

Aside from those costs, O & M cost is required to support or endorse the following activities or items of expense;

- Cost of technical staff,
- Departmental overheads,
- Labour and materials,
- Operation and maintenance of equipment, and
- Annual repair and periodic replacement of CFD facilities.

In the regional planning, O & M cost is assumed to be proportional to the direct construction cost. The following rates are adopted for earthwork and structural work, respectively;

- Earthwork : 5 %
- Structural work : 3 %

(5) Price level and exchange rate

Cost will be estimated in foreign currency portion and local currency portion, respectively. All prices are adjusted for September 1992 (US\$ 1.0 = Tk. 38.9 = Yen 123).

6.3. Estimated Implementation Cost of Each Option

6.3.1. Unit Rates

Unit rates of construction works are estimated based on the schedules of rates from official publication of BWDB, RHD, etc. as well as information from newly completed projects in Bangladesh. Unit rates of construction work are estimated through the analysis of unit rates of labour, materials and equipment required for execution of such work elements as embankment, excavation and other structural works. Estimated values of work elements are checked with the unit rates prevailing over the ongoing projects and other FAP studies completed.

6.3.2. Methodology of Costing

Costing is made based on the unit rates and quantities estimated for elements of work proposed in the nine (9) projects. For such structures as regulators and groynes, unit cost for structure is adopted from the summarial cost therefor estimated in the Gaibandha Improvement Project, other FAP studies and other completed projects.

(1) Earthwork

The quantification for the earth works is made using the river cross sections in the planning units. Considering the availability of the cross section, each reach is divided into several sub-reaches based on distribution of survey locations of river cross-sections. In a sub-reach, quantity of earthwork per 1.m along the alignment is measured for a typical cross-section selected, and a subtotal of quantity of earthwork for a sub-reach is calculated by multiplying a distance of a sub-reach under consideration. Cost of the sub-reach is estimated by a product of the subtotal of quantity and a unit rate of element of earthwork. The same procedure is repeated in the following sub-reach until the entire reach is covered.

Cost of earthwork incorporate all or part of the following elements:

Cost of flood embankment

- clearing & stripping (sq.m),
- earth excavation & hauling or disposal (cu.m),
- compaction & shaping (cu.m),
- turving (sq.m), and
- other miscellaneous works.

Cost of channel excavation

- clearing (sq.m),
- excavation & disposal (cu.m), and
- other miscellaneous works.

(2) Structural work

Use of unit costs for structures are acceptable for regulators, sluiceways, groynes, navigation locks and overflow weirs. They are costed as follows;

- Regulators (Tk/vent)
- Sluiceways (Tk/vent)
- Groynes (Tk/l.m) (for unit length of structure)
- Navigation locks (Tk/no)
- Overflow weir (Tk/l.m)

Those unit costs incorporate such elements of work as embankment, excavation, backfilling, concreting, reinforcement, and any other protection works for structures, etc. For regulators, replacement cost of the gate facilities is required to be disbursed within the project life while the existing regulator bodies remains as they are.

On the other hand, revetments and road pavements are costed based on quantity from typical sections of those structures. They are calculated adopting the same procedures of costing for earthwork.

Cost of revetments

Cost of "revetments" comprises cost for all or part of the following works;

- slope protection work (sq.m),
- concrete footing (cu.m),
- earth excavation and disposal (cu.m),
- backfilling with compaction (cu.m), and
- other miscellaneous works

Cost of road pavements

Cost of "road pavements" comprise cost for all or part of the following works;

- earth excavation and disposal (cu.m)
- bricks metalling (sq.m),
- brick chips metalling (cu.m),
- base course by brick chips (cu.m, or sq.m),
- asphalt pavement (sq.m), and
- other miscellaneous works.

(3) Land acquisition

Costing of land acquisition is made based on prevailing prices over the NW region. Those adopted in other FAP studies and projects are also referred to. Cost of "land acquisition" covers cost for acquiring the following private area;

- land to be embanked,
- land to be excavated for channels and structures, and
- land to be exploited as borrow areas.

Those areas are calculated based on maps in scale of 1/125,000 under the following assumptions;

- Bottom of flood embankment and borrow pit area will be acquired including the area of 6 m wide between them.
- Borrow pits will be located on river side along the alignment of flood embankment.
- Borrow pits will be excavated to the maximum depth of 2 m.
- Earth excavated will be spoiled in the nearby depression areas to elevate the land and no acquisition of spoil bank area is necessary except where the earth is embanked for structures.

Unit rates and unit costs of the construction works for the regional planning study are worked out as tabulated in the following page;

Earthwork

Work Item	Unit	F.C (Tk)	(%)	L.C (Tk)	(%)	Total (Tk)
a). Embankment						
Clearing & stripping	sq.m	-	0	9	100	9
Earth excavation & hauling (l=50 m)	cu.m	-	0	46	100	46
Compaction & shaping	cu.m	-	0	23	100	23
Turfing	sq.m	-	0	5	100	5
b). Channel excavation						
Excavation & disposal (l=50 m)	cu.m	-	0	46	100	46

Structural works

Work Item	Unit	F.C (Tk)	(%)	L.C (Tk)	(%)	Total (Tk)
a). Regulators						
Regulators with 1 vent	vent	963,000	56	757,000	44	1,720,000
Regulators with 2 vents	vent	668,000	62	409,000	38	1,077,000
Regulators with 3 vents	vent	602,000	63	353,000	37	955,000
Regulators with 4 vents	vent	585,000	64	329,000	36	914,000
Regulators with 5 vents	vent	568,000	65	306,000	35	874,000
Regulators with 6 vents or more	vent	541,000	65	291,000	35	832,000
b). Sluiceways						
Sluiceways with 1 vent	vent	289,000	48	314,000	52	603,000
c). Groynes						
d). Revetments						
Brick mattress (t=200)	sq.m	139	29	336	71	475
Concrete blocks (300 x 300 x 300)	cu.m	1,589	59	1,122	41	2,711
e). Overflow weirs						
f). Steel slide gate (1.9 m x 1.6 m)						
g). Navigation lock						
Navigation lock of 2.5 m wide	nos	6,300,000	90	700,000	10	7,000,000
Navigation lock of 4.0 m wide	nos	8,100,000	90	900,000	10	9,000,000
h). Road pavement						
Bricks metalling (2 layer, t=140)	sq.m	109	32	235	68	344
Brick chips metalling (t=250)	cu.m (sq.m)	191 (48)	16	999 (250)	84	1,190 (298)
Asphalt pavement (t=50)	sq.m	613	57	471	43	1,084

6.3.4. Implementation Cost of Each Option

Costing is made for each of the options under the formulated development scenarios. Costs required for implementation of those options are estimated as shown in Tables 6.1 to 6.34, respectively. The implementation costs are summarized below;

(Unit: 1,000 Tk)

No	Planning unit	Construction cost	Administration cost	Phys. contingency	Engineering cost	Land acquisition	Total	O&M cost
3	Teesta Right Bank	408,712	12,261	102,178	76,634	33,323	633,108	14,996
4	Teesta Left Bank	*1) 608,387 *2) 534,053	18,252 16,022	152,097 133,513	114,072 100,135	58,538 47,493	951,346 831,216	23,233 19,437
6+8	Bangali Floodway (Upper Karatoya + Middle Bangali)	*1) 2,076,418 *2) 1,854,094 *3) 1,540,309 *4) 1,358,260 *5) 4,050,462 *6) 3,526,605	62,293 55,623 46,209 40,748 121,514 105,798	519,105 463,524 385,078 339,565 1,012,616 831,652	389,329 347,643 288,808 254,674 759,462 661,239	234,780 199,760 218,840 188,900 810,320 684,280	3,281,925 2,920,644 2,479,244 2,182,147 6,754,374 5,859,574	93,689 82,594 66,884 57,802 192,438 166,251
7	Gaibandha	735,088	22,053	110,263	84,536	85,032	1,036,972	27,623
9	Joypurhat	18,325	565	4,706	3,530	5,958	33,584	898
11	Mohananda Basin	86,067	2,582	21,517	16,138	33,144	159,448	4,088
12	Atrai Left Bank Total (CFD area) (Flow area)	199,897 160,446 39,451	5,997 4,813 1,184	49,975 40,112 9,863	37,481 30,084 7,397	28,508 25,508 3,000	321,858 260,963 60,895	8,927 7,268 1,659
13	Atrai Right Bank Total (CFD area) (Flow area)	449,795 341,774 108,021	13,494 10,253 3,241	112,450 85,444 27,006	84,337 64,083 20,254	68,644 60,392 8,252	728,720 561,946 166,774	20,712 16,113 4,599
14	Lower Bangali Total (CFD area) (Flow area)	333,518 286,093 47,425	10,006 8,583 1,423	83,380 71,524 11,856	62,535 53,643 8,892	49,232 46,616 2,616	538,671 466,459 72,212	15,043 13,070 1,973

Notes: *1) : Option-1, *2) : Option-2, *3) : Option-3, *4) : Option-4, *5) : Option-5, *6) : Option-6

Figures above for the planning unit No. 7 : Gaibandha are transferred from those in the Gaibandha Improvement Project, which are presented in detail in Chapter 7 of the volume 7, "Engineering on Gaibandha Improvement Project".

Table 6.1 IMPLEMENTATION COST OF PLANNING UNIT NO.3

Planning Unit 3 : Teesta Right Bank

Option _ :

Beneficial Area : 0 ha
NCA : 0 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	136,711,682	136,711,682
a) Embankment							
- Clearing & stripping	sq.m	1,633,067	-	9	0	14,697,603	14,697,603
- Earth excavation & hauling (l=50m)	cu.m	1,648,801	-	46	0	75,844,846	75,844,846
- Compaction & shaping	cu.m	1,648,801	-	23	0	37,922,423	37,922,423
- Turfing	sq.m	1,649,362	-	5	0	8,246,810	8,246,810
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					116,000,000	156,000,000	272,000,000
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	4,000	29,000	39,000	116,000,000	156,000,000	272,000,000
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	167			0	33,322,660	33,322,660
- Embankment	sq.m	367,733	-	20	0	7,354,660	7,354,660
- Borrow pits	sq.m	1,298,400	-	20	0	25,968,000	25,968,000
Civil Works					116,000,000	292,711,682	408,711,682
Land Acquisition					0	33,322,660	33,322,660
Total					116,000,000	326,034,342	442,034,342

Summary of Project Cost

1 Civil Works		116,000,000	292,712,000	408,712,000
2 Administration	3% of (1)	-	12,261,000	12,261,000
3 Physical Contingency	25% of (1)	29,000,000	73,178,000	102,178,000
4 Engineering Cost	15% of (1+3)	21,750,000	54,884,000	76,634,000
5 Land Acquisition		-	33,323,000	33,323,000
6 Total		166,750,000	466,358,000	633,108,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	14,996,000	14,996,000
8 Capital Cost / ha NCA				
9 O & M / ha NCA				

Table 6.2 IMPLEMENTATION COST OF PLANNING UNIT NO.4 (OPTION-1) (1/2)

Planning Unit 4 : Teesta Left Bank

Option 1 : CFD with Salinadi Backwater Embankment

Beneficial Area : 58,400 ha
NCA : 51,021 ha

Work Item	Unit	Quantity	(Manual + Mechanical)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					340,758,704	217,581,856	558,340,560
a) Embankment							
- Clearing & stripping	sq.m	1,745,659	11	4	19,202,249	6,982,636	26,184,885
- Earth excavation & hauling (l=50m)	cu.m	2,228,783	38	40	84,693,754	89,151,320	173,845,074
- Compaction & shaping	cu.m	3,248,045	61	22	198,130,745	71,456,990	269,587,735
- Turfing	sq.m	1,844,086		5	0	9,220,430	9,220,430
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	1,019,262	38	40	38,731,956	40,770,480	79,502,436
					158,441,500	201,570,500	360,012,000
2. Structural Works							
a) Regulators							
- Site 1 :	vent	1	970,000	762,000	970,000	762,000	1,732,000
- Site 2 :	vent	5	608,000	299,000	3,040,000	1,495,000	4,535,000
- Site 3 :	vent	15	580,000	285,000	8,700,000	4,275,000	12,975,000
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	5,000	29,000	39,000	145,000,000	195,000,000	340,000,000
c) Revetment							
- Brick mattress (l=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	37,250	50,750	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	2	365,750	19,250	731,500	38,500	770,000
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, l=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (l=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (l=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	293			0	58,537,660	58,537,660
- Embankment	sq.m	1,384,492		20	0	27,689,840	27,689,840
- Borrow pits	sq.m	1,542,391		20	0	30,847,820	30,847,820
Civil Works					499,200,204	419,152,356	918,352,560
Land Acquisition					0	58,537,660	58,537,660
Total					499,200,204	477,690,016	976,890,220
Summary of Project Cost							
1 Civil Works					499,200,000	419,152,000	918,352,000
2 Administration	3% of (1)					27,551,000	27,551,000
3 Physical Contingency	25% of (1)				124,800,000	104,788,000	229,588,000
4 Engineering Cost	15% of (1+3)				93,600,000	78,591,000	172,191,000
5 Land Acquisition						58,538,000	58,538,000
6 Total					717,600,000	688,620,000	1,406,220,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)					38,717,000	38,717,000
8 Capital Cost / ha NCA					14,065	13,497	27,562
9 O & M / ha NCA						759	759

Table 6.2 IMPLEMENTATION COST OF PLANNING UNIT NO.4 (OPTION-3) (2/2)

Planning Unit 4 : Teesta Left Bank

Option 3 : CFD with Satinadi Backwater Embankment without Groynes

Beneficial Area : 58,400 ha
NCA : 51,021 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	249,046,466	249,046,466
a) Embankment							
- Clearing & stripping	sq.m	1,745,659	-	9	0	15,710,931	15,710,931
- Earth excavation & hauling (l=50m)	cu.m	2,228,783	-	46	0	102,524,018	102,524,018
- Compaction & shaping	cu.m	3,248,045	-	23	0	74,705,035	74,705,035
- Turfing	sq.m	1,844,086	-	5	0	9,220,430	9,220,430
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	1,019,262	-	46	0	46,886,052	46,886,052
2. Structural Works					12,649,500	6,690,500	19,340,000
a) Regulators							
- Site 1 :	vent	1	963,000	757,000	963,000	757,000	1,720,000
- Site 2 :	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 3 :	vent	15	541,000	291,000	8,115,000	4,365,000	12,480,000
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	2	365,750	19,250	731,500	38,500	770,000
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	293			0	58,537,660	58,537,660
- Embankment	sq.m	1,384,492	-	20	0	27,689,840	27,689,840
- Borrow pits	sq.m	1,542,391	-	20	0	30,847,820	30,847,820
Civil Works					12,649,500	255,736,966	268,386,466
Land Acquisition					0	58,537,660	58,537,660
Total					12,649,500	314,274,626	326,924,126

Summary of Project Cost

1 Civil Works		12,650,000	255,737,000	268,387,000
2 Administration	3% of (1)	-	8,052,000	8,052,000
3 Physical Contingency	25% of (1)	3,163,000	63,934,000	67,097,000
4 Engineering Cost	15% of (1+3)	2,372,000	47,951,000	50,323,000
5 Land Acquisition		-	58,538,000	58,538,000
6 Total		18,185,000	434,212,000	452,397,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	13,033,000	13,033,000
8 Capital Cost / ha NCA		356	8,510	8,866
9 O & M / ha NCA		-	255	255

Table 6.3 IMPLEMENTATION COST OF PLANNING UNIT NO.4 (OPTION-2)

Planning Unit 4 : Teesta Left Bank

Option 2 : CFD with Satinadi Outfall Regulator

Beneficial Area : 58,400 ha
NCA : 51,021 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	170,762,580	170,762,580
a) Embankment							
- Clearing & stripping	sq.m	1,197,907	-	9	0	10,781,163	10,781,163
- Earth excavation & hauling (i=50m)	cu.m	2,228,783	-	46	0	102,524,018	102,524,018
- Compaction & shaping	cu.m	2,228,783	-	23	0	51,262,009	51,262,009
- Turfing	sq.m	1,239,078	-	5	0	6,195,390	6,195,390
b) Channel excavation							
- Excavation & disposal (i=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					160,219,500	203,070,500	363,290,000
a) Regulators							
- Site 1 :	vent	1	963,000	757,000	963,000	757,000	1,720,000
- Site 2 :	vent	25	541,000	291,000	13,525,000	7,275,000	20,800,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	5,000	29,000	39,000	145,000,000	195,000,000	340,000,000
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	2	365,750	19,250	731,500	38,500	770,000
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	237			0	47,492,540	47,492,540
- Embankment	sq.m	832,236	-	20	0	16,644,720	16,644,720
- Borrow pits	sq.m	1,542,391	-	20	0	30,847,820	30,847,820
Civil Works					160,219,500	373,833,080	534,052,580
Land Acquisition					0	47,492,540	47,492,540
Total					160,219,500	421,325,620	581,545,120

Summary of Project Cost

1. Civil Works		160,220,000	373,833,000	534,053,000
2. Administration	3% of (1)	-	16,022,000	16,022,000
3. Physical Contingency	25% of (1)	40,055,000	93,458,000	133,513,000
4. Engineering Cost	15% of (1+3)	30,041,000	70,094,000	100,135,000
5. Land Acquisition		-	47,493,000	47,493,000
6. Total		230,316,000	600,900,000	831,218,000
7. O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	19,437,000	19,437,000
8. Capital Cost / ha NCA		4,514	11,778	18,282
9. O & M / ha NCA		-	381	381

Table 6.4 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-1)

Bangali Floodway, Option 1

Compound Cross Section with Excavation of Existing River, Route - 1

Beneficial Area : 69,457 ha
NCA : 64,177 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					107,692,000	1,452,149,640	1,569,841,640
a) Embankment							
- Clearing & stripping	sq.m	5,100,500	-	9	0	45,904,500	45,904,500
- Earth excavation & hauling (l=50m)	cu.m	2,005,000	-	46	0	92,230,000	92,230,000
- Compaction & shaping	cu.m	10,308,580	-	23	0	237,097,340	237,097,340
- Turfing	sq.m	5,531,500	-	5	0	27,657,500	27,657,500
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	20,563,050	-	46	0	945,900,300	945,900,300
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	2,834,000	38	40	107,692,000	113,360,000	221,052,000
2. Structural Works					443,527,010	63,048,980	506,575,990
a) Regulators							
- Site 1: Sub-basin 1	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 2: Sub-basin 2	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3: Sub-basin 3	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 4: Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 5: Sub-basin 5	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 6: Sub-basin 6	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,090	1,589	1,122	4,910,010	3,466,980	8,376,990
- Brick mattress (t=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	0	289,000	314,000	0	0	0
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
3. Land Acquisition	ha	1,174			0	234,780,000	234,780,000
- Embankment	sq.m	5,158,000	-	20	0	103,160,000	103,160,000
- Borrow pits	sq.m	0	-	20	0	0	0
- Spoil-bank	sq.m	6,581,000	-	20	0	131,620,000	131,620,000
Civil Works					551,219,010	1,525,199,620	2,076,418,630
Land Acquisition					0	234,780,000	234,780,000
Total					551,219,010	1,759,978,620	2,311,197,630

Summary of Project Cost

1 Civil Works		551,219,000	1,525,199,000	2,076,418,000
2 Administration	3% of (1)	-	62,293,000	62,293,000
3 Physical Contingency	25% of (1)	137,805,000	381,300,000	519,105,000
4 Engineering Cost	15% of (1+3)	103,354,000	285,975,000	389,329,000
5 Land Acquisition		-	234,780,000	234,780,000
6 Total		792,378,000	2,489,547,000	3,281,925,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	93,689,000	93,689,000
8 Capital Cost / ha NCA		12,347	38,792	61,139
9 O & M / ha NCA		-	1,480	1,480

Table 6.5 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-2)

