

APPENDIX X

**IMPLEMENTATION SCHEDULE
AND
COST ESTIMATE**

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IMPLEMENTATION SCHEDULE AND COST ESTIMATE

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1. UNIT PRICE

- (1) UNIT PRICE OF MATERIALS
- (2) UNIT PRICE OF LABOR
- (3) UNIT PRICE OF CIVIL WORKS
- (4) UNIT PRICE OF INLAND TRANSPORTATION

Table X - 1 - 1

UNIT PRICE OF MATERIALS

<u>Materials</u>	<u>Component (%)</u>			<u>Unit Price (Tk)</u>		
	<u>Local</u>	<u>Foreign</u>	<u>Unit</u>	<u>L/C</u>	<u>F/C</u>	<u>Total</u>
1. Brick (1st class)	100	0	1,000Nos	1,650	0	1,650
Brick (2nd class)	100	0	1,000Nos	1,430	0	1,430
Brick (3rd class)	100	0	1,000Nos	880	0	880
Brick bats of Picked Jhama and 1st class break	100	0	m ³	500	0	500
2. Cement	25	75	per bag (50kg)	32	93	125
3. Sand						
Local sand (Min. FM 1.00)	100	0	m ³	120	0	120
Local coarse sand (F.M more than 1.50) (For ordinary concrete)	100	0	m ³	240	0	240
Coarse sand (Sylhet or equivalent) (FM 2.90 min.)	100	0	m ³	700	0	700
4. Stone shignles/gravels						
to stone	100	0	m ³	1,060	0	1,060
to 3" shingles	100	0	m ³	1,130	0	1,130
3" and above gravels	100	0	m ³	1,130	0	1,130
5. M.S. Plate (3mm to 6mm thick)	40	60	Ton	10,000	14,900	24,900
6. M.S. Rod (Plain)	40	60	Ton	6,300	9,500	15,800
M.S. Rod (Deformed)	40	60	Ton	7,100	10,700	17,800
7. Steel Sheet Piles	0	100	Ton	0	34,100	34,100
8. R.C. Pile L=12.0m	60	40	1 No.	2,700	1,800	4,500
9. 12 S.W.G. Hexagonal wire netting 100 mm mesh	40	60	m ²	20	30	50

Source : Schedule of Rates for Rajshahi Circle (1986)
Schedule of Rates for Pabna IRD Project (1987)

Table X - 1 - 2

UNIT PRICE OF LABOUR

<u>Description</u>	<u>Unit Price (TK/day)</u> (8 hours per day)
- Skilled Labour	37
- Unskilled Labour	31
- Head Mason	66
- Mason	55
- Head Carpenter	66
- Carpenter	55
- Painter	55
- Plumber	55
- Fitter	44
- Blacksmith	55
- Electrician	55
- Welder	39
- Thatcher	66
- Head Rod Mistry	55
- Rod Mistry	55
- Serang	66
- Assistant Serang	55
- Supervisor	44
- Assistant Supervisor	44
- Typist	44
- Work Assistant	44
- Driver	44
- Pump Operator	44

Source : Schedule of Rate for Rajshahi Circle, 1986

Table X - 1 - 3

UNIT PRICE OF CIVIL WORKS

<u>Description</u>	<u>Unit Price (Tk)</u>			
	<u>Unit</u>	<u>L/C</u>	<u>F/C</u>	<u>Total</u>
1. Earth Work				
a. Stripping				
- Manual	m ²	0.3		0.3
- Machine	m ²	0.6		0.6
b. Excavation (Canal)				
- Type A	m ³	15		15
- Type B	m ³	19		19
c. Excavation (Pump Station)				
- Type C 1/	m ³	5	13	18
- Type D 2/	m ³	14	35	49
d. Embankment				
- Type A 3/	m ³	20	6	26
- Type B	m ³	23	6	29
e. Compacting (Mechanical)	m ³	3	7	10
f. Backfilling (Structure)	m ³	16		16
g. Turfing	m ²	3		3
2. Concrete for Major Structure				
4/				
a. Type A	m ³	2,720	1,530	4,250
b. Type B	m ³	1,950	560	2,510
3. Concrete for Minor Structure				
4/				
a. Type C	m ³	2,300	1,320	3,620
b. Type D	m ³	1,040	570	1,610
4. Brick Work				
a. 1st Class Brick	m ³	1,280	-	1,280
b. 2nd Class Brick	m ³	1,070	-	1,070

Note : 1/ By Bulldozer down to 3.0m from ground level
 2/ By Dragline and Dump Truck below 3.0 from ground level.
 3/ By Mechanical compaction
 4/ Including M.S. reinforced bars and forms

Table X - 1 - 4

UNIT PRICE OF INLAND TRANSPORTATION

1. By Truck ^{1/}	
	Tk 5,170 / 8 ton
a. Chittagong to Dhaka	Tk <u>3,432</u> / 8 ton
Dhaka to Rajshahi	Tk 8,602 / 8 ton
	Unit price ; 8,602 : 8 = 1,075 Tk/ton
b. Mongla to Khulna	Tk 1,760 / 8 ton
Khulna to Rajshahi	Tk 3,780 / 8 ton
Ferry	Tk <u>124</u>
	Tk 5,664 / 8 ton
	Unit price ; 5,664 : 8 = 708 Tk/ton
2. By Railway ^{2/}	
a. Chittagong to Rajshahi	Tk 790 / ton
b. Khulna to Rajshahi	Tk 450 / ton

Price will be less if open wagon (22 ton) is used.

Source : 1/ Bangladesh Road Transportation Cooperation

2/ Booking Office in Rajshahi Railway Station

2. BILL OF QUANTITY

- (1) PUMPING STATION
- (2) IRRIGATION FACILITIES
- (3) DRAINAGE FACILITIES
- (4) ROAD AND BRIDGE
- (5) ON-FARM DEVELOPMENT

Table X-2-1

Bill of QuantityI Pumping Station
(1) Baraipara

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>	
1. Pumping Station				
a. Main Pump	Ø 1,350 Vertical Mixed Flow Type	Nos	4	
	Main Pump	Ø 1,650 Vertical Mixed Flow Type	Nos	4
b. Motor	2,390Kw × 20P	Nos	4	
	Motor	1,460Kw × 16P	Nos	4
c. Valve	Ø 1,350 Butterfly	Nos	4	
	Valve	Ø 1,650 Butterfly	Nos	4
	Valve	Ø 1,350 Check	Nos	4
	Valve	Ø 1,650 Check	Nos	4
d. Pipe	Ø 1,350 15m	Nos	4	
	Pipe	Ø 1,650 15m	Nos	4
e. Crane	span 75m, 60m long	Nos	1	
f. Screen		Nos	1	
g. Switch Board		Nos	1	
2. Supporting Structure				
a. Earth work	Excavation	m ³	626,943	
	Embankment	m ³	24,493	
	Backfilling	m ³	25,289	
b. R.C Concrete		m ³	7,682	
c. R.C Pile	400 × 400 × 12,000	Nos	234	
	400 × 400 × 14,000	Nos	168	
d. Steel Sheet Pile	II - type	m ²	1,043	
e. Brick Protection		m ²	25,987	
3. Pipeline				
a. Pipe Steel	Ø 2,000 × 2	m	2,800	
	Pipe Steel	Ø 1,800 × 4	m	5,600

(continued)

(2) Kasba

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>
1. Pumping Station			
a. Main Pump	Ø 1,000 Vertical Mixed Flow Type	Nos	2
	Main Pump Ø 1,350 Vertical Mixed Flow Type	Nos	1
b. Motor	720Kw × 16P	Nos	2
	Motor 370Kw × 16P	Nos	1
c. Valve	Ø 1,000 Butterfly	Nos	2
	Valve Ø 1,350 Butterfly	Nos	1
	Valve Ø 1,000 Check	Nos	2
	Valve Ø 1,350 Check	Nos	1
d. Pipe	Ø 1,200 15m	Nos	2
	Pipe Ø 1,350 15m	Nos	1
e. Crane	span 14m, 25m long	Nos	1
f. Screen		Nos	1
g. Switch Board		Nos	1
2. Supporting Structure			
a. Earth work	Excavation	m ³	167,526
	Embankment	m ³	28,849
	Backfilling	m ³	33,635
b. R.C Concrete		m ³	3,071
c. R.C Pile	400 × 400 × 13,000	Nos	77
	400 × 400 × 15,000	Nos	66
	300 × 300 × 15,000	Nos	51
d. Steel Sheet Pile	II - type	m ²	550
e. Brick Protection		m ²	14,507

(continued)

II Irrigation Facilities
(1) Barind Area

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>
1. Irrigation Canal			
a. Length			
- Main		m	48,770
- Secondary		m	159,660
- Sub-secondary		m	285,470
b. Earth work			
- Excavation		m ³	6,677,769
- Embankment		m ³	4,722,859
2. Bifurcation			
a. A - 1 Type	Gate 4.0m × 2.3m × 2Nos	Nos	2
b. A - 2 Type	Gate 3.0m × 2.0m × 2Nos	Nos	2
c. A - 3 Type	Gate 2.0m × 1.65m × 2Nos	Nos	-
d. A - 4 Type	Gate 1.5m × 1.2m × 2Nos	Nos	-
e. B - 1 Type	Gate 2.0m × 2.3m × 1Nos	Nos	1
f. B - 2 Type	Gate 1.5m × 2.0m × 1Nos	Nos	2
g. B - 3 Type	Gate 1.0m × 1.5m × 1Nos	Nos	7
h. C Type	Ø 900	Nos	37
i. Farmturont	Ø 600	Nos	88
3. Check Gate			
a. Type - A	Gate 3.5m × 3.9m × 4Nos	Nos	1
b. Type - B	Gate 3.0m × 3.8m × 4Nos	Nos	1
4. Siphon			
a. S - 1		m	160
b. S - 2		m	240
5. Chute			
a. S - 1	H=1.0m B=2.5m	Nos	1
b. S - 2	H=2.0m B=8.5m	Nos	1
6. Vertical Drop			
a. D - 1	H=1.0m	Nos	64
b. D - 2	H=1.5m	Nos	1
c. D - 3	H=2.0m X-9	Nos	81

(continued)

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>
7. Culvert			
a. C - 1		Nos	1
b. C - 2		Nos	1
c. C - 3		Nos	1
8. Overchute			
a. O - 1		Nos	10
9. Duble Orfice			
a. D - 1	for 0.5m ³ /s	Nos	7
b. D - 2	for 1.0m ³ /s	Nos	3
(2) Flood Plain Area			
1. Irrigation Canal			
a. Length		m	13,908
- Main		m	62,800
- Secondary		m	18,790
- Sub-secondary			
b. Earth work			
- Excavation		m ³	138,708
- Embankment		m ³	1,290,845
2. Bifurcation			
a. A-3 Type	Gate 2.0m × 1.65m × 2Nos	Nos	2
b. A-4 Type	Gate 1.5m × 1.2m × 2Nos	Nos	2
c. B-2 Type	Gate 1.5m × 2.0m × 1Nos	Nos	2
d. C Type	Ø 900	Nos	4
e. Farm turnout	Ø 600	Nos	7
3. Check Gate			
a. B Type	Gate 3.0m × 3.9m × 4Nos	Nos	1
4. Siphon			
a. S-3	H=1.0m	m	300

(continued)

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>
5. Aqueduct			
a. A - 1		Nos	3
6. Overchute			
a. D - 1	H=1.0m	Nos	1
 III Drainage Facilities			
(1) Barind Area			
1. Drainage			
a. Length		m	12,000
b. Earth work		m ³	960,000
(2) Flood Plain Area			
1. Drainage			
a. Length		m	31,600
b. Earth work	excavation	m ³	2,001,395
2. Regulator			
a. A - 1 Type	Gate 3.0m × 5.0m × 10Nos	Nos	2
b. A - 2 Type	Gate 3.0m × 3.0m × 10Nos	Nos	1
c. B Type	Gate 3.0m × 3.0m × 10Nos	Nos	1
3. Railway Bridge			
a. III - 1		Nos	8
4. Farm Bridge			
a. A		Nos	7
b. B		Nos	8
 IV Road and Bridge			
1. Road			
a. Trunk	Asphalt 3.66m	m	5,000
b. Mainterance			
- Main	Herring bone bond	m	13,908
- Secondary	Herring bone bond	m	62,800

(continued)

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Q'ty</u>
2. Bridge			
a. II - 1 Type		Nos	2
b. II - 2 Type		Nos	2
3. Railway Bridge			
a. II - 1		Nos	1
V On-Farm Development			
1. Sample Area (A)			
a. Area		ha	119
b. Canal			
- Tertiary		m	3,570
- Farm Ditch		m	9,282
- Farm Drain		m	4,760
c. Farm Turnout		Nos	8
d. Total Applied Area		ha	7,942
2. Sample Area (B)			
a. Area		ha	181
b. Canal			
- Tertiary		m	2,353
- Farm Ditch		m	10,679
- Farm Drain		m	5,611
c. Farm Turnout		Nos	3
d. Total Applied Area		ha	17,247
3. Sample Area (C)			
a. Area		ha	191
b. Canal			
- Tertiary		m	3,438
- Farm Ditch		m	3,438
- Farm Drain		m	6,876
c. Farm Turnout		Nos	3
d. Total Applied Area		ha	17,011

(continued)

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Qty</u>
4. Sample Area (D)			
a. Area		ha	138
b. Canal			
- Tertiary		m	4,416
- Farm Ditch		m	4,554
- Farm Drain		m	6,072
c. Farm Turnout		Nos	6
d. Total Applied Area		ha	9,000

3. SUMMARY OF COST

- (1) SUMMARY OF PROJECT COST
- (2) SUMMARY OF PROJECT COST
- (3) SUMMARY OF PROJECT COST
- (4) SUMMARY OF BARAIPARA PUMPING STATION COST
- (5) SUMMARY OF KASBA PUMPING STATION COST
- (6) SUMMARY OF IRRIGATION FACILITIES COST
- (7) SUMMARY OF DRAINAGE FACILITIES COST
- (8) SUMMARY OF ROAD AND BRIDGE COST
- (9) SUMMARY OF ON-FARM DEVELOPMENT COST
- (10) SUMMARY OF CONSTRUCTION MACHINES
- (11) SUMMARY OF AGRICULTURAL SUPPORTING SERVICE
- (12) SUMMARY OF CONSULTING SERVICE
- (13) SUMMARY OF LAND ACQUISITION COST
- (14) SUMMARY OF PROJECT ADMINISTRATION COST

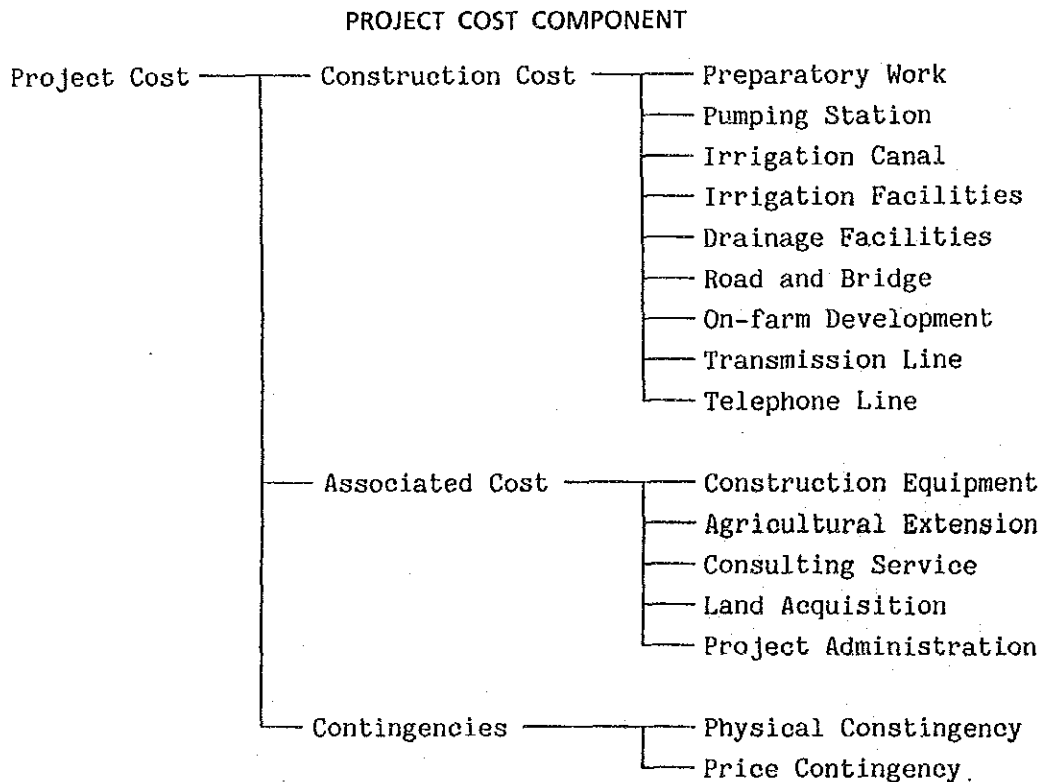


Table X-3-1

Summary of Project Cost

Description	Cost			unit ; ×1,000TK
	F/C	L/C	Tax	
1. Pumping station				
- Baraipara	1,146,072	145,829	455,846	1,747,747
- Kasba	256,815	37,210	116,190	410,215
Sub - total	<u>1,402,887</u>	<u>183,039</u>	<u>572,036</u>	<u>2,157,962</u>
2. Irrigation Canal				
- Barind Area	28,337	207,979	-	236,316
- Flood Plain	7,745	27,896	-	35,641
Sub - total	<u>36,082</u>	<u>235,875</u>	<u>-</u>	<u>271,957</u>
3. Irrigation Facilities				
- Barind Area	39,830	43,779	-	83,609
- Flood Plain	15,068	13,549	-	28,617
Sub - total	<u>54,898</u>	<u>57,328</u>	<u>-</u>	<u>112,226</u>
4. Drainage Facilities				
- Barind Area	-	15,360	-	15,360
- Flood Plain	89,810	98,805	-	188,615
Sub - total	<u>89,810</u>	<u>114,165</u>	<u>-</u>	<u>203,975</u>
5. Road and Bridge				
- Barind Area	10,463	162,944	-	173,407
- Flood Plain	3,655	59,779	-	63,434
Sub - total	<u>14,118</u>	<u>222,723</u>	<u>-</u>	<u>236,841</u>
6. On - Farm				
- Barind Area	-	56,371	-	56,371
- Flood Plain	-	14,292	-	14,292
Sub - total	<u>-</u>	<u>70,663</u>	<u>-</u>	<u>70,663</u>
7. Transmission Line				
- Barind Area	35,553	4,797	17,776	58,126
- Flood Plain	11,152	1,968	5,576	18,696
Sub - total	<u>46,705</u>	<u>6,765</u>	<u>23,352</u>	<u>76,822</u>

Description	Cost		unit ; ×1,000TK	
	F/C	L/C	Tax	Total
8. Telephone Line				
- Barind Area	90	360	-	450
- Flood Plain	150	600	-	750
Sub - total	<u>240</u>	<u>960</u>	-	<u>1,200</u>
9. Construction				
Equipment	<u>102,363</u>	<u>5,473</u>	<u>51,402</u>	<u>159,238</u>
10. Agricultural				
Extension	<u>11,900</u>	<u>12,190</u>	<u>5,400</u>	<u>29,490</u>
11. Consulting				
Service	<u>190,938</u>	<u>38,016</u>	-	<u>228,954</u>
Total	<u>1,949,941</u>	<u>947,197</u>	<u>652,190</u>	<u>3,549,328</u>
12. Land Acquisition				
- Barind Area	-	194,145	-	194,145
- Flood Plain	-	28,730	-	28,730
Sub - total	-	<u>222,875</u>	-	<u>222,875</u>
13. Administration				
- Administration	4,332	27,987	2,166	34,485
- Overhead (5%)	-	46,655	-	46,655
Sub - total	<u>4,332</u>	<u>74,642</u>	<u>2,166</u>	<u>81,140</u>
Total	1,954,273	1,244,714	654,356	3,853,345
14. Physical	256,623	170,500	98,153	525,276
Contingency				
Total	<u>2,210,896</u>	<u>1,415,214</u>	<u>752,509</u>	<u>4,378,619</u>
15. Price Escalation	140,312	407,903	56,307	604,522
16. Grand Total	<u>2,351,208</u>	<u>1,823,117</u>	<u>808,816</u>	<u>4,983,141</u>

Table X-3-2

Summary of Area-wise Project Cost

(1) Barind Area

Description	Cost			unit ; ×1,000TK
	F/C	L/C	Tax	
1. Pumping Station	1,146,072	145,829	455,846	1,747,747
2. Irrigation Canal	28,337	207,979	--	236,316
3. Irrigation Facilities	39,830	43,779	--	83,609
4. Drainage Facilities	--	15,360	--	15,360
5. Road and Bridge	10,463	162,944	--	173,407
6. On Farm	--	56,371	--	56,371
7. Transmission Line	35,553	4,797	17,776	58,126
8. Telephone Line	90	360	--	450
9. Construction Equipment	84,369	4,510	42,366	131,245
10. Agricultural Extension	9,805	10,044	4,449	24,298
11. Consulting Service	156,569	31,173	--	187,742
sub - total	<u>1,511,088</u>	<u>683,146</u>	<u>520,437</u>	<u>2,714,671</u>
12. Land Aquisition	--	194,145	--	194,145
13. Administration	3,569	61,505	1,784	66,858
sub - total	<u>1,574,657</u>	<u>938,796</u>	<u>522,221</u>	<u>2,975,674</u>
14. Physical contingency (15%)	197,986	124,530	78,333	400,849
sub - total	<u>1,712,643</u>	<u>1,063,326</u>	<u>600,554</u>	<u>3,376,523</u>
15. Price Escalation	108,690	306,479	44,936	460,105
16. Grand Total	<u>1,821,333</u>	<u>1,369,805</u>	<u>645,490</u>	<u>3,836,628</u>

(2) Flood Plain Area

1. Pumping Station	256,815	37,210	116,190	410,215
2. Irrigation Canal	7,745	27,896	--	35,641
3. Irrigation Facilities	15,068	13,549	--	28,617
4. Drainage Facilities	89,810	98,805	--	188,615
5. Road and Bridge	3,655	59,779	--	63,434
6. On-farm	--	14,292	--	14,292
7. Transmission Line	11,152	1,968	5,576	18,696
8. Telephone Line	150	600	--	750
9. Construction Equipment	17,994	963	9,036	27,993
10. Agricultural Extension	2,095	2,146	951	5,192
11. Consulting Service	34,369	6,843	--	41,212
sub - total	<u>438,853</u>	<u>264,051</u>	<u>131,753</u>	<u>834,657</u>

Table X-3-3

Summary of Project Cost

Description	Cost			unit ; ×1,000TK
	F/C	L/C	Tax	Total
12. Land Aquisition	—	28,730	—	28,730
13. Administration	763	13,137	382	14,282
sub - total	439,616	305,918	132,135	877,669
14. Physical Contingency	58,637	45,970	19,820	124,427
sub - total	498,253	351,888	151,955	1,002,096
15. Price Escalation	31,622	101,424	11,371	144,417
16. Grand Total	529,875	453,312	163,326	1,146,513

Table X - 3 - 4 Summary of Baraipara Pump Station Cost

unit ; 1,000Tk

<u>Description</u>	<u>F/C</u> (C·I·F)	<u>L/C</u>	<u>Tax</u>	<u>Total</u>
1. Pump Facilities				
a. Pump 1,650 × 4	132,000	6,600	52,800	191,400
Pump 1,350 × 4	92,800	4,640	37,120	134,560
b. Motor 2,390Kw × 4	172,000	8,600	86,000	266,600
Motor 1,460Kw × 4	72,000	3,600	36,000	111,600
c. Valves	37,600	1,880	18,800	58,280
d. Pipes	23,600	1,180	11,800	36,580
e. Crane	12,200	610	6,100	18,910
f. Screen	36,600	1,830	18,300	56,730
g. Electric Board and others	46,000	2,300	23,000	71,300
<u>Sub-total</u>	<u>624,800</u>	<u>31,240</u>	<u>289,920</u>	<u>945,960</u>
3. Installation	71,400	17,800	-	89,200
4. Supporting Structure				
a. Earth work	18,181	6,896	-	25,077
b. R.C concrete	11,753	20,895	-	32,648
c. R.C pile	1,485	2,229	-	3,714
d. Steel Sheet Pile	23,707	-	<u>16,594</u>	40,301
e. Brick Protection	-	10,394	-	10,394
f. Preparation(15%)	8,268	6,062	-	14,330
<u>Sub-total</u>	<u>63,394</u>	<u>46,476</u>	<u>16,594</u>	<u>126,464</u>
5. Pile line				
a. Civil	2,063	2,293	-	4,356
b. Pipe Material	298,664	-	149,332	447,996
c. Pipe Installation	69,250	29,678	-	98,928
d. Preparation (15%)	10,696	4,795	-	15,491
<u>Sub-total</u>	<u>380,673</u>	<u>36,766</u>	<u>149,332</u>	<u>566,771</u>
6. Building Work				
a. Building	5,805	13,547	-	19,352
<u>Sub-total</u>	<u>5,805</u>	<u>13,547</u>	<u>-</u>	<u>19,352</u>
<u>Total</u>	<u>1,146,072</u>	<u>145,829</u>	<u>455,849</u>	<u>1,747,747</u>

Table X - 3 - 5

Summary of Kasba Pump Station Cost

	unit ; 1,000Tk			
<u>Description</u>	<u>F/C</u> (C·I·F)	<u>L/C</u>	<u>Tax</u>	<u>Total</u>
1. Pump Facilities				
a. Pump 1,350 × 1	33,000	1,650	13,200	47,850
Pump 1,000 × 2	33,400	1,670	13,360	48,430
b. Motor 720Kw × 4	21,600	1,080	10,800	33,480
Motor 370Kw × 4	21,500	1,075	10,750	33,325
c. Valves	15,100	755	7,550	23,405
d. Pipes	23,100	1,155	11,550	35,805
e. Crane	5,600	280	2,800	8,680
f. Screen	11,800	590	5,900	18,290
g. Electric Board and others	30,900	1,545	30,900	30,900
<u>Sub-total</u>	<u>196,000</u>	<u>9,800</u>	<u>106,810</u>	<u>312,610</u>
2. Installation	<u>27,900</u>	<u>6,975</u>	<u>—</u>	<u>34,875</u>
3. Supporting Structure				
a. Earth work	5,032	2,956	—	7,988
b. R.C concrete	4,667	8,353	—	13,020
c. R.C pile	614	920	—	1,534
d. Sheet piling	12,507	—	9,380	21,887
e. Brick Protection	5,802	—	—	5,802
f. Preparation(15%)	4,293	1,834	—	6,127
<u>Sub-total</u>	<u>32,915</u>	<u>14,063</u>	<u>9,380</u>	<u>56,358</u>
4. Building Work	<u>—</u>	<u>6,372</u>	<u>—</u>	<u>6,372</u>
<u>Total</u>	<u>256,815</u>	<u>37,210</u>	<u>116,190</u>	<u>410,215</u>

Table X - 3 - 6 Summary of Irrigation Facilities Cost

(1) Barind Area

<u>Work item</u>	<u>Cost (unit : 1,000TK)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Irrigation Canal	28,337	207,979	236,316
2. Bifurcation	11,400	11,673	23,073
3. Check Gate	16,873	11,647	28,520
4. Siphon	6,624	11,720	18,344
5. Aqueduct	-	-	-
6. Chute	343	598	941
7. Vertical Drop	195	329	524
8. Culvert	3,868	6,890	1,0758
9. Wasteway	-	-	-
10. Overchute	480	840	1,320
11. Double Orfice	47	82	129
<u>Total</u>	<u>68,167</u>	<u>251,758</u>	<u>319,925</u>

(2) Flood Plain Area

<u>Work item</u>	<u>Cost (unit : 1,000TK)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Irrigation Canal	7,745	27,896	35,641
2. Bifurcation	5,247	4,449	9,696
3. Check Gate	8,074	5,562	13,636
4. Siphon	1,290	2,340	3,630
5. Aqueduct	456	1,197	1,653
6. Chute	-	-	-
7. Vertical Drop	1.0	1.7	2.7
8. Culvert	-	-	-
9. Wasteway	-	-	-
10. Overchute	-	-	-
11. Double Orfice	-	-	-
<u>Total</u>	<u>22,813</u>	<u>41,445</u>	<u>64,258</u>

Table X-3-7

Summary of Drainage Facilities Cost

(1) Barind Area

<u>Work item</u>	<u>Cost (unit ; 1,000Tk)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Drainage	—	15,360	15,360

(2) Flood Plain

<u>Work item</u>	<u>Cost (unit ; 1,000Tk)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Drainage	—	32,022	32,022
2. Regulator	89,810	66,783	156,593
<u>Total</u>	<u>89,810</u>	<u>98,805</u>	<u>188,615</u>

Table X-3-8

Summary of Road Bridge Cost

(1) Barind Area

<u>Work item</u>	<u>Cost (unit ; 1,000Tk)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Road	5,190	153,842	159,032
2. Bridge	2,495	4,438	6,933
3. Railway Bridge	2,271	2,880	5,152
4. Farm Bridge	506	1,784	2,290
<u>Total</u>	<u>10,463</u>	<u>162,944</u>	<u>173,407</u>

