75% availability from observed data (1948-73))	Withdrawal by India at Farakka	Releases to Bangladesh
(1)		(2)	(3)	(4)
	Cusecs	Cusecs	Cusecs	
January	1—10	98,500	40,000	58,500
	11—20	89,750	38,000	51,750
	21—31	82,500	35,500	47,000
February	1—10	79,250	33,000	46,250
	11—20	74,000	31,250	42,750
	21—28/29	70,000	31,000	39,000
March	1—10	65,250	26,500	38,750
	11—20	63,500	25,500	38,000
	21—31	61,000	25,250	35,750
April	1—10	59,000	24,000	35,000
	11—20	55,500	20,750	34,750
	21—30	55,000	20,500	34,500
May	1—10	56,500	21,500	35,000
	11—20	59,250	24,250	35,000
	21—31	65,500	26,500	39,000

1. If the actual availability of waters at Farakka during a 10-day period is higher or lower than the quantum shown in column 2 of the Schedule it shall be shared in the proportion applicable to that period.
2. The Joint Inspection and Monitoring of the above sharing arrangement shall be the responsibility of a Joint Committee consisting of an equal number of representatives of each side. The Joint Committee shall be constituted immediately and shall establish teams to be stationed at Farakka and Hardinge Bridge. These teams shall record at Farakka the daily flows below Farakka Barrage and in the feeder canal and the flows passing daily at Hardinge Bridge. The Joint Committee which shall decide its own procedures and method of functioning shall submit the data collected by it and its teams and a yearly report to both Governments.
3. The Joint Committee shall be responsible for implementing the sharing arrangements. Any difficulty arising out of the implementation of the above sharing arrangements and of the operation of the Farakka Barrage shall be examined urgently by this Joint Committee and any differences or disputes, if not resolved by the Committee shall be considered by a Panel of an equal number of representatives of the two Governments to whom the Joint Committee shall refer the difference or dispute. If the difference or dispute remains unresolved by the Panel, it shall be referred to the two Governments for urgent discussion.

**AGREEMENT ON SHARING OF EXCEPTIONALLY LOW FLOWS AT FARAKKA FOR
1986 — 88.**

As per Indo-Bangladesh Memorandum of Understanding of 22nd November, 1985, it was agreed that in case of exceptionally low flows during any of the next three dry seasons, the two Governments would hold immediate consultations and decide how to minimise the burden of either country.

In case of exceptionally low flows at Farakka during 1986 — 88, it is now being agreed that :-

- (i) If the flow at Farakka is upto and above 75% of the standard flow for the corresponding ten-day period, the releases to Bangladesh would be pro-rata releases agreed to in the Memorandum of Understanding; (The flow reaching Farakka for the various 10-day periods which are incorporated in the Memorandum of Understanding of 22nd November, 1985 will be termed as standard flow for the corresponding period).
- (ii) If the flow at Farakka is below 75% of the standard flow for the corresponding ten-day period, releases for Bangladesh would be calculated as below: -
 - (a) Calculate the pro-rata release for Bangladesh at 75% of the standard flow.
 - (b) Calculate pro-rata release for Bangladesh at the actual flow.
 - (c) '(a)' minus '(b)' would be termed as the burden.
 - (d) The burden would be shared by India and Bangladesh on 50 : 50 basis i. e. 50% of (c) would be added to (b).

Signed in two originals at New Delhi on 22nd November, 1985.

Sd/-
(MOHAMMED ALI)
Secretary,
Ministry of Irrigation, Water Development
and Flood Control,
Government of Bangladesh.

Sd/-
(RAMASWAMY R. IYER)
Secretary,
Ministry of Water Resources,
Government of India,
New Delhi.