Bangali Floodway, Option 2

Compound Cross Section with Excavation of Existing River, Route - 2

Beneficial Area : 67,062 ha
NCA : 61,964 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					114,760,000	1,233,776,490	1,348,536,490
a) Embankment							
- Clearing & stripping	sq.m	4,571,500	-	9	0	41,143,500	41,143,500
- Earth excavation & hauling (l=50m)	cu.m	2,016,300	-	46	0	92,749,800	92,749,800
- Compaction & shaping	cu.m	8,806,830	-	23	0	202,557,090	202,557,090
- Turfing	sq.m	4,916,500	-	5	0	24,582,500	24,582,500
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	16,346,600	-	46	0	751,943,600	751,943,600
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	3,020,000	38	40	114,760,000	120,800,000	235,560,000
					442,939,450	62,618,100	505,557,550
2. Structural Works							
a) Regulators							
- Site 1 : Sub-basin 1	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 : Sub-basin 2	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 : Sub-basin 3	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 4 : Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 5 : Sub-basin 5	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 6 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,050	1,589	1,122	4,846,450	3,422,100	8,268,550
- Brick mattress (l=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	0	289,000	314,000	0	0	0
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
	ha	999			0	199,760,000	199,760,000
3. Land Acquisition							
- Embankment	sq.m	4,729,000	-	20	0	94,580,000	94,580,000
- Borrow pits	sq.m	0	-	20	0	0	0
- Spoil-bank	sq.m	5,259,000	-	20	0	105,180,000	105,180,000
Civil Works					557,699,450	1,296,394,590	1,854,094,040
Land Acquisition					0	199,760,000	199,760,000
Total					557,699,450	1,496,154,590	2,053,854,040

Summary of Project Cost

1 Civil Works		557,699,000	1,296,395,000	1,854,094,000
2 Administration	3% of (1)	-	55,623,000	55,623,000
3 Physical Contingency	25% of (1)	139,425,000	324,099,000	463,524,000
4 Engineering Cost	15% of (1+3)	104,569,000	243,074,000	347,643,000
5 Land Acquisition		-	199,760,000	199,760,000
6 Total		801,693,000	2,118,951,000	2,920,644,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	82,594,000	82,594,000
8 Capital Cost / ha NCA		12,938	34,196	47,134
9 O & M / ha NCA		-	1,333	1,333

Table 6.6 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-3)

Bangali Floodway, Option 3

Compound Cross Section without Excavation of Existing River, Route - 1

Beneficial Area : 69,457 ha
NCA : 64,177 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					107,692,000	926,040,590	1,033,732,590
a) Embankment							
- Cleaning & stripping	sq.m	5,154,250	-	9	0	46,388,250	46,388,250
- Earth excavation & hauling (l=50m)	cu.m	8,872,300	-	46	0	408,125,800	408,125,800
- Compaction & shaping	cu.m	10,296,480	-	23	0	236,819,040	236,819,040
- Turfing	sq.m	5,547,500	-	5	0	27,737,500	27,737,500
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	2,035,000	-	46	0	93,610,000	93,610,000
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	2,834,000	38	40	107,692,000	113,360,000	221,052,000
2. Structural Works					443,527,010	63,048,980	506,575,990
a) Regulators							
- Site 1 : Sub-basin 1	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 2 : Sub-basin 2	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 : Sub-basin 3	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 4 : Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 5 : Sub-basin 5	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 6 : Sub-basin 6	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,090	1,589	1,122	4,910,010	3,466,980	8,376,990
- Brick mattress (t=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	0	289,000	314,000	0	0	0
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
3. Land Acquisition	ha	1,094			0	218,840,000	218,840,000
- Embankment	sq.m	6,060,000	-	20	0	121,200,000	121,200,000
- Borrow pits	sq.m	4,125,000	-	20	0	82,500,000	82,500,000
- Spoil-bank	sq.m	757,000	-	20	0	15,140,000	15,140,000
Civil Works					551,219,010	989,069,570	1,540,308,580
Land Acquisition					0	218,840,000	218,840,000
Total					551,219,010	1,207,929,570	1,759,148,580

Summary of Project Cost

1 Civil Works		551,219,000	989,069,000	1,540,308,000
2 Administration	3% of (1)	-	48,209,000	48,209,000
3 Physical Contingency	25% of (1)	137,805,000	247,273,000	385,078,000
4 Engineering Cost	15% of (1+3)	103,354,000	185,454,000	288,808,000
5 Land Acquisition		-	218,840,000	218,840,000
6 Total		792,378,000	1,666,866,000	2,479,244,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	66,884,000	66,884,000
8 Capital Cost / ha NCA		12,347	26,285	38,632
9 O & M / ha NCA		-	1,042	1,042

Table 6.7 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-4)

Bangali Floodway, Option 4

Compound Cross Section without Excavation of Existing River, Route - 2

Beneficial Area : 67,062 ha
NCA : 61,984 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					76,266,000	776,437,350	852,703,350
a) Embankment							
- Cleaning & stripping	sq.m	4,602,250	-	9	0	41,420,250	41,420,250
- Earth excavation & hauling (l=50m)	cu.m	7,068,600	-	46	0	325,155,600	325,155,600
- Compaction & shaping	cu.m	8,806,000	-	23	0	202,538,000	202,538,000
- Turfing	sq.m	4,929,500	-	5	0	24,647,500	24,647,500
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	2,226,000	-	40	0	102,398,000	102,398,000
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	2,007,000	38	40	76,266,000	80,280,000	156,546,000
2. Structural Works					442,939,450	62,818,100	505,557,550
a) Regulators							
- Site 1 : Sub-basin 1	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 : Sub-basin 2	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 : Sub-basin 3	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 4 : Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 5 : Sub-basin 5	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 6 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,050	1,589	1,122	4,846,450	3,422,100	8,268,550
- Brick mattress (l=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	0	289,000	314,000	0	0	0
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
3. Land Acquisition	ha	945			0	188,900,000	188,900,000
- Embankment	sq.m	5,608,000	-	20	0	112,160,000	112,160,000
- Borrow pits	sq.m	3,305,000	-	20	0	66,100,000	66,100,000
- Spoil-bank	sq.m	532,000	-	20	0	10,640,000	10,640,000
Civil Works					519,205,450	839,055,450	1,358,260,900
Land Acquisition					0	188,900,000	188,900,000
Total					519,205,450	1,027,955,450	1,547,160,900

Summary of Project Cost

1 Civil Works		519,205,000	839,055,000	1,358,260,000
2 Administration	3% of (1)	-	40,748,000	40,748,000
3 Physical Contingency	25% of (1)	129,801,000	209,764,000	339,565,000
4 Engineering Cost	15% of (1+3)	97,351,000	157,323,000	254,674,000
5 Land Acquisition		-	188,900,000	188,900,000
6 Total		746,357,000	1,435,790,000	2,182,147,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	12,045	23,171	35,216
8 Capital Cost / ha NCA			933	933
9 O & M / ha NCA				

Table 6.8 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-5)

Bangali Floodway, Option 5

Single Cross Section, Route - 1

Beneficial Area : 69,457 ha
NCA : 64,177 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					107,692,000	3,438,496,740	3,546,188,740
a) Embankment							
- Clearing & stripping	sq.m	2,883,750	-	9	0	25,953,750	25,953,750
- Earth excavation & hauling (l=50m)	cu.m	0	-	46	0	0	0
- Compaction & shaping	cu.m	5,863,230	-	23	0	134,854,290	134,854,290
- Turfing	sq.m	3,071,000	-	5	0	15,355,000	15,355,000
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	68,455,950	-	46	0	3,148,973,700	3,148,973,700
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	2,834,000	38	40	107,692,000	113,360,000	221,052,000
2. Structural Works					441,374,010	62,898,960	504,272,990
a) Regulators							
- Site 1 : Sub-basin 3	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 : Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 3 : Sub-basin 5	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 4 : Sub-basin 6	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,090	1,589	1,122	4,910,010	3,466,980	8,376,990
- Brick mattress (t=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	7	289,000	314,000	2,023,000	2,198,000	4,221,000
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
3. Land Acquisition	ha	4,052			0	810,320,000	810,320,000
- Embankment	sq.m	4,356,000	-	20	0	87,120,000	87,120,000
- Channel excavation	sq.m	4,412,000	-	20	0	88,240,000	88,240,000
- Spoil-bank	sq.m	31,748,000	-	20	0	634,960,000	634,960,000
Civil Works					549,066,010	3,501,395,720	4,050,461,730
Land Acquisition					0	810,320,000	810,320,000
Total					549,066,010	4,311,715,720	4,860,781,730

Summary of Project Cost

1 Civil Works		549,066,000	3,501,396,000	4,050,462,000
2 Administration	3% of (1)	-	121,514,000	121,514,000
3 Physical Contingency	25% of (1)	137,267,000	875,349,000	1,012,616,000
4 Engineering Cost	15% of (1+3)	102,950,000	656,512,000	759,462,000
5 Land Acquisition		-	810,320,000	810,320,000
6 Total		789,283,000	5,965,091,000	6,754,374,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	192,438,000	192,438,000
8 Capital Cost / ha NCA		12,299	82,947	105,246
9 O & M / ha NCA		-	2,999	2,999

Table 6.9 IMPLEMENTATION COST OF BANGALI FLOODWAY (OPTION-6)

Bangali Floodway, Option 6

Single Cross Section, Route - 2

Beneficial Area : 67,062 ha
NCA : 61,864 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					114,760,000	2,907,876,590	3,022,636,590
a) Embankment							
- Clearing & stripping	sq.m	2,426,250	-	9	0	21,836,250	21,836,250
- Earth excavation & hauling (l=50m)	cu.m	0	-	46	0	0	0
- Compaction & shaping	cu.m	4,541,580	-	23	0	104,456,340	104,456,340
- Turfing	sq.m	2,522,000	-	5	0	12,610,000	12,610,000
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	57,569,000	-	46	0	2,648,174,000	2,648,174,000
- Excavation & disposal (l=50m) (manual + mechanical)	cu.m	3,020,000	38	40	114,760,000	120,800,000	235,560,000
2. Structural Works					441,286,450	62,682,100	503,968,550
a) Regulators							
- Site 1: Sub-basin 3	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 2: Sub-basin 4	vent	5	568,000	306,000	2,840,000	1,530,000	4,370,000
- Site 3: Sub-basin 5	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 4:	vent	0	0	0	0	0	0
- Site 5:	vent	0	0	0	0	0	0
- Site 6:	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Concrete blocks	cu.m	3,050	1,589	1,122	4,846,450	3,422,100	8,268,550
- Brick mattress (t=200)	sq.m	15,000	139	336	2,085,000	5,040,000	7,125,000
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Sluiceway	nos	7	289,000	314,000	2,023,000	2,198,000	4,221,000
g) Regulating weir							
- Bangali (6gates x 15m width x 10m height)	L.S.				270,000,000	30,000,000	300,000,000
- New channel (6gates x 15m width x 3m height)	L.S.				153,000,000	17,000,000	170,000,000
3. Land Acquisition	ha	3,421			0	684,280,000	684,280,000
- Embankment	sq.m	3,998,000	-	20	0	79,960,000	79,960,000
- Channel excavation	sq.m	3,222,000	-	20	0	64,440,000	64,440,000
- Spoil-bank	sq.m	26,994,000	-	20	0	539,880,000	539,880,000
Civil Works					556,046,450	2,970,558,690	3,526,605,140
Land Acquisition					0	684,280,000	684,280,000
Total					556,046,450	3,654,838,690	4,210,885,140