(2) Flood Plain Area

<u>Work item</u>	<u>Cost (unit ; 1,000Tk)</u>		
	<u>F/C</u>	<u>L/C</u>	<u>Total</u>
1. Road	2,595	58,211	60,806
2. Bridge	492	848	1,340
3. Railway Bridge	568	720	1,288
4. Farm Bridge	—	—	—
<u>Total</u>	<u>3,655</u>	<u>59,779</u>	<u>63,434</u>

Table X-3-9

Summary of On-Farm Development Cost

(1) Barind Area

<u>Item</u>	<u>Calculation</u>	<u>F/C</u>	<u>Cost (unit ; 1,000Tk)</u>	
			<u>L/C</u>	<u>Total</u>
1. Sample A	2,218Tk × 8,735 ha	-	19,374	19,374
2. Sample B	1,075Tk × 17,725ha	-	19,054	19,054
3. Sample C	1,140Tk × 15,740ha	-	17,943	17,943
<u>Total</u>			<u>56,371</u>	<u>56,371</u>

(2) Flood Plain Area

<u>Item</u>	<u>Calculation</u>	<u>F/C</u>	<u>Cost (unit ; 1,000Tk)</u>	
			<u>L/C</u>	<u>Total</u>
1. Sample D	1,588Tk × 9,000ha	-	14,292	14,292
<u>Total</u>			<u>14,292</u>	<u>14,292</u>

Table X-3-10

Summary of Construction Machines

<u>Description</u>	<u>F/C</u>	<u>L/C</u>	<u>Amount(× 1,000 Tk)</u>	
			<u>Tax</u>	<u>Total</u>
1. Construction Machines	102,363	5,473	51,402	159,238

Table X-3-11

Summary of Agricultural Supporting Service

<u>Description</u>	<u>F/C</u>	<u>L/C</u>	<u>Amount(× 1,000 Tk)</u>	
			<u>Tax</u>	<u>Total</u>
1. Buildings	-	10,440	-	10,440
2. Equipments	5,700	-	2,850	8,550
3. Vehicle	5,120	-	2,550	7,670
4. Pilot Farm	-	150	-	150
5. Miscellaneous	1,080	1,600	-	2,680
<u>Total</u>	<u>11,900</u>	<u>12,190</u>	<u>5,400</u>	<u>29,490</u>

Table X-3-12

Summary of Consulting Service

<u>Description</u>	<u>F/C</u>	<u>L/C</u>	<u>Amount(× 1,000 Tk)</u>	
			<u>Tax</u>	<u>Total</u>
1. Detailed design	53,398	22,440	-	75,838
2. Construction Supervision	137,540	15,576	-	153,116
<u>Total</u>	<u>190,938</u>	<u>38,016</u>	<u>-</u>	<u>228,954</u>

Table X-3-13

Summary of Land Acquisition Cost

(1) Barind Area

<u>Description</u>	<u>Area(ha)</u>	<u>Unit/ha</u>	<u>Amount(× 1,000 Tk)</u>
			<u>Cost</u>
1. Pumping Station	5.7	350	1,995
2. Irrigation Canal	1,281	150	192,150
<u>Total</u>			<u>194,145</u>

(2) Flood Plain Area

<u>Description</u>	<u>Area(ha)</u>	<u>Unit/ha</u>	<u>Amount(× 1,000 Tk)</u>
			<u>Cost</u>
1. Pumping Station	3.1	300	930
2. Irrigation Canal	278	100	27,800
<u>Total</u>			<u>28,730</u>

Table X-3-14

Summary of Project Administration Cost

<u>Description</u>	<u>F/C</u>	<u>L/C</u>	<u>Amount(× 1,000 Tk)</u>	
			<u>Tax</u>	<u>Total</u>
1. Personnel	-	21,723	-	21,723
2. Equipment	3,382	-	738	4,120
3. Repair and Maintenance	2,910	-	-	2,910
4. Training	4,326	1,406	-	5,732
<u>Total</u>	<u>10,618</u>	<u>23,129</u>	<u>738</u>	<u>34,485</u>

4. BREAKDOWN OF COSTS

- (1) COST BREAKDOWN OF PUMPING STATION
- (2) COST BREAKDOWN OF IRRIGATION FACILITIES
- (3) COST BREAKDOWN OF BIFURCATION
- (4) COST BREAKDOWN OF HYDRAULIC STRUCTURES
- (5) COST BREAKDOWN OF DRAINAGE FACILITIES
- (6) COST BREAKDOWN OF REGULATOR
- (7) COST BREAKDOWN OF ROAD AND BRIDGE
- (8) COST BREAKDOWN OF BRIDGE
- (9) COST BREAKDOWN OF ON-FARM DEVELOPMENT
- (10) COST BREAKDOWN OF TRANSMISSION LINE
- (11) COST BREAKDOWN OF CONSTRUCTION MACHINES
- (12) COST BREAKDOWN OF TAX AND INLAND TRANSPORTATION
- (13) TAX RATE OF IMPORTED ITEMS
- (14) COST BREAKDOWN OF AGRICULTURAL SUPPORTING SERVICE
- (15) COST BREAKDOWN OF CONSULTING SERVICE
- (16) COST BREAKDOWN OF LAND AQUISITION
- (17) COST BREAKDOWN OF PROJECT ADMINISTRATION

Table X - 4 - 1 (1)

(1) Baripara

Cost Breakdown of Pumping Station

Cost (unit: X 1,000 Tk)

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u> Tk	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1. Supporting structure						
a. Earth work						
- Excavation	m3	626,943	40	18,181	6,896	25,077
- Embankment	m3	24,493	26	146	489	635
- Backfilling	m3	25,289	16	-	404	404
<u>Sub - total</u>				<u>18,327</u>	<u>7,789</u>	<u>26,116</u>
b. R.C. concrete	m3	7,682	4,250	11,753	20,895	32,648
<u>Sub - total</u>				<u>11,753</u>	<u>20,895</u>	<u>32,648</u>
c. R.C. pile						
- 400 X 400 X 12m	Nos	234	8,640	808	1,213	2,021
- 400 X 400 X 14m	Nos	168	10,080	677	1,016	1,993
<u>Sub - total</u>				<u>1,485</u>	<u>2,229</u>	<u>3,714</u>
d. Steel Sheet Pile	m2	2,120	1,043	2,211	-	2,211
<u>Sub - total</u>				<u>2,211</u>	<u>-</u>	<u>2,211</u>
e. Brick Protection	m2	25,987	400	-	10,394	10,394
<u>Sub - total</u>				<u>-</u>	<u>10,394</u>	<u>10,394</u>
2. Pipe line						
a. Civil						
- Excavation	m3	108,600	27	2,063	868	2,931
- Borkilling	m3	89,100	16	-	1,425	1,425
<u>Sub - total</u>				<u>2,063</u>	<u>2,293</u>	<u>4,356</u>
b. Pipe line						
- Pipe Material	m	2,800	41,000	114,800	57,400	172,200
- 2,000 X 2	m	5,600	32,833	183,864	91,932	275,796
- 1,800 X 4						
- Pipe Installation	m	2,800	13,166	25,805	11,059	36,864
- 2,000 X 2	m	5,600	11,083	43,445	18,619	62,064
- 1,800 X 4						
<u>Sub - total</u>				<u>367,914</u>	<u>179,010</u>	<u>546,924</u>

Table X - 4 - 1 (2)
(2) Kasba

Cost Breakdown of Pumping Station

Cost (unit: X 1,000 Tk)

Work Item	Unit	Q'ty	Unit	Foreign	Local	Total
1. Supporting structure						
a. Earth work						
- Excavation	m3	167,526	40	4,858	1,842	6,700
- Embankment	m3	28,849	26	174	567	750
- Backfilling	m3	33,635	16	--	538	538
<u>Sub - total</u>				<u>5,032</u>	<u>2,956</u>	<u>7,988</u>
b. R.C. concrete	m3	3,071	4,250	4,667	8,353	13,020
<u>Sub - total</u>				<u>4,667</u>	<u>8,353</u>	<u>13,020</u>
c. R.C. pile						
- 400 X 400 X 13m	Nos	77	9,360	288	432	720
- 400 X 400 X 15m	Nos	66	10,800	285	427	712
- 300 X 300 X 5m	Nos	51	2,025	41	61	102
<u>Sub - total</u>				<u>614</u>	<u>920</u>	<u>1,534</u>
d. Steel Piling						
<u>Sub - total</u>	m2	550	2,120	<u>1,166</u>	<u>583</u>	<u>1,749</u>
e. Brick Protection						
<u>Sub - total</u>	m2	14,507	400	<u>5,802</u>	<u>--</u>	<u>5,802</u>

Table X - 4 - 2 (1)

(1) Barind Area

Cost Breakdown of Irrigation Facilities

Cost (unit: X 1,000 Tk)

Work Item	Unit	Q'ty	Unit	Foreign	Local	Total
1. Irrigation Canal						
- Excavation	m ³	6,677,769	Tk 17	-	113,522	113,522
- Embankment	m ³	4,722,859	26	28,337	94,457	122,794
<u>Sub - total</u>				<u>28,337</u>	<u>207,979</u>	<u>236,316</u>
2. Bifurcation						
- A-1 Type	Nos	2	X 1,000 Tk 3,965	4,262	3,668	7,930
- A-2 Type	Nos	2	3,306	3,548	3,064	6,612
- A-3 Type	Nos	-	2,185	-	-	-
- A-4 Type	Nos	-	1,555	-	-	-
- B-1 Type	Nos	1	1,298	709	589	1,298
- B-2 Type	Nos	2	1,005	1,100	910	2,010
- B-3 Type	Nos	7	443	1,505	1,596	3,101
- C Type	Nos	37	20.3	92	658	750
- Farm turnout		88	15.6	184	1,188	1,372
<u>Sub - total</u>				<u>11,400</u>	<u>11,673</u>	<u>23,073</u>
3. Check Gate						
- A	Nos	1	14,884	8,799	6,085	14,884
- B	Nos	1	13,636	8,074	5,562	13,636
<u>Sub - total</u>				<u>16,873</u>	<u>11,647</u>	<u>28,520</u>
4. Siphon						
- S-1	m	160	56.6	3,264	5,792	9,056
- S-2	m	240	38.7	3,360	5,928	9,288
- S-3	m	-	12.1	-	-	-
<u>Sub - total</u>				<u>6,624</u>	<u>11,720</u>	<u>18,344</u>
5. Aqueduct						
	Nos	-	551	-	-	-
<u>Sub - total</u>				-	-	-

Table X - 4 - 2 (2)

Cost Breakdown of Irrigation Facilities

(unit: X 1,000 Tk)

Work Item	Unit	Q'ty	Unit	Foreign	Local	Total
6. Chute	Nos					
- C-1		1	110	40	70	110
- C-2		1	831	303	528	831
<u>Sub - total</u>				<u>343</u>	<u>598</u>	<u>941</u>
7. Vertical Drop	Nos					
- D-1		64	2.7	64	108	172
- D-2		1	3.5	1.3	2.2	3.5
- D-3		81	4.3	129.6	218.7	348.3
<u>Sub - total</u>				<u>195</u>	<u>329</u>	<u>524.0</u>
8. Culvert	Nos					
- C-1		1	4,711	1,696	3,015	4,711
- C-2		1	3,356	1,203	2,153	3,356
- C-3		1	2,418	969	1,722	2,691
<u>Sub - total</u>				<u>3,868</u>	<u>6,890</u>	<u>10,758</u>
9. Waste way	Nos					
W-1		-	544	-	-	-
<u>Sub - total</u>				<u>-</u>	<u>-</u>	<u>-</u>
10. Over Chute	Nos					
O-1		10	132	480	840	1,320
<u>Sub - total</u>				<u>480</u>	<u>840</u>	<u>1,320</u>
11. Double Orifice	Nos					
D-1		7	9.9	25.2	44.1	69.3
D-2		3	19.9	21.9	37.8	59.7
<u>Sub - total</u>				<u>47</u>	<u>82</u>	<u>129</u>

Table X - 4 - 2 (3)

(2) flood Plain Area

Cost Breakdown of Irrigation Facilities

Cost (unit: X 1,000 Tk)

Work Item	Unit	Qty	Unit	Foreign	Local	Total
1. Irrigation Canal						
- Excavation	m ³	138,708	15	-	2,080	2,080
- Embankment	m ³	1,290,845	26	7,745	25,816	33,561
<u>Sub - total</u>				<u>7,745</u>	<u>27,896</u>	<u>35,641</u>
2. Bifurcation			X 1,000 Tk			
- A-1 Type	Nos	-	3,965	-	-	-
- A-2 Type	Nos	-	3,306	-	-	-
- A-3 Type	Nos	2	2,185	2,400	1,970	4,370
- A-4 Type	Nos	2	1,555	1,706	1,404	3,110
- B-1 Type	Nos	-	1,298	-	-	-
- B-2 Type	Nos	2	1,005	1,100	910	2,010
- B-3 Type	Nos	-	443	-	-	-
- C Type	Nos	4	20.3	10	71	81
- Farm turnout		7	15.6	31	94	125
<u>Sub - total</u>				<u>5,247</u>	<u>4,449</u>	<u>9,696</u>
3. Check Gate						
- A	Nos	-	14,884	-	-	-
- B	Nos	1	13,636	8,074	5,562	13,636
<u>Sub - total</u>				<u>8,074</u>	<u>5,562</u>	<u>13,636</u>
4. Siphon						
- S-1	m	-	56.6	-	-	-
- S-2	m	-	38.7	-	-	-
- S-3	m	300	12.1	1,290	2,340	3,630
<u>Sub - total</u>				<u>1,290</u>	<u>2,340</u>	<u>3,630</u>
5. Aqueduct						
- A-1	Nos	3	551	456	1,197	1,653
<u>Sub - total</u>				<u>456</u>	<u>1,197</u>	<u>1,653</u>

Table X - 4 - 2 (4)

Cost Breakdown of Irrigation Facilities

Cost (unit; X 1,000 Tk)

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
6. Chute						
- C-1	Nos	-	110	-	-	-
- C-2	Nos	-	831	-	-	-
<u>Sub - total</u>				<u>=</u>	<u>=</u>	<u>=</u>
7. Vertical Drop						
- D-1	Nos	1	2.7	1.0	1.7	2.7
<u>Sub - total</u>				<u>1.0</u>	<u>1.7</u>	<u>2.7</u>

Table X - 4 - 3 (1)

Cost Breakdown of Bifurcation

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u>		
				<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1. A-1						
- Concrete	m ³	79	3,620	104	181	285
- Brick	m ³	183	1,280	-	234	234
- RC pile	Nos	36	2,430	34	52	87
300 X 300 ℓ=6.0m						
- Gate	Nos	2	1,500,000	1,800	1,200	3,000
4.0 X 2.3 (3.0t)						
- Preparation (10%)				193	167	360
- <u>sub - total</u>				<u>2,131</u>	<u>1,834</u>	<u>3,965</u>
2. A-2						
- Concrete	m ³	66	3,620	87	151	238
- Brick	m ³	159	1,280	-	203	203
- RC pile	Nos	27	2,430	26	39	65
300 X 300 ℓ=6.0m						
- Gate	Nos	2	1,250,000	1,500	1,000	12,500
3.0 X 2.0 (2.5t)						
- Preparation (10%)				161	139	300
- <u>sub - total</u>				<u>1,774</u>	<u>1,532</u>	<u>3,306</u>
3. A-3						
- Concrete	m ³	45	3,620	59	103	162
- Brick	m ³	75	1,280	-	96	96
- RC pile	Nos	27	1,080	12	17	29
200 X 200 ℓ=6.0m						
- Gate	Nos	2	850,000	1,020	680	1,700
2.0m X 1.65 m (1.7t)						
- Preparation (10%)				109	89	198
- <u>sub - total</u>				<u>1,200</u>	<u>985</u>	<u>2,185</u>

Table X - 4 - 3 (2)

Cost Breakdown of Bifurcation

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u>			<u>Total</u>
				<u>Foreign</u>	<u>Local</u>	<u>(unit: X 1,000 Tk)</u>	
4. A-4							
- Concrete	m3	36	3,620	48	82	130	
- Brick	m3	50	1,280	-	64	64	
- RC pile	Nos	20	1,080	8	13	21	
200 X 200 $\ell=6.0m$							
- Gate	Nos	2	600,000	720	480	1,200	
1.5m X 1.2m (1.2t)							
- Preparation (10%)				77	63	140	
- <u>sub - total</u>				<u>853</u>	<u>702</u>	<u>1,555</u>	
5. B-1							
- Concrete	m3	32	3,620	42	73	115	
- Brick	m3	47	1,280	-	60	60	
- RC pile	Nos	6	1,080	2.6	3.9	6.5	
200 X 200 $\ell=6.0m$							
- Gate	Nos	1	1,000,000	600	400	1,000	
2.0 X 2.3 (2t)							
- Preparation (10%)				64	53	117	
- <u>sub - total</u>				<u>709</u>	<u>589</u>	<u>1,298</u>	
6. B-2							
- Concrete	m3	13	3,620	17.1	29.9	47.0	
- Brick	m3	47	1,280	-	60.1	60.1	
- RC pile	Nos	6	1,080	2.6	3.9	6.5	
200 X 200 $\ell=6.0m$							
- Gate	Nos	1	800,000	480	320	800	
1.5m X 2.0 m (1.6t)							
- Preparation (10%)				50.0	41.4	91.4	
- <u>sub - total</u>				<u>550</u>	<u>455</u>	<u>1,005</u>	

Table X - 4 - 3 (3)

Cost Breakdown of Bifurcation

Cost (unit: X 1,000 Tk)

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
7. B-3						
- Concrete	m ³	10	3,620	13	23	36
- Brick	m ³	47	1,280	-	60	60
- RC pile	Nos	6	1,080	2.6	3.9	6.5
200 X 200 $\ell=6.0m$						
- Gate	Nos	1	300,000	180	120	300
1.0 X 1.5m (1.2t)						
- Preparation (10%)				19.6	20.7	40.3
- <u>sub - total</u>				<u>215</u>	<u>228</u>	<u>443</u>
8. C						
- Concrete	m ³	0-6	3,620	0.8	1.4	2.2
- Brick	m ³	7	1,280	-	9.0	9.0
- RC pile $\phi 900$	m	4.25	1,706	1.5	5.8	7.3
- Preparation (10%)				0.2	1.6	1.8
- <u>sub - total</u>				<u>2.5</u>	<u>17.8</u>	<u>20.3</u>
9. Farm-turnout						
- Concrete	m ³	0.5	3,620	1.2	0.6	1.8
- Brick	m ³	7	1,280	-	9.0	9.0
- RC pile	m	4.25	803	0.7	2.7	3.4
- Preparation (5%)				0.2	1.2	1.4
- <u>sub - total</u>				<u>2.1</u>	<u>13.5</u>	<u>15.6</u>

Table X - 4 - 4 (1)

Cost Breakdown of Hydraulic Structure

(unit: X 1,000 Tk)

Work Item	Unit	Q'ty	Unit	Foreign	Local	Total
1. Check Gate A						
- Concrete	m ³	88	3,620	116	202	318
- Brick	m ³	210	1,280	-	268	268
- Steel Sheet Pile	m ³	240	2,120	508	-	508
- RC pile	Nos	120	3,645	175	262	437
300 X 300 ℓ =9.0m						
- Gate	Nos	4	3,000,000	7,200	4,800	12,000
3.5 X 3.9m (6ton)						
- Preparation (10%)				800	553	1,353
<u>sub - total</u>				<u>8,799</u>	<u>6,085</u>	<u>14,884</u>
2. Check Gate B						
- Concrete	m ³	74	3,620	97	170	267
- Brick	m ³		1,280	-	247	247
- Steel Sheet Pile	m ²	193	2,120	483	-	483
- RC pile	Nos	228	3,645	160	240	400
300 X 300 ℓ =9.0m		110				
- Gate	Nos	4	2,750,000	6,600	4,400	11,000
3.0 X 3.8m (5.5t)						
- Preparation (10%)				734	505	1,239
<u>sub - total</u>				<u>8,074</u>	<u>5,562</u>	<u>13,636</u>
3. Siphon S-1						
- Concrete	m ³		4,250	18.5	32.9	51.4
- Preparation (10%)		12.1		1.9	3.3	5.2
<u>sub - total</u>				<u>20.4</u>	<u>36.2</u>	<u>56.6</u>
4. Siphon S-2						
- Concrete	m ³		4,250	12.7	22.5	35.2
- Preparation (10%)		8.3		1.3	2.2	3.5
<u>sub - total</u>				<u>14</u>	<u>24.7</u>	<u>38.7</u>

Table X - 4 - 4 (2)

Cost Breakdown of Hydraulic Structure

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u>		<u>Total</u>
				<u>Foreign</u>	<u>Local</u>	
5. Siphon S-3						
- Concrete	m3	2.6	4,250	3.0	7.1	11.0
- Preparation (10%)				0.4	0.7	1.1
<u>sub - total</u>				<u>4.3</u>	<u>7.8</u>	<u>12.1</u>
6. Aqueduct						
- Concrete	m3	89	4,250	136	242	378
- Brick	m3	92	1,280	-	117	117
- RC pile	Nos	12	540	2.6	3.9	6.5
200 X 200 $\ell=3m$				13.8	36.3	50.1
- Preparation (10%)				<u>152</u>	<u>399</u>	<u>551</u>
<u>sub - total</u>						
7. Chute 1						
- Concrete	m3	29	3,620	38.2	66.7	104.9
- Preparation (5%)				1.9	3.3	5.2
<u>sub - total</u>				<u>40.1</u>	<u>70.0</u>	<u>110</u>
8. Chute 2						
- Concrete	m3	219	3,620	28.9	503	792
- Preparation (5%)				14.4	25.1	39.5
<u>sub - total</u>				<u>303</u>	<u>528</u>	<u>831</u>
9. Vertical Drop 1						
- Concrete	m3	0.7	3,620	0.9	1.6	2.5
- Preparation (5%)				0.1	0.1	0.2
<u>sub - total</u>				<u>1.0</u>	<u>1.7</u>	<u>2.7</u>
10. Vertical Drop 2						
- Concrete	m3	0.9	3,620	1.2	2.1	3.3
- Preparation (5%)				0.1	0.1	0.2
<u>sub - total</u>				<u>1.3</u>	<u>2.2</u>	<u>3.5</u>

Table X - 4 - 4 (3)

Cost Breakdown of Hydraulic Structure

Cost unit: X 1,000 Tk

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
11. Vertical Drop 3						
- Concrete	m3	1.1	3,620	1.5	2.5	4.0
- Preparation (5%)				0.1	0.2	0.3
<u>sub - total</u>				<u>1.6</u>	<u>2.7</u>	<u>4.3</u>
12. Culvert C-1						
- Concrete	m3	1,008	4,250	1,542	2,741	4,283
- Preparation (10%)				154	274	428
<u>sub - total</u>				<u>1,696</u>	<u>3,015</u>	<u>4,711</u>
13. Culvert C-2						
- Concrete	m3	720	4,250	1,094	1,958	3,052
- Preparation (10%)				109	195	304
<u>sub - total</u>				<u>1,203</u>	<u>2,153</u>	<u>3,356</u>
14. Culvert C-3						
- Concrete	m3	576	4,250	881	1,566	2,447
- Preparation (10%)				88	156	244
<u>sub - total</u>				<u>969</u>	<u>1,722</u>	<u>2,691</u>
15. Waste way W-1						
- Concrete	m3	137	3,620	180	315	495
- Preparation (10%)				18	31	49
<u>sub - total</u>				<u>198</u>	<u>346</u>	<u>544</u>
16. Overchute						
- Concrete	m3	35	3,620	46	80	126
- Preparation (5%)				2.3	4.0	6
<u>sub - total</u>				<u>48</u>	<u>84</u>	<u>132</u>
17. Double Orifice 1						
- Concrete	m3	2.5	3,620	3.3	5.7	9.0
- Preparation (5%)				0.3	0.6	0.9
<u>sub - total</u>				<u>3.6</u>	<u>6.3</u>	<u>9.9</u>

Table X - 4 - 4 (4)

Cost Breakdown of Hydraulic Structure

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u>		
				<u>Foreign</u>	<u>Local</u>	<u>Total</u>
18. Double Orifice 2						
- Concrete	m3	5.0	3,620	6.6	11.5	18.1
- Preparation (5%)				0.7	1.1	1.8
<u>sub - total</u>				<u>7.3</u>	<u>12.6</u>	<u>19.9</u>

(unit; x 1,000 Tk)

Table X - 4 - 5

(1) Barind Area

Cost Breakdown of Drainage Facilities

Cost (unit: X 1,000 Tk)

<u>Work Item</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1. Drainage						
Excavation	m3	980,000	16	-	15,360	15,360
<u>Sub - total</u>				=	<u>15,360</u>	<u>15,360</u>

(2) Flood Plain Area

Cost (unit: X 1,000 Tk)

<u>Work Item</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1. Drainage						
Excavation	m3	2,001,395	16	-	32,022	32,022
<u>Sub - total</u>				=	<u>32,022</u>	<u>32,022</u>
2. Regulator						
A-1	Nos	2	50,561	57,412	43,710	101,122
A-2	Nos	1	29,851	17,278	12,573	29,851
B	Nos	1	25,620	15,120	10,500	25,620
<u>Sub - total</u>				<u>89,810</u>	<u>66,783</u>	<u>156,593</u>

Table X - 4 - 6 (1)

Cost Breakdown of Regulator

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u>		
				<u>Foreign</u>	<u>Local</u>	<u>Total</u>
(unit: X 1,000 Tk)						
1. A-1						
- Concrete	m3	616	4,250	942	1,676	2,618
- Brick	m3	768	1,280	-	983	983
- Protection	m2	1,130	887	-	1,002	1,002
- Steel Sheet Pile	m2	480	2,120	1,107	-	1,017
- RC pile	Nos	95	3,645	138	208	346
300 X 300 ℓ =9.0m						
- Gate	Nos	10	4,000,000	24,000	16,000	40,000
3.0m X 5.0m (8t)						
- Preparation (10%)				2,609	1,986	4,595
<u>sub - total</u>				<u>28,706</u>	<u>21,855</u>	<u>50,561</u>
2. A-2						
- Concrete	m3	493	4,250	1,341	754	2,095
- Brick	m3	614	1,280	-	785	785
- Protection	m2	900	887	-	798	798
- Steel Sheet Pile	m2	380	2,120	805	-	805
- RC pile	Nos	64	2,430	62	93	155
300 X 300 ℓ =6.0m						
- Gate	Nos	10	2,250,000	13,500	9,000	22,500
3.0 X 3.0 (4.5t)						
- Preparation (10%)				1,570	1,140	2,713
<u>sub - total</u>				<u>17,278</u>	<u>12,573</u>	<u>29,851</u>

Table X - 4 - 6 (2)

Cost Breakdown of Regulator

Work Item	Unit	Q'ty	Unit	Cost (unit; × 1,000 Tk)		
				Foreign	Local	Total
3. B						
- Concrete	m ³	120	4,250	184	326	510
- Brick	m ³	45	1,280	-	57	57
- Protection	m ²	80	887	-	70	70
- RC pile	Nos	64	2,430	62	93	155
300 × 300 ℓ=6.0						
- Gate	Nos	10	2,250,000	13,500	9,000	22,500
3.0 × 3.0 (4.5t)						
- Preparation (10%)				1,374	954	2,328
sub - total				<u>15,120</u>	<u>10,500</u>	<u>25,620</u>

Table X-4-7 (1)

Cost Breakdown of Road and Bridge

(1) Barind Area		Cost				(unit: X 1,000 Tk)
<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1. Road						
- Main	m	10,000	1730	5,190	12,110	17,300
- Maintenance	m	208,430	680	-	141,732	141,732
				<u>5,190</u>	<u>153,842</u>	<u>159,032</u>
2. Bridge						
- I-1 Type	Nos	2	1,808	1,302	2,314	3,616
- I-2 Type	Nos	1	1,696	610	1,086	1,696
- I-3 Type	Nos	1	1,621	583	1,038	1,621
- II-1 Type	Nos	-	345	-	-	-
- II-2 Type	Nos	-	325	-	-	-
				<u>2,495</u>	<u>4,438</u>	<u>6,933</u>
3. Railway Bridge						
- II-1	Nos	8	644	2,272	2,880	5,172
				<u>2,272</u>	<u>2,880</u>	<u>5,172</u>
4. Farm Bridge						
- A	Nos	7	266	413	1,449	1,862
- B	Nos	8	53.5	93	335	428
				<u>506</u>	<u>1,784</u>	<u>2,290</u>

Table X-4-7 (2)

Cost Breakdown of Bridge

Work Item	Unit	Qty	Unit	Cost			Total
				Foreign	Local	(unit; X 1,000 Tk)	
1. Road							
- Trunk	m	5,000	1,730	2,595	6,055	8,650	
- Maintenance	m	76,700	680	-	52,156	52,156	
<u>Sub - total</u>				<u>2,595</u>	<u>58,211</u>	<u>60,806</u>	
2. Bridge							
- I -1 Type	Nos	-					
- I -2 Type	Nos	-					
- I -3 Type	Nos	-					
- II -1 Type	Nos	2	345	254	436	690	
- II -2 Type	Nos	2	325	238	412	650	
<u>Sub - total</u>				<u>492</u>	<u>848</u>	<u>1,340</u>	
3. Railway Bridge							
- III -1	Nos	2	644	568	720	1,288	
<u>Sub - total</u>				<u>568</u>	<u>720</u>	<u>1,288</u>	
4. Farm Bridge							
- A	Nos	-		-	-	-	
- B	-	-		-	-	-	
<u>Sub - total</u>				<u>-</u>	<u>-</u>	<u>-</u>	