Summary of Project Cost

1 Civil Works		556,046,000	2,970,559,000	3,526,605,000
2 Administration	3% of (1)	-	105,798,000	105,798,000
3 Physical Contingency	25% of (1)	139,012,000	742,640,000	881,652,000
4 Engineering Cost	15% of (1+3)	104,259,000	556,980,000	661,239,000
5 Land Acquisition		-	684,280,000	684,280,000
6 Total		799,317,000	5,060,257,000	5,859,574,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	166,251,000	166,251,000
8 Capital Cost / ha NCA		12,800	81,684	94,584
9 O & M / ha NCA		-	2,683	2,683

Table 6.10 IMPLEMENTATION COST OF PLANNING UNIT NO.9

Planning Unit 9 : Joypurhat

Option : Upper Badalgachi

Beneficial Area : 42,982 ha
NCA : 39,770 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	16,671,143	16,671,143
a) Embankment							
- Clearing & stripping	sq.m	131,449	-	9	0	1,183,041	1,183,041
- Earth excavation & hauling (l=50m)	cu.m	214,148	-	46	0	9,850,808	9,850,808
- Compaction & shaping	cu.m	214,148	-	23	0	4,925,404	4,925,404
- Turfing	sq.m	142,378	-	5	0	711,890	711,890
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					1,336,000	818,000	2,154,000
a) Regulators							
- Site 1 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	30			0	5,959,000	5,958,000
- Embankment	sq.m	131,449	-	20	0	2,628,980	2,628,980
- Borrow pits	sq.m	166,451	-	20	0	3,329,020	3,329,020
Civil Works					1,336,000	17,489,143	18,825,143
Land Acquisition					0	5,959,000	5,958,000
Total					1,336,000	23,447,143	24,783,143

Summary of Project Cost

1 Civil Works		1,336,000	17,489,000	18,825,000
2 Administration	3% of (1)	-	585,000	585,000
3 Physical Contingency	25% of (1)	334,000	4,372,000	4,706,000
4 Engineering Cost	15% of (1+3)	251,000	3,279,000	3,530,000
6 Land Acquisition		-	5,958,000	5,958,000
6 Total		1,921,000	31,683,000	33,584,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	898,000	898,000
8 Capital Cost / ha NCA		48	796	844
9 O & M / ha NCA		-	23	23

Table 6.11 IMPLEMENTATION COST OF PLANNING UNIT NO.11

Planning Unit 11 : Mohananda

Option : -

Beneficial Area : 16,900 ha
NCA : 15,073 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	75,296,914	75,296,914
a) Embankment							
- Clearing & stripping	sq.m	690,526	-	9	0	6,214,734	6,214,734
- Earth excavation & hauling (l=50m)	cu.m	947,335	-	46	0	43,577,410	43,577,410
- Compaction & shaping	cu.m	947,335	-	23	0	21,788,705	21,788,705
- Turfing	sq.m	743,213	-	5	0	3,716,065	3,716,065
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					6,680,000	4,090,000	10,770,000
a) Regulators							
- Site 1 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 2 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 4 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 5 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	166			0	33,144,000	33,144,000
- Embankment	sq.m	690,526	-	20	0	13,810,520	13,810,520
- Borrow pits	sq.m	966,674	-	20	0	19,333,480	19,333,480
Civil Works					6,680,000	79,386,914	86,066,914
Land Acquisition					0	33,144,000	33,144,000
Total					6,680,000	112,530,914	119,210,914

Summary of Project Cost

1 Civil Works		6,680,000	79,387,000	86,067,000
2 Administration	3% of (1)	-	2,582,000	2,582,000
3 Physical Contingency	25% of (1)	1,670,000	19,847,000	21,517,000
4 Engineering Cost	15% of (1+3)	1,253,000	14,885,000	16,138,000
5 Land Acquisition		-	33,144,000	33,144,000
6 Total		9,603,000	149,845,000	159,448,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	637	9,941	10,578
8 Capital Cost / ha NCA		-	271	271
9 O & M / ha NCA		-	-	-

Table 6.12 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (WHOLE UNIT OF CFD AREA)

Planning Unit 12 : Atral left bank (CFD area)

Option :-

Beneficial Area : 104,260 ha

NCA : 96,826 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	122,721,861	122,721,861
a) Embankment							
- Cleaning & stripping	sq.m	1,248,659	-	9	0	11,237,931	11,237,931
- Earth excavation & hauling (l=50m)	cu.m	1,060,770	-	46	0	48,795,420	48,795,420
- Compaction & shaping	cu.m	1,060,770	-	23	0	24,397,710	24,397,710
- Turfing	sq.m	914,560	-	5	0	4,572,800	4,572,800
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	733,000	-	46	0	33,718,000	33,718,000
2. Structural Works					21,000,010	16,724,150	37,724,160
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	20	541,000	291,000	10,820,000	5,820,000	16,640,000
- Site 3 :	vent	6	541,000	291,000	3,246,000	1,746,000	4,992,000
- Site 4 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	29,890	109	235	3,258,010	7,024,150	10,282,160
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	128			0	25,508,000	25,508,000
- Embankment	sq.m	924,000	-	20	0	18,480,000	18,480,000
- Borrow pits	sq.m	351,400	-	20	0	7,028,000	7,028,000
Civil Works					21,000,010	139,446,011	160,446,021
Land Acquisition					0	25,508,000	25,508,000
Total					21,000,010	164,954,011	185,954,021

Summary of Project Cost

1 Civil Works		21,000,000	139,446,000	160,446,000
2 Administration	3% of (1)	-	4,813,000	4,813,000
3 Physical Contingency	25% of (1)	5,250,000	34,862,000	40,112,000
4 Engineering Cost	15% of (1+3)	3,938,000	26,146,000	30,084,000
5 Land Acquisition		-	25,508,000	25,508,000
6 Total		30,188,000	230,775,000	260,963,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	7,268,000	7,268,000
8 Capital Cost / ha NCA		312	2,383	2,695
9 O & M / ha NCA		-	75	75

Table 6.13 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (BOGRA POLDER-2 UNIT, CFD AREA)

Planning Unit 12 : Atral Left Bank (Bogra polder-2 unit, CFD area)

Option :-

Beneficial Area : 49,065 ha
NCA : 45,319 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	87,241,711	87,241,711
a) Embankment							
- Clearing & stripping	sq.m	282,809	-	9	0	2,545,281	2,545,281
- Earth excavation & hauling (l=50m)	cu.m	790,470	-	46	0	36,361,620	36,361,620
- Compaction & shaping	cu.m	790,470	-	23	0	18,180,810	18,180,810
- Turfing	sq.m	46,200	-	5	0	231,000	231,000
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	650,500	-	46	0	29,923,000	29,923,000
2. Structural Works					15,487,150	12,153,250	27,640,400
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	20	541,000	291,000	10,820,000	5,820,000	16,640,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	21,350	109	235	2,327,150	5,017,250	7,344,400
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	93			0	18,558,000	18,558,000
- Embankment	sq.m	724,000	-	20	0	14,480,000	14,480,000
- Borrow pits	sq.m	203,900	-	20	0	4,078,000	4,078,000
Civil Works					15,487,150	99,394,961	114,882,111
Land Acquisition					0	18,558,000	18,558,000
Total					15,487,150	117,952,961	133,440,111

Summary of Project Cost

1 Civil Works		15,487,000	99,395,000	114,882,000
2 Administration	3% of (1)	-	3,446,000	3,446,000
3 Physical Contingency	25% of (1)	3,872,000	24,849,000	28,721,000
4 Engineering Cost	15% of (1+3)	2,904,000	18,637,000	21,541,000
5 Land Acquisition		-	18,558,000	18,558,000
6 Total		22,263,000	164,885,000	187,148,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	5,191,000	5,191,000
8 Capital Cost / ha NCA		491	3,638	4,129
9 O & M / ha NCA		-	115	115

Table 6.14 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (BOGRA POLDER-3 UNIT, CFD AREA)

Planning Unit 12 : Atral Left Bank (Bogra polder-3 unit, CFD area)

Option :-

Beneficial Area : 55,195 ha
NCA : 50,507 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	LC (TK)	F.C (TK)	LC (TK)	
1. Earthwork					0	35,480,150	35,480,150
a) Embankment							
- Clearing & stripping	sq.m	965,850	-	9	0	8,692,650	8,692,650
- Earth excavation & hauling (l=50m)	cu.m	270,300	-	46	0	12,433,800	12,433,800
- Compaction & shaping	cu.m	270,300	-	23	0	6,216,900	6,216,900
- Turfing	sq.m	868,360	-	5	0	4,341,800	4,341,800
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	82,500	-	46	0	3,795,000	3,795,000
2. Structural Works					5,512,860	4,570,900	10,083,760
a) Regulators							
- Site 1 :	vent	6	541,000	291,000	3,248,000	1,746,000	4,992,000
- Site 2 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	8,540	109	235	930,860	2,006,900	2,937,760
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	35			0	6,950,000	6,950,000
- Embankment	sq.m	200,000	-	20	0	4,000,000	4,000,000
- Borrow pits	sq.m	147,500	-	20	0	2,950,000	2,950,000
Civil Works					5,512,860	40,051,050	45,563,910
Land Acquisition					0	6,950,000	6,950,000
Total					5,512,860	47,001,050	52,513,910