Table X-4-8 (1)

Cost Breakdown of Bridge

<u>Work Item</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit</u>	<u>Cost</u>		<u>Total</u>
				<u>Foreign</u>	<u>Local</u>	
1. Bridge I-1						
- Concrete	m3	387	4,250	592	1,052	1,644
- Preparation (10%)				59	105	164
<u>Sub - total</u>				<u>651</u>	<u>1,157</u>	<u>1,808</u>
2. Bridge I-2						
- Concrete	m3	363	4,250	555	987	1,542
- Preparation (10%)				55	99	154
<u>Sub - total</u>				<u>610</u>	<u>1,086</u>	<u>1,696</u>
3. Bridge I-3						
- Concrete	m3	347	4,250	530	944	1,474
- Preparation (10%)				53	94	147
<u>Sub - total</u>				<u>583</u>	<u>1,038</u>	<u>1,621</u>
4. Bridge I-3						
- Concrete	m3	79	3,620	104	181	285
- RC pile		18	1,687	12	18	30
250 X 250 ℓ =6.0m						
- Preparation (10%)				11	19	30
<u>Sub - total</u>				<u>127</u>	<u>218</u>	<u>345</u>
5. Bridge II-2						
- Concrete	m3	74	3,620	97	170	267
- RC pile	Nos	18	1,687	12	18	30
250 X 250 ℓ =6.0m						
- Preparation (10%)				10	18	28
<u>Sub - total</u>				<u>119</u>	<u>206</u>	<u>325</u>

Table X-4-8 (2)

Cost Breakdown of Bridge

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Cost</u> (unit: X 1,000 Tk.)		
				<u>Foreign</u>	<u>Local</u>	<u>Total</u>
6. Railway Bridge						
- Concrete	m3	72	4,250	110	196	306
- Brick	m3	25	1,280	-	32	32
- Steel	t	10	24,900	149	3.9	249
- Preparation (10%)				25	18.9	57
<u>Sub - total</u>				<u>284</u>	<u>207</u>	<u>644</u>
7. Farm Bridge A						
- Concrete	m3	39	3,620	51	89	140
- Brick	m3	75	1,280	-	96	96
- RC pile 200 x 200 l=3.0	Nos	12	540	2.6	3.9	9.5
- Preparation (10%)				5.4	18.9	24.3
<u>Sub - total</u>				<u>59</u>	<u>207</u>	<u>266</u>
8. Farm Bridge B						
- Concrete	m3	6	3,620	7.9	13.8	21.7
- Brick	m3	16	1,280	-	20.4	20.4
- RC pile	Nos	12	540	2.6	3.9	6.5
- Preparation (10%)				1.1	3.8	4.9
<u>Sub - total</u>				<u>11.6</u>	<u>41.9</u>	<u>53.5</u>

Table X-4-9

Cost Breakdown of On-farm Development

Work Item	Unit	Q'ty	Unit	Cost			Total
				Foreign	Local	(unit: X 1,000 Tk/ha)	
1. Sample A							
- Excavation	m ³ /ha	39.4	13 Tk	-	512	512	
- Embankment	m ³ /ha	43.9	15 Tk	-	658	658	
- Farm Turnout	Nos/ha	8/119	15600 Tk	-	1,048	1,048	
<u>Sub - total</u>				=	<u>2,218</u>	<u>2,218</u>	
2. Sample B							
- Excavation	m ³ /ha	29.2	13 Tk	-	379	379	
- Embankment	m ³ /ha	29.2	15 Tk	-	438	438	
- Farm Turnout	Nos/ha	3/181	15600 Tk	-	258	258	
<u>Sub - total</u>				=	<u>1,075</u>	<u>1,075</u>	
3. Sample C							
- Excavation	m ³ /ha	33.0	13 Tk	-	429	429	
- Embankment	m ³ /ha	31.1	15 Tk	-	466	466	
- Farm Turnout	Nos/ha	3/191	15600 Tk	-	245	245	
<u>Sub - total</u>				=	<u>1,140</u>	<u>1,140</u>	
4. Sample D							
- Excavation	m ³ /ha	36.8	13 Tk	-	478	478	
- Embankment	m ³ /ha	28.8	15 Tk	-	432	432	
- Farm Turnout	Nos/ha	6/138	15600 Tk	-	678	678	
<u>Sub - total</u>				=	<u>1,588</u>	<u>1,588</u>	

Table X-4-10

Cost Breakdown of Transmission Line

Description	Cost			uniti×1,000TK
	F/C	L/C	Tax	Total
1. Baraipara				
a. 132 KV/32KV sub-station	35,000	4,700	17,500	57,200
b. Tee-off line 132KV (5 miles)	553	97	276	926
c. <u>sub-total</u>	<u>35,553</u>	<u>4,797</u>	<u>17,776</u>	<u>358,126</u>
2. Kasba				
a. 32 KV/11KV sub-station	10,625	1,875	5,312	17,812
b. Tee-off line 32KV (1 mile)	527	93	264	884
c. <u>sub-total</u>	<u>11,152</u>	<u>1,968</u>	<u>5,576</u>	<u>18,696</u>

Table X-4-11

Cost Breakdown of Construction Machines
(C.I.F Base)

unit ; 1,000 Tk

<u>Description</u>	<u>Unit</u>	<u>No</u>	<u>Total</u>
1. Dragline	0.6m ³	2	10,124
Dragline	0.6m ³	1	11,970
2. Bulldozer	11 ton	2	5,310
Bulldozer	21 ton	1	5,175
3. Dump Truck	11 ton	5	8,885
4. Crawler Crane	22.5 ton	2	10,260
5. Tower Crane	2t×30m	1	4,207
6. Trailer Crane	25 ton	1	7,582
7. Road Roller	8~10ton	1	1,345
8. Generator	200 KVA	1	1,489
Generator	50 KVA	2	890
9. Pile hammer	3.5 ton	2	20,700
10. Vibro Pile Driver	40 Kw	2	2,722
11. Winch and piling frame	400	2	800
12. Well point equipments	200	10	2,000
13. Spare parts	(10%)		8,904
<u>Total</u>			<u>97,953</u>

Table X-4-12 Tax and Inland Transportation of Construction Machines

unit ; 1,000 Tk

<u>Description</u>		<u>Total Price</u>	<u>Weight (ton)</u>	<u>Inland Transportation</u>	<u>Total</u>
1.	Dragline 0.6m ³	10,124	54.4	42.9	5,062
	Dragline 0.6m ³	11,970	50.5	39.8	5,985
2.	Bulldozer 11 ton	5,310	23.8	18.8	2,655
	Bulldozer 21 ton	5,175	22.1	17.4	2,587
3.	Dump Truck 11 ton	8,885	46.5	36.7	4,442
4.	Crawler Crane 22.5 ton	10,260	58.2	45.9	5,130
5.	Tower Crane 2t×30m	4,207	19.0	15.0	2,103
6.	Trailer Crane 25 ton	7,582	32.2	25.4	3,791
7.	Road Roller 8~10ton	1,345	8.0	6.3	672
8.	Generator 200 KVA	1,489	4.0	3.1	744
	Generator 50 KVA	890	1.2	0.9	445
9.	Pile hammer 3.5 ton	20,700	122.2	96.5	10,350
10.	Vibro Pile Driver 40 Kw	2,722	7.0	5.5	1,361
11.	Winch and piling frame	800	1.0	0.7	400
12.	Well point equipments	2,000		0.7	1,000
13.	Spare parts (10%)	8,904		35.6	
	sub-total	<u>102,363</u>		<u>391.2</u>	<u>51,402</u>
14.	Handling Charge (5%)		<u>5,118</u>		

Table X - 4 - 13

TAX RATE OF IMPORTED ITEMS

<u>Item</u>	<u>Tax Rate</u> (added to CIF)	<u>Chapter</u>
Cement	20%	25.23
M.S. rod (steel bar)	50%	73.10
Steel Sheet Piling	75%	73.11
Pipe and Valve	50%	73.20
Pumps	40%	84.10
Pumps, Spare parts	40%	84.10
Motors	50%	84.08
Motors, Spare parts	50%	84.08
Crane	50%	84.22
Agricultural Machinery for Soil Preparation or Cultivation	50%	84.24
Harvesting and Threshing Machinery	50%	84.25
Seed Cleaner	50%	84.25
Weighing Machinery	50%	84.20
Heat-treating Machinery	50%	84.17
Sprayer	50%	84.21
Earthworking Machinery	50%	84.23
Printing Machinery	50%	84.34
Typewriters	50%	84.51
Machine Tools	50%	84.45
Hand Tools	50%	84.49
Welding Tools & Appliances	50%	84.50
Calculators	20%	84.52
Duplicating Machines	50%	84.54
Other Office Machine	50%	84.54
Transformers	50%	85.01
Generators	50%	85.08
Switch Gear	100%	85.19
Insulated electric Wire	125%	85.23
Pontoons	15%	89.01
Jeeps and Pickups	50%	87.02
Surveying & Hydrological Instruments	20%	90.14
Instruments for Physical or Chemical Analysis	20%	90.25
Fertilizer	0	31.00
Furniture	125%	94.00

Source : The Customs Act, Ministry of law and Justice Import
policy Order 1987-88, Ministry of commerce.

Table X-4-14

Cost Breakdown for Agricultural Supporting Facilities

<u>Work Item</u>	<u>Unit</u>	<u>Q'ty</u>	<u>Unit Price</u>	<u>Cost</u>			<u>Total</u>
				<u>F/C</u>	<u>L/C</u>	<u>unit: X 1,000 Tk</u>	
1. Building							
- Main office	m ²	500	5,000	-	2,500		2,500
- Accommodation	m ²	1,000	4,600	-	4,600		4,600
- Furnitures	set	1	1,600	-	1,600		1,600
- Miscellaneous (20%)				-	1,740		1,740
Sub - total					<u>10,440</u>		<u>10,440</u>
2. Equipment							
- Office equipment	set	1	1,040,000	1,040	520		1,560
- Reseavd equipment	set	1	1,560,000	1,560	780		2,360
- Farm machnary	set	1	2,600,000	2,600	1,300		3,900
- Communication	set	1	1500,000	500	250		750
Sub - total				<u>5,700</u>	<u>2,850</u>		<u>8,550</u>
3. Vehicle							
- Sedan	set	2	375,000	750	370		1,120
- Jeep		3	625,000	1,870	930		2,800
- Motor cycle		20	125,000	2,500	1,250		3,750
Sub - total				<u>5,120</u>	<u>2,550</u>		<u>7,670</u>
4. Pilot Farm	ha	5	30,000		<u>150</u>		<u>150</u>
5. Miscellaneous				1,080	1,600		2,680
Total				<u>11,900</u>	<u>17,590</u>		<u>29,490</u>

Table X-4-15 (1)

Cost Breakdown of Consulting Service

<u>Description</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Rate</u>	<u>F/C</u>	<u>L/C</u>
1. Detailed Design Stage					
1-1 Foreign Currency					
- Consultants Remuneration	84	month	500,000	42,000	-
- Out-of-Pocket Expenses					
· International Travel Expense	21	trip	101,500	2,131	
· Reimbursable cost Item and Other (10%)		L.S		4,413	
- Miscellaneous (10%)		L.S		4,854	
				<u>53,398</u>	
1-2 Local Currency					
- Consultants Remuneration	118	month	100,000		11,800
- Consultants per Diem					
· Foreign	2,520	day	1,000		2,520
· Local	3,540	day	500		1,770
- Living Allowance and Quarter					
· Foreign	84	month	18,000		1,512
· Local	118	month	11,000		1,298
- Local communication and Transportation	L.S				800
- Printing of Reports	L.S				700
- Miscellaneous (10%)					2,040
Sub - total					<u>22,440</u>
2. Construction Supervision Service					
2-1 Foreign Currency					
- Consultant Remuneration	245	month	500,000	122,500	-
- Out-of-Pocket Expenses					
· International ravel Expense	25	trip	101,500	2,537	-
· Reimbursable cost Item and Other (10%)		L.S		12,503	
- Miscellaneous (10%)				8,362	
Sub - total				<u>137,540</u>	

Cost(X 1,000 Tk)

Table X-4-15 (2)

Cost Breakdown of Consulting Service

<u>Description</u>	<u>Qty</u>	<u>Unit</u>	<u>Rate</u>	<u>F/C</u>	<u>L/C</u>
2-2 Local Currency					
- Consultants Remuneration					0
- consultants per Diem					
. Foreign	7,350	day	1,000		7,350
. Local					
- Living Allowance and Quarter					
. Foreign	245	month	18,000		4,410
. Local					
- Local communication and Transportation					2,000
- Printing of Reports					400
- Miscellaneous (10%)					1,416
Sub - total					<u>15,576</u>

Cost(X 1,000 Tk)

FIGURE X-4-1 Proposed Schedule for Consulting Services

Description	1st Year		1st Year			2nd Year			3rd Year			4th Year			5th Year			6th Year			7th Year			
	Foreign	Local	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
I. Detailed Design																								
1. Team Leader	11	11																						
2. Hydrologist	2	12																						
3. Irrigation Engineer	3	3																						
4. Soil Scientist	3	6																						
5. Geologist	5	5																						
6. Surveyor	5	12																						
7. Design Engineer(Pump)	8	8																						
8. Design Engineer(Pump)	8	8																						
9. Design Engineer(Canal)	8	8																						
10. Design Engineer(Canal)	8	8																						
11. Design Engineer(Architecture)	3	3																						
12. Design Engineer(Mechanical)	4	4																						
13. Construction Planning	3	3																						
14. Cost Estimate	3	3																						
15. Specialist for Tender Document	3	3																						
16. Specification Writer	3	3																						
17. Agronomist	2	10																						
18. Economist	2	8																						
Sub-total	84	118																						
II. Construction Supervision																								
II-1. Tendering																								
1. Team Leader	2	2																						
2. Mechanical Engineer	1	1																						
3. Civil Engineer	1	1																						
4. Cost Estimate	1																							
Sub-total	5	4																						

Description	1st Year		1st Year			2nd Year			3rd Year			4th Year			5th Year			6th Year			7th Year			
	Foreign	Local	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
II-2Construction																								
1. Team Leader	63																							
2. Pump Engineer	39																							
3. Canal Engineer	56																							
4. Mechanical Engineer	24																							
5. Geologist	16																							
6. Economist	2																							
7. Surveyor	40																							
Sub-total	240	0																						

Table X-4-16

Cost Breakdown of Land Acquisition

(1) Barind Area

<u>Description</u>	<u>Area (ha)</u>	<u>Unit×1,000Tk/ha</u>	<u>Cost×1,000Tk</u>
1. Pumping station	5.7	350	1,995
2. Irrigation canal			
- Main	214	150	32,100
- Secondary	346	150	51,900
- Sub-secondary	490	150	73,500
- Tertiary	231	150	34,650
sub-total			
<u>Total</u>			<u>192,150</u>

(2) Flood Plain Area

<u>Description</u>	<u>Area (ha)</u>	<u>Unit×1,000Tk/ha</u>	<u>Cost×1,000Tk</u>
1. Pumping station	3.1	300	930
2. Irrigation canal			
- Main	41	100	4,100
- Secondary	127	100	12,700
- Sub-secondary	26	100	2,600
- Tertiary	84	100	8,400
sub-total			27,800
<u>Total</u>			<u>28,730</u>

Table X-4-17

Cost Breakdown of Project Administration

1. Personnel Cost

(1) Detailed Design Stage

Project office Staff

Tk 3,700 / month × 7 pers × 12 man-month =	<u>Tk 310,800</u>
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(2) Construction Stage

Personnel cost is calculated on the basis of the proposed organization for project implementation as shown in Figure.

(a) Superintending Engineer

Tk 5,200 / month × 12 month × 6 year × 1 pers =	<u>Tk 374,400</u>
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(b) Executive Engineer

Tk 4,000 / month × 12 month × 6 year × 3 pers =	<u>Tk 864,000</u>
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(c) Sub-Divisional Engineer

Tk 3,300 / month × 12 month × 6 year × 6 pers =	<u>Tk 1,425,600</u>
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(d) Assistant Engineer

Tk 2,600 / month × 12 month × 6 year × 14 pers =	<u>Tk 2,620,800</u>
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(e) Sub-Divisional Office Staff

• sub-asistant	Tk 2,400/month × 3pers =	Tk 7,200
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• Cashier	Tk 2,200/month × 1pers =	Tk 2,200
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• Clerk	Tk 2,200/month × 1pers =	Tk 2,200
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• Typist	Tk 2,000/month × 1pers =	Tk 2,000
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• Surveyer	Tk 2,000/month × 2pers =	Tk 4,000
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• Store keeper	Tk 1,650/month × 1pers =	Tk 1,650
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• Driver	Tk 1,650/month × 1pers =	Tk 1,650
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• Analyst	Tk 1,650/month × 2pers =	Tk 3,300
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• Chowkider	Tk 1,300/month × 1pers =	Tk 1,300
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• Night Guard	Tk 1,300/month × 3pers =	Tk 3,900
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• Sweeper	Tk 1,300/month × 1pers =	Tk 1,300
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• Orderly Peon	Tk 1,300/month × 1pers =	Tk 1,300
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sub-total	Tk32,000
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Tk 3,200 / month × 12 month × 6 year × 6 pers =	<u>Tk 13,824,000</u>
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(f) Superintending Engineer Office Staff

Same as the above

Tk 32,000 / month × 12 month × 6 year × 14 pers =	<u>Tk 2,304,000</u>
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Personal Cost Total =	X-57	<u>RS 21,723,000</u>
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2. Equipment Cost for Construction Supervision

Equipment	Q'ty	Unit Rate	Amount × 1,000 Tk		Total
			F/C	L/C	
- Jeep, 4×4	6 unit	281	1,686	-	1,686
- motorcycle 70cc	6 unit	37	222	-	222
- Theodolite	2 unit	112	224	-	224
- Level	2 unit	46	92	-	92
- Current Meter	2 set	75	150	-	150
- Transceiver	1 set	225	225	-	225
- Walkie- Talkie	10 set	15	15	-	15
- Personal Computer	1 set	468	468	-	468
- Miscellaneous	L.S		300	-	300
Total			3,382	-	3,382

3. Repair and Maintenance Cost

(× 1,000 Tk)		
- Vehicle Repair	Tk 281,000 × 15% × 6 units =	252
- Vehicle Fuel	Tk 7.0/lit × 15 lit/day × 300days × 6 unit =	189
- Office Supply (10%)		= 44
sub - total		= 485
Total	485 × 6 years	= <u>2,910</u>

4. Training Cost

- 4 person/year × 6 year = 24 persons
- 20 days / 1 time
- 1 time / year

(1) Foriegn Currency

(× 1,000 Tk)		
- International travel expenses,	101,500 × 101,500 × 24 =	2,436
- Accommodation charge	Tk 2,810 × 24pers × 20days =	1,349
- Attendance cost		
• Accommodation charge	Tk 2,810 × 4times × 20days × 1pers =	224
• Domestic transportation charge		
	Tk 23,430 × 1pers × 4 times =	93
• Allowance charge	Tk2,810 × 1pers × 4 times × 20days =	224
- sub - total		4,326

(2) Local Currency

- Domestic transportation charge Tk 2,430 × 24 pers = 58
- Allowance charge Tk 2,810 × 24pers × 20days = 1,349
- sub - total 1,406

(3) Ltotal 5,723

5. Total cost for Project administration

$$\text{Tk } 1,723 + 3,382 + 2,910 + 5,732 = \underline{33,747} \times \text{Tk } 1000$$

5. OPERATOIN AND MAINTENANCE COST

- (1) SUMMARY OF OPERATION AND MAINTENANCE COST
- (2) BREAKDOWN OF OPERATION AND MAINTENANCE COST

Table X-5-1

Summary of Operation and Maintenance Cost

unit ; ×1,000TK

Description	Barind	Flood Plain	Total
1. Pumping Station			
a. Civil Work	88	88	176
b. Mechanical	12,496	3,920	16,416
c. Electricity	86,188	7,740	93,928
d. Dredging	2,420	517	2,937
sub - total	101,192	12,265	113,457
2. Canal and Road			
a. On - farm	3,747	799	4,546
b. Main and Secondary	4,385	848	5,233
c. Embankment	864	246	1,110
d. Bifurcation	1,198	244	1,442
e. Check Gate	44	-	44
f. Regulator	-	44	44
sub - total	10,238	2,181	12,419
3. Miscellaneous	11,143	1,444	12,587
4. Administration	4,314	922	5,236
5. Total	<u>126,887</u>	<u>16,812</u>	<u>143,699</u>

Table X-5-2 Breakdown of Operation and Maintenance Cost

1. Barined Area

(1) Pumping Station

a. Civil work for pump station		
10persons×1 place×20 days×12 month×37 TK=88,000TK		<u>88,000TK</u>
b. Maintenance work for pump and electrical facility		
624,800,000×0.02=12,496,000TK		<u>12,496,000TK</u>
c. Electricity		
i) Service Charge	400TK/day×12=4,000	
ii) Basic Charge	35TK/KW/year×15,400=539,000	
iii) Utility Charge	3.75TK/KW/hr×0.1×2,990×15,400 +1.65TK/KW/hr×0.9×2,990×15,400 =85,645,000TK	
sub - total		<u>86,188,000TK</u>
d. Dredging		
44,000m ³ /year×55TK/m ³ =2,420,000TK		<u>2,420,000TK</u>
e. sub - total		<u>101,192,000TK</u>

(2) Canal and Road

a. On-farm		
42,200ha/100ha×1person×20days×12month×37TK =		<u>3,747,000TK</u>
b. Main and Secondary		
493.9km×1person×20days×12month×37TK =		<u>4,385,000TK</u>
c. Embankment		
48.7km×2person×20days×12month×37TK =		<u>864,000TK</u>
d. Bifurcation		
54place×5person×20days×6month×37TK =		<u>1,198,000TK</u>
e. Check Gate		
2places×5persons×20days×6month×37TK =		<u>44,000TK</u>
f. sub-total		<u>10,238,000TK</u>

(3) Miscellaneous work 11,143,000TK

(4) Total 122,573,000TK

2. Flood Plain Area

(1) Pumping Station

a. Civil work for pumping station		
10person×1place×20days×12months×37TK=88,000TK		88,000TK
b. Maintenance work for pump and electrical facility		
196,000,000×0.02=3,920,000TK		3,920,000TK
c. Electricity		
i) Service Charge	400TK/day×12=4,000	
ii) Basic Charge	35TK/KW/year×1,460=51,100TK	
iii) Utility Charge	3.75TK/KW/hr×0.1×2,830×1,460 +1.65×0.9×2,830×1,460 =7,685,000	
sub - total		7,740,000 TK
d. Dredging		
9,400m ³ /year×55TK/m ³ =517,000TK		517,000TK
e. sub - total		<u>12,265,000TK</u>

(2) Canal and Road

a. On-farm		
900ha/100ha×1person×20days×12month×37TK =		799,000TK
b. Main and Secondary		
95,5km×1person×20days×12month×37TK =		848,000TK
c. Embankment		
13.9km×2person×20days×12month×37TK =		246,000TK
d. Bifurcation		
11places×5persons×20days×6months×37TK =		244,000TK
e. Regulator		
2places×5persons×20days×6months×37TK =		44,400TK
f. sub-total		<u>2,181,000TK</u>

(3) Miscellaneous work

1,444,000TK

(4) Total

15,890,000TK

3. Administration

(1) Personnel Cost

- O/M office		
· Superintending Eng.	5,200TK×12month=	62,400TK
· Executive Eng.	4,000TK×12month×2=	96,000TK

· sub-divisional Eng.	$3,300\text{TK} \times 12\text{month} \times 4 =$	158,400TK
· Assistant Eng.	$2,600\text{TK} \times 12\text{month} \times 6 =$	187,200TK
· sub-divisional Office staff	$32,000\text{TK} \times 12\text{month} \times 4 =$	1,536,000TK
· Superintending Engineer's	$32,000\text{TK} \times 12\text{month} \times 1 =$	384,000TK
- sub-total		<u>2,424,000TK</u>

(2) Equipment Cost for O/M

Equipment	Q'ty	Amount 1,000TK	
		unit	Total
- Jeep 4x4	4	281	1,124
- Motorcycle 70 CC	6	37	222
- Transceiver	1	225	225
- Walkie-Talkie	10	15	150
- Personal Computer	1	468	468
- Miscellaneous	L.S	300	300
<u>sub-Total</u>			<u>2,489</u>

(3) Repair and Maintenance

- Vehicle Repair	$\text{TK}281,000 \times 15\% \times 4\text{units} = 168 \times 1,000\text{TK}$	
- Vehicle Fuel	$\text{TK}7.0 \text{ 1lit} \times 15\text{lit 1days}$ $\times 300\text{days} \times 4\text{unit} = 126$	
- Office Supply (10%)		29
<u>sub-total</u>		<u>323,000 TK</u>

(4) Total 5,236,000TK

6. ANNUAL DISBURSEMENT SCHEDULE

TABLE X-6-1 Annual Disbursement Schedule

Cost Item	Total					1st Year					2nd Year				
	F/C	L/C	Tax	Total		F/C	L/C	Tax	Total		F/C	L/C	Tax	Total	
1. Construction Work															
a. Pumping Station (Baraipara)	140,599	77,823	16,594	235,016											
b. Pumping Station(Kasba)	60,815	27,410	9,380	97,605											
c. Civil Work(Barind)	78,630	486,433	—	565,063											
d. Civil Work(Flood Plain)	116,278	214,321	—	330,599							9,346	15,857	—	25,203	
e. Transmission, Telephone	46,945	7,725	23,352	78,022											
Sub-total	443,267	813,712	49,326	1,306,305							9,346	15,857	—	25,203	
2. Procurement of Pump	1,303,836	83,279	597,464	1,984,579							58,336	3,726	26,732	88,794	
Construction Machine and Equipment															
3. Agricultural Extention	11,900	12,190	5,400	29,490											
4. Consulting Service	190,938	38,016	—	228,954							60,026	8,995	—	69,021	
Sub-total	1,949,941	947,197	652,190	3,549,328							60,026	8,995	—	69,021	
5. Administration	4,332	74,642	2,666	81,140											
6. Land Aquisition	—	222,875	—	222,875											
Sub-total	1,954,273	1,244,714	654,356	3,853,343							60,026	8,995	—	69,021	
7. Physical Contingency	256,623	170,500	98,153	525,276											
8. Price Escalation	140,312	407,903	56,307	604,522											
Sub-total	2,351,208	1,823,117	808,816	4,983,141							63,928	10,140	—	74,068	
Grand Total											91,319	62,897	33,869	188,085	

Cost Item	3rd Year					4th Year					5th Year						
	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	
1. Construction Work																	
a. Pumping Station (Baraipara)																	
b. Pumping Station(Kasba)	6,082	2,741	938	9,761	12,163	5,482	1,876	19,521	27,367	12,334	4,221	43,922	28,120	15,565	3,318	47,003	
c. Civil Work(Barind)	5,861	36,254	—	42,115	15,458	95,628	—	111,086	20,658	127,799	—	148,457	20,658	127,799	—	148,457	
d. Civil Work(Flood Plain)	32,346	49,525	—	81,871	51,857	76,296	—	128,153	16,839	49,735	—	66,574	16,839	49,735	—	66,574	
e. Transmission, Telephone	45	180	—	225	3,477	1,118	1,672	6,267	18,535	3,069	9,236	30,840	18,535	3,069	9,236	30,840	
Sub-total	44,334	88,700	938	133,972	97,015	186,306	5,208	288,529	111,519	208,502	16,775	336,796	111,519	208,502	16,775	336,796	
2. Procurement of Construction Machine and Pump Equipment	423,478	27,048	194,052	644,578	676,418	43,204	309,959	1,029,581	145,604	9,301	66,721	221,626	145,604	9,301	66,721	221,626	
3. Agricultural Exertion																	
4. Consulting Service	14,877	2,962	—	17,839	18,598	3,703	—	22,301	29,707	5,915	—	35,622	29,707	5,915	—	35,622	
Sub-total	482,689	118,710	194,990	796,389	792,031	233,213	315,167	1,340,411	293,970	225,546	86,736	606,252	293,970	225,546	86,736	606,252	
5. Administration	823	14,169	411	15,403	450	7,750	225	8,425	450	7,750	225	8,425	450	7,750	225	8,425	
6. Land Acquisition	—	100,293	—	100,293	—	89,150	—	89,150	—	22,289	—	22,289	—	22,289	—	22,289	
Sub-total	483,512	233,172	195,401	912,085	792,481	330,113	315,392	1,437,986	294,420	255,585	86,961	636,966	294,420	255,585	86,961	636,966	
7. Physical Contingency	59,875	20,134	29,101	109,110	102,796	25,797	49,675	178,268	47,646	25,636	11,620	84,902	47,646	25,636	11,620	84,902	
8. Price Escalation	16,069	47,197	17,023	80,289	33,891	99,310	24,773	157,974	35,168	85,505	8,907	129,580	35,168	85,505	8,907	129,580	
Grand Total	559,456	300,503	241,525	1,101,484	929,168	455,220	389,840	1,774,228	357,234	386,726	107,488	851,448	357,234	386,726	107,488	851,448	

Cost Item	6th year				7th Year							
	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total
1. Construction Work												
a. Pumping Station (Baraipara)	56,240	31,129	11,616	98,985	42,179	23,347	0	65,526				
b. Pumping Station(Kasba)	15,204	6,853	2,345	24,402								
c. Civil Work(Barind)	23,661	146,379	—	170,040	12,992	80,573	—	93,365				
d. Civil Work(Flood Plain)	5,890	22,908	—	28,798								
e. Transmission,Telephone	24,888	3,358	12,444	40,690								
Sub-total	125,883	210,627	26,405	362,915	55,171	103,720	0	158,891				
2. Procurement of Pump Construction Machine and Equipment												
3. Agricultural Extention	4,760	4,266	2,160	11,186	—	6,096	—	6,096				
4. Consulting Service	38,680	10,657	—	49,337	23,254	4,630	—	27,884				
Sub-total	169,323	225,550	28,565	423,438	78,425	114,446	0	192,871				
5. Administration	638	10,960	636	12,234	637	10,960	316	11,915				
6. Land Aquisition												
Sub-total	169,961	236,510	29,201	435,672	79,062	125,406	0	204,786				
7. Physical Contingency	49,596	19,645	4,006	73,247	1,444	54,889	0	56,333				
8. Price Escalation	11,357	123,284	2,887	137,528	38,365	27,897	0	86,262				
Grand Total	230,914	379,439	36,094	646,447	119,189	228,192	0	347,381				

APPENDIX X I

PROJECT JUSTIFICATION

APPENDIX X I

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TABLE X I -1 PRODUCTION BY PROJECT AREA

Production Crop	Paba Area								Barind Area								Whole Project Area							
	Without				With				Without				With				Without				With			
	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)	Cropp- ing rate (%)	Area (ha)	Yield (t/ha)	Quantities (t)
Aus	38.2	3,438	2.0	6,876	12.0	1,080	3.5	3,780	18.9	7,976	2.0	15,952	30.0	12,660	3.5	44,310	22.3	11,414	2.0	22,828	26.8	13,740	3.5	48,090
T. Aman	26.2	2,358	2.3	5,423	60.0	5,400	4.0	21,600	94.7	39,963	2.3	91,915	100.0	42,200	4.0	168,800	82.7	42,321	2.3	97,338	43.0	47,600	4.0	190,400
Paddy B. Aman	20.8	1,872	1.3	2,434	8.0	720	1.5	1,080	1.4	591	1.3	768	-	-	1.5	-	4.8	2,463	1.3	3,202	1.4	720	1.5	1,080
Boro	3.1	279	3.2	893	32.0	2,880	5.0	14,400	4.6	1,941	3.2	6,211	60.0	25,320	5.0	126,600	4.3	2,220	3.2	7,104	55.1	28,200	5.0	141,000
<u>Sub-Total</u>	<u>88.3</u>	<u>7,947</u>		<u>15,626</u>	<u>112.0</u>	<u>10,080</u>		<u>40,860</u>	<u>119.6</u>	<u>50,471</u>		<u>114,846</u>	<u>190.0</u>	<u>80,180</u>		<u>339,710</u>	<u>114.1</u>	<u>58,418</u>		<u>130,472</u>	<u>176.3</u>	<u>90,260</u>		<u>380,570</u>
Wheat	17.0	1,530	2.3	3,519	12.0	1,080	3.5	3,780	5.9	2,490	2.3	5,727	10.0	4,220	3.5	14,770	7.9	4,020	2.3	9,246	10.4	5,300	3.5	18,550
Sugarcane	21.7	1,953	50.0	97,650	24.0	2,160	6.5	140,400	0.1	42	50.0	2,100	-	-	65.0	-	3.9	1,995	50.0	99,750	4.2	2,160	65.0	140,400
Jute	18.6	1,674	1.5	2,511	12.0	1,080	2.0	2,160	0.3	127	1.5	191	-	-	2.0	-	3.5	1,801	1.5	2,702	2.1	1,080	2.0	2,160
Pulses	5.6	504	0.8	403	18.0	1,620	1.2	1,944	0.4	169	0.8	135	9.5	4,009	1.2	4,811	1.3	673	0.8	538	11.0	5,629	1.2	6,755
Oilseed	3.0	270	0.7	189	6.0	540	1.0	540	0.8	338	0.7	237	1.5	633	1.0	633	1.2	608	0.7	426	2.3	1,173	1.0	1,173
Potatoes (and others)	23.8	2,142	8.0	17,136	12.0	1,080	12.0	12,960	4.7	1,983	8.0	15,864	2.2	928	12.0	11,136	8.1	4,125	8.0	33,000	3.9	2,008	12.0	24,096
<u>Total (Cropped Area)</u>	<u>178</u>	<u>16,020</u>		<u>(137,034)</u>	<u>196.0</u>	<u>17,640</u>		<u>(202,644)</u>	<u>131.8</u>	<u>55,620</u>		<u>(139,100)</u>	<u>213.2</u>	<u>89,970</u>		<u>(371,060)</u>	<u>139.9</u>	<u>71,640</u>		<u>(276,134)</u>	<u>210.2</u>	<u>107,610</u>		<u>(573,704)</u>

Source: NRIP Survey 1987

TABLE X I-2 ECONOMIC PRICE OF PADDY

I t e m	Unit	Price
1) IBRD projection price in 2,000 in 1985 constant price (5% broken white rice, FOB Bangladesh)	US\$/ton	216
2) Converted to 1987 constand price (1x1.201 ^{*1})	"	259
3) Adjusted projected price (adjustment factor = 0.9 ^{*2})	"	233
4) Estimate rate ^{*3}	TK/US\$	33.0
5) CIF Chittagong	TK/ton	7,689
6) Shadow rate ^{*4} of TK 1,250 for handling and transportation charge from rice mill in the Project Area to Chittagong Port	"	1,000
7) Shadow rate ^{*4} of TK 813 for milling cost	"	650
8) Milled price of rice	"	8,039
9) Ex-milled price of rice ^{*5} (paddy)	"	5,386
10) Shadow rate ^{*4} of TK 380 for handling and transportation charge from farmgate to rice mill	"	303
11) Farmgate price of paddy	"	5,083

Note: *1 --- IBRD International Price Index.

*2 --- Based on past relationship between import unit prices and reference quality export unit prices (include freight to Chittagong Port).

*3 --- WES rate (obtained at the auctions conducted by the Wage Earners' Funds Disposal Committee for the sale of dollars under the Wage Earners' Schemes 1987-88).

*4 --- 0.8 of standard conversion factor is applied to convert to economic price.

*5 --- 0.67 of milling rate is applied to equivalent price of paddy.

TABLE X I-3 ECONOMIC PRICE OF WHEAT

I t e m	Unit	Price
1) IBRD projection price in 2,000 in 1985 constant price (No.1 Westan Red Spring (CWRS) 13.5% Thunder Bay Canada)	US\$/ton	140
2) Converted to 1987 constant price (1x1.201 ^{*1})	"	168
3) Adjusted projected price (adjustment factor = 1.1 ^{*2})	"	185
4) Estimate rate ^{*3}	TK/US\$	33.0
5) CIF Chittagong	TK/ton	6,105
6) Shadow rate ^{*4} of TK 1,250 for handling and transportation charge from wheat mill in the Project Area to Chittagong Port	"	1,000
7) Shadow rate ^{*4} of TK 560 for milling cost	"	450
8) Milled price of wheat	"	6,655
9) Ex-milled price ^{*5} of wheat	"	6,322
10) Shadow rate ^{*4} of TK 380 for handling and transportation charge from farmgate to wheat mill	"	303
11) Farmgate price of wheat	"	6,019

Note: *1 --- IBRD International Price Index.

*2 --- Based on past relationship between import unit prices and reference quality prices.

*3 --- WES (Wage Earners' Scheme) rate.

*4 --- 0.8 of standard conversion factor is applied to convert to economic price.

*5 --- 0.95 of milling rate is applied to equivalent price of Ex-milled wheat.

TABLE X I-4 ECONOMIC PRICE OF SUGARCANE

I t e m	Unit	Price
1) IBRD projection price in 2,000 in 1985 constant price (LSA daily price FOB and stowed at greater Caribbean Ports)	US\$/ton	255
2) Converted to 1987 constant price (1x1.201 ^{*1})	"	306
3) Adjusted projected price (adjustment factor = 0.9 ^{*2})	"	275
4) Estimate rate ^{*3}	TK/US\$	33.0
5) CIF Chittagong	TK/ton	9,075
6) Shadow rate ^{*4} of TK 1,250 for handling and transportation charge from Chittagong Port to market area	"	1,000
7) Shadow rate ^{*4} of TK 630 for transportation from market area to mill	"	500
8) Shadow rate ^{*4} of TK 1,250 for milling cost	"	1,000
9) Milled price of sugar	"	8,575
10) Ex-milled price of sugar ^{*5} (sugarcane)	"	772
11) Shadow rate ^{*4} of TK 138 for handling and transportation charge from farmgate to mill	"	110
12) Farmgate price of sugarcane	"	662

Note: *1 --- IBRD International Price Indes.

*2 --- Based on past relationship between import unit prices and reference quality export prices.

*3 --- WES (Wage Earners' Scheme) rate.

*4 --- 0.8 of standard conversion factor is applied to convert to economic price.

*5 --- 9% (since 1992) of sugar content rate is applied to equivalent price of sugarcane.

TABLE XI-5 ECONOMIC PRICE OF JUTE

I t e m	Unit	Price
1) IBRD projection price in 2000 in 1985 constant price (White D. FOB Chittagong/Chalna)	US\$/ton	315
2) Converted to 1987 constant price (1x1.201 ^{*1})	"	378
3) Converted to Bangladesh Takas (\$1 = TK 33)	TK/ton	12,474
4) Shadow rate ^{*2} of TK 1825 for handling and transportation charge from jute mill in Project Area to Chittagong Port	"	1,460
5) Shadow rate ^{*2} of TK 1800 for milling costs, handling and transportation charge from jute mill to farmgate	"	1,440
6) Milled farmgate price of jute	"	9,574
7) Adjusted milling efficiency		80 %
8) Farmgate price of jute	"	7,659

Note: *1 --- IBRD International Price Index.

*2 --- 0.8 of standard conversion factor is applied to convert to economic price.

TABLE XI-6 ECONOMIC PRICE OF FERTILIZER

Item	Unit	Urea	TSP	MP
1) IBRD projection price in 2000 in 1985 constant price	US\$/ton	179	154	93
2) Converted to 1987 constant price (1 x 1.201 ^{*1})	"	215	185	112
3) Adjustment price*2 (Urea=FOB*3, TSP, MP=CIF at Chittagong)	-	-	259	157
4) Converted to Bangladesh Takas (\$1=TK 33)	TK/ton	7,095	8,547	5,181
5) Shadow rate*4 of TK 1,125 for handling and transportation charge between storage in Project Area and Chittagong Port	"	900	900	900
6) Shadow rate*4 of TK 250 for handling and transportation charge between storage and farmgate	"	200	200	200
7) Farmgate price of fertilizer	"	6,395	9,647	6,281

Note: *1 --- IBRD International Price Index.

*2 --- Adjustment factor of 1.4 is based on past relationship between import unit prices and reference quality prices (including international shipping and handling charge).

*3 --- It is assumed that by 1991 Bangladesh will become a net exporter of urea.

*4 --- 0.8 of standard conversion factor is applied to convert to economic price.

TABLE X I-7 MONTHLY LABOUR REQUIREMENT OF CROP PER HECTARE (WITHOUT)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Aus	-	-	3	63	19	2	29	47	-	-	-	-	163
B. Aman	-	-	40	33	-	-	-	-	-	-	39	28	140
T. Aman	-	-	-	-	-	10	45	52	12	13	35	31	198
Boro	63	40	2	2	51	15	-	-	-	-	-	20	193
Jute	-	-	49	33	22	-	64	47	-	-	-	-	215
Wheat	-	1	55	7	-	-	-	-	-	-	48	14	125
Sugarcane	73	71	33	17	27	3	-	-	-	-	-	25	249
Pulses	-	-	34	7	1	30	9	-	-	-	-	-	81
Oilseeds	9	6	33	-	-	-	-	-	-	-	7	27	82
Potato (and others of winter vegetables)	23	55	52	14	-	-	-	-	7	41	47	7	246

Source: 1) Farm Economic Survey

2) Summary costs of Cultivation of Agro-Economic Research Unit (AER)

3) Feasibility Report of the Baranai Project (Draft)

TABLE XI-8 MONTHLY LABOUR REQUIREMENT OF CROP PER HECTARE (WITH)

	(in manday)												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Aus	-	-	1	62	61	2	34	36	-	-	-	-	196
B. Aman	-	-	42	31	-	-	-	-	-	-	40	30	143
T. Aman	-	-	-	-	-	10	47	54	13	14	44	37	219
Boro	64	43	5	5	66	24	-	-	-	-	1	22	230
Jute	-	-	50	34	22	-	69	51	-	-	-	-	226
Wheat	1	1	63	9	-	-	-	-	-	-	48	15	137
Sugarcane	80	79	34	19	27	3	-	-	-	-	-	15	257
Pulses	-	-	35	9	1	30	9	-	-	-	-	-	84
Oilseeds	10	7	33	-	-	-	-	-	-	-	7	28	85
Potato (and others of winter vegetables)	26	72	69	17	-	-	-	-	7	42	48	7	288

TABLE X I-9 MONTHLY LABOURS REQUIREMENT (WITHOUT)

Whole Project Area		(in man-day)												
Crop	Cropping Area ha	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Aus	11,414	-	-	34,242	719,082	216,866	22,828	331,006	536,458	-	-	-	-	1,860,482
B. Aman	2,463	-	-	98,520	81,279	-	-	-	-	-	-	96,057	68,964	344,820
T. Aman	42,321	-	-	-	-	-	423,210	1,904,445	2,200,692	507,852	550,173	1,481,235	1,311,951	8,379,558
Boro	2,220	139,860	88,800	4,440	4,440	113,220	33,300	-	-	-	-	-	44,400	428,460
Jute	1,801	-	-	88,249	59,433	39,622	-	115,264	84,647	-	-	-	-	387,215
Wheat	4,020	-	4,020	221,100	28,140	-	-	-	-	-	-	192,960	56,280	502,500
Sugarcane	1,995	145,635	141,645	65,835	33,913	53,865	5,985	-	-	-	-	-	49,875	496,755
Pulses	673	-	-	22,882	4,711	673	20,190	6,057	-	-	-	-	-	54,513
Oilseed	608	5,472	3,648	20,064	-	-	-	-	-	-	-	4,256	16,416	49,856
Potato and others of (winter vegetables)	4,125	94,875	226,875	214,500	57,750	-	-	-	-	28,875	169,125	193,875	28,875	1,014,750
Total	71,640	385,842	464,988	769,832	988,750	424,246	505,513	2,356,772	2,821,797	536,727	719,298	1,968,383	1,576,761	13,518,909
Project Whole Farm Land	83,631	433,705	520,597	860,963	1,128,750	485,283	597,811	2,779,284	3,329,998	636,843	845,401	2,312,394	1,857,940	15,788,969

TABLE X I -10 MONTHLY LABOUR REQUIREMENT (WITH)

Whole Project Area		(in man-day)												
Crop	Cropping Area ha	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Aus	13,740	-	-	13,740	851,880	838,140	27,480	467,160	494,640	-	-	-	-	2,693,040
B. Aman	720	-	-	30,240	22,320	-	-	-	-	-	-	28,800	21,600	102,960
T. Aman	47,600	-	-	-	-	-	476,000	2,237,200	2,570,400	618,800	666,400	2,094,400	1,761,200	10,424,400
Boro	28,200	1,804,800	1,212,600	141,000	141,000	1,861,200	676,800	-	-	-	-	28,200	620,400	6,486,000
Jute	1,080	-	-	54,000	36,720	23,760	-	74,520	55,080	-	-	-	-	244,080
Wheat	5,300	5,300	5,300	333,900	47,700	-	-	-	-	-	-	254,400	79,500	726,100
Sugarcane	2,160	172,800	170,640	73,440	41,040	58,320	6,480	-	-	-	-	-	32,400	555,120
Pulses	5,629	-	-	197,015	50,661	5,629	168,870	50,661	-	-	-	-	-	472,836
Oilseed	1,173	11,730	8,211	38,709	-	-	-	-	-	-	-	8,211	32,844	99,705
Potato (and others of winter vegetables)	2,008	52,208	144,576	138,552	34,136	-	-	-	-	14,056	84,336	96,384	14,056	578,304
Total	107,610	2,046,838	1,541,327	1,020,596	1,225,477	2,787,049	1,355,630	2,829,541	3,120,120	632,856	750,736	2,510,395	2,562,000	22,382,565
Non-irrigation area		47,863	55,609	91,131	140,000	61,037	92,298	422,512	508,201	100,116	126,103	344,011	281,179	2,270,060
Total (Whole Farm Land)		2,094,701	1,596,936	1,111,727	1,365,477	2,848,086	1,447,928	3,252,053	3,628,321	732,972	876,839	2,854,406	2,843,179	24,652,625

TABLE XI-11. LABOUR SUPPLY

(1) Present

1. Net cultivated area per household (including non-farm household) = 0.9 ha (Agricultural Census, 1983-84).
2. Farm land of the Project Area = 60.097 ha
3. Accordingly, the number of households = 66,77⁴ H.H = 67,000 H.H
- 3' Number of households in Project Area (union boundary) = 58,000 H.H (Population Census, 1981)
- 3'' Number of households in Project Area in 1987 = 68,440 H.H. = 68,000 H.H. (Annual growth rate 2.8% from 1981 to 1987)
4. According to 3' and 3'' the number of households in the Project Area in 1987 = 67,000 H.H.
5. Average household size = 6.3 persons (NRIP Farm Economic Survey)
6. According to Labour Force Survey 1983-84, economically active persons in household size of 6 persons = 1.65 persons (Rural) = 1.7 persons.
- 6' According to NRIP Farm Economic Survey, economically active persons = 1.73 persons = 1.7 persons
7. According to 6 and 6', economically active persons = 1.7 persons
8. Labour unit (converted to adult manpower) per H.H = 1.5 persons
9. Potential labour population in the Project Area = 100,500 persons = 101,000 persons
10. Monthly available labour man-days = 2,525 thousand man-days = 2,530 thousand man-days (Monthly available labour days = 25 days (8 hours/day))

TABLE XI-12. LABOUR SUPPLY

Future (Without, With)

1. Farm land of the Project Area = 60,97 ha (equivalent to present)
2. Average household size = 6.3 persons (-ditto-)
3. Number of households = 87,100 H.H = 87,000 H.H (67,000 H.H.) (at present x 1.3 (annual) average growth rate 2.0% from 1984 to 2000)
4. Labour unit (converted to adult man power) per H.H = 1.5 persons (equivalent to present)
5. Potential labour population of the Project Area (future) = 130,500 = 130,000 persons
6. Monthly available labour days = 25 days (8 hours/day)
7. Monthly available labour man-days = 3,250 thousand man-days

TABLE X I -13 AVERAGE WAGE RATE (FINANCIAL, ECONOMIC) (WITHOUT)

Month	Labour Supply ('000 'man-days)	Labour Demand ('000 'man-days)	Monthly daily *1 wage rate TK	Percent of demand to supply %	Weight of labour requirement %	Marginal Wage rate TK	Weighted marginal wage rate TK	Average year economic wage rate
Jan.	3,250	434	15	13.4	2.7	2	0.1	
Feb.	"	521	15	16.0	3.3	2	0.1	
Mar.	"	861	15	27.3	5.5	4	0.2	
Apr.	"	1,129	15	35.6	7.2	5	0.3	
May	"	485	15	14.9	3.1	2	0.1	
Jun.	"	598	15	18.4	3.8	3	0.1	
Jul.	"	2,779	25	85.5	17.6	21	3.7	
Aug.	"	3,330	25	102.0	21.1	25	5.3	
Sep.	"	637	15	19.6	4.0	3	0.1	
Oct.	"	845	15	26.0	5.3	4	0.2	
Nov.	"	2,512	25	71.1	14.6	18	2.6	
Dec.	"	1,858	25	57.2	11.8	14	1.6	
Total		15,789			100.0		14.4	14

Note: *1 --- Without food

TABLE X I -14 AVERAGE WAGE RATE (FINANCIAL, ECONOMIC) (WITH)

Month	Labour Supply ('000 man-days)	Labour Demand ('000 man-days)	Monthly daily wage rate TK	Percent of demand to supply %	Weight of labour requirement %	Marginal Wage rate TK	Weighted marginal wage rate TK	Average year economic wage rate
Jan.	3,250	2,095	15	64.5	8.5	10	0.8	
Feb.	"	1,597	15	49.1	6.5	7	0.5	
Mar.	"	1,112	15	34.2	4.5	5	0.2	
Apr.	"	1,365	15	42.0	5.5	6	0.3	
May	"	2,848	15	87.6	11.6	13	1.5	
Jun.	"	1,448	15	44.5	5.9	7	0.4	
Jul.	"	3,252	25	100.0	13.2	25	3.3	
Aug.	"	3,628	25	111.4	14.7	28	4.1	
Sep.	"	733	15	22.5	3.0	3	0.1	
Oct.	"	877	15	27.0	3.5	4	0.1	
Nov.	"	2,854	25	87.8	11.6	22	2.6	
Dec.	"	2,843	25	87.5	11.5	22	2.5	
Total		24,652			100.0		16.4	16

TABLE X I -15-(1)

PRODUCTION COST PER HECTARE (Economic)-(1)

(Economic)		Fertilizer																Labour				
Crop	Cost	By Without With	Seed			Urea			T S P			M P			Manure			Total Cost	Q	U.P.	Cost	
			Q	U.P.	Cost	Q	U.P.	Cost	Q	U.P.	Cost	Q	U.P.	Cost	Q	U.P.	Cost					
			kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	KT	man-days	daily	TK	TK
Aus		Without (W)	100	5.59	559	75	6.40	480	75	9.65	724	35	6.28	220	-	-	-	1,424	163	14	2,282	
		With (W)	50	"	280	87	"	557	83	"	801	35	"	220	2,000	0.16	320	1,898	196	16	3,136	
T. Aman		W	45	"	252	80	"	512	80	"	772	40	"	251	-	-	-	1,535	198	14	2,772	
		W	40	"	224	87	"	557	83	"	801	40	"	251	5,000	"	800	2,409	219	16	3,504	
B. Aman		W	110	"	615	75	"	480	75	"	724	35	"	220	-	-	-	1,424	140	14	1,960	
		W	100	"	559	75	"	480	75	"	724	35	"	220	-	-	-	1,424	143	16	2,288	
Boro		W	55	"	307	150	"	960	100	"	965	60	"	377	-	-	-	2,302	193	14	2,702	
		W	45	"	252	180	"	1,152	130	"	1,255	60	"	377	5,000	"	800	3,584	230	16	3,680	
Wheat		W	125	6.02	752	75	"	480	75	"	724	35	"	220	-	-	-	1,424	125	14	1,750	
		W	125	"	752	163	"	1,043	99	"	955	35	"	220	2,000	"	320	2,538	137	16	2,192	
Sugarcane		W	5,000	0.66	3,300	180	"	1,152	175	"	1,689	60	"	377	-	-	-	3,218	249	14	3,486	
		W	6,250	"	4,125	275	"	1,760	275	"	2,654	90	"	565	-	-	-	4,979	257	16	4,112	
Jute		W	8	7.66	61	62	"	397	25	"	241	35	"	220	-	-	-	858	215	14	3,010	
		W	8	"	61	110	"	704	25	"	241	50	"	314	1,000	"	160	1,419	226	16	3,616	
Pulses		W	31	2.56	79	25	"	160	35	"	338	25	"	157	-	-	-	665	81	14	1,134	
		W	31	"	79	35	"	224	45	"	434	30	"	188	-	-	-	846	84	16	1,344	
Oilseed		W	14	8.54	120	120	"	768	80	"	772	37	"	232	-	-	-	1,772	82	14	1,148	
		W	14	"	120	138	"	883	138	"	1,332	37	"	232	-	-	-	2,447	85	16	1,360	
Potatoes (and others)		W	1,600	3.20	5,120	200	"	1,280	150	"	1,448	150	"	942	-	-	-	3,670	246	14	3,444	
		W	1,700	"	5,440	200	"	1,280	150	"	1,448	200	"	1,256	10,000	"	1,600	5,584	288	16	4,608	

Source: 1) The above data

2) Farm Economic Survey

3) Feasibility Report of the Baranai Project (Draft)

4) Agriculture Extension Rajshahi Zone

5) Appraisal Report of Baranai Project

TABLE X I -15-(2)

PRODUCTION COST PER HECTARE (Economic)-(2)

(Economic)		Pesticide											Bullock (pair)		Sub- Total	By Produc- tion	Produc- tion Cost
Crop	Cost By Without With	Bidrin, Dimecron			Sumithion, Malathion, Diazinon			Total Cost	(Plough and others)			Others					
		Q	U.P.	Cost	Q	U.P.	Cost		Q	U.P.	Cost						
		ℓ	TK/ℓ	TK	ℓ	TK/ℓ	TK	TK	pair	TK/pair	TK	TK	TK	TK	TK		
Aus	Without (W)	Bi 1.0 Di 1.0 }mix	Bi 536 Di 428	964			964	964	47	33	1,551	375	7,155	210	6,945		
	With (W)	-	-	-	Su 3.3	Su 240	792	792	50	"	1,650	458	8,214	370	7,844		
T. Aman	W	Bi 1.0 Di 1.0 }mix	"	964			-	964	52	"	1,716	428	7,667	604	7,063		
	W	-	-	-	Su 3.3	"	792	792	58	"	1,914	522	9,365	1,003	8,362		
B. Aman	W	-	-	-	-	-	-	-	42	"	1,386	280	5,665	1,024	4,641		
	W	-	-	-	-	-	-	-	42	"	1,386	344	6,001	1,042	4,959		
Boro	W	Bi 1.0 Di 1.0 }mix	"	964			-	964	45	"	1,485	515	8,275	569	7,706		
	W	-	-	-	Su 2.2	"	528	528	52	"	1,716	626	10,386	950	9,436		
Wheat	W	-	-	-			-	-	40	"	1,320	300	5,546	904	4,642		
	W	-	-	-	Ma 2.2	Ma 240	528	528	42	"	1,386	368	7,764	1,158	6,606		
Sugarcane	W	-	-	-			-	-	74	"	2,442	482	12,928	4,594	8,334		
	W	-	-	-	Dia 6.8	Dia 283	1,924	1,924	84	"	2,772	586	18,498	6,015	12,483		
Jute	W	-	-	-			-	-	45	"	1,485	278	5,692	2,903	2,789		
	W	-	-	-			-	-	46	"	1,518	341	6,955	2,929	4,026		
Pulses	W	-	-	-			-	-	34	"	1,122	216	3,206	782	2,424		
	W	-	-	-			-	-	34	"	1,122	267	3,658	882	2,776		
Oilseed	W	-	-	-			-	-	34	"	1,122	216	4,378	518	3,860		
	W	-	-	-			-	-	34	"	1,122	267	5,316	738	4,578		
Potatoes (and others)	W	-	-	-	Dia 2.2	"	623	623	36		1,188	742	14,787	-	14,787		
	W	-	-	-	Su 3.3	240	792	792	39		1,287	898	18,609	-	18,609		

Source: 1) The above data

2) Farm Economic Survey

3) Feasibility Report of the Baranai Project (Draft)

4) Agriculture Extension Rajshahi Zone

5) Appraisal Report of Baranai Project

TABLE X I -16 BENEFITS OF CROPS

(Economic)

	Without				With				Incremen- tal Benefit				
	Per Hecter		Area ha	Total N.P.V. 1,000TK	Per Hecter		Area ha	Total N.P.V. 1,000TK					
	Yield t	G.P.V. TK			P.C.	N.P.V.				Yield t	G.P.V. TK	P.C.	N.P.V.
Aus	2.0	10,166	6,945	3,221	11,414	36,764	3.5	17,791	7,844	9,947	13,740	136,672	
T. Aman	2.3	11,691	7,063	4,628	42,321	195,862	4.0	20,332	8,362	11,970	47,600	569,772	
B. Aman	1.3	6,608	4,641	1,967	2,463	4,845	1.5	7,625	4,959	2,666	720	1,920	
Boro	3.2	16,266	7,706	8,560	2,220	19,003	5.0	25,415	9,436	15,979	28,200	450,608	
<u>Sub-Total</u>					<u>58,418</u>	<u>256,474</u>					<u>90,260</u>	<u>1,158,972</u>	<u>902,498</u>
Wheat	2.3	13,844	4,642	9,202	4,020	36,992	3.5	21,067	6,606	14,461	5,300	76,643	
Sugarcane	50.0	33,100	8,334	24,766	1,995	49,408	65.0	43,030	12,483	30,547	2,160	65,982	
Jute	1.5	11,489	2,789	8,700	1,801	15,669	2.0	15,318	4,026	11,292	1,080	12,195	
Pulses	0.8	2,812	2,424	388	673	261	1.2	4,218	2,776	1,442	5,629	8,117	
Oilseeds	0.7	5,981	3,860	2,121	608	1,290	1.0	8,544	4,578	3,966	1,173	4,652	
Potato	8.0	25,632	14,787	10,845	4,125	44,736	12.0	38,448	18,609	19,839	2,008	39,837	
<u>Sub-Total</u>					<u>13,221</u>	<u>148,356</u>					<u>17,350</u>	<u>207,426</u>	<u>59,070</u>
<u>Grand Total</u>					<u>71,640</u>	<u>404,830</u>					<u>107,610</u>	<u>1,366,398</u>	<u>961,568</u>