Summary of Project Cost

1 Civil Works		5,513,000	40,051,000	45,564,000
2 Administration	3% of (1)	-	1,387,000	1,387,000
3 Physical Contingency	25% of (1)	1,378,000	10,013,000	11,391,000
4 Engineering Cost	15% of (1+3)	1,034,000	7,510,000	8,544,000
5 Land Acquisition		-	6,950,000	6,950,000
6 Total		7,925,000	65,891,000	73,816,000
7 O & M	(6% of Earthwork and 3% of Structural Works Cost)	-	2,077,000	2,077,000
8 Capital Cost / ha NCA		157	1,305	1,462
9 O & M / ha NCA		-	41	41

Table 6.15 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (WHOLE UNIT OF FLOW AREA)

Planning Unit 12 : Atrai left bank (Flow area)

Option :-

Beneficial Area : 12,872 ha
NCA : 11,841 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	23,755,420	23,755,420
a) Embankment							
- Clearing & stripping	sq.m	392,150	-	9	0	3,529,350	3,529,350
- Earth excavation & hauling (l=50m)	cu.m	285,230	-	46	0	13,120,580	13,120,580
- Compaction & shaping	cu.m	285,230	-	23	0	6,560,290	6,560,290
- Turfing	sq.m	109,040	-	5	0	545,200	545,200
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					13,276,000	2,420,000	15,696,000
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	20	33,800	51,000	676,000	1,020,000	1,696,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	2	6,300,000	700,000	12,600,000	1,400,000	14,000,000
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	15			0	3,000,000	3,000,000
- Embankment	sq.m	100,000	-	20	0	2,000,000	2,000,000
- Borrow pits	sq.m	50,000	-	20	0	1,000,000	1,000,000
Civil Works					13,276,000	26,175,420	39,451,420
Land Acquisition					0	3,000,000	3,000,000
Total					13,276,000	29,175,420	42,451,420

Summary of Project Cost

1 Civil Works		13,276,000	26,175,000	39,451,000
2 Administration	3% of (1)	-	1,184,000	1,184,000
3 Physical Contingency	25% of (1)	3,319,000	6,544,000	9,863,000
4 Engineering Cost	15% of (1+3)	2,489,000	4,908,000	7,397,000
5 Land Acquisition		-	3,000,000	3,000,000
6 Total		19,084,000	41,811,000	60,895,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	1,659,000	1,659,000
8 Capital Cost / ha NCA		1,612	3,531	5,143
9 O & M / ha NCA		-	140	140

Table 6.16 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (BOGRA POLDER-2 UNIT, FLOW AREA)

Planning Unit 12 : Atral Left Bank (Bogra polder-2 unit, Flow area)

Option :-

Beneficial Area : 7,330 ha
NCA : 6,770 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	14,091,320	14,091,320
a) Embankment							
- Clearing & stripping	sq.m	241,550	-	9	0	2,173,950	2,173,950
- Earth excavation & hauling (l=50m)	cu.m	170,430	-	46	0	7,839,780	7,839,780
- Compaction & shaping	cu.m	170,430	-	23	0	3,919,890	3,919,890
- Turfing	sq.m	31,540	-	5	0	157,700	157,700
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					6,976,000	1,720,000	8,696,000
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	20	33,800	51,000	676,000	1,020,000	1,696,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	1	6,300,000	700,000	6,300,000	700,000	7,000,000
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	15			0	3,000,000	3,000,000
- Embankment	sq.m	100,000	-	20	0	2,000,000	2,000,000
- Borrow pits	sq.m	50,000	-	20	0	1,000,000	1,000,000
Civil Works					6,976,000	15,811,320	22,787,320
Land Acquisition					0	3,000,000	3,000,000
Total					6,976,000	18,811,320	25,787,320

Summary of Project Cost

1 Civil Works		6,976,000	15,811,000	22,787,000
2 Administration	3% of (1)	-	684,000	684,000
3 Physical Contingency	25% of (1)	1,744,000	3,953,000	5,697,000
4 Engineering Cost	15% of (1+3)	1,308,000	2,985,000	4,273,000
5 Land Acquisition		-	3,000,000	3,000,000
6 Total		10,028,000	26,413,000	36,441,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	965,000	965,000
8 Capital Cost / ha NCA		1,481	3,901	5,382
9 O & M / ha NCA		-	143	143

Table 6.17 IMPLEMENTATION COST OF PLANNING UNIT NO.12 (BOGRA POLDER-3 UNIT, FLOW AREA)

Planning Unit 12 : Atral Left Bank (Bogra polder-3 unit, Flow area)

Option :-

Beneficial Area : 5,542 ha
NCA : 5,071 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	9,664,100	9,664,100
a) Embankment							
- Clearing & stripping	sq.m	150,600	-	9	0	1,355,400	1,355,400
- Earth excavation & hauling (l=50m)	cu.m	114,800	-	46	0	5,280,800	5,280,800
- Compaction & shaping	cu.m	114,800	-	23	0	2,640,400	2,640,400
- Turfing	sq.m	77,500	-	5	0	387,500	387,500
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					6,300,000	700,000	7,000,000
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	1	6,300,000	700,000	6,300,000	700,000	7,000,000
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	0			0	0	0
- Embankment	sq.m	0	-	20	0	0	0
- Borrow pits	sq.m	0	-	20	0	0	0
Civil Works					6,300,000	10,364,100	16,664,100
Land Acquisition					0	0	0
Total					6,300,000	10,364,100	16,664,100

Summary of Project Cost

1 Civil Works		6,300,000	10,364,000	16,664,000
2 Administration	3% of (1)	-	500,000	500,000
3 Physical Contingency	25% of (1)	1,575,000	2,591,000	4,166,000
4 Engineering Cost	15% of (1+3)	1,161,000	1,943,000	3,124,000
5 Land Acquisition		-	0	0
6 Total		9,055,000	15,398,000	24,454,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	693,000	693,000
8 Capital Cost / ha NCA		1,786	3,036	4,822
9 O & M / ha NCA		-	137	137

Table 6.18 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (WHOLE UNIT OF CFD AREA)

Planning Unit 13 : Atrai Right Bank (CFD area)

Option :-

Beneficial Area : 112,880 ha
NCA : 103,262 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	293,000,707	293,000,707
a) Embankment							
- Clearing & stripping	sq.m	889,608	-	9	0	8,006,472	8,006,472
- Earth excavation & hauling (l=50m)	cu.m	3,665,025	-	46	0	168,591,150	168,591,150
- Compaction & shaping	cu.m	3,665,025	-	23	0	84,295,575	84,295,575
- Turfing	sq.m	1,545,502	-	5	0	7,727,510	7,727,510
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	530,000	-	46	0	24,380,000	24,380,000
2. Structural Works					31,528,000	17,245,000	48,773,000
a) Regulators							
- Site 1 :	vent	20	541,000	291,000	10,820,000	5,820,000	16,640,000
- Site 2 :	vent	14	541,000	291,000	7,574,000	4,074,000	11,648,000
- Site 3 :	vent	9	541,000	291,000	4,869,000	2,619,000	7,488,000
- Site 4 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 5 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 6 :	vent	3	602,000	353,000	1,806,000	1,059,000	2,865,000
- Site 7 :	vent	7	541,000	291,000	3,787,000	2,037,000	5,824,000
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	302			0	60,392,000	60,392,000
- Embankment	sq.m	1,916,800	-	20	0	38,336,000	38,336,000
- Borrow pits	sq.m	1,102,800	-	20	0	22,056,000	22,056,000
Civil Works					31,528,000	310,245,707	341,773,707
Land Acquisition					0	60,392,000	60,392,000
Total					31,528,000	370,637,707	402,165,707

Summary of Project Cost

1 Civil Works		31,528,000	310,246,000	341,774,000
2 Administration	3% of (1)		10,253,000	10,253,000
3 Physical Contingency	25% of (1)		77,562,000	85,444,000
4 Engineering Cost	15% of (1+3)		5,912,000	64,083,000
5 Land Acquisition			60,392,000	60,392,000
6 Total		45,322,000	516,624,000	561,946,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)		16,113,000	16,113,000
8 Capital Cost / ha NCA		439	5,003	5,442
9 O & M / ha NCA			156	156

Table 6.19 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-A UNIT, CFD AREA)

Planning Unit 13 : Atral Right Bank (Polder-A unit, CFD area)

Option :-

Beneficial Area : 23,858 ha
NCA : 21,549 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	50,886,929	50,886,929
a) Embankment							
- Clearing & stripping	sq.m	297,020	-	9	0	2,673,180	2,673,180
- Earth excavation & hauling (l=50m)	cu.m	573,491	-	46	0	26,380,588	26,380,588
- Compaction & shaping	cu.m	573,491	-	23	0	13,190,293	13,190,293
- Turfing	sq.m	348,574	-	5	0	1,742,870	1,742,870
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	150,000	-	46	0	6,900,000	6,900,000
2. Structural Works					10,820,000	5,820,000	16,640,000
a) Regulators					10,820,000	5,820,000	16,640,000
- Site 1 :	vent	20	541,000	291,000	10,820,000	5,820,000	16,640,000
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	46			0	9,120,000	9,120,000
- Embankment	sq.m	319,200	-	20	0	6,384,000	6,384,000
- Borrow pits	sq.m	136,800	-	20	0	2,736,000	2,736,000
Civil Works					10,820,000	58,706,929	67,526,929
Land Acquisition					0	9,120,000	9,120,000
Total					10,820,000	67,846,929	78,666,929

Summary of Project Cost

1 Civil Works		10,820,000	56,707,000	67,527,000
2 Administration	3% of (1)	-	2,026,000	2,026,000
3 Physical Contingency	25% of (1)	2,705,000	14,177,000	16,882,000
4 Engineering Cost	15% of (1+3)	2,029,000	10,633,000	12,662,000
5 Land Acquisition		-	9,120,000	9,120,000
6 Total		15,554,000	92,663,000	108,217,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	3,044,000	3,044,000
8 Capital Cost / ha NCA		722	4,300	5,022
9 O & M / ha NCA		-	141	141

Table 6.20 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-B UNIT, CFD AREA)

Planning Unit 13 : Atrai Right Bank (Polder-B unit, CFD area)