TABLE X I -17 FARMGATE PRICE (TK/KG) (FINANCIAL)

1) Aus	5.0
2) B. Aman	5.5
3) T. Aman	5.4
4) Boro	5.1
5) Wheat	5.0
6) Jute	5.3
7) Sugarcane	0.64
8) Pulses	3.2
9) Oilseed	10.7
10) Potato	4.0

Source: 1) Farm Economic Survey
2) District Agricultural Marketing Office, Rajshahi
3) Department of Agricultural Marketing

TABLE X I-18-(1)

PRODUCTION COST PER HECTARE (Financial)-(1)

(Financial)

Crop	Cost By Without With	Seed			Fertilizer												Labour				
		Q	U.P.	Cost	Urea			T S P			M P			Manure			Total Cost	Q	U.P.	Cost	
					Q	U.P.	Cost	Q	U.P.	Cost	Q	U.P.	Cost	Q	U.P.	Cost					TK
kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	kg	TK/kg	TK	TK	man-days	daily TK	TK
Aus	Without (W)	100	8.14	814	75	4.80	360	75	5.00	375	35	4.00	140	-	0.20	-	875	163			3,205
	With (W)	50	"	407	87	"	418	83	"	415	35	"	140	2,000	"	400	1,373	196	15 ~ 25		3,640
T. Aman	W	45	9.00	405	80	"	384	80	"	400	40	"	160	-	"	-	944	198			4,600
	W	40	"	360	87	"	418	83	"	415	40	"	160	5,000	"	1,000	1,993	219			5,105
B. Aman	W	110	9.00	990	75	"	360	75	"	375	35	"	140	-	"	-	875	140			2,770
	W	100	"	900	75	"	360	75	"	375	35	"	140	-	"	-	875	143			2,845
Boro	W	55	7.71	424	150	"	720	100	"	500	60	"	240	-	"	-	1,460	193			3,095
	W	45	"	347	180	"	864	130	"	650	60	"	240	5,000	"	1,000	1,754	230			3,680
Wheat	W	125	8.14	1,018	75	"	360	75	"	375	35	"	140	-	"	-	875	125			2,495
	W	125	"	1,018	163	"	782	99	"	495	35	"	140	2,000	"	400	1,817	137			2,685
Sugarcane	W	5,000	0.64	3,200	180	"	864	175	"	875	60	"	240	-	"	-	1,979	249			3,985
	W	6,250	"	4,000	275	"	1,320	275	"	1,375	90	"	360	-	"	-	3,055	259			4,005
Jute	W	8	6.10	49	62	"	298	25	"	125	35	"	140	-	"	-	563	215			4,335
	W	8	"	49	110	"	528	25	"	125	50	"	200	1,000	"	200	1,053	226			4,590
Pulses	W	31	3.20	99	25	"	120	35	"	175	25	"	100	-	"	-	395	81			1,305
	W	31	"	99	35	"	168	45	"	225	30	"	120	-	"	-	513	84			1,350
Oilseed	W	14	10.68	150	120	"	576	80	"	400	37	"	148	-	"	-	1,124	82			1,570
	W	14	"	150	138	"	662	138	"	690	37	"	148	-	"	-	1,500	85			1,625
Potatoes (and others)	W	1,600	4.01	6,416	200	"	960	150	"	750	150	"	600	-	"	-	2,310	246			4,230
	W	1,700	"	6,817	200	"	960	150	"	750	200	"	800	10,000	"	2,000	4,510	288			4,870

Source: See that of Economic

TABLE X I -18-(2)

PRODUCTION COST PER HECTARE (Financial)-(2)

(Financial)																
Crop	Cost	By Without	Pesticide						Bullock (pair)			Others	Sub-Total	By Production	Production Cost	
			Bidrin, Dimecron			Sumithion, Malathion, Diazinon			(Plough and others)							
			Q	U.P.	Cost	Q	U.P.	Cost	Cost	Q	U.P.					Cost
			ℓ	TK/ℓ	TK	ℓ	TK/ℓ	TK	TK	pair	TK/pair	TK	TK	TK	TK	
Aus		Without (W)	Bi 1.0, Di 1.0 }mix	Bi 670 Di 535	1,205	-	-	1,205	47	41	1,927	469	8,495	262	8,233	
		With (W)	-	-	-	Su 3.3	300	990	990	50	"	2,050	573	9,033	463	8,570
T. Aman		W	Bi 1.0, Di 1.0 }mix	"	1,205	-	-	1,205	52	"	2,132	535	9,821	755	9,066	
		W	-	"	-	Su 3.3	"	990	990	58	"	2,378	652	11,478	1,254	10,224
B. Aman		W	-	"	-	-	-	-	-	42	"	1,722	350	6,707	1,280	5,427
		W	-	"	-	-	-	-	-	42	"	1,722	430	6,772	1,302	5,470
Boro		W	Bi 1.0, Di 1.0 }mix	"	1,205	-	-	1,205	45	"	1,845	644	8,673	711	7,962	
		W	-	"	-	Su 2.2	"	660	660	52	"	2,132	783	9,356	1,187	8,169
Wheat		W	-	"	-	-	-	-	-	40	"	1,640	375	6,403	1,130	5,273
		W	-	"	-	Ma 2.2	300	660	660	42	"	1,722	460	8,362	1,448	6,914
Sugarcane		W	-	"	-	-	-	-	-	74	"	3,034	602	12,800	5,743	7,057
		W	-	"	-	Dia 6.8	354	2,407	2,407	84	"	3,444	732	17,643	7,519	10,124
Jute		W	-	"	-	-	-	-	-	45	"	1,845	347	7,139	3,629	3,510
		W	-	"	-	-	-	-	-	46	"	1,886	426	8,004	3,661	4,343
Pulses		W	-	"	-	-	-	-	-	34	"	1,394	270	3,463	978	2,485
		W	-	"	-	-	-	-	-	34	"	1,394	334	3,690	1,102	2,588
Oilseed		W	-	"	-	-	-	-	-	34	"	1,394	270	4,508	648	3,860
		W	-	"	-	-	-	-	-	34	"	1,394	334	5,003	923	4,080
Potatoes (and others)		W	-	"	-	Dia 2.2	-	779	779	36	"	1,476	927	16,138	-	16,138
		W	-	"	-	Su 3.3	-	990	990	39	"	1,599	1,122	18,918	-	18,918

Source: See that of Economic

TABLE X I -19 BENEFITS OF CROPS

(Financial)

	Without						With						Incremental Benefit
	Per Hectre			Area ha	Total N.P.V. 1,000TK	Yield t	Per Hectre			Area ha	Total N.P.V. 1,000TK		
	Yield t	G.P.V. TK	P.C. TK				N.P.V. TK	G.P.V. TK	P.C. TK			N.P.V. TK	
Aus	2.0	10,000	8,233	1,767	11,414	20,169	3.5	17,500	8,570	8,930	13,740	122,698	
T. Aman	2.3	12,420	9,066	3,354	42,321	141,945	4.0	21,600	10,224	11,376	47,600	541,498	
B. Aman	1.3	7,150	5,427	1,723	2,463	4,244	1.5	8,250	5,470	2,780	720	2,002	
Boro	3.2	16,320	7,962	8,358	2,220	18,555	5.0	25,500	8,169	17,331	28,200	488,734	
<u>Sub-Total</u>					<u>58,418</u>	<u>184,913</u>					<u>90,260</u>	<u>1,154,932</u>	<u>970,019</u>
Wheat	2.5	11,730	5,273	6,457	4,020	25,957	3.5	17,850	6,914	10,936	5,300	57,961	
Sugarcane	50.0	32,000	7,057	24,943	1,995	49,761	65.0	41,600	10,124	31,476	2,160	57,988	
Jute	1.5	7,950	3,510	4,440	1,801	7,996	2.0	10,600	4,343	6,257	1,080	6,758	
Pulses	0.8	2,560	2,485	75	673	50	1.2	3,840	2,588	1,252	5,629	7,048	
Oilseeds	0.7	7,490	3,860	3,630	608	2,207	1.0	10,700	4,080	6,620	1,173	7,765	
Potato	8.0	32,000	16,138	15,862	4,125	65,431	12.0	48,000	18,918	29,082	2,008	58,397	
<u>Sub-Total</u>					<u>13,221</u>	<u>151,402</u>					<u>17,350</u>	<u>205,917</u>	<u>54,515</u>
<u>Grand Total</u>					<u>71,640</u>	<u>336,315</u>					<u>107,610</u>	<u>1,360,849</u>	<u>1,024,534</u>

Table XI - 20: BENEFIT SCHEDULE OF CROPS

1) Economic

Year	Bar.ind		1995		1996		1997		Total		Paba		1993		1994		Total		Whole Area		
	1993	1994	1994	1995	1996	1997	1997	1997	1997	1997	1997	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22901	22901	22901	22901
2	108257	142619	0	130060	0	0	0	0	108257	0	22901	38509	32427	38509	32427	141684	71936	38509	32427	22901	141684
3	159523	159523	171348	191659	172860	0	0	0	272679	172860	180193	46324	50213	46324	198832	198832	102537	102537	46324	46324	198832
4	159523	159523	191659	191659	227732	164019	0	0	503731	227732	375216	46324	67627	46324	227150	227150	113951	113951	46324	46324	227150
5	159523	159523	191659	191659	254723	216080	0	0	742933	254723	856884	46324	67627	46324	227150	227150	113951	113951	46324	46324	227150
6	159523	159523	191659	191659	254723	241691	0	0	821985	254723	935936	46324	67627	46324	227150	227150	113951	113951	46324	46324	227150
7	159523	159523	191659	191659	254723	241691	0	0	847596	254723	961547	46324	67627	46324	227150	227150	113951	113951	46324	46324	227150
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2) Financial

Year	Bar.ind		1995		1996		1997		Total		Paba		1993		1994		Total		Whole Area		
	1993	1994	1994	1995	1996	1997	1997	1997	1997	1997	1997	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27421	27421	27421	27421
2	116513	151818	0	139978	0	0	0	0	116513	0	27421	43309	40039	43309	40039	156552	83348	43309	40039	27421	156552
3	169109	169109	182339	182339	186039	0	0	0	291796	186039	180193	51219	63236	51219	215054	215054	114455	114455	51219	51219	215054
4	169109	169109	203176	203176	242411	176523	0	0	537547	242411	375216	51219	74782	51219	243891	243891	126001	126001	51219	51219	243891
5	169109	169109	203176	203176	270024	230012	0	0	791219	270024	856884	51219	74782	51219	243891	243891	126001	126001	51219	51219	243891
6	169109	169109	203176	203176	270024	256211	0	0	872321	270024	935936	51219	74782	51219	243891	243891	126001	126001	51219	51219	243891
7	169109	169109	203176	203176	270024	256211	0	0	898520	270024	961547	51219	74782	51219	243891	243891	126001	126001	51219	51219	243891
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table XI 1 - 21 Benefits of Fisheries

I. Ponds

1. With Project

(1) Production Cost of Fish Pond Culture per hectare (Carps)

Items	Financial	Economic	
	TK	TK	
1. Rent	7,500	-	
2. Flushing	5,600	6,800	(Salary for × 16/22 TK =0.73)
3. Repairing and Maintenance	3,700		
4. Lime (412kg)	2,250		
5. Cowdung (5,625kg)	2,250	1,800	(×0.8)
6. Mustard Oil Cake (562kg)	3,700	3,000	(×0.8)
7. Chemical Fertilizer (1,125kg)	5,600	9,200	Urea...1.125kg×0.4×6.4TK/kg TSP...1.125kg×0.6×9.65TK/kg
8. Fingerlings (2" - 3")	3,700	3,000	(×0.8)
9. Labour (Hired 50%) 190 Mandays	7,500	5,500	(×0.73)
Total Production Cost	41,800	31,110	≅ 31,100

(2) Gross Production Value from Carps per hectare

	Yield per hectare	Unit Price	Gross Value	
			<u>Financial</u> TK	<u>Economic</u> TK
1. Katla/Carps	1,388kg	TK50 P/kg	69,400	55,520 (×0.8)
2. Rui/Carps	1,110kg	TK50 P/kg	55,500	44,400 (×0.8)
3. Mrigal	280kg	TK50 P/kg	14,000	11,200 (×0.8)
	2,778kg		138,900	111,100

(3) Net Production Value per hectare

<u>Financial</u> TK	<u>Economic</u> TK
<u>97,100</u>	<u>80,000</u>

(4) Appendix

STATEMENT OF INCOME AND EXPENDITURE OF FISH PRODUCTION IN A BIGHA OF POND

EXPENDITURE ITEMS	TAKA
RENT	1,000.00
FLUSHING	750.00
MAINTENANCE	500.000
LIME (55KG)	300.000
COWDUNG (750KG)	300.000
MUSTARD OIL CAKE (75KG)	500.00
FERTILIZER (150KG)	750.000
FINGERLINGS (2" - 3")	500.000
(LABOUR)	1,000.00

TOTAL	5,600.00
INCOME	
185KG KATLA	
148KG RUI AND 37KG	
MRIGAL AVERAGE PRICE TK 50.00/KG	18,500.00 INCOME
	5,600.00 EXPENSE

	12,900.00 NET INCOME.

1 BIGHA MEANS 0.33 ACRE OF LAND, THAT IS 7.5 BIGHAS MAKE A HECTARE.

SOURCE : A POPULAR GUIDE TO INTENSIVE FISH FARMING (RURAL PISCICULTURE) WITH FISH FARMERS CALENDAR FOR BANGLADESH PUBLISHED JOINTLY BY FISHERY ADVISER FAO/UNDP ADVISORY PROJECT, DHAKA RESEARCH OFFICER, FISH RESEARCH CENTRE, CHANDPUR COMILLA AND SENIOR SCIENTIFIC OFFICER, ACQUEEN ITEM EXPERIMENT MYMSNSINGH,

2. Without Project

(1) Production Cost of Fish Pond culture per hectare (Carps)

Items	Financial	Economic	
	TK	TK	
1. Rent	7,500	-	
2. Flushing	4,000	4,800	(×0.73)
3. Repairing and Maintenance	2,600		
4. Lime (285kg)	1,600	1,300	(×0.8)
5. Cowdung (400kg)	1,600	1,300	(×0.8)
6. Mustard Oil Cake (400kg)	2,600	2,100	(×0.8)
7. Chemical Fertilizer (800kg)	4,000	6,700	Urea...800kg×0.4×6.4TK/kg TSP...800kg×0.6×9.65TK/kg
8. Fingerlings (2" - 3")	2,700	2,200	(×0.8)
9. Labour (Hired 30%) 100 Mandays	4,000	2,900	(×0.73)
<hr/>			
Total Production Cost	30,600	21,300	

(2) Gross Production Value from Carps per hectare

	Yield per hectare	Unit Price	Gross Value	
			Financial TK	Economic TK
Katla/Rui/Silver Carp/ Mrigal/Grass Carp/Comanon Carp	1,875kg	TK50P/kg	93,750	75,000 (×0.8)

(3) Net Production Value per hectare

Financial TK	Economic TK
<u>63,150</u>	<u>53,700</u>

3. Benefits of Fish Pond Culture

A Benefits per hectare

- 1) Financial TK 33,950 (With NPV 97,100TK - Without NPV 63,150TK)
- 2) Economic TK 26,300 (With NPV 80,000TK - Without NPV 53,700TK)

B Area of Ponds 570ha*1

C Total Benefits

- 1) Financial TK 19,352⁰⁰⁰
- 2) Economic TK 14,991⁰⁰⁰

Note : *1...Surface area of full water level of ponds $634\text{ha} \times 0.9$

II. Beels along Sibu River (During Dry Season)

1) Production Cost per hectare

		---With--- *1				
		Unit Price	Quantity	<u>Financial</u>	<u>Economic</u>	
1. Fish Fry	0.657 TK *2	/Fry	450 Fry *3	/ha	296TK	237TK (×0.8)
2. Labour	40TK		24 Mandays *4		960	700 (×0.73)
Sub - total					1,256	937
3. Others (sub-total ×0.05)					63	47
<u>Total</u>					<u>1,319</u>	<u>984</u>

2) Gross Production Value per hectare

Unit Price	Unit Yield	<u>Financial</u>	<u>Economic</u>	
50 TK/Kg	200 TK/ha *5	<u>TK 10,000</u>	<u>TK 8,000</u>	(×0.8)

Note : *1 In case of without project, as there is without water it is seems that production of aquaculture does not occur during dry season.

*2 Unit price of fish pond culture is used.

*3 In according to average fish production by stocking rat of fish fry in *Fisheries Resources and Opportunities in Freshwater Fish Culture in Bangladesh*, ratio of production/input of fry is 0.4~0.5. Accordingly, as fish production during dry season is accumulated 200kg per hectare, inputted quantities of fish fries are average 450kg per hectare.

*4 6 months × 4 times × 1 person = 24 mandays

*5 Annual catches in beels are 450kg per hectare (1986 Statistical Yearbook of Bangladesh). Accordingly, increment during dry season with project estimated at about half of 450 kg i. e. about 200 kg per hectare.

3) Net Production Value per hectare

Without		With	
Financial	Economic	Financial	Economic
---	---	<u>TK 8,681</u>	<u>TK 7,016</u>

4) Benefits per hectare

Financial	Economic
<u>TK 8,681</u>	<u>TK 7,016</u>

5) Beneficial Area 3,400 ha *6

Note : *6 ... $4,800\text{ha} \times 0.7 = 3,360\text{ ha} \approx 3,400\text{ ha}$

6) Total Benefits

Financial	Economic
<u>TK 29,515</u>	<u>TK 23,854</u>

III. Total Benefits

	<u>Financial</u>	<u>Economic</u>
1. Ponds	TK 19,352 ⁰⁰⁰	TK 14,991 ⁰⁰⁰
2. Beels (along sibu river)	TK 29,515 ⁰⁰⁰	TK 23,854 ⁰⁰⁰
<u>Total</u>	TK 48,867 ⁰⁰⁰	TK 38,845 ⁰⁰⁰

IV. Total Benefits by Area

	<u>Financial</u>	<u>Economic</u>
1. Barind	TK 45,373 ⁰⁰⁰	TK 36,136 ⁰⁰⁰
2. Paba	TK 3,494 ⁰⁰⁰	TK 2,709 ⁰⁰⁰
<u>Total</u>	TK 48,867 ⁰⁰⁰	TK 38,845 ⁰⁰⁰

Note :

1) Area	Barind	Paba	Whole Area
(1) Ponds	519 ha	115 ha	634 ha
(2) Beels	4,800	—	4,800
2) Benefits with Ponds			
Financial	15,858 ⁰⁰⁰	3,494 ⁰⁰⁰	19,352 ⁰⁰⁰
	(33,950 TK/ha × 519ha × 0.9)	(33,950 TK/ha × 115ha × 0.9)	
Economic	12,282 ⁰⁰⁰	2,709 ⁰⁰⁰	14,991 ⁰⁰⁰
	(26,300 TK/ha × 519ha × 0.9)	(26,300 TK/ha × 115ha × 0.9)	
3) Benefits with Beels			
Financial	29,515 ⁰⁰⁰	—	29,515 ⁰⁰⁰
Economic	23,854 ⁰⁰⁰	—	23,854 ⁰⁰⁰

TABLE XI-22. BENEFITS OF ROAD NETWORK

1. Output

1) Marketing Quantities of Production

Whole Area

<u>Crop</u>	<u>Area</u> (ha)	<u>Production</u> (t)	<u>Marketing</u> <u>Quantities</u> (t)
Rice	90,260	380,570	190,290
Aus	13,740	48,090	
T. Aman	47,600	190,400	
B. Aman	720	1,080	
Bore	28,200	141,000	
Wheat	5,300	18,550	9,280
Sugarcane	2,160	140,400	126,400
Jute	1,080	2,160	1,940
Pulses	5,629	6,755	5,410
Oilseed	1,173	1,173	940
Potatoes	481	5,760	4,610
Vegetables	1,083	11,610	8,850
Fruits	444	3,312	3,180
Total			<u>350,900</u>

2) Transport Cost of a cart with a pair of Buffaloes (Bullocks)

- (1) (a) Capacity of a Cart with a pair of Buffaloes: 30 - 35 mds
 Bullocks: 25 - 30 mds
 (b) Average Capacity of a Cart 30 mds
 (2) Speed of a Coar: 3 miles per hour
 (3) Unit Cost of Transport: TK 1.0 per and permile^{*1}
 (4) Transport Cost a Cart per ton of Loadage

$$1.0 \text{ TK} \times 30 \text{ md} \left(\frac{1}{3} \text{ t}\right) \times 1 \text{ km} \left(0.62137 \text{ mile}\right) 18.6 \text{ TK} \div 19 \text{ TK}$$

Note: This is collected from local owners of carts by Mr. Chakravorty.

3) Benefits of Reduced Transport Expenses

(1) Loadage

(a) Paba Area	<u>160,640 t</u>
(b) Barind Area	<u>190,260 t</u>
<u>Total</u>	<u>350,900 t</u>

(2) Average Capacity of a cort 30md ÷ 1 t

(3) Cart Requirement

(1) Paba Area	total number of <u>160,640</u> carts
(2) Barind Area	" <u>190,260</u> carts
(3) Whole Area	" <u>350,900</u> carts

(4) Short-cuttet Distance 4 km^{*1}

(5) Reduced Transport Expenses of a cart $\frac{76 \text{ TK}}{(19 \text{ TK} \times 4 \text{ km})}$

(6) Total Benefits of Reduced Transport Expenses

	Financial	Economic
(a) Paba Area	<u>TK 12,210⁰⁰⁰</u> (160,640 carts x 76)	<u>TK 9,770⁰⁰⁰*2</u>
(b) Barind Area	<u>TK 14,460⁰⁰⁰</u> (190,260 carts x 76 ^{TK})	<u>TK 11,570⁰⁰⁰*2</u>
(c) Whole Area	<u>TK 26,670⁰⁰⁰</u>	<u>TK 21,340⁰⁰⁰*2</u>

Note: *1 ... Farm products which are shipped from this Project area are carried out to markets through the main road. And it is considered that the distance of connected roads from the villages to the main road in the area is about 6 km on an average. If a new road network is constructed, the distance from the villages to the new road becomes about 2 km. When it is considered that the distance from the connected point of the present main road to the markets is the same as that from the connected point of the projected road to the markets, the distance from the villages is cut by 4 km through the construction of the projected road. Its construction also cuts transportation expenses which correspond to 4 km's shipping charge.

*2 ... 0.8 of standard conversion factor is applied to convert to economic price.

2. Input

1) Input Quantities (Fertilizer)

(1) Paba Area	5,400 t
(2) Barind Area	23,340 t
(3) Total	28,740 t

2) Cart Requirement

(1) Paba Area	5,400 carts
(2) Barind Area	23,340
(3) Total	28,740

3) Transport Cost of a Cart per ton of Loadage

19TK

4) Short-cutted Distance 4 km^{*1}

5) Reduced Transport Expenses of a cart

76^{TK}
(19^{TK} x 4 km)

6) Total Benefits of Reduced Transport Expenses

	Financial	Economic
(1) Paba Area	<u>TK 410⁰⁰⁰</u>	<u>TK 328⁰⁰⁰</u>
(2) Barind Area	<u>TK 1,774</u>	<u>TK 1,419⁰⁰⁰</u>
(3) Whole Area	<u>TK 2,184</u>	<u>TK 1,747⁰⁰⁰</u>

3. Total Benefits

	Financial	Economic
1) Paba Area	<u>TK 12,600⁰⁰⁰</u>	<u>TK 10,098⁰⁰⁰</u>
2) Barind Area	<u>TK 16,234⁰⁰⁰</u>	<u>TK 12,989⁰⁰⁰</u>
3) Whole Area TK 28,854 ⁰⁰⁰	<u>TK 28,854⁰⁰⁰</u>	<u>TK 23,087⁰⁰⁰</u>

TABLE XI-23 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, ECONOMIC, WHOLE AREA
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	10 %		15 %		20 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	69.7	0.0	69.7	0.0	-69.7	69.70	0.00	69.70	0.00	69.70	0.00
2 1990	123.1	0.0	123.1	0.0	-123.1	101.74	0.00	93.08	0.00	85.49	0.00
3 1991	657.0	0.0	657.0	0.0	-657.0	493.61	0.00	431.99	0.00	380.21	0.00
4 1992	1098.9	0.0	1098.9	0.0	-1098.9	750.57	0.00	628.30	0.00	529.95	0.00
5 1993	551.2	5.4	556.6	28.1	-328.5	345.61	17.45	276.73	13.97	223.69	11.29
6 1994	436.7	32.5	469.2	202.2	-267.0	264.85	114.14	202.85	87.42	157.13	67.72
7 1995	227.4	55.4	282.8	408.4	-27.6	145.12	209.58	106.32	153.53	78.92	113.98
8 1996	0.0	86.0	86.0	665.6	579.6	40.12	310.51	28.11	217.59	20.00	154.80
9 1997	0.0	114.9	114.9	918.8	803.9	48.73	389.66	32.66	261.18	22.27	178.07
10 1998	0.0	114.9	114.9	883.0	883.0	44.30	384.74	28.40	246.67	18.36	161.17
11 1999	0.0	114.9	114.9	1023.5	908.6	40.27	358.73	24.70	220.00	15.46	137.75
12 2000	0.0	114.9	114.9	1023.5	908.6	36.61	326.12	21.48	191.30	12.89	114.79
13 2001	0.0	114.9	114.9	1023.5	908.6	33.28	296.47	18.67	166.35	10.74	95.66
14 2002	0.0	114.9	114.9	1023.5	908.6	30.26	269.52	16.24	144.65	8.95	79.72
15 2003	0.0	114.9	114.9	1023.5	908.6	27.51	245.02	14.12	125.78	7.46	66.43
16 2004	0.0	114.9	114.9	1023.5	908.6	25.01	222.75	12.28	109.38	6.21	55.36
17 2005	0.0	114.9	114.9	1023.5	908.6	22.73	202.50	10.68	95.11	5.18	46.13
18 2006	0.0	114.9	114.9	1023.5	908.6	20.67	184.09	9.28	82.71	4.32	38.44
19 2007	0.0	114.9	114.9	1023.5	908.6	18.79	167.35	8.07	71.92	3.60	32.04
20 2008	0.0	114.9	114.9	1023.5	908.6	17.08	152.14	7.02	62.54	3.00	26.70
21 2009	0.0	114.9	114.9	1023.5	908.6	15.53	138.31	6.10	54.38	2.50	22.25
22 2010	0.0	114.9	114.9	1023.5	908.6	14.12	125.74	5.31	47.29	2.08	18.54
23 2011	0.0	114.9	114.9	1023.5	908.6	12.83	114.30	4.62	41.12	1.73	15.45
24 2012	0.0	114.9	114.9	1023.5	908.6	11.67	103.91	4.01	35.76	1.45	12.87
25 2013	0.0	114.9	114.9	1023.5	908.6	10.61	94.47	3.49	31.09	1.20	10.73
26 2014	0.0	165.9	165.9	1023.5	857.6	13.92	85.88	4.38	27.04	1.45	8.94
27 2015	0.0	368.9	368.9	1023.5	634.6	28.14	78.07	4.38	23.51	2.69	7.45
28 2016	0.0	468.1	468.1	1023.5	555.4	32.46	70.97	9.35	20.44	2.84	6.21
29 2017	0.0	309.6	309.6	1023.5	713.9	19.52	64.52	5.38	17.78	1.57	5.17
30 2018	0.0	114.9	114.9	1023.5	908.6	9.58	58.66	1.74	15.46	0.48	4.31
31 2019	0.0	114.9	114.9	1023.5	908.6	5.99	53.32	1.51	13.44	0.40	3.59
32 2020	0.0	114.9	114.9	1023.5	908.6	5.44	48.48	1.31	11.69	0.34	2.99
33 2021	0.0	114.9	114.9	1023.5	908.6	4.95	44.07	1.14	10.16	0.28	2.50
34 2022	0.0	114.9	114.9	1023.5	908.6	4.50	40.06	0.99	8.84	0.23	2.08
35 2023	0.0	114.9	114.9	1023.5	908.6	4.09	36.42	0.86	7.69	0.19	1.73
36 2024	0.0	114.9	114.9	1023.5	908.6	3.72	33.11	0.75	6.68	0.16	1.44
37 2025	0.0	114.9	114.9	1023.5	908.6	3.38	30.10	0.65	5.81	0.14	1.20
38 2026	0.0	114.9	114.9	1023.5	908.6	3.07	27.36	0.57	5.05	0.11	1.00
39 2027	0.0	114.9	114.9	1023.5	908.6	2.79	24.88	0.49	4.39	0.09	0.84
40 2028	0.0	114.9	114.9	1023.5	908.6	2.54	22.61	0.43	3.82	0.08	0.70
41 2029	0.0	114.9	114.9	1023.5	908.6	2.31	20.56	0.37	3.32	0.07	0.58
42 2030	0.0	114.9	114.9	1023.5	908.6	2.10	18.69	0.32	2.89	0.05	0.48
43 2031	0.0	114.9	114.9	1023.5	908.6	1.91	16.99	0.28	2.51	0.05	0.40
44 2032	0.0	114.9	114.9	1023.5	908.6	1.73	15.45	0.25	2.18	0.04	0.34
45 2033	0.0	114.9	114.9	1023.5	908.6	1.58	14.04	0.21	1.90	0.04	0.28
46 2034	0.0	165.9	165.9	1023.5	857.6	2.07	12.77	0.27	1.65	0.04	0.23
47 2035	0.0	368.9	368.9	1023.5	634.6	4.18	11.61	0.52	1.44	0.07	0.19
48 2036	0.0	468.1	468.1	1023.5	555.4	4.83	10.55	0.57	1.25	0.07	0.16
49 2037	0.0	309.6	309.6	1023.5	713.9	2.90	9.59	0.33	1.09	0.04	0.13
50 2038	0.0	114.9	114.9	1826.5	1711.6	0.98	8.98	0.11	1.09	0.04	0.20
TOTAL	3164.0	6710.9	9874.9	44964.0	35089.1	2806.96	5291.83	2105.48	2661.45	1684.20	1513.06

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.89 (10%), 1.26 (15%), 0.90 (20%)
INTERNAL RATE OF RETURN (IRR) = 18.4 %

TABLE X I-24 PROJECT COST AND BENEFITS - THE NORTH RAJSHAHI IRRIGATION PROJECT, ECONOMIC FLOOD PLAIN
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE							
	CAPITAL	O & M				10 % (COST)	10 % (BENEFITS)	15 % (COST)	15 % (BENEFITS)	20 % (COST)	20 % (BENEFITS)		
1 1989	10.5	0.0	10.5	0.0	-10.5	10.50	0.00	10.50	0.00	10.50	0.00	10.50	0.00
2 1990	32.5	0.0	32.5	0.0	-32.5	26.86	0.00	24.57	0.00	24.57	0.00	22.57	0.00
3 1991	231.5	0.0	231.5	0.0	-231.5	173.93	0.00	152.22	0.00	152.22	0.00	133.97	0.00
4 1992	262.2	0.0	262.2	0.0	-262.2	179.09	0.00	149.91	0.00	149.91	0.00	126.45	0.00
5 1993	119.5	5.4	124.9	28.1	-96.8	77.55	17.45	62.10	13.97	62.10	13.97	50.19	11.29
6 1994	57.8	13.4	71.2	84.7	13.5	40.19	47.81	30.78	36.62	30.78	23.84	28.37	28.37
7 1995	0.0	13.4	13.4	115.3	101.9	6.88	59.17	5.04	43.35	5.04	3.74	32.18	32.18
8 1996	0.0	13.4	13.4	126.8	113.4	6.25	59.15	4.38	41.45	4.38	3.12	29.49	29.49
9 1997	0.0	13.4	13.4	126.8	113.4	5.68	53.78	3.81	36.04	3.81	2.60	24.57	24.57
10 1998	0.0	13.4	13.4	126.8	113.4	5.17	48.89	3.31	31.34	3.31	2.16	20.48	20.48
11 1999	0.0	13.4	13.4	126.8	113.4	4.70	44.44	2.88	27.26	2.88	1.80	17.07	17.07
12 2000	0.0	13.4	13.4	126.8	113.4	4.27	40.40	2.50	23.70	2.50	1.50	14.22	14.22
13 2001	0.0	13.4	13.4	126.8	113.4	3.88	36.73	2.18	20.61	2.18	1.25	11.85	11.85
14 2002	0.0	13.4	13.4	126.8	113.4	3.53	33.39	1.89	17.92	1.89	1.04	9.88	9.88
15 2003	0.0	13.4	13.4	126.8	113.4	3.21	30.36	1.65	15.58	1.65	0.87	8.23	8.23
16 2004	0.0	13.4	13.4	126.8	113.4	2.92	27.60	1.43	13.55	1.43	0.72	6.86	6.86
17 2005	0.0	13.4	13.4	126.8	113.4	2.65	25.09	1.25	11.78	1.25	0.60	5.72	5.72
18 2006	0.0	13.4	13.4	126.8	113.4	2.41	22.81	1.08	10.25	1.08	0.50	4.76	4.76
19 2007	0.0	13.4	13.4	126.8	113.4	2.19	20.73	0.94	8.91	0.94	0.42	3.97	3.97
20 2008	0.0	13.4	13.4	126.8	113.4	1.99	18.85	0.82	7.75	0.82	0.35	3.31	3.31
21 2009	0.0	13.4	13.4	126.8	113.4	1.81	17.13	0.71	6.74	0.71	0.29	2.76	2.76
22 2010	0.0	13.4	13.4	126.8	113.4	1.65	15.58	0.62	5.86	0.62	0.24	2.50	2.50
23 2011	0.0	13.4	13.4	126.8	113.4	1.50	14.16	0.54	5.09	0.54	0.20	1.91	1.91
24 2012	0.0	13.4	13.4	126.8	113.4	1.36	12.87	0.47	4.43	0.47	0.17	1.60	1.60
25 2013	0.0	13.4	13.4	126.8	113.4	1.24	11.70	0.41	3.85	0.41	0.14	1.30	1.30
26 2014	0.0	64.4	64.4	126.8	62.4	5.60	10.64	1.70	3.35	1.70	0.56	1.11	1.11
27 2015	0.0	105.1	105.1	126.8	21.7	8.02	9.67	2.41	2.91	2.41	0.77	0.92	0.92
28 2016	0.0	74.6	74.6	126.8	52.2	5.17	8.79	1.49	2.53	1.49	0.45	0.77	0.77
29 2017	0.0	13.4	13.4	126.8	113.4	0.84	7.99	0.23	2.20	0.23	0.07	0.64	0.64
30 2018	0.0	13.4	13.4	126.8	113.4	0.77	7.27	0.20	1.92	0.20	0.06	0.53	0.53
31 2019	0.0	13.4	13.4	126.8	113.4	0.70	6.61	0.18	1.67	0.18	0.05	0.45	0.45
32 2020	0.0	13.4	13.4	126.8	113.4	0.63	6.01	0.15	1.45	0.15	0.04	0.37	0.37
33 2021	0.0	13.4	13.4	126.8	113.4	0.58	5.46	0.13	1.26	0.13	0.03	0.31	0.31
34 2022	0.0	13.4	13.4	126.8	113.4	0.52	4.96	0.12	1.09	0.12	0.03	0.26	0.26
35 2023	0.0	13.4	13.4	126.8	113.4	0.48	4.51	0.10	0.95	0.10	0.02	0.21	0.21
36 2024	0.0	13.4	13.4	126.8	113.4	0.43	4.10	0.09	0.83	0.09	0.02	0.18	0.18
37 2025	0.0	13.4	13.4	126.8	113.4	0.39	3.73	0.08	0.72	0.08	0.02	0.15	0.15
38 2026	0.0	13.4	13.4	126.8	113.4	0.36	3.39	0.07	0.65	0.07	0.01	0.12	0.12
39 2027	0.0	13.4	13.4	126.8	113.4	0.33	3.08	0.06	0.54	0.06	0.01	0.10	0.10
40 2028	0.0	13.4	13.4	126.8	113.4	0.30	2.80	0.05	0.47	0.05	0.01	0.09	0.09
41 2029	0.0	13.4	13.4	126.8	113.4	0.27	2.55	0.04	0.41	0.04	0.01	0.07	0.07
42 2030	0.0	13.4	13.4	126.8	113.4	0.24	2.32	0.04	0.36	0.04	0.01	0.06	0.06
43 2031	0.0	13.4	13.4	126.8	113.4	0.22	2.10	0.03	0.31	0.03	0.01	0.05	0.05
44 2032	0.0	13.4	13.4	126.8	113.4	0.20	1.91	0.03	0.27	0.03	0.00	0.04	0.04
45 2033	0.0	13.4	13.4	126.8	113.4	0.18	1.74	0.02	0.24	0.02	0.00	0.03	0.03
46 2034	0.0	64.4	64.4	126.8	62.4	0.80	1.58	0.10	0.20	0.10	0.01	0.03	0.03
47 2035	0.0	105.1	105.1	126.8	21.7	1.19	1.44	0.15	0.18	0.15	0.02	0.05	0.05
48 2036	0.0	74.6	74.6	126.8	52.2	0.77	1.31	0.09	0.15	0.09	0.01	0.02	0.02
49 2037	0.0	13.4	13.4	126.8	113.4	0.13	1.19	0.01	0.13	0.01	0.00	0.02	0.02
50 2038	0.0	13.4	13.4	126.8	278.1	0.11	2.48	0.01	0.27	0.01	0.00	0.02	0.02
TOTAL	714.0	1016.2	1730.2	5845.2	4115.0	600.44	765.72	473.58	411.10	391.48	248.72	248.72	248.72

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.28 (10%), 0.87 (15%), 0.64 (20%)
INTERNAL RATE OF RETURN (IRR) = 13.0 %

TABLE X I-25 PROJECT COST AND BENEFITS, THE NORTH RAJSHAWI IRRIGATION PROJECT, ECONOMIC, BARIND (UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	10 %		15 %		20 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	59.2	0.0	59.2	0.0	-59.2	59.20	0.00	59.20	0.00	59.20	0.00
2 1990	90.6	0.0	90.6	0.0	-90.6	74.88	0.00	68.51	0.00	62.92	0.00
3 1991	425.5	0.0	425.5	0.0	-425.5	319.69	0.00	279.77	0.00	246.24	0.00
4 1992	836.7	0.0	836.7	0.0	-836.7	571.48	0.00	478.39	0.00	403.50	0.00
5 1993	431.7	0.0	431.7	0.0	-431.7	268.05	0.00	214.63	0.00	173.49	0.00
6 1994	379.0	19.1	398.1	117.5	-280.6	224.72	66.33	172.11	50.80	133.32	39.35
7 1995	227.4	42.0	269.4	293.0	23.6	138.25	150.36	101.28	110.15	75.18	81.77
8 1996	0.0	72.6	72.6	538.9	466.3	43.05	251.40	23.73	176.17	16.88	125.33
9 1997	0.0	101.5	101.5	871.1	789.6	39.13	335.93	28.85	235.17	19.67	153.51
10 1998	0.0	101.5	101.5	896.7	795.2	35.58	314.29	25.09	215.32	16.39	140.69
11 1999	0.0	101.5	101.5	896.7	795.2	32.34	285.72	21.82	192.74	13.66	120.69
12 2000	0.0	101.5	101.5	896.7	795.2	29.40	259.74	16.50	145.74	11.38	100.57
13 2001	0.0	101.5	101.5	896.7	795.2	26.73	236.13	14.34	126.73	9.49	83.81
14 2002	0.0	101.5	101.5	896.7	795.2	24.30	214.67	12.47	110.20	7.91	69.84
15 2003	0.0	101.5	101.5	896.7	795.2	22.09	195.15	10.85	95.83	5.49	58.20
16 2004	0.0	101.5	101.5	896.7	795.2	20.08	177.41	9.43	83.33	4.57	40.42
17 2005	0.0	101.5	101.5	896.7	795.2	18.28	161.28	8.20	72.46	3.81	33.68
18 2006	0.0	101.5	101.5	896.7	795.2	16.60	146.62	7.13	63.01	3.18	28.07
19 2007	0.0	101.5	101.5	896.7	795.2	15.09	133.29	6.20	54.79	2.65	23.39
20 2008	0.0	101.5	101.5	896.7	795.2	13.72	121.17	5.39	47.64	2.21	19.49
21 2009	0.0	101.5	101.5	896.7	795.2	12.47	110.16	4.69	41.43	1.84	16.24
22 2010	0.0	101.5	101.5	896.7	795.2	11.34	100.14	4.08	36.02	1.53	13.54
23 2011	0.0	101.5	101.5	896.7	795.2	10.31	91.04	3.55	31.33	1.28	11.28
24 2012	0.0	101.5	101.5	896.7	795.2	9.37	82.76	3.08	27.24	1.06	9.40
25 2013	0.0	101.5	101.5	896.7	795.2	8.52	75.24	2.88	25.69	0.89	7.83
26 2014	0.0	101.5	101.5	896.7	795.2	7.82	68.40	2.66	20.60	0.89	6.53
27 2015	0.0	263.8	263.8	896.7	632.9	20.12	62.18	6.06	17.91	1.92	5.44
28 2016	0.0	393.6	393.6	896.7	503.1	27.29	56.53	7.86	15.57	2.39	4.53
29 2017	0.0	296.2	296.2	896.7	600.5	18.67	51.39	5.14	13.54	1.50	3.78
30 2018	0.0	101.5	101.5	896.7	795.2	5.82	46.72	1.33	10.24	0.36	3.15
31 2019	0.0	101.5	101.5	896.7	795.2	5.29	42.47	1.16	8.90	0.25	2.62
32 2020	0.0	101.5	101.5	896.7	795.2	4.81	38.61	1.01	7.74	0.21	1.82
33 2021	0.0	101.5	101.5	896.7	795.2	4.37	35.10	0.88	6.73	0.17	1.52
34 2022	0.0	101.5	101.5	896.7	795.2	3.97	31.91	0.76	5.86	0.14	1.27
35 2023	0.0	101.5	101.5	896.7	795.2	3.61	29.01	0.66	5.09	0.12	1.05
36 2024	0.0	101.5	101.5	896.7	795.2	3.28	26.37	0.58	4.43	0.10	0.88
37 2025	0.0	101.5	101.5	896.7	795.2	2.99	23.97	0.50	3.85	0.08	0.73
38 2026	0.0	101.5	101.5	896.7	795.2	2.71	21.79	0.44	3.35	0.07	0.61
39 2027	0.0	101.5	101.5	896.7	795.2	2.47	19.81	0.38	2.91	0.06	0.51
40 2028	0.0	101.5	101.5	896.7	795.2	2.24	18.01	0.33	2.53	0.05	0.42
41 2029	0.0	101.5	101.5	896.7	795.2	2.04	16.37	0.29	2.20	0.04	0.35
42 2030	0.0	101.5	101.5	896.7	795.2	1.85	14.89	0.25	1.91	0.03	0.29
43 2031	0.0	101.5	101.5	896.7	795.2	1.68	13.53	0.22	1.66	0.03	0.25
44 2032	0.0	101.5	101.5	896.7	795.2	1.53	12.30	0.19	1.45	0.02	0.20
45 2033	0.0	101.5	101.5	896.7	795.2	1.39	11.18	0.16	1.26	0.05	0.17
46 2034	0.0	101.5	101.5	896.7	795.2	1.27	10.17	0.14	1.09	0.06	0.14
47 2035	0.0	263.8	263.8	896.7	632.9	2.99	9.24	0.37	0.95	0.04	0.12
48 2036	0.0	393.6	393.6	896.7	600.5	4.06	8.40	0.51	0.82	0.01	0.16
49 2037	0.0	296.2	296.2	896.7	503.1	2.78	7.82	0.48	0.76	0.01	0.16
50 2038	0.0	101.5	101.5	1333.5	3333.5	0.86	12.22	0.09	1.32	0.01	0.16
TOTAL	2450.1	5694.9	8145.0	39018.9	30875.9	2206.58	4525.29	1631.94	2250.27	1292.75	1264.34

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 2.05 (10%), 1.38 (15%), 0.98 (20%)
INTERNAL RATE OF RETURN (IRR) = 19.7 %

TABLE XI-26 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, FINANCIAL, WHOLE AREA
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE			(BENEFITS)	(COST)	20 % (BENEFITS)	(COST)	20 % (BENEFITS)
	CAPITAL	O & M				10 % (COST)	15 % (COST)	20 % (COST)					
1 1989	74.1	0.0	74.1	0.0	-74.1	74.10	0.00	74.10	0.00	74.10	0.00	74.10	0.00
2 1990	188.1	0.0	188.1	0.0	-188.1	155.45	0.00	142.23	0.00	142.23	0.00	130.63	0.00
3 1991	1101.5	0.0	1101.5	0.0	-1101.5	827.57	0.00	724.26	0.00	724.26	0.00	637.44	0.00
4 1992	1774.2	0.0	1774.2	0.0	-1774.2	1211.81	0.00	1014.41	0.00	1014.41	0.00	855.62	0.00
5 1993	851.4	6.8	858.2	34.0	-824.2	532.88	21.11	426.68	16.90	426.68	16.90	344.89	13.66
6 1994	646.4	40.7	687.1	227.6	-459.5	387.85	128.47	297.05	98.40	297.05	98.40	230.11	76.22
7 1995	347.4	69.3	416.7	447.9	-31.2	213.83	229.84	156.65	116.29	156.65	116.29	125.00	125.00
8 1996	0.0	107.5	107.5	733.7	616.2	50.15	337.61	35.14	236.58	25.00	236.58	168.31	168.31
9 1997	0.0	143.7	143.7	994.9	851.2	60.94	421.94	40.85	282.81	27.85	282.81	192.82	192.82
10 1998	0.0	143.7	143.7	1076.0	935.3	55.40	414.85	35.52	265.97	23.21	265.97	173.78	173.78
11 1999	0.0	143.7	143.7	1102.2	958.5	50.37	386.32	30.89	236.91	19.34	236.91	148.34	148.34
12 2000	0.0	143.7	143.7	1102.2	958.5	45.79	351.20	26.86	206.01	16.12	206.01	123.62	123.62
13 2001	0.0	143.7	143.7	1102.2	958.5	41.63	319.27	23.36	179.14	13.43	179.14	103.02	103.02
14 2002	0.0	143.7	143.7	1102.2	958.5	37.84	290.25	20.31	155.77	11.19	155.77	85.85	85.85
15 2003	0.0	143.7	143.7	1102.2	958.5	34.40	263.86	17.66	135.46	9.33	135.46	71.54	71.54
16 2004	0.0	143.7	143.7	1102.2	958.5	31.27	239.87	15.36	117.79	7.77	117.79	59.62	59.62
17 2005	0.0	143.7	143.7	1102.2	958.5	28.43	218.07	13.35	102.42	6.48	102.42	49.68	49.68
18 2006	0.0	143.7	143.7	1102.2	958.5	25.85	198.24	11.61	89.06	5.40	89.06	41.40	41.40
19 2007	0.0	143.7	143.7	1102.2	958.5	23.50	180.22	10.10	77.45	4.50	77.45	34.50	34.50
20 2008	0.0	143.7	143.7	1102.2	958.5	21.36	163.84	8.78	67.35	3.75	67.35	28.75	28.75
21 2009	0.0	143.7	143.7	1102.2	958.5	19.42	148.94	7.63	58.56	3.12	58.56	23.96	23.96
22 2010	0.0	143.7	143.7	1102.2	958.5	17.65	135.40	6.64	50.92	2.60	50.92	19.97	19.97
23 2011	0.0	143.7	143.7	1102.2	958.5	16.05	123.09	5.77	44.28	2.17	44.28	16.64	16.64
24 2012	0.0	143.7	143.7	1102.2	958.5	14.59	111.90	5.02	38.51	1.81	38.51	13.86	13.86
25 2013	0.0	143.7	143.7	1102.2	958.5	13.26	101.73	4.37	33.48	1.51	33.48	11.55	11.55
26 2014	0.0	221.9	221.9	1102.2	880.3	18.62	92.48	5.86	29.12	1.94	29.12	9.63	9.63
27 2015	0.0	520.9	520.9	1102.2	581.3	39.73	84.08	11.97	25.32	3.79	25.32	8.02	8.02
28 2016	0.0	663.2	663.2	1102.2	439.0	45.99	76.43	13.25	22.02	4.02	22.02	6.69	6.69
29 2017	0.0	427.5	427.5	1102.2	674.7	26.95	69.48	19.14	19.14	2.16	19.14	5.57	5.57
30 2018	0.0	143.7	143.7	1102.2	958.5	8.24	63.17	2.17	16.65	0.61	16.65	4.64	4.64
31 2019	0.0	143.7	143.7	1102.2	958.5	7.49	57.42	1.89	14.48	0.50	14.48	3.87	3.87
32 2020	0.0	143.7	143.7	1102.2	958.5	6.81	52.20	1.64	12.59	0.42	12.59	3.22	3.22
33 2021	0.0	143.7	143.7	1102.2	958.5	6.19	47.46	1.43	10.95	0.35	10.95	2.69	2.69
34 2022	0.0	143.7	143.7	1102.2	958.5	5.62	43.14	1.24	9.52	0.29	9.52	2.24	2.24
35 2023	0.0	143.7	143.7	1102.2	958.5	5.11	39.22	1.08	8.28	0.24	8.28	1.87	1.87
36 2024	0.0	143.7	143.7	1102.2	958.5	4.65	35.66	0.94	7.20	0.20	7.20	1.56	1.56
37 2025	0.0	143.7	143.7	1102.2	958.5	4.23	32.41	0.82	6.26	0.17	6.26	1.30	1.30
38 2026	0.0	143.7	143.7	1102.2	958.5	3.84	29.47	0.71	5.44	0.14	5.44	1.08	1.08
39 2027	0.0	143.7	143.7	1102.2	958.5	3.49	26.79	0.62	4.73	0.12	4.73	0.90	0.90
40 2028	0.0	143.7	143.7	1102.2	958.5	3.18	24.35	0.54	4.11	0.10	4.11	0.75	0.75
41 2029	0.0	143.7	143.7	1102.2	958.5	2.89	22.14	0.47	3.58	0.08	3.58	0.62	0.62
42 2030	0.0	143.7	143.7	1102.2	958.5	2.62	20.13	0.41	3.11	0.07	3.11	0.52	0.52
43 2031	0.0	143.7	143.7	1102.2	958.5	2.39	18.30	0.35	2.71	0.06	2.71	0.43	0.43
44 2032	0.0	143.7	143.7	1102.2	958.5	2.17	16.63	0.31	2.35	0.05	2.35	0.36	0.36
45 2033	0.0	143.7	143.7	1102.2	958.5	1.97	15.12	0.27	2.05	0.04	2.05	0.30	0.30
46 2034	0.0	221.9	221.9	1102.2	880.3	2.77	13.75	0.36	1.78	0.05	1.78	0.25	0.25
47 2035	0.0	520.9	520.9	1102.2	581.3	5.91	12.50	0.73	1.55	0.10	1.55	0.21	0.21
48 2036	0.0	663.2	663.2	1102.2	439.0	6.84	11.36	0.81	1.35	0.10	1.35	0.17	0.17
49 2037	0.0	427.5	427.5	1102.2	674.7	4.01	10.33	0.45	1.17	0.06	1.17	0.15	0.15
50 2038	0.0	143.7	143.7	218.4	1998.7	1.22	18.25	0.13	1.98	0.02	1.98	0.24	0.24
TOTAL	4983.1	8777.1	13760.2	48632.3	34872.1	4214.51	5718.33	3210.44	2879.57	2589.33	1839.37		

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.56 (10%), 0.90 (15%), 0.63 (20%)
INTERNAL RATE OF RETURN (IRR) = 13.6 %

TABLE X I-27 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, FINANCIAL, FLOOD PLAIN (UNIT : MILLION TK)

YEAR	PROJECT COST		O & M	TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE						
	CAPITAL	0 & M					10 %	15 %	20 %	(BENEFITS)	(COST)	(BENEFITS)	(COST)
1 1989	11.1	0.0	0.0	11.1	0.0	-11.1	11.10	0.00	11.10	0.00	11.10	0.00	0.00
2 1990	49.5	0.0	0.0	49.5	0.0	-49.5	40.91	0.00	37.43	0.00	34.38	0.00	0.00
3 1991	345.7	0.0	0.0	345.7	0.0	-345.7	259.73	0.00	227.30	0.00	200.06	0.00	0.00
4 1992	375.0	0.0	0.0	375.0	0.0	-375.0	256.13	0.00	214.41	0.00	180.85	0.00	0.00
5 1993	164.7	6.8	0.0	171.5	34.0	-137.5	106.49	21.11	85.27	16.90	68.92	13.66	0.00
6 1994	83.6	16.8	16.8	100.4	99.5	-0.9	56.67	56.17	43.41	43.02	33.32	13.66	0.00
7 1995	0.0	16.8	16.8	16.8	130.6	113.8	8.62	67.02	6.32	49.10	4.69	36.45	0.00
8 1996	0.0	16.8	16.8	16.8	142.1	125.3	7.84	66.29	5.49	46.45	3.91	35.05	0.00
9 1997	0.0	16.8	16.8	16.8	142.1	125.3	7.12	60.26	4.78	40.39	3.26	27.54	0.00
10 1998	0.0	16.8	16.8	16.8	142.1	125.3	6.48	54.79	4.15	35.13	2.71	22.95	0.00
11 1999	0.0	16.8	16.8	16.8	142.1	125.3	5.89	49.81	3.61	30.54	2.26	19.13	0.00
12 2000	0.0	16.8	16.8	16.8	142.1	125.3	5.35	45.28	3.14	26.56	1.88	15.94	0.00
13 2001	0.0	16.8	16.8	16.8	142.1	125.3	4.87	41.16	2.73	23.10	1.57	13.28	0.00
14 2002	0.0	16.8	16.8	16.8	142.1	125.3	4.42	37.42	2.37	20.08	1.31	11.07	0.00
15 2003	0.0	16.8	16.8	16.8	142.1	125.3	4.02	34.02	2.06	17.46	1.09	9.22	0.00
16 2004	0.0	16.8	16.8	16.8	142.1	125.3	3.66	30.93	1.80	15.19	0.91	7.69	0.00
17 2005	0.0	16.8	16.8	16.8	142.1	125.3	3.32	28.11	1.56	13.20	0.76	6.40	0.00
18 2006	0.0	16.8	16.8	16.8	142.1	125.3	3.02	25.56	1.36	11.48	0.63	5.34	0.00
19 2007	0.0	16.8	16.8	16.8	142.1	125.3	2.75	23.23	1.18	9.98	0.53	4.45	0.00
20 2008	0.0	16.8	16.8	16.8	142.1	125.3	2.50	21.12	1.05	8.88	0.44	3.71	0.00
21 2009	0.0	16.8	16.8	16.8	142.1	125.3	2.27	19.20	0.89	7.55	0.37	3.09	0.00
22 2010	0.0	16.8	16.8	16.8	142.1	125.3	2.06	17.46	0.78	6.57	0.30	2.57	0.00
23 2011	0.0	16.8	16.8	16.8	142.1	125.3	1.88	15.87	0.67	5.71	0.25	2.15	0.00
24 2012	0.0	16.8	16.8	16.8	142.1	125.3	1.71	14.43	0.59	4.96	0.21	1.79	0.00
25 2013	0.0	16.8	16.8	16.8	142.1	125.3	1.55	13.12	0.51	4.32	0.18	1.49	0.00
26 2014	0.0	16.8	16.8	16.8	142.1	125.3	1.41	11.92	0.45	3.75	0.15	1.24	0.00
27 2015	0.0	16.8	16.8	16.8	142.1	125.3	1.29	10.84	0.40	3.26	0.13	1.03	0.00
28 2016	0.0	16.8	16.8	16.8	142.1	125.3	1.18	9.85	0.36	2.84	0.11	0.86	0.00
29 2017	0.0	16.8	16.8	16.8	142.1	125.3	1.06	8.96	0.32	2.47	0.08	0.72	0.00
30 2018	0.0	16.8	16.8	16.8	142.1	125.3	0.96	8.14	0.29	2.15	0.07	0.60	0.00
31 2019	0.0	16.8	16.8	16.8	142.1	125.3	0.88	7.40	0.26	1.87	0.06	0.50	0.00
32 2020	0.0	16.8	16.8	16.8	142.1	125.3	0.80	6.73	0.19	1.62	0.05	0.42	0.00
33 2021	0.0	16.8	16.8	16.8	142.1	125.3	0.72	6.12	0.17	1.41	0.04	0.35	0.00
34 2022	0.0	16.8	16.8	16.8	142.1	125.3	0.66	5.56	0.15	1.23	0.03	0.29	0.00
35 2023	0.0	16.8	16.8	16.8	142.1	125.3	0.60	5.06	0.13	1.07	0.03	0.24	0.00
36 2024	0.0	16.8	16.8	16.8	142.1	125.3	0.54	4.60	0.11	0.93	0.02	0.20	0.00
37 2025	0.0	16.8	16.8	16.8	142.1	125.3	0.49	4.18	0.10	0.81	0.02	0.17	0.00
38 2026	0.0	16.8	16.8	16.8	142.1	125.3	0.45	3.80	0.08	0.70	0.02	0.14	0.00
39 2027	0.0	16.8	16.8	16.8	142.1	125.3	0.41	3.45	0.07	0.61	0.01	0.12	0.00
40 2028	0.0	16.8	16.8	16.8	142.1	125.3	0.37	3.14	0.06	0.53	0.01	0.10	0.00
41 2029	0.0	16.8	16.8	16.8	142.1	125.3	0.34	2.85	0.05	0.46	0.01	0.08	0.00
42 2030	0.0	16.8	16.8	16.8	142.1	125.3	0.31	2.59	0.05	0.40	0.01	0.07	0.00
43 2031	0.0	16.8	16.8	16.8	142.1	125.3	0.28	2.36	0.04	0.35	0.01	0.06	0.00
44 2032	0.0	16.8	16.8	16.8	142.1	125.3	0.25	2.14	0.04	0.30	0.01	0.05	0.00
45 2033	0.0	16.8	16.8	16.8	142.1	125.3	0.23	1.95	0.03	0.26	0.00	0.04	0.00
46 2034	0.0	16.8	16.8	16.8	142.1	125.3	1.18	1.77	0.15	0.23	0.02	0.03	0.00
47 2035	0.0	16.8	16.8	16.8	142.1	125.3	1.79	1.61	0.22	0.20	0.05	0.03	0.00
48 2036	0.0	16.8	16.8	16.8	142.1	125.3	1.14	1.46	0.13	0.17	0.02	0.02	0.00
49 2037	0.0	13.4	13.4	13.4	142.1	128.7	0.13	1.33	0.01	0.15	0.00	0.02	0.00
50 2038	0.0	13.4	13.4	13.4	394.7	381.3	0.11	3.36	0.01	0.36	0.00	0.04	0.00
TOTAL	1029.6	1381.4	1381.4	2411.0	6627.0	4216.0	851.71	863.55	674.83	464.52	559.38	281.67	0.00