Option :-

Beneficial Area : 29,285 ha
NCA : 26,828 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	74,270,366	74,270,366
a) Embankment							
- Cleaning & stripping	sq.m	38,840	-	9	0	349,560	349,560
- Earth excavation & hauling (l=50m)	cu.m	869,714	-	46	0	40,006,844	40,006,844
- Compaction & shaping	cu.m	869,714	-	23	0	20,003,422	20,003,422
- Turfing	sq.m	252,108	-	5	0	1,260,540	1,260,540
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	275,000	-	46	0	12,650,000	12,650,000
2. Structural Works					12,443,000	6,693,000	19,136,000
a) Regulators							
- Site 1 :	vent	14	541,000	291,000	7,574,000	4,074,000	11,648,000
- Site 2 :	vent	9	541,000	291,000	4,869,000	2,619,000	7,488,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	77			0	15,352,000	15,352,000
- Embankment	sq.m	537,600		20	0	10,752,000	10,752,000
- Borrow pits	sq.m	230,000		20	0	4,600,000	4,600,000
Civil Works					12,443,000	80,963,366	93,406,366
Land Acquisition					0	15,352,000	15,352,000
Total					12,443,000	96,315,366	108,758,366

Summary of Project Cost

1 Civil Works		12,443,000	80,963,000	93,406,000
2 Administration	3% of (1)	-	2,802,000	2,802,000
3 Physical Contingency	25% of (1)	3,111,000	20,241,000	23,352,000
4 Engineering Cost	15% of (1+3)	2,333,000	15,181,000	17,514,000
5 Land Acquisition		-	15,352,000	15,352,000
6 Total		17,887,000	134,539,000	152,426,000
7 O & M (5% of Earthwork and 3% of Structural Works Cost)		-	4,288,000	4,288,000
8 Capital Cost / ha NCA		667	5,015	5,682
9 O & M / ha NCA		-	160	160

Table 6.21 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-C UNIT, CFD AREA)

Planning Unit 13 : Atral Right Bank (Polder-C unit, CFD area)

Option :-

Beneficial Area : 18,125 ha
NCA : 16,756 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	50,530,200	50,530,200
a) Embankment							
- Clearing & stripping	sq.m	150,300	-	9	0	1,352,700	1,352,700
- Earth excavation & hauling (l=50m)	cu.m	697,500	-	46	0	32,085,000	32,085,000
- Compaction & shaping	cu.m	697,500	-	23	0	16,042,500	16,042,500
- Turfing	sq.m	210,000	-	5	0	1,050,000	1,050,000
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
					8,265,000	4,732,000	12,997,000
2. Structural Works							
a) Regulators							
- Site 1 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 2 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 :	vent	3	602,000	353,000	1,806,000	1,059,000	2,865,000
- Site 4 :	vent	7	541,000	291,000	3,787,000	2,037,000	5,824,000
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition							
	ha	67			0	13,400,000	13,400,000
- Embankment	sq.m	400,000	-	20	0	8,000,000	8,000,000
- Borrow pits	sq.m	270,000	-	20	0	5,400,000	5,400,000
Civil Works					8,265,000	55,262,200	63,527,200
Land Acquisition					0	13,400,000	13,400,000
Total					8,265,000	68,662,200	76,927,200

Summary of Project Cost

1 Civil Works		8,265,000	55,262,000	63,527,000
2 Administration	3% of (1)	-	1,908,000	1,908,000
3 Physical Contingency	25% of (1)	2,066,000	13,816,000	15,882,000
4 Engineering Cost	15% of (1+3)	1,550,000	10,362,000	11,912,000
5 Land Acquisition		-	13,400,000	13,400,000
6 Total		11,881,000	94,746,000	106,627,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	2,918,000	2,918,000
8 Capital Cost / ha NCA		709	6,654	6,363
9 O & M / ha NCA		-	174	174

Table 6.22 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-D UNIT, CFD AREA)

Planning Unit 13 : Atrai Right Bank (Polder-D unit, CFD area)

Option :-

Beneficial Area : 41,612 ha
NCA : 38,129 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	LC (TK)	F.C (TK)	LC (TK)	
1. Earthwork					0	117,313,212	117,313,212
a) Embankment							
- Clearing & stripping	sq.m	403,448	-	9	0	3,631,032	3,631,032
- Earth excavation & hauling (t=50m)	cu.m	1,524,320	-	46	0	70,118,720	70,118,720
- Compaction & shaping	cu.m	1,524,320	-	23	0	35,059,360	35,059,360
- Turfing	sq.m	734,820	-	5	0	3,674,100	3,674,100
b) Channel excavation							
- Excavation & disposal (t=50m)	cu.m	105,000	-	46	0	4,830,000	4,830,000
2. Structural Works					0	0	0
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	113			0	22,520,000	22,520,000
- Embankment	sq.m	660,000	-	20	0	13,200,000	13,200,000
- Borrow pits	sq.m	466,000	-	20	0	9,320,000	9,320,000
Civil Works					0	117,313,212	117,313,212
Land Acquisition					0	22,520,000	22,520,000
Total					0	139,833,212	139,833,212

Summary of Project Cost

1 Civil Works		0	117,313,000	117,313,000
2 Administration	3% of (1)		3,519,000	3,519,000
3 Physical Contingency	25% of (1)	0	29,328,000	29,328,000
4 Engineering Cost	15% of (1+3)	0	21,996,000	21,996,000
5 Land Acquisition		0	22,520,000	22,520,000
6 Total		0	194,676,000	194,676,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	0	5,886,000	5,886,000
8 Capital Cost / ha NCA		0	5.106	5.106
9 O & M / ha NCA			154	154

Table 6.23 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (WHOLE UNIT OF FLOW AREA)

Planning Unit 13 : Atrai Right Bank (Flow area)

Option :-

Beneficial Area : 53,338 ha
NCA : 49,013 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	67,927,603	67,927,603
a) Embankment					0	2,492,532	2,492,532
- Clearing & stripping	sq.m	276,948	-	9	0	2,492,532	2,492,532
- Earth excavation & hauling (l=50m)	cu.m	918,859	-	46	0	42,267,514	42,267,514
- Compaction & shaping	cu.m	918,859	-	23	0	21,133,757	21,133,757
- Turfing	sq.m	406,760	-	5	0	2,033,800	2,033,800
b) Channel excavation					0	0	0
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					24,386,820	15,706,800	40,093,620
a) Regulators					5,410,000	2,910,000	8,320,000
- Site 1 :	vent	10	541,000	291,000	5,410,000	2,910,000	8,320,000
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment					208,500	504,000	712,500
- Brick mattress (t=200)	sq.m	1,500	139	336	208,500	504,000	712,500
d) Overflow weirs	l.m	110	33,800	51,000	3,718,000	5,610,000	9,328,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock					12,600,000	1,400,000	14,000,000
- Navigation lock of 2.5 m wide	nos	2	6,300,000	700,000	12,600,000	1,400,000	14,000,000
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement					2,450,320	5,282,800	7,733,120
- Bricks metalling (2 layer, t=140)	sq.m	22,480	109	235	2,450,320	5,282,800	7,733,120
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	41			0	8,252,000	8,252,000
- Embankment	sq.m	312,000	-	20	0	6,240,000	6,240,000
- Borrow pits	sq.m	100,600	-	20	0	2,012,000	2,012,000
Civil Works					24,386,820	83,634,403	108,021,223
Land Acquisition					0	8,252,000	8,252,000
Total					24,386,820	91,886,403	116,273,223

Summary of Project Cost

1 Civil Works		24,387,000	83,634,000	108,021,000
2 Administration	3% of (1)	-	3,241,000	3,241,000
3 Physical Contingency	25% of (1)	6,097,000	20,909,000	27,006,000
4 Engineering Cost	15% of (1+3)	4,573,000	15,881,000	20,254,000
5 Land Acquisition		-	8,252,000	8,252,000
6 Total		35,057,000	131,717,000	166,774,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	4,599,000	4,599,000
8 Capital Cost / ha NCA		715	2,687	3,402
9 O & M / ha NCA		-	94	94

Table 6.24 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-A UNIT, FLOW AREA)

Planning Unit 13 : Atral Right Bank (Polder-A unit, Flow area)

Option :-

Beneficial Area : 6,828 ha
NCA : 6,167 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	26,505,541	26,505,541
a) Embankment				9	0	1,069,020	1,069,020
- Clearing & stripping	sq.m	118,780	-	46	0	16,390,214	16,390,214
- Earth excavation & hauling (l=50m)	cu.m	356,309	-	23	0	8,195,107	8,195,107
- Compaction & shaping	cu.m	356,309	-	5	0	851,200	851,200
- Turfing	sq.m	170,240	-				
b) Channel excavation				46	0	0	0
- Excavation & disposal (l=50m)	cu.m	0	-				
					2,875,720	5,543,800	8,419,520
2. Structural Works							
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	30	33,800	51,000	1,014,000	1,530,000	2,544,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	17,080	109	235	1,861,720	4,013,800	5,875,520
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	9			0	1,702,000	1,702,000
- Embankment	sq.m	60,000	-	20	0	1,200,000	1,200,000
- Borrow pits	sq.m	25,100	-	20	0	502,000	502,000
					2,875,720	32,049,341	34,925,061
Civil Works					0	1,702,000	1,702,000
Land Acquisition					2,875,720	33,751,341	36,627,061
Total							

Summary of Project Cost

		2,876,000	32,049,000	34,925,000
1 Civil Works	3% of (1)	-	1,048,000	1,048,000
2 Administration	25% of (1)	719,000	8,012,000	8,731,000
3 Physical Contingency	15% of (1+3)	539,000	6,009,000	6,548,000
4 Engineering Cost		-	1,702,000	1,702,000
5 Land Acquisition		4,134,000	48,820,000	52,954,000
6 Total		-	1,578,000	1,578,000
7 O & M (5% of Earthwork and 3% of Structural Works Cost)		670	7,916	8,586
8 Capital Cost / ha NCA		-	256	256
9 O & M / ha NCA		-	-	-

Table 6.25 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-B UNIT, FLOW AREA)

Planning Unit 13 : Atrai Right Bank (Polder-B unit, Flow area)