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.01 (10%), 0.69 (15%), 0.50 (20%)
INTERNAL RATE OF RETURN (IRR) = 10.2 %

TABLE X I-28 PROJECT COST AND BENEFITS - THE NORTH RAJSHAHI IRRIGATION PROJECT, FINANCIAL BARIND (UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE			20 % (BENEFITS)
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	
1 1989	63.0	0.0	63.0	0.0	-63.0	63.00	0.00	63.00	0.00
2 1990	138.6	0.0	138.6	0.0	-138.6	114.55	0.00	104.80	0.00
3 1991	755.8	0.0	755.8	0.0	-755.8	567.84	0.00	496.95	0.00
4 1992	1399.2	0.0	1399.2	0.0	-1399.2	955.68	0.00	800.00	0.00
5 1993	686.7	0.0	686.7	0.0	-686.7	426.39	0.00	341.41	0.00
6 1994	586.8	23.9	610.7	128.1	-458.7	331.23	72.31	275.97	42.90
7 1995	347.4	52.5	400.0	317.5	-82.6	205.21	162.85	196.52	88.55
8 1996	90.7	90.7	181.4	581.6	490.9	42.31	271.32	111.61	135.26
9 1997	0.0	126.9	126.9	852.8	725.9	55.82	361.67	21.09	165.28
10 1998	0.0	126.9	126.9	933.9	807.0	48.93	360.06	20.50	150.83
11 1999	0.0	126.9	126.9	960.1	835.2	44.48	356.51	27.28	129.22
12 2000	0.0	126.9	126.9	960.1	835.2	40.43	305.92	17.95	107.68
13 2001	0.0	126.9	126.9	960.1	835.2	36.76	278.11	11.86	89.74
14 2002	0.0	126.9	126.9	960.1	835.2	33.42	252.83	9.88	74.78
15 2003	0.0	126.9	126.9	960.1	835.2	30.58	229.84	8.24	62.52
16 2004	0.0	126.9	126.9	960.1	835.2	27.62	208.95	6.86	51.93
17 2005	0.0	126.9	126.9	960.1	835.2	25.11	189.95	5.72	43.28
18 2006	0.0	126.9	126.9	960.1	835.2	22.82	172.69	4.77	36.06
19 2007	0.0	126.9	126.9	960.1	835.2	20.75	156.99	3.97	30.05
20 2008	0.0	126.9	126.9	960.1	835.2	18.86	142.72	3.31	25.04
21 2009	0.0	126.9	126.9	960.1	835.2	17.15	129.74	2.76	20.87
22 2010	0.0	126.9	126.9	960.1	835.2	15.59	117.95	2.30	17.59
23 2011	0.0	126.9	126.9	960.1	835.2	14.17	107.22	1.92	14.49
24 2012	0.0	126.9	126.9	960.1	835.2	12.88	97.48	1.60	12.08
25 2013	0.0	126.9	126.9	960.1	835.2	11.71	88.62	1.33	10.06
26 2014	0.0	126.9	126.9	960.1	835.2	10.65	80.56	1.11	8.39
27 2015	0.0	365.4	365.4	960.1	596.7	27.72	73.24	2.65	6.99
28 2016	0.0	552.6	552.6	960.1	407.5	38.32	66.58	3.35	5.82
29 2017	0.0	410.7	410.7	960.1	549.4	25.89	11.04	19.18	6.99
30 2018	0.0	126.9	126.9	960.1	835.2	7.27	7.13	2.08	4.85
31 2019	0.0	126.9	126.9	960.1	835.2	6.61	55.02	2.08	4.85
32 2020	0.0	126.9	126.9	960.1	835.2	6.01	50.02	2.08	4.85
33 2021	0.0	126.9	126.9	960.1	835.2	5.46	45.47	2.08	4.85
34 2022	0.0	126.9	126.9	960.1	835.2	4.97	41.34	2.08	4.85
35 2023	0.0	126.9	126.9	960.1	835.2	4.52	37.58	2.08	4.85
36 2024	0.0	126.9	126.9	960.1	835.2	4.11	34.17	2.08	4.85
37 2025	0.0	126.9	126.9	960.1	835.2	3.73	31.06	2.08	4.85
38 2026	0.0	126.9	126.9	960.1	835.2	3.39	28.24	2.08	4.85
39 2027	0.0	126.9	126.9	960.1	835.2	3.08	25.67	2.08	4.85
40 2028	0.0	126.9	126.9	960.1	835.2	2.80	23.34	2.08	4.85
41 2029	0.0	126.9	126.9	960.1	835.2	2.55	21.21	2.08	4.85
42 2030	0.0	126.9	126.9	960.1	835.2	2.32	19.29	2.08	4.85
43 2031	0.0	126.9	126.9	960.1	835.2	2.11	17.53	2.08	4.85
44 2032	0.0	126.9	126.9	960.1	835.2	1.92	15.94	2.08	4.85
45 2033	0.0	126.9	126.9	960.1	835.2	1.74	14.49	2.08	4.85
46 2034	0.0	126.9	126.9	960.1	835.2	1.58	13.17	2.08	4.85
47 2035	0.0	363.4	363.4	960.1	596.7	4.12	11.97	2.08	4.85
48 2036	0.0	552.6	552.6	960.1	407.5	5.70	10.89	2.08	4.85
49 2037	0.0	410.7	410.7	960.1	549.4	3.85	9.90	2.08	4.85
50 2038	0.0	126.9	126.9	1747.8	1620.9	1.08	14.89	2.08	4.85
TOTAL	3953.6	7388.9	11342.5	42005.4	30662.9	3362.59	4854.78	2415.05	2029.98

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.44 (10%), 0.95 (15%), 0.67 (20%)
INTERNAL RATE OF RETURN (IRR) = 14.4 %

TABLE X I -29 PROJECT COST AND BENEFITS , THE NORTH RAJSHAHI IRRIGATION PROJECT, ECONOMIC, WHOLE AREA
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	10 %		15 %		20 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	69.7	0.0	69.7	0.0	-69.7	69.70	0.00	69.70	0.00	69.70	0.00
2 1990	123.1	0.0	123.1	0.0	-123.1	101.74	0.00	93.08	0.00	85.49	0.00
3 1991	657.0	0.0	657.0	0.0	-657.0	493.61	0.00	431.99	0.00	380.21	0.00
4 1992	1098.9	0.0	1098.9	0.0	-1098.9	750.57	0.00	628.30	0.00	529.95	0.00
5 1993	551.2	5.4	556.6	22.9	-533.7	345.61	14.22	276.73	11.39	223.69	9.20
6 1994	436.7	32.5	469.2	180.2	-289.0	264.85	101.72	202.85	77.91	157.13	60.35
7 1995	227.4	55.4	282.8	375.2	92.4	145.12	106.52	106.52	141.05	78.92	104.71
8 1996	0.0	86.0	86.0	617.7	531.7	40.12	288.16	28.11	201.93	20.00	143.66
9 1997	0.0	114.9	114.9	856.9	742.0	48.73	363.41	32.66	243.59	22.27	166.07
10 1998	0.0	114.9	114.9	935.9	821.0	44.30	360.83	28.40	231.34	18.56	151.15
11 1999	0.0	114.9	114.9	961.5	846.6	40.27	337.00	24.70	206.67	15.46	129.41
12 2000	0.0	114.9	114.9	961.5	846.6	36.61	306.37	21.48	179.71	12.89	107.84
13 2001	0.0	114.9	114.9	961.5	846.6	33.28	278.52	18.67	156.27	10.74	89.87
14 2002	0.0	114.9	114.9	961.5	846.6	30.26	253.20	16.24	135.89	8.95	74.89
15 2003	0.0	114.9	114.9	961.5	846.6	27.51	230.18	14.12	118.16	7.46	62.41
16 2004	0.0	114.9	114.9	961.5	846.6	25.01	209.25	12.28	102.75	6.21	52.01
17 2005	0.0	114.9	114.9	961.5	846.6	22.73	190.23	10.68	89.35	5.18	43.34
18 2006	0.0	114.9	114.9	961.5	846.6	20.67	172.94	9.28	77.70	4.32	36.12
19 2007	0.0	114.9	114.9	961.5	846.6	18.79	157.22	8.07	67.56	3.60	30.10
20 2008	0.0	114.9	114.9	961.5	846.6	17.08	142.92	7.02	58.75	3.00	25.08
21 2009	0.0	114.9	114.9	961.5	846.6	15.53	129.93	6.10	51.09	2.50	20.90
22 2010	0.0	114.9	114.9	961.5	846.6	14.12	118.12	5.31	44.42	2.08	17.42
23 2011	0.0	114.9	114.9	961.5	846.6	12.83	107.38	4.62	38.63	1.73	14.51
24 2012	0.0	114.9	114.9	961.5	846.6	11.67	97.62	4.01	33.59	1.45	12.09
25 2013	0.0	114.9	114.9	961.5	846.6	10.61	88.74	3.49	29.21	1.20	10.08
26 2014	0.0	165.9	165.9	961.5	795.6	13.92	80.68	4.38	25.40	1.45	8.40
27 2015	0.0	368.9	368.9	961.5	592.6	28.14	73.34	8.47	22.09	2.69	7.00
28 2016	0.0	468.1	468.1	961.5	493.4	32.46	66.68	9.35	19.21	2.84	5.83
29 2017	0.0	309.6	309.6	961.5	651.9	19.52	60.61	5.38	16.70	1.57	4.86
30 2018	0.0	114.9	114.9	961.5	846.6	6.58	50.09	1.74	14.52	0.48	4.05
31 2019	0.0	114.9	114.9	961.5	846.6	5.99	45.54	1.51	12.63	0.40	3.38
32 2020	0.0	114.9	114.9	961.5	846.6	5.44	41.40	1.31	10.98	0.34	2.81
33 2021	0.0	114.9	114.9	961.5	846.6	4.95	37.64	1.14	9.55	0.28	2.34
34 2022	0.0	114.9	114.9	961.5	846.6	4.50	34.22	0.99	8.30	0.23	1.95
35 2023	0.0	114.9	114.9	961.5	846.6	4.09	31.10	0.86	7.22	0.19	1.63
36 2024	0.0	114.9	114.9	961.5	846.6	3.72	28.28	0.75	6.28	0.16	1.36
37 2025	0.0	114.9	114.9	961.5	846.6	3.38	25.71	0.65	5.46	0.14	1.13
38 2026	0.0	114.9	114.9	961.5	846.6	3.07	23.37	0.57	4.75	0.11	0.94
39 2027	0.0	114.9	114.9	961.5	846.6	2.79	21.25	0.49	4.13	0.09	0.79
40 2028	0.0	114.9	114.9	961.5	846.6	2.54	19.31	0.43	3.59	0.08	0.65
41 2029	0.0	114.9	114.9	961.5	846.6	2.31	17.56	0.37	3.12	0.07	0.55
42 2030	0.0	114.9	114.9	961.5	846.6	2.10	15.96	0.32	2.71	0.05	0.45
43 2031	0.0	114.9	114.9	961.5	846.6	1.91	14.51	0.28	2.36	0.05	0.38
44 2032	0.0	114.9	114.9	961.5	846.6	1.73	13.19	0.25	2.05	0.04	0.32
45 2033	0.0	114.9	114.9	961.5	846.6	1.58	11.99	0.21	1.78	0.03	0.26
46 2034	0.0	165.9	165.9	961.5	795.6	2.07	11.99	0.27	1.55	0.04	0.22
47 2035	0.0	368.9	368.9	961.5	592.6	4.18	10.90	0.52	1.35	0.07	0.18
48 2036	0.0	468.1	468.1	961.5	493.4	4.83	9.91	0.57	1.17	0.07	0.15
49 2037	0.0	309.6	309.6	961.5	651.9	2.90	9.01	0.33	1.02	0.04	0.13
50 2038	0.0	114.9	114.9	1681.6	1566.7	0.98	14.33	0.11	1.55	0.01	0.18
TOTAL	3164.0	6710.9	9874.9	42168.9	32294.0	2806.96	4952.18	2105.48	2486.42	1684.20	1411.14

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.76 (10%), 1.18 (15%), 0.84 (20%)
INTERNAL RATE OF RETURN (IRR) = 17.4 %

TABLE X I -30 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, ECONOMIC, FLOOD PLAIN (UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE		15 % (BENEFITS)	15 % (COST)	15 % (BENEFITS)
	CAPITAL	O & M				5 % (BENEFITS)	5 % (COST)			
1 1989	10.5	0.0	10.5	0.0	-10.5	10.50	0.00	0.00	10.50	2.00
2 1990	32.5	0.0	32.5	0.0	-32.5	29.48	0.00	0.00	24.57	0.00
3 1991	231.5	0.0	231.5	0.0	-231.5	199.98	0.00	0.00	152.22	0.00
4 1992	262.2	0.0	262.2	0.0	-262.2	215.71	0.00	0.00	149.91	0.00
5 1993	119.5	5.4	124.9	22.9	-102.0	97.86	17.94	14.22	62.10	11.39
6 1994	57.8	13.4	71.2	71.9	0.7	53.13	53.65	40.59	30.78	31.08
7 1995	0.0	13.4	13.4	102.5	89.1	9.52	72.85	52.60	5.04	38.53
8 1996	0.0	13.4	13.4	114.0	100.6	9.07	77.16	6.25	4.38	37.27
9 1997	0.0	13.4	13.4	114.0	100.6	8.64	73.49	5.68	3.81	32.41
10 1998	0.0	13.4	13.4	114.0	100.6	8.23	69.99	5.17	3.31	28.18
11 1999	0.0	13.4	13.4	114.0	100.6	7.83	66.65	4.70	2.88	24.50
12 2000	0.0	13.4	13.4	114.0	100.6	7.46	63.48	4.27	2.50	21.31
13 2001	0.0	13.4	13.4	114.0	100.6	7.11	60.46	3.88	2.18	18.53
14 2002	0.0	13.4	13.4	114.0	100.6	6.77	57.58	3.53	1.89	16.11
15 2003	0.0	13.4	13.4	114.0	100.6	6.45	54.84	3.21	1.65	14.01
16 2004	0.0	13.4	13.4	114.0	100.6	6.14	52.23	2.92	1.43	12.18
17 2005	0.0	13.4	13.4	114.0	100.6	5.85	49.74	2.65	1.23	10.59
18 2006	0.0	13.4	13.4	114.0	100.6	5.57	47.37	2.41	1.08	9.21
19 2007	0.0	13.4	13.4	114.0	100.6	5.30	45.11	2.19	0.94	8.01
20 2008	0.0	13.4	13.4	114.0	100.6	5.05	42.97	1.99	0.82	6.97
21 2009	0.0	13.4	13.4	114.0	100.6	4.81	40.92	1.81	0.71	6.06
22 2010	0.0	13.4	13.4	114.0	100.6	4.58	38.97	1.65	0.62	5.27
23 2011	0.0	13.4	13.4	114.0	100.6	4.36	37.12	1.50	0.54	4.58
24 2012	0.0	13.4	13.4	114.0	100.6	4.16	35.35	1.36	0.47	3.98
25 2013	0.0	13.4	13.4	114.0	100.6	3.96	33.67	1.24	0.41	3.46
26 2014	0.0	64.4	64.4	114.0	49.6	18.11	32.06	5.40	1.70	3.01
27 2015	0.0	105.1	105.1	114.0	8.9	28.15	30.54	8.70	2.41	2.62
28 2016	0.0	74.6	74.6	114.0	39.4	19.03	29.08	7.91	1.49	2.28
29 2017	0.0	13.4	13.4	114.0	100.6	3.26	27.70	7.19	1.98	2.28
30 2018	0.0	13.4	13.4	114.0	100.6	3.10	26.38	6.53	0.23	1.72
31 2019	0.0	13.4	13.4	114.0	100.6	2.95	25.12	5.94	0.18	1.50
32 2020	0.0	13.4	13.4	114.0	100.6	2.81	23.93	5.40	0.15	1.30
33 2021	0.0	13.4	13.4	114.0	100.6	2.68	22.79	4.91	0.13	1.13
34 2022	0.0	13.4	13.4	114.0	100.6	2.55	21.70	4.46	0.12	0.98
35 2023	0.0	13.4	13.4	114.0	100.6	2.43	20.67	4.06	0.10	0.86
36 2024	0.0	13.4	13.4	114.0	100.6	2.31	19.68	3.69	0.09	0.74
37 2025	0.0	13.4	13.4	114.0	100.6	2.20	18.75	3.35	0.08	0.65
38 2026	0.0	13.4	13.4	114.0	100.6	2.10	17.85	3.05	0.07	0.56
39 2027	0.0	13.4	13.4	114.0	100.6	2.00	17.00	2.77	0.06	0.49
40 2028	0.0	13.4	13.4	114.0	100.6	1.90	16.19	2.52	0.05	0.43
41 2029	0.0	13.4	13.4	114.0	100.6	1.81	15.42	2.29	0.04	0.37
42 2030	0.0	13.4	13.4	114.0	100.6	1.73	14.69	2.08	0.04	0.32
43 2031	0.0	13.4	13.4	114.0	100.6	1.64	13.99	1.89	0.03	0.28
44 2032	0.0	13.4	13.4	114.0	100.6	1.57	13.32	1.72	0.03	0.24
45 2033	0.0	13.4	13.4	114.0	100.6	1.49	12.69	1.56	0.02	0.21
46 2034	0.0	64.4	64.4	114.0	49.6	6.83	12.08	1.42	0.10	0.18
47 2035	0.0	105.1	105.1	114.0	8.9	10.61	11.51	1.29	0.15	0.16
48 2036	0.0	74.6	74.6	114.0	39.4	7.17	10.96	1.18	0.09	0.14
49 2037	0.0	13.4	13.4	114.0	100.6	1.23	10.44	1.07	0.01	0.12
50 2038	0.0	13.4	13.4	279.1	265.7	1.17	24.34	2.38	0.01	0.26
TOTAL	744.0	1016.2	1750.2	5264.4	3534.2	858.35	1580.40	684.11	473.58	366.17

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.84 (5%), 1.14 (10%), 0.77 (15%)
INTERNAL RATE OF RETURN (IRR) = 11.6%

TABLE X I -31 PROJECT COST AND BENEFITS , THE NORTH RAJSHAHI IRRIGATION PROJECT, ECONOMIC, BARIND (UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE		
	CAPITAL	O & M				15 %	20 %	25 %
	(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1980	59.2	0.0	59.2	0.0	-59.2	59.20	0.00	59.20
2 1990	90.6	0.0	90.6	0.0	-90.6	62.92	0.00	57.98
3 1991	425.5	0.0	425.5	0.0	-425.5	246.24	0.00	217.86
4 1992	836.7	0.0	836.7	0.0	-836.7	403.50	0.00	342.71
5 1993	431.7	0.0	431.7	0.0	-431.7	173.49	0.00	141.46
6 1994	379.0	19.1	398.1	108.3	-289.8	172.11	46.82	104.36
7 1995	227.4	42.0	269.4	272.7	3.3	101.28	102.52	76.11
8 1996	0.0	72.6	72.6	503.7	431.1	23.73	164.66	56.50
9 1997	0.0	101.5	101.5	742.9	641.4	28.85	211.18	12.18
10 1998	0.0	101.5	101.5	822.0	720.5	25.09	163.59	13.62
11 1999	0.0	101.5	101.5	847.6	746.1	21.82	182.19	10.90
12 2000	0.0	101.5	101.5	847.6	746.1	18.97	158.42	8.72
13 2001	0.0	101.5	101.5	847.6	746.1	16.50	137.76	6.98
14 2002	0.0	101.5	101.5	847.6	746.1	14.34	9.49	5.58
15 2003	0.0	101.5	101.5	847.6	746.1	12.47	7.91	4.46
16 2004	0.0	101.5	101.5	847.6	746.1	10.85	6.59	3.57
17 2005	0.0	101.5	101.5	847.6	746.1	9.43	5.49	2.86
18 2006	0.0	101.5	101.5	847.6	746.1	8.20	4.57	2.29
19 2007	0.0	101.5	101.5	847.6	746.1	7.13	3.81	1.83
20 2008	0.0	101.5	101.5	847.6	746.1	6.20	3.18	1.46
21 2009	0.0	101.5	101.5	847.6	746.1	5.39	2.65	1.17
22 2010	0.0	101.5	101.5	847.6	746.1	4.69	2.21	0.94
23 2011	0.0	101.5	101.5	847.6	746.1	4.08	1.84	0.75
24 2012	0.0	101.5	101.5	847.6	746.1	3.55	1.53	0.60
25 2013	0.0	101.5	101.5	847.6	746.1	3.08	1.28	0.48
26 2014	0.0	101.5	101.5	847.6	746.1	2.68	1.06	0.38
27 2015	0.0	263.8	263.8	847.6	746.1	2.39	0.89	0.31
28 2016	0.0	393.6	393.6	847.6	583.8	1.92	0.67	0.25
29 2017	0.0	296.2	296.2	847.6	454.0	1.54	0.50	0.18
30 2018	0.0	101.5	101.5	847.6	551.4	1.23	0.43	0.13
31 2019	0.0	101.5	101.5	847.6	746.1	1.01	0.36	0.10
32 2020	0.0	101.5	101.5	847.6	746.1	0.88	0.30	0.08
33 2021	0.0	101.5	101.5	847.6	746.1	0.76	0.25	0.06
34 2022	0.0	101.5	101.5	847.6	746.1	0.66	0.21	0.05
35 2023	0.0	101.5	101.5	847.6	746.1	0.58	0.17	0.04
36 2024	0.0	101.5	101.5	847.6	746.1	0.50	0.14	0.03
37 2025	0.0	101.5	101.5	847.6	746.1	0.44	0.12	0.03
38 2026	0.0	101.5	101.5	847.6	746.1	0.38	0.10	0.02
39 2027	0.0	101.5	101.5	847.6	746.1	0.33	0.08	0.02
40 2028	0.0	101.5	101.5	847.6	746.1	0.29	0.07	0.01
41 2029	0.0	101.5	101.5	847.6	746.1	0.25	0.06	0.01
42 2030	0.0	101.5	101.5	847.6	746.1	0.22	0.05	0.01
43 2031	0.0	101.5	101.5	847.6	746.1	0.19	0.03	0.01
44 2032	0.0	101.5	101.5	847.6	746.1	0.16	0.03	0.00
45 2033	0.0	101.5	101.5	847.6	746.1	0.14	0.02	0.00
46 2034	0.0	101.5	101.5	847.6	746.1	0.12	0.02	0.00
47 2035	0.0	263.8	263.8	847.6	583.8	0.10	0.02	0.00
48 2036	0.0	393.6	393.6	847.6	454.0	0.08	0.01	0.00
49 2037	0.0	296.2	296.2	847.6	551.4	0.06	0.01	0.00
50 2038	0.0	101.5	101.5	847.6	551.4	0.05	0.01	0.00
TOTAL	2450.1	5694.9	8145.0	36908.5	28763.5	1631.94	2120.44	1061.63
						1292.75	1190.32	722.06

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.30 (15%), 0.92 (20%), 0.68 (25%)
INTERNAL RATE OF RETURN (IRR) = 18.8 %

APPENDIX X II

STAGE DEVELOPMENT PLAN

APPENDIX X II

STAGE DEVELOPMENT PLAN

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TABLE XII-1-1 STAGE DEVELOPMENT PLAN

Area Item	Flood Plain			Barind				Total
	Stage-1	Stage-2	Stage-3	Stage-4	Stage-3	Stage-4	Stage-4	
I. Benefit Area	9,000	7,942	17,247	17,011				42,200
II. Discharge	9,436	9,804	18,082	17,834				44,242
III. Pump	1,350×1 1,000×2	1,650×1 1,350×1	1,650×3					1,650×4 1,350×4
IV. Canal								
a. Main	13,908	-	32,400	16,370				48,770
b. Secondary	62,800	19,500	96,100	44,060				159,660
c. Sub-Secondary	18,790	100,470	116,470	68,530				285,470
V. Irrigation Facilities								
a. Bifurcation	15	46	69	24				139
b. Check Gate	1	-	2	-				2
c. Siphon	300	-	160	200				360
d. Aqueduct	3	-	-	-				-
e. Chute	-	-	2	-				2
f. Vertical Drop	1	78	61	7				146
g. Culvert	-	-	2	1				3
h. Overchute	-	-	7	4				10
i. Double Orifice	-	-	4	1				5

Area		Flood Plain				Barind			
Item		Stage-1	Stage-2	Stage-3	Stage-4	Total			
VI. Drainage									
a. Excavation		2,001,395	-	-	-	-			
b. Regulator		4	-	-	-	-			
VII. Road and Bridge									
a. Road									
• Trunk		5,000	4,000	3,000	3,000	10,000			
• Maintenance		76,708	19,500	128,500	60,430	208,430			
b. Bridge		6	-	20	7	27			
VIII. On-Farm		9,000	7,942	17,247	17,011	42,200			
IX. Transmission Line	set	1	1	-	-	-			
X. Telephone Line	set	1	1	-	-	-			
XI. Construction Machine	set	1	1	-	-	-			
XII. Land Acquisition	ha	281.1	246.7	523	517	1,286.7			
XIII. Consulting Service	set	1	1	1	1	-			

FIGURE XII-2-1 STAGE DEVELOPMENT IMPLEMENTATION SCHEDULE

Item	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I. Flood Plain a. Detail Design b. Land Acquisition c. Procurement d. Construction • Pumping Station • Canal Work • Drainage Work															
II. Barind Phase I a. Detail Design b. Land Acquisition c. Procurement d. Construction • Pumping Station • Canal Work • Agricultural Extension															
III. Barind Phase II a. Detail Design b. Land Acquisition c. Procurement d. Construction • Pumping Station • Canal Work															
IV. Barind Phase III a. Detail Design b. Land Acquisition c. Procurement d. Construction • Pumping Station • Canal Work															

FIGURE X II-3-1 Project Cost By Stage Development

X Million TK

	Flood Plain			Phase I (Barind)			Phase II (Barind)			Phase III (Barind)			Total (Barind)							
	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total	F/C	L/C	Tax	Total				
1. Pumping Station	256.8	37.2	116.2	410.2	493.4	94.2	178.5	766.1	475.6	38.0	194.0	707.6	177.0	13.6	83.2	273.8	1,146.0	145.8	455.7	1,747.5
2. Irrigation Canal	7.7	27.9	-	35.6	6.5	32.8	-	39.3	14.9	122.2	-	137.1	6.9	52.9	-	59.8	28.3	207.9	-	236.2
3. Irrigation Facilities	15.1	13.5	-	28.6	2.9	4.6	-	7.5	28.1	28.8	-	56.9	11.8	15.5	-	27.3	42.8	48.9	-	91.7
4. Drainage Facilities	89.8	98.8	-	188.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Road and Bridge	3.6	59.8	-	63.4	2.1	18.1	-	20.2	6.1	98.4	-	104.5	4.4	43.8	-	48.2	12.6	160.3	-	172.9
6. On-farm	-	14.3	-	14.3	-	10.6	-	10.6	-	23.0	-	23.0	-	22.7	-	22.7	-	-	-	56.3
7. Transmission Line	11.1	2.0	5.6	18.7	35.6	4.8	17.8	58.2	-	-	-	-	-	-	-	-	35.6	4.8	17.8	58.2
8. Telephone Line	0.2	0.6	-	0.8	11.1	2.0	5.6	18.7	-	-	-	-	-	-	-	-	11.1	2.0	5.6	18.7
9. Construction Machines	51.2	2.7	25.7	79.8	51.2	2.7	25.7	79.6	-	-	-	-	-	-	-	-	51.2	2.7	25.7	79.6
10. Agriculture Supporting	-	-	-	-	11.9	12.2	5.4	29.5	-	-	-	-	-	-	-	-	11.9	12.2	5.4	29.5
11. Land Acquisition	-	28.7	-	28.7	-	38.2	-	38.2	-	78.5	-	78.5	-	77.6	-	77.6	-	194.3	-	194.3
12. Consulting Service	74.3	18.7	-	93.0	79.6	19.6	-	99.2	39.0	9.0	-	48.0	39.0	9.0	-	48.0	157.6	37.6	-	195.2
13. Project Administration	5.3	30.6	-	0.5	5.3	27.4	0.5	33.2	5.3	35.8	0.5	41.6	5.3	27.2	0.5	33.0	15.9	90.4	1.5	107.8
14. Physical Contingency	77.3	50.2	22.2	149.7	104.9	40.1	35.0	180.0	28.5	66.7	9.7	104.9	36.7	39.3	12.6	88.6	170.1	146.1	57.3	373.5
15. Price Escalation	-	-	-	130.9	-	-	-	351.7	-	-	-	455.5	-	-	-	379.6	-	-	-	1,186.8
Total				1,278.5				1,732.2				1,758.1				1,058.6				4,535.7

TABLE XII-4-1 PROJECT COST AND BENEFITS / THE NORTH RAJSHAHI IRRIGATION PROJECT, ST-DV WHOLE AREA
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	15 %		20 %		25 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	87.7	0.0	87.7	0.0	-87.7	87.70	0.00	87.70	0.00	87.70	0.00
2 1990	263.2	0.0	263.2	0.0	-263.2	199.02	0.00	182.78	0.00	168.45	0.00
3 1991	350.9	5.4	356.3	22.5	-333.8	234.27	14.79	206.19	13.02	182.43	11.52
4 1992	175.5	10.8	186.3	60.4	-125.9	106.52	34.53	89.84	29.13	76.31	24.74
5 1993	102.0	13.4	115.4	94.7	-20.7	138.86	47.08	46.38	38.06	37.81	31.03
6 1994	305.9	15.3	321.2	12.9	-308.3	161.24	5.58	107.57	4.32	84.20	3.38
7 1995	407.9	21.0	428.9	160.6	-268.3	76.07	60.38	119.70	44.82	89.95	33.68
8 1996	204.0	28.7	232.7	215.9	-16.8	62.91	70.58	54.12	50.21	39.04	36.22
9 1997	188.8	32.5	221.3	256.4	35.1	126.73	72.89	42.89	49.69	29.70	34.41
10 1998	471.9	40.8	512.7	452.9	-195.7	74.09	97.35	46.39	51.20	55.05	34.04
11 1999	283.1	61.6	344.7	108.2	108.2	31.05	106.18	60.38	60.96	29.61	38.90
12 2000	92.1	74.0	166.1	568.1	402.0	50.77	106.49	18.63	63.72	11.41	39.04
13 2001	230.2	82.2	312.4	655.2	342.8	34.02	112.61	29.20	61.24	17.17	36.02
14 2002	138.1	102.6	240.7	796.8	556.1	14.12	111.88	7.46	62.06	10.59	35.04
15 2003	0.0	114.9	114.9	910.4	795.5	12.28	101.59	6.21	59.09	4.04	32.03
16 2004	0.0	114.9	114.9	930.6	835.7	10.68	89.35	5.18	51.42	3.23	26.76
17 2005	0.0	114.9	114.9	961.5	846.6	9.28	77.70	4.32	43.34	2.59	21.65
18 2006	0.0	114.9	114.9	961.5	846.6	8.07	67.56	3.60	36.12	2.07	17.32
19 2007	0.0	114.9	114.9	961.5	846.6	7.02	58.75	3.00	30.10	1.66	13.86
20 2008	0.0	114.9	114.9	961.5	846.6	6.10	51.09	2.50	25.08	1.32	11.09
21 2009	0.0	114.9	114.9	961.5	846.6	5.31	44.42	2.08	17.42	0.85	7.09
22 2010	0.0	114.9	114.9	961.5	846.6	4.62	38.63	1.73	14.51	0.68	5.68
23 2011	0.0	114.9	114.9	961.5	846.6	4.07	33.59	1.44	12.09	0.78	4.54
24 2012	0.0	165.8	165.8	961.5	795.7	3.59	29.21	2.09	10.08	0.78	3.63
25 2013	0.0	206.6	206.6	961.5	754.9	3.28	25.40	1.54	8.40	0.53	2.91
26 2014	0.0	176.1	176.1	961.5	785.4	2.84	22.09	1.07	7.00	0.28	2.32
27 2015	0.0	114.9	114.9	961.5	846.6	2.64	19.21	1.07	5.83	0.34	1.86
28 2016	0.0	176.5	176.5	961.5	785.4	2.50	16.70	1.14	4.86	0.35	1.49
29 2017	0.0	225.8	225.8	961.5	735.7	2.50	14.52	0.80	4.05	0.23	1.19
30 2018	0.0	188.8	188.8	961.5	772.7	2.86	12.63	0.67	3.38	0.19	0.95
31 2019	0.0	190.1	190.1	961.5	771.4	2.04	10.98	0.73	2.81	0.20	0.76
32 2020	0.0	250.3	250.3	961.5	711.2	1.40	9.55	0.50	2.34	0.13	0.61
33 2021	0.0	205.2	205.2	961.5	756.3	1.50	8.50	0.34	1.95	0.08	0.39
34 2022	0.0	161.8	161.8	961.5	799.7	1.12	7.22	0.34	1.63	0.06	0.31
35 2023	0.0	199.4	199.4	961.5	762.1	1.12	6.28	0.24	1.36	0.03	0.25
36 2024	0.0	171.2	171.2	961.5	790.3	0.65	5.46	0.14	1.13	0.02	0.20
37 2025	0.0	114.9	114.9	961.5	846.6	0.57	4.75	0.11	0.94	0.02	0.16
38 2026	0.0	114.9	114.9	961.5	846.6	0.49	4.13	0.09	0.79	0.02	0.13
39 2027	0.0	114.9	114.9	961.5	846.6	0.43	3.59	0.08	0.65	0.02	0.10
40 2028	0.0	114.9	114.9	961.5	846.6	0.37	3.12	0.07	0.55	0.01	0.08
41 2029	0.0	114.9	114.9	961.5	846.6	0.32	2.71	0.05	0.45	0.01	0.07
42 2030	0.0	114.9	114.9	961.5	846.6	0.28	2.36	0.05	0.38	0.01	0.05
43 2031	0.0	165.8	165.8	961.5	795.7	0.35	2.05	0.05	0.32	0.01	0.05
44 2032	0.0	206.6	206.6	961.5	754.9	0.38	1.78	0.06	0.26	0.01	0.04
45 2033	0.0	176.1	176.1	961.5	785.4	0.28	1.55	0.04	0.22	0.01	0.03
46 2034	0.0	114.9	114.9	961.5	846.6	0.16	1.35	0.02	0.18	0.00	0.03
47 2035	0.0	176.5	176.5	961.5	785.0	0.22	1.17	0.03	0.15	0.00	0.02
48 2036	0.0	225.8	225.8	961.5	735.7	0.24	1.02	0.03	0.13	0.00	0.02
49 2037	0.0	188.8	188.8	1380.8	1192.0	0.17	0.87	0.02	0.15	0.00	0.02
50 2038	0.0	3301.3	9315.0	38584.7	29269.7	1564.11	1699.78	1182.29	898.47	941.11	525.03
TOTAL											

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.09 (15%), 0.76 (20%), 0.56 (25%)
INTERNAL RATE OF RETURN (IRR) = 16.1 %

TABLE XII-4-2 PROJECT COST AND BENEFITS / THE NORTH RAJSHAHI IRRIGATION PROJECT, STAGED DEVELOPMENT-PABA
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	15 %		20 %		25 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	87.7	0.0	87.7	0.0	-87.7	87.70	0.00	87.70	0.00	87.70	0.00
2 1990	263.2	0.0	263.2	0.0	-263.2	199.02	0.00	182.78	0.00	168.45	0.00
3 1991	350.9	5.4	356.3	22.5	-333.8	234.27	14.79	206.19	13.02	182.43	11.52
4 1992	175.5	10.8	186.3	60.4	-125.9	106.52	34.53	89.84	29.13	76.31	24.74
5 1993	0.0	13.4	13.4	94.7	81.3	6.66	47.08	5.39	38.06	4.39	31.03
6 1994	0.0	13.4	13.4	110.1	96.7	5.79	47.60	4.49	36.87	3.51	28.86
7 1995	0.0	13.4	13.4	113.9	100.5	5.04	42.82	3.74	31.79	2.81	23.89
8 1996	0.0	13.4	13.4	113.9	100.5	4.38	37.23	3.12	26.49	2.25	19.11
9 1997	0.0	13.4	13.4	113.9	100.5	3.81	32.38	2.60	22.07	1.80	15.29
10 1998	0.0	13.4	13.4	113.9	100.5	3.31	28.15	2.16	18.40	1.44	12.23
11 1999	0.0	13.4	13.4	113.9	100.5	2.88	24.48	1.80	15.33	1.15	9.78
12 2000	0.0	13.4	13.4	113.9	100.5	2.50	21.29	1.50	12.77	0.92	7.83
13 2001	0.0	13.4	13.4	113.9	100.5	2.18	18.51	1.25	10.65	0.74	6.26
14 2002	0.0	13.4	13.4	113.9	100.5	1.89	16.10	1.04	8.87	0.59	5.01
15 2003	0.0	13.4	13.4	113.9	100.5	1.65	14.00	0.87	7.39	0.47	4.01
16 2004	0.0	13.4	13.4	113.9	100.5	1.43	12.17	0.72	6.16	0.38	3.21
17 2005	0.0	13.4	13.4	113.9	100.5	1.25	10.58	0.60	5.13	0.30	2.56
18 2006	0.0	13.4	13.4	113.9	100.5	1.08	9.20	0.50	4.28	0.24	2.05
19 2007	0.0	13.4	13.4	113.9	100.5	0.94	8.00	0.42	3.57	0.19	1.64
20 2008	0.0	13.4	13.4	113.9	100.5	0.82	6.96	0.35	2.97	0.15	1.31
21 2009	0.0	13.4	13.4	113.9	100.5	0.71	6.05	0.29	2.48	0.12	1.05
22 2010	0.0	13.4	13.4	113.9	100.5	0.62	5.26	0.24	2.06	0.10	0.84
23 2011	0.0	13.4	13.4	113.9	100.5	0.54	4.58	0.20	1.72	0.08	0.67
24 2012	0.0	64.3	64.3	113.9	49.6	2.25	3.98	1.10	1.43	0.30	0.54
25 2013	0.0	105.1	105.1	113.9	8.8	3.19	3.46	1.10	1.19	0.40	0.43
26 2014	0.0	74.6	74.6	113.9	39.3	1.97	3.01	0.65	0.99	0.23	0.34
27 2015	0.0	13.4	13.4	113.9	100.5	0.31	2.62	0.10	0.83	0.03	0.28
28 2016	0.0	13.4	13.4	113.9	100.5	0.27	2.28	0.08	0.69	0.03	0.22
29 2017	0.0	13.4	13.4	113.9	100.5	0.23	1.98	0.07	0.58	0.02	0.18
30 2018	0.0	13.4	13.4	113.9	100.5	0.20	1.72	0.06	0.48	0.02	0.14
31 2019	0.0	13.4	13.4	113.9	100.5	0.18	1.50	0.05	0.40	0.01	0.11
32 2020	0.0	13.4	13.4	113.9	100.5	0.15	1.30	0.04	0.33	0.01	0.09
33 2021	0.0	13.4	13.4	113.9	100.5	0.13	1.13	0.03	0.28	0.01	0.07
34 2022	0.0	13.4	13.4	113.9	100.5	0.12	0.98	0.03	0.23	0.01	0.06
35 2023	0.0	13.4	13.4	113.9	100.5	0.10	0.86	0.02	0.19	0.01	0.05
36 2024	0.0	13.4	13.4	113.9	100.5	0.09	0.74	0.02	0.16	0.00	0.04
37 2025	0.0	13.4	13.4	113.9	100.5	0.08	0.65	0.02	0.13	0.00	0.03
38 2026	0.0	13.4	13.4	113.9	100.5	0.07	0.56	0.01	0.11	0.00	0.02
39 2027	0.0	13.4	13.4	113.9	100.5	0.06	0.49	0.01	0.09	0.00	0.02
40 2028	0.0	13.4	13.4	113.9	100.5	0.05	0.43	0.01	0.08	0.00	0.02
41 2029	0.0	13.4	13.4	113.9	100.5	0.04	0.37	0.01	0.06	0.00	0.01
42 2030	0.0	13.4	13.4	113.9	100.5	0.04	0.32	0.01	0.05	0.00	0.01
43 2031	0.0	13.4	13.4	113.9	100.5	0.03	0.28	0.01	0.04	0.00	0.01
44 2032	0.0	64.3	64.3	113.9	49.6	0.14	0.24	0.04	0.04	0.00	0.01
45 2033	0.0	105.1	105.1	113.9	8.8	0.20	0.21	0.03	0.03	0.00	0.01
46 2034	0.0	74.6	74.6	113.9	39.3	0.12	0.18	0.02	0.03	0.00	0.00
47 2035	0.0	13.4	13.4	113.9	100.5	0.02	0.16	0.00	0.02	0.00	0.00
48 2036	0.0	13.4	13.4	113.9	100.5	0.02	0.14	0.00	0.02	0.00	0.00
49 2037	0.0	13.4	13.4	113.9	100.5	0.01	0.12	0.00	0.02	0.00	0.00
50 2038	0.0	13.4	13.4	260.7	247.3	0.01	0.24	0.00	0.03	0.00	0.00
TOTAL	877.3	1040.2	1917.5	5446.1	3528.6	685.06	471.73	601.01	307.76	537.62	215.58

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 0.69 (15%), 0.51 (20%), 0.40 (25%)
INTERNAL RATE OF RETURN (IRR) = 10.0 %

TABLE XII-4-3 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, STAGED DEVELOPMENT-BARI (Phase I) (UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	15 %		20 %		25 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
2 1990	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
3 1991	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
4 1992	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
5 1993	102.0	0.0	102.0	0.0	-102.0	50.71	0.00	40.99	0.00	33.42	0.00
6 1994	303.9	1.9	305.8	10.8	-297.0	133.07	4.67	103.06	3.62	80.69	2.83
7 1995	407.9	7.6	415.5	46.7	-368.8	156.20	17.56	115.96	13.03	87.14	9.79
8 1996	204.0	15.3	219.3	102.0	-117.3	71.69	33.34	51.00	23.72	36.79	17.11
9 1997	0.0	19.1	19.1	142.5	123.4	5.43	40.51	3.70	27.62	2.56	19.13
10 1998	0.0	19.1	19.1	156.1	137.0	4.72	38.59	3.08	25.21	2.05	16.76
11 1999	0.0	19.1	19.1	159.5	140.4	4.11	34.28	2.57	21.47	1.64	13.70
12 2000	0.0	19.1	19.1	159.5	140.4	3.57	29.81	2.14	17.89	1.31	10.96
13 2001	0.0	19.1	19.1	159.5	140.4	3.10	25.92	1.79	14.91	1.05	8.77
14 2002	0.0	19.1	19.1	159.5	140.4	2.70	22.54	1.49	12.42	0.84	7.01
15 2003	0.0	19.1	19.1	159.5	140.4	2.35	19.60	1.24	10.35	0.67	5.61
16 2004	0.0	19.1	19.1	159.5	140.4	2.04	17.05	1.03	8.63	0.54	4.49
17 2005	0.0	19.1	19.1	159.5	140.4	1.77	14.82	0.86	7.19	0.43	3.59
18 2006	0.0	19.1	19.1	159.5	140.4	1.54	12.89	0.72	5.99	0.34	2.87
19 2007	0.0	19.1	19.1	159.5	140.4	1.34	11.21	0.60	4.99	0.28	2.30
20 2008	0.0	19.1	19.1	159.5	140.4	1.17	9.75	0.50	4.16	0.22	1.84
21 2009	0.0	19.1	19.1	159.5	140.4	1.01	8.47	0.42	3.47	0.18	1.47
22 2010	0.0	19.1	19.1	159.5	140.4	0.88	7.37	0.35	2.89	0.14	1.18
23 2011	0.0	19.1	19.1	159.5	140.4	0.77	6.41	0.29	2.41	0.11	0.94
24 2012	0.0	19.1	19.1	159.5	140.4	0.67	5.57	0.24	2.01	0.09	0.75
25 2013	0.0	19.1	19.1	159.5	140.4	0.58	4.85	0.20	1.67	0.07	0.60
26 2014	0.0	19.1	19.1	159.5	140.4	0.50	4.21	0.17	1.39	0.06	0.48
27 2015	0.0	19.1	19.1	159.5	140.4	0.44	3.66	0.14	1.16	0.05	0.39
28 2016	0.0	80.7	80.7	159.5	78.8	1.61	3.19	0.49	0.97	0.16	0.31
29 2017	0.0	130.0	130.0	159.5	29.5	2.26	2.77	0.66	0.81	0.20	0.25
30 2018	0.0	93.0	93.0	159.5	66.5	1.40	2.41	0.39	0.67	0.12	0.20
31 2019	0.0	19.1	19.1	159.5	140.4	0.25	2.09	0.07	0.56	0.02	0.16
32 2020	0.0	19.1	19.1	159.5	140.4	0.22	1.82	0.06	0.47	0.02	0.13
33 2021	0.0	19.1	19.1	159.5	140.4	0.19	1.58	0.05	0.39	0.01	0.10
34 2022	0.0	19.1	19.1	159.5	140.4	0.16	1.38	0.04	0.32	0.01	0.08
35 2023	0.0	19.1	19.1	159.5	140.4	0.14	1.20	0.03	0.27	0.01	0.06
36 2024	0.0	19.1	19.1	159.5	140.4	0.12	1.04	0.03	0.23	0.01	0.05
37 2025	0.0	19.1	19.1	159.5	140.4	0.11	0.91	0.02	0.19	0.00	0.04
38 2026	0.0	19.1	19.1	159.5	140.4	0.09	0.79	0.02	0.16	0.00	0.03
39 2027	0.0	19.1	19.1	159.5	140.4	0.08	0.68	0.02	0.13	0.00	0.03
40 2028	0.0	19.1	19.1	159.5	140.4	0.07	0.60	0.01	0.11	0.00	0.02
41 2029	0.0	19.1	19.1	159.5	140.4	0.06	0.52	0.01	0.09	0.00	0.02
42 2030	0.0	19.1	19.1	159.5	140.4	0.05	0.45	0.01	0.08	0.00	0.01
43 2031	0.0	19.1	19.1	159.5	140.4	0.05	0.39	0.01	0.06	0.00	0.01
44 2032	0.0	19.1	19.1	159.5	140.4	0.04	0.34	0.01	0.05	0.00	0.01
45 2033	0.0	19.1	19.1	159.5	140.4	0.04	0.30	0.01	0.04	0.00	0.01
46 2034	0.0	19.1	19.1	159.5	140.4	0.03	0.26	0.00	0.03	0.00	0.01
47 2035	0.0	19.1	19.1	159.5	140.4	0.03	0.22	0.00	0.03	0.00	0.00
48 2036	0.0	80.7	80.7	159.5	78.8	0.10	0.19	0.01	0.03	0.00	0.00
49 2037	0.0	130.0	130.0	159.5	29.5	0.14	0.17	0.01	0.03	0.00	0.00
50 2038	0.0	93.0	93.0	159.5	288.3	0.09	0.35	0.01	0.02	0.00	0.01
TOTAL	1019.8	1319.8	2339.6	7059.9	4720.3	457.72	396.73	334.51	221.94	251.24	134.12

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 0.87 (15%), 0.66 (20%), 0.53 (25%)
INTERNAL RATE OF RETURN (IRR) = 12.8 %

TABLE XII-4-4 PROJECT COST AND BENEFITS, THE NORTH RAJSHAKHI IRRIGATION PROJECT, STAGED DEVELOPMENT-BARI
(UNIT : MILLION TK) (Phase II)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE			15% (BENEFITS)	15% (COST)	15% (BENEFITS)
	CAPITAL	O & M				5% (COST)	5% (BENEFITS)	10% (COST)			
1 1989	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
2 1990	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
3 1991	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
4 1992	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
5 1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
6 1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
7 1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
8 1996	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
9 1997	188.8	0.0	188.8	0.0	-188.8	121.70	0.00	80.07	0.00	53.67	0.00
10 1998	471.9	8.3	480.2	47.0	-433.2	294.80	28.85	185.14	18.12	118.70	11.62
11 1999	283.1	29.1	312.2	179.5	-132.7	182.54	104.95	109.43	62.91	67.11	38.58
12 2000	0.0	41.5	41.5	294.7	253.2	23.11	164.10	13.22	93.90	7.76	55.08
13 2001	0.0	41.5	41.5	335.4	293.9	22.01	177.87	12.02	97.15	6.74	54.51
14 2002	0.0	41.5	41.5	346.4	304.9	20.96	174.96	10.93	91.22	5.87	48.96
15 2003	0.0	41.5	41.5	346.4	304.9	19.96	166.63	9.93	82.93	5.10	42.57
16 2004	0.0	41.5	41.5	346.4	304.9	19.01	158.69	9.03	75.39	4.43	37.02
17 2005	0.0	41.5	41.5	346.4	304.9	18.11	151.14	8.21	68.53	3.86	32.19
18 2006	0.0	41.5	41.5	346.4	304.9	17.24	143.94	7.46	62.50	3.35	27.99
19 2007	0.0	41.5	41.5	346.4	304.9	16.42	137.08	6.79	56.64	2.92	24.34
20 2008	0.0	41.5	41.5	346.4	304.9	15.64	130.56	6.17	51.49	2.54	21.17
21 2009	0.0	41.5	41.5	346.4	304.9	14.90	124.34	5.61	46.81	2.20	18.40
22 2010	0.0	41.5	41.5	346.4	304.9	14.19	118.42	5.10	42.55	1.92	16.00
23 2011	0.0	41.5	41.5	346.4	304.9	13.51	112.78	4.63	38.69	1.67	13.92
24 2012	0.0	41.5	41.5	346.4	304.9	12.87	107.41	4.21	35.17	1.45	12.10
25 2013	0.0	41.5	41.5	346.4	304.9	12.26	102.30	3.83	31.97	1.26	10.52
26 2014	0.0	41.5	41.5	346.4	304.9	11.67	97.42	3.48	29.07	1.10	9.15
27 2015	0.0	41.5	41.5	346.4	304.9	11.12	92.79	3.17	26.42	0.95	7.96
28 2016	0.0	41.5	41.5	346.4	304.9	10.59	88.37	2.88	24.02	0.83	6.92
29 2017	0.0	41.5	41.5	346.4	304.9	10.08	84.16	2.62	21.84	0.72	6.02
30 2018	0.0	41.5	41.5	346.4	304.9	9.60	80.15	2.38	19.85	0.63	5.23
31 2019	0.0	116.7	116.7	346.4	229.7	25.72	76.33	8.08	18.05	1.53	4.55
32 2020	0.0	176.9	176.9	346.4	169.5	37.13	72.70	6.38	16.41	1.31	3.96
33 2021	0.0	131.8	131.8	346.4	214.6	26.34	69.24	5.88	14.92	1.20	3.44
34 2022	0.0	41.5	41.5	346.4	304.9	7.90	65.94	1.62	13.56	0.36	2.99
35 2023	0.0	41.5	41.5	346.4	304.9	7.52	62.80	1.48	12.33	0.31	2.60
36 2024	0.0	41.5	41.5	346.4	304.9	7.17	59.81	1.34	11.21	0.27	2.26
37 2025	0.0	41.5	41.5	346.4	304.9	6.82	56.96	1.22	10.19	0.24	1.97
38 2026	0.0	41.5	41.5	346.4	304.9	6.50	54.25	1.11	9.26	0.20	1.71
39 2027	0.0	41.5	41.5	346.4	304.9	6.19	51.67	1.01	8.42	0.18	1.49
40 2028	0.0	41.5	41.5	346.4	304.9	5.90	49.21	0.92	7.65	0.15	1.29
41 2029	0.0	41.5	41.5	346.4	304.9	5.61	46.86	0.83	6.96	0.13	1.12
42 2030	0.0	41.5	41.5	346.4	304.9	5.35	44.63	0.76	6.33	0.12	0.98
43 2031	0.0	41.5	41.5	346.4	304.9	5.09	42.51	0.69	5.75	0.10	0.85
44 2032	0.0	41.5	41.5	346.4	304.9	4.85	40.48	0.63	5.23	0.09	0.74
45 2033	0.0	41.5	41.5	346.4	304.9	4.62	38.55	0.57	4.75	0.08	0.64
46 2034	0.0	41.5	41.5	346.4	304.9	4.40	36.72	0.52	4.32	0.07	0.56
47 2035	0.0	41.5	41.5	346.4	304.9	4.19	34.97	0.47	3.93	0.06	0.49
48 2036	0.0	41.5	41.5	346.4	304.9	3.99	33.31	0.43	3.57	0.05	0.42
49 2037	0.0	41.5	41.5	346.4	304.9	3.80	31.72	0.39	3.25	0.04	0.37
50 2038	0.0	41.5	41.5	346.4	304.9	3.62	30.21	0.35	2.95	0.04	0.32
TOTAL	943.8	1956.8	2900.6	13673.4	10772.8	1075.00	3545.78	530.78	1246.00	302.12	533.00

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 3.30 (5%), 2.35 (10%), 1.76 (15%)
INTERNAL RATE OF RETURN (IRR) = 28.9%

TABLE XII-4-5 PROJECT COST AND BENEFITS, THE NORTH RAJSHAHI IRRIGATION PROJECT, STAGED DEVELOPMENT-BARI (UNIT : MILLION TK) (Phase III)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	5 %		10 %		15 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
2 1990	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
3 1991	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
4 1992	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
5 1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
6 1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
7 1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
8 1996	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
9 1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
10 1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
11 1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
12 2000	92.1	0.0	92.1	0.0	-92.1	51.29	0.00	29.35	0.00	17.21	0.00
13 2001	230.2	8.2	238.4	46.4	-192.0	126.43	24.61	69.06	13.44	38.75	7.54
14 2002	138.1	28.6	166.7	177.0	10.3	84.20	89.79	43.90	46.61	23.56	25.02
15 2003	0.0	40.9	40.9	290.6	249.7	19.67	139.79	9.79	69.57	5.03	35.71
16 2004	0.0	40.9	40.9	330.8	289.9	18.74	151.55	8.90	71.99	4.37	35.35
17 2005	0.0	40.9	40.9	341.7	300.8	17.84	149.09	8.09	67.60	3.80	31.75
18 2006	0.0	40.9	40.9	341.7	300.8	17.00	141.99	7.36	61.46	3.30	27.61
19 2007	0.0	40.9	40.9	341.7	300.8	16.19	135.22	6.69	55.87	2.87	24.01
20 2008	0.0	40.9	40.9	341.7	300.8	15.42	128.79	6.08	50.79	2.50	20.88
21 2009	0.0	40.9	40.9	341.7	300.8	14.68	122.65	5.53	46.17	2.17	18.16
22 2010	0.0	40.9	40.9	341.7	300.8	13.98	116.81	5.02	41.98	1.89	15.79
23 2011	0.0	40.9	40.9	341.7	300.8	13.32	111.25	4.57	38.16	1.64	13.73
24 2012	0.0	40.9	40.9	341.7	300.8	12.68	105.95	4.15	34.69	1.43	11.94
25 2013	0.0	40.9	40.9	341.7	300.8	12.08	100.91	3.77	31.54	1.24	10.38
26 2014	0.0	40.9	40.9	341.7	300.8	11.50	96.10	3.43	28.67	1.08	9.03
27 2015	0.0	40.9	40.9	341.7	300.8	10.96	91.53	3.12	26.06	0.94	7.85
28 2016	0.0	40.9	40.9	341.7	300.8	10.43	87.17	2.84	23.70	0.82	6.83
29 2017	0.0	40.9	40.9	341.7	300.8	9.94	83.02	2.58	21.54	0.71	5.93
30 2018	0.0	40.9	40.9	341.7	300.8	9.46	79.06	2.34	19.58	0.62	5.16
31 2019	0.0	40.9	40.9	341.7	300.8	9.01	75.30	2.13	17.80	0.54	4.49
32 2020	0.0	40.9	40.9	341.7	300.8	8.58	71.71	1.94	16.18	0.47	3.99
33 2021	0.0	40.9	40.9	341.7	300.8	8.18	68.30	1.76	14.71	0.41	3.39
34 2022	0.0	87.8	87.8	341.7	253.9	16.71	65.05	3.44	13.38	0.76	2.95
35 2023	0.0	125.4	125.4	341.7	216.3	22.73	61.95	4.46	12.16	0.94	2.57
36 2024	0.0	97.2	97.2	341.7	244.5	16.78	59.00	3.14	11.05	0.63	2.23
37 2025	0.0	40.9	40.9	341.7	300.8	6.73	56.19	1.20	10.05	0.23	1.94
38 2026	0.0	40.9	40.9	341.7	300.8	6.41	53.51	1.09	9.14	0.20	1.69
39 2027	0.0	40.9	40.9	341.7	300.8	6.10	50.97	0.99	8.31	0.18	1.47
40 2028	0.0	40.9	40.9	341.7	300.8	5.81	48.54	0.90	7.55	0.15	1.28
41 2029	0.0	40.9	40.9	341.7	300.8	5.53	46.23	0.82	6.86	0.13	1.11
42 2030	0.0	40.9	40.9	341.7	300.8	5.27	44.03	0.75	6.24	0.12	0.96
43 2031	0.0	40.9	40.9	341.7	300.8	5.02	41.93	0.68	5.67	0.10	0.84
44 2032	0.0	40.9	40.9	341.7	300.8	4.78	39.93	0.62	5.16	0.09	0.73
45 2033	0.0	40.9	40.9	341.7	300.8	4.55	38.03	0.56	4.69	0.08	0.63
46 2034	0.0	40.9	40.9	341.7	300.8	4.34	36.22	0.51	4.26	0.07	0.55
47 2035	0.0	40.9	40.9	341.7	300.8	4.13	34.50	0.46	3.87	0.06	0.48
48 2036	0.0	40.9	40.9	341.7	300.8	3.93	32.85	0.42	3.52	0.05	0.42
49 2037	0.0	40.9	40.9	341.7	300.8	3.75	31.29	0.38	3.20	0.04	0.36
50 2038	0.0	40.9	40.9	392.4	351.5	3.57	34.22	0.35	3.34	0.04	0.36
TOTAL	460.4	1696.9	2157.3	12513.3	10356.0	637.70	2944.62	253.19	916.59	119.21	345.01

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 4.62 (5%), 3.62 (10%), 2.89 (15%)
INTERNAL RATE OF RETURN (IRR) = 55.1 %

TABLE XII-4-6 PROJECT COST AND BENEFITS / THE NORTH RAJSHAHI IRRIGATION PROJECT