Option :-

Beneficial Area : 2,820 ha
NCA : 2,583 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	4,528,522	4,528,522
a) Embankment							
- Clearing & stripping	sq.m	1,268	-	9	0	11,412	11,412
- Earth excavation & hauling (t=50m)	cu.m	64,690	-	46	0	2,975,740	2,975,740
- Compaction & shaping	cu.m	64,690	-	23	0	1,487,870	1,487,870
- Turfing	sq.m	10,700	-	5	0	53,500	53,500
b) Channel excavation							
- Excavation & disposal (t=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					676,000	1,020,000	1,696,000
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	20	33,800	51,000	676,000	1,020,000	1,696,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	7			0	1,340,000	1,340,000
- Embankment	sq.m	47,000	-	20	0	940,000	940,000
- Borrow pits	sq.m	20,000	-	20	0	400,000	400,000
Civil Works					676,000	5,548,522	6,224,522
Land Acquisition					0	1,340,000	1,340,000
Total					676,000	6,888,522	7,564,522

Summary of Project Cost

1 Civil Works		676,000	5,549,000	6,225,000
2 Administration	3% of (1)	-	187,000	187,000
3 Physical Contingency	25% of (1)	169,000	1,387,000	1,556,000
4 Engineering Cost	15% of (1+3)	127,000	1,040,000	1,167,000
5 Land Acquisition		-	1,340,000	1,340,000
6 Total		972,000	9,503,000	10,475,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	277,000	277,000
8 Capital Cost / ha NCA		376	3,679	4,055
9 O & M / ha NCA		-	107	107

Table 6.26 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-C UNIT, FLOW AREA)

Planning Unit 13 : Atral Right Bank (Polder-C unit, Flow area)

Option :-

Beneficial Area : 27,845 ha
NCA : 25,742 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	17,729,700	17,729,700
a) Embankment							
- Clearing & stripping	sq.m	51,900	-	9	0	467,100	467,100
- Earth excavation & hauling (l=50m)	cu.m	247,500	-	46	0	11,385,000	11,385,000
- Compaction & shaping	cu.m	247,500	-	23	0	5,692,500	5,692,500
- Turfing	sq.m	37,020	-	5	0	185,100	185,100
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
					15,216,600	5,729,000	20,945,600
2. Structural Works							
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	60	33,800	51,000	2,028,000	3,060,000	5,088,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	2	6,300,000	700,000	12,600,000	1,400,000	14,000,000
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	5,400	109	235	588,600	1,269,000	1,857,600
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	9			0	1,800,000	1,800,000
- Embankment	sq.m	90,000	-	20	0	1,800,000	1,800,000
- Borrow pits	sq.m	0	-	20	0	0	0
Civil Works					15,216,600	23,458,700	38,675,300
Land Acquisition					0	1,800,000	1,800,000
Total					15,216,600	25,258,700	40,475,300

Summary of Project Cost

1 Civil Works		15,217,000	23,459,000	38,678,000
2 Administration	3% of (1)	-	1,160,000	1,160,000
3 Physical Contingency	25% of (1)	3,804,000	5,865,000	9,669,000
4 Engineering Cost	15% of (1+3)	2,853,000	4,399,000	7,252,000
5 Land Acquisition		-	1,800,000	1,800,000
6 Total		21,874,000	36,683,000	58,557,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	1,515,000	1,515,000
8 Capital Cost / ha NCA		850	1,425	2,275
9 O & M / ha NCA		-	59	59

Table 6.27 IMPLEMENTATION COST OF PLANNING UNIT NO.13 (POLDER-D UNIT, FLOW AREA)

Planning Unit 13 : Atrai Right Bank (Polder-D unit, Flow area)

Option : -

Beneficial Area : 15,848 ha
NCA : 14,521 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	19,163,840	19,163,840
a) Embankment							
- Clearing & stripping	sq.m	105,000	-	9	0	945,000	945,000
- Earth excavation & hauling (t=50m)	cu.m	250,360	-	46	0	11,516,560	11,516,560
- Compaction & shaping	cu.m	250,360	-	23	0	5,758,280	5,758,280
- Turfing	sq.m	188,800	-	5	0	944,000	944,000
b) Channel excavation							
- Excavation & disposal (t=50m)	cu.m	0	-	46	0	0	0
					5,618,500	3,414,000	9,032,500
2. Structural Works							
a) Regulators							
- Site 1 :	vent	10	541,000	291,000	5,410,000	2,910,000	8,320,000
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	1,500	139	336	208,500	504,000	712,500
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	17			0	3,410,000	3,410,000
- Embankment	sq.m	115,000	-	20	0	2,300,000	2,300,000
- Borrow pits	sq.m	55,500	-	20	0	1,110,000	1,110,000
					5,618,500	22,577,840	28,196,340
Civil Works					0	3,410,000	3,410,000
Land Acquisition					5,618,500	25,987,840	31,606,340
Total							

Summary of Project Cost

1 Civil Works		5,619,000	22,578,000	28,197,000
2 Administration	3% of (1)		848,000	848,000
3 Physical Contingency	25% of (1)	1,405,000	5,645,000	7,050,000
4 Engineering Cost	15% of (1+3)	1,054,000	4,233,000	5,287,000
5 Land Acquisition			3,410,000	3,410,000
6 Total		8,078,000	36,712,000	44,790,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)		1,229,000	1,229,000
8 Capital Cost / ha NCA		556	2,528	3,084
9 O & M / ha NCA			85	85

Table 6.28 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (WHOLE UNIT OF CFD AREA)

Planning Unit 14 : Lower Bangali (CFD area)

Option :-

Beneficial Area : 63,068 ha
NCA : 54,882 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	224,347,071	224,347,071
a) Embankment							
- Clearing & stripping	sq.m	1,231,107	-	9	0	11,079,963	11,079,963
- Earth excavation & hauling (l=50m)	cu.m	2,926,577	-	46	0	134,622,542	134,622,542
- Compaction & shaping	cu.m	2,926,577	-	23	0	67,311,271	67,311,271
- Turfing	sq.m	1,346,659	-	5	0	6,733,295	6,733,295
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	100,000	-	46	0	4,600,000	4,600,000
2. Structural Works					32,110,880	29,635,200	61,746,080
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 3 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 4 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 5 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 6 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 7 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 8 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	68,320	109	235	7,446,880	16,055,200	23,502,080
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	46	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	233			0	46,816,000	46,816,000
- Embankment	sq.m	1,700,800		20	0	34,016,000	34,016,000
- Borrow pits	sq.m	630,000		20	0	12,600,000	12,600,000
Civil Works					32,110,880	253,982,271	286,093,151
Land Acquisition					0	46,816,000	46,816,000
Total					32,110,880	300,598,271	332,709,151

Summary of Project Cost

1 Civil Works		32,111,000	253,982,000	286,093,000
2 Administration	3% of (1)	-	8,583,000	8,583,000
3 Physical Contingency	25% of (1)	8,028,000	63,496,000	71,524,000
4 Engineering Cost	15% of (1+3)	6,021,000	47,822,000	53,843,000
5 Land Acquisition		-	46,816,000	46,816,000
6 Total		46,160,000	420,299,000	466,459,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	13,070,000	13,070,000
8 Capital Cost / ha NCA		841	7,658	8,499
9 O & M / ha NCA		-	238	238

Table 6.29 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (HURASAGAR-NORTH UNIT, CFD AREA)

Planning Unit 14 : Lower Bangali (Hurasagar-North unit, CFD area)

Option :-

Beneficial Area : 29,000 ha
NCA : 25,250 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	120,738,298	120,738,298
a) Embankment							
- Clearing & stripping	sq.m	848,852	-	9	0	7,639,668	7,639,668
- Earth excavation & hauling (l=50m)	cu.m	1,550,420	-	46	0	71,319,320	71,319,320
- Compaction & shaping	cu.m	1,550,420	-	23	0	35,659,660	35,659,660
- Turfing	sq.m	763,930	-	5	0	3,819,650	3,819,650
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	50,000	-	46	0	2,300,000	2,300,000
					9,008,000	4,960,000	13,968,000
2. Structural Works							
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 3 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (l=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, l=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (l=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (l=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	143			0	28,600,000	28,600,000
- Embankment	sq.m	1,100,000	-	20	0	22,000,000	22,000,000
- Borrow pits	sq.m	330,000	-	20	0	6,600,000	6,600,000
Civil Works					9,008,000	125,698,298	134,706,298
Land Acquisition					0	28,600,000	28,600,000
Total					9,008,000	154,298,298	163,306,298

Summary of Project Cost

1 Civil Works		9,008,000	125,698,000	134,706,000
2 Administration	3% of (1)	-	4,041,000	4,041,000
3 Physical Contingency	25% of (1)	2,252,000	31,425,000	33,677,000
4 Engineering Cost	15% of (1+3)	1,689,000	23,568,000	25,257,000
5 Land Acquisition		-	28,600,000	28,600,000
6 Total		12,949,000	213,332,000	226,281,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	6,458,000	6,458,000
8 Capital Cost / ha NCA		513	8,449	8,962
9 O & M / ha NCA		-	256	256

Table 6.30 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (HURASAGAR-SOUTH UNIT, CFD AREA)

Planning Unit 14 : Lower Bangali (Hurasagar-South unit, CFD area)

Option : -

Beneficial Area : 7,500 ha
NCA : 6,225 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)	
			Unit Cost		Amount			
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)		
1. Earthwork					0	27,209,835	27,209,835	
a) Embankment								
- Clearing & stripping	sq.m	16,210	-	9	0	145,890	145,890	
- Earth excavation & hauling (l=50m)	cu.m	385,000	-	46	0	17,710,000	17,710,000	
- Compaction & shaping	cu.m	385,000	-	23	0	8,855,000	8,855,000	
- Turfing	sq.m	99,789	-	5	0	498,945	498,945	
b) Channel excavation								
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0	
					11,774,880	18,383,200	30,158,080	
2. Structural Works								
a) Regulators								
- Site 1 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,856,000	
- Site 2 :	vent	0	0	0	0	0	0	
- Site 3 :	vent	0	0	0	0	0	0	
- Site 4 :	vent	0	0	0	0	0	0	
- Site 5 :	vent	0	0	0	0	0	0	
- Site 6 :	vent	0	0	0	0	0	0	
- Site 7 :	vent	0	0	0	0	0	0	
- Site 8 :	vent	0	0	0	0	0	0	
b) Groynes	l.m	0	29,000	39,000	0	0	0	
c) Revetment								
- Brick mattress (t=200)	sq.m	0	139	338	0	0	0	
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0	
e) Steel slide gate (1.0m x 1.6m)	nos	0	365,750	19,250	0	0	0	
f) Navigation lock								
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0	
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0	
g) Road pavement								
- Bricks metalling (2 layer, t=140)	sq.m	68,320	109	235	7,448,880	16,055,200	23,502,080	
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0	
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0	
- Asphalt pavement	sq.m	0	613	471	0	0	0	
3. Land Acquisition	ha	13			0	2,616,000	2,616,000	
- Embankment	sq.m	130,800	-	20	0	2,616,000	2,616,000	
- Borrow pits	sq.m	0	-	20	0	0	0	
					11,774,880	45,593,035	57,367,915	
Civil Works						0	2,616,000	2,616,000
Land Acquisition						11,774,880	48,209,035	59,983,915
Total								

Summary of Project Cost

1 Civil Works		11,775,000	45,593,000	57,368,000
2 Administration	3% of (1)	-	1,721,000	1,721,000
3 Physical Contingency	25% of (1)	2,944,000	11,398,000	14,342,000
4 Engineering Cost	15% of (1+3)	2,208,000	8,549,000	10,757,000
5 Land Acquisition		-	2,616,000	2,616,000
6 Total		16,927,000	69,877,000	86,804,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	2,285,000	2,285,000
8 Capital Cost / ha NCA		2,719	11,225	13,944
9 O & M / ha NCA		-	384	364

Table 6.31 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (SIRDUP UNIT, CFD AREA)

Planning Unit 14 : Lower Bangali (SIRDUP unit, CFD area)

Option :-

Beneficial Area : 20,568 ha
NCA : 23,407 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	76,398,938	76,398,938
a) Embankment							
- Clearing & stripping	sq.m	366,045	-	9	0	3,294,405	3,294,405
- Earth excavation & hauling (l=50m)	cu.m	991,157	-	46	0	45,593,222	45,593,222
- Compaction & shaping	cu.m	991,157	-	23	0	22,796,611	22,796,611
- Turfing	sq.m	482,940	-	5	0	2,414,700	2,414,700
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	50,000	-	46	0	2,300,000	2,300,000
2. Structural Works					11,328,000	6,292,000	17,620,000
a) Regulators							
- Site 1 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 2 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 3 :	vent	8	541,000	291,000	4,328,000	2,328,000	6,656,000
- Site 4 :	vent	2	668,000	409,000	1,336,000	818,000	2,154,000
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m ²	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	77			0	15,400,000	15,400,000
- Embankment	sq.m	470,000	-	20	0	9,400,000	9,400,000
- Borrow pits	sq.m	300,000	-	20	0	6,000,000	6,000,000
Civil Works					11,328,000	82,690,938	94,018,938
Land Acquisition					0	15,400,000	15,400,000
Total					11,328,000	98,090,938	109,418,938

Summary of Project Cost

1 Civil Works		11,328,000	82,691,000	94,019,000
2 Administration	3% of (1)	-	2,821,000	2,821,000
3 Physical Contingency	25% of (1)	2,832,000	20,673,000	23,505,000
4 Engineering Cost	15% of (1+3)	-	15,400,000	15,400,000
5 Land Acquisition		16,284,000	137,090,000	153,374,000
6 Total			4,349,000	4,349,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	698	5,857	6,553
8 Capital Cost / ha NCA			186	186
9 O & M / ha NCA				

Table 6.32 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (WHOLE UNIT OF FLOW AREA)

Planning Unit 14 : Lower Bangali (Flow area)

Option : -

Beneficial Area : 53,886 ha
NCA : 47,092 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	27,514,292	27,514,292
a) Embankment							
- Clearing & stripping	sq.m	17,260	-	9	0	155,340	155,340
- Earth excavation & hauling (l=50m)	cu.m	387,088	-	46	0	17,806,048	17,806,048
- Compaction & shaping	cu.m	387,088	-	23	0	8,903,024	8,903,024
- Turfing	sq.m	100,536	-	5	0	502,680	502,680
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	3,200	-	46	0	147,200	147,200
2. Structural Works					8,741,440	11,169,600	19,911,040
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groynes	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	10	33,800	51,000	338,000	510,000	848,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	34,160	109	235	3,723,440	8,027,600	11,751,040
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	13			0	2,616,000	2,616,000
- Embankment	sq.m	130,800	-	20	0	2,616,000	2,616,000
- Borrow pits	sq.m	0	-	20	0	0	0
Civil Works					8,741,440	38,683,892	47,425,332
Land Acquisition					0	2,616,000	2,616,000
Total					8,741,440	41,299,892	50,041,332

Summary of Project Cost

1 Civil Works		8,741,000	38,684,000	47,425,000
2 Administration	3% of (1)	-	1,423,000	1,423,000
3 Physical Contingency	25% of (1)	2,185,000	9,671,000	11,856,000
4 Engineering Cost	15% of (1+3)	1,639,000	7,253,000	8,892,000
5 Land Acquisition		-	2,616,000	2,616,000
6 Total		12,565,000	58,647,000	72,212,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	1,973,000	1,973,000
8 Capital Cost / ha NCA		267	1,267	1,534
9 O & M / ha NCA		-	42	42

Table 6.33 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (HURASAGAR-SOUTH UNIT, FLOW AREA)

Planning Unit 14 : Lower Bangali (Hurasagar-South unit, Flow area)

Option : -

Beneficial Area : 7,500 ha
NCA : 6,225 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	27,209,820	27,209,820
a) Embankment							
- Clearing & stripping	sq.m	16,210	-	9	0	145,890	145,890
- Earth excavation & hauling (l=50m)	cu.m	385,000	-	46	0	17,710,000	17,710,000
- Compaction & shaping	cu.m	385,000	-	23	0	8,855,000	8,855,000
- Turfing	sq.m	99,786	-	5	0	498,930	498,930
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	0	-	46	0	0	0
2. Structural Works					8,741,440	11,169,600	19,911,040
a) Regulators							
- Site 1 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 2 :	vent	4	585,000	329,000	2,340,000	1,316,000	3,656,000
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	10	33,800	51,000	338,000	510,000	848,000
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m	34,160	109	235	3,723,440	8,027,600	11,751,040
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	13			0	2,616,000	2,616,000
- Embankment	sq.m	130,800	-	20	0	2,616,000	2,616,000
- Borrow pits	sq.m	0	-	20	0	0	0
Civil Works					8,741,440	38,379,420	47,120,860
Land Acquisition					0	2,616,000	2,616,000
Total					8,741,440	40,995,420	49,736,860

Summary of Project Cost

1 Civil Works		8,741,000	38,379,000	47,120,000
2 Administration	3% of (1)	-	1,414,000	1,414,000
3 Physical Contingency	25% of (1)	2,185,000	8,595,000	11,780,000
4 Engineering Cost	15% of (1+3)	1,639,000	7,198,000	8,835,000
5 Land Acquisition		-	2,616,000	2,616,000
6 Total		12,585,000	69,200,000	71,765,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	1,958,000	1,958,000
8 Capital Cost / ha NCA		2,018	9,510	11,528
9 O & M / ha NCA		-	315	315

Table 6.34 IMPLEMENTATION COST OF PLANNING UNIT NO.14 (SIRDP UNIT, FLOW AREA)

Planning Unit 14 : Lower Bangali (SIRDP unit, Flow area)

Option : -

Beneficial Area : 46,386 ha
NCA : 40,867 ha

Work Item	Unit	Quantity	(Manual)				Total (TK)
			Unit Cost		Amount		
			F.C (TK)	L.C (TK)	F.C (TK)	L.C (TK)	
1. Earthwork					0	304,472	304,472
a) Embankment							
- Clearing & stripping	sq.m	1,050	-	9	0	9,450	9,450
- Earth excavation & hauling (l=50m)	cu.m	2,088	-	46	0	96,048	96,048
- Compaction & shaping	cu.m	2,088	-	23	0	48,024	48,024
- Turfing	sq.m	750	-	5	0	3,750	3,750
b) Channel excavation							
- Excavation & disposal (l=50m)	cu.m	3,200	-	46	0	147,200	147,200
2. Structural Works					0	0	0
a) Regulators							
- Site 1 :	vent	0	0	0	0	0	0
- Site 2 :	vent	0	0	0	0	0	0
- Site 3 :	vent	0	0	0	0	0	0
- Site 4 :	vent	0	0	0	0	0	0
- Site 5 :	vent	0	0	0	0	0	0
- Site 6 :	vent	0	0	0	0	0	0
- Site 7 :	vent	0	0	0	0	0	0
- Site 8 :	vent	0	0	0	0	0	0
b) Groyne	l.m	0	29,000	39,000	0	0	0
c) Revetment							
- Brick mattress (t=200)	sq.m	0	139	336	0	0	0
d) Overflow weirs	l.m	0	33,800	51,000	0	0	0
e) Steel slide gate (1.9m x 1.6m)	nos	0	365,750	19,250	0	0	0
f) Navigation lock							
- Navigation lock of 2.5 m wide	nos	0	6,300,000	700,000	0	0	0
- Navigation lock of 4.0 m wide	nos	0	8,100,000	900,000	0	0	0
g) Road pavement							
- Bricks metalling (2 layer, t=140)	sq.m ²	0	109	235	0	0	0
- Brick chips metalling (t=250)	cu.m	0	191	999	0	0	0
- Brick chips metalling (t=250)	sq.m	0	48	250	0	0	0
- Asphalt pavement	sq.m	0	613	471	0	0	0
3. Land Acquisition	ha	0			0	0	0
- Embankment	sq.m	0	-	20	0	0	0
- Borrow pits	sq.m	0	-	20	0	0	0
Civil Works					0	304,472	304,472
Land Acquisition					0	0	0
Total					0	304,472	304,472

Summary of Project Cost

1 Civil Works		0	304,000	304,000
2 Administration	3% of (1)	-	9,000	9,000
3 Physical Contingency	25% of (1)	0	78,000	78,000
4 Engineering Cost	15% of (1+3)	-	57,000	57,000
5 Land Acquisition		0	0	0
6 Total		0	448,000	448,000
7 O & M	(5% of Earthwork and 3% of Structural Works Cost)	-	15,000	15,000
8 Capital Cost / ha NCA		0	11	11
9 O & M / ha NCA		-	0	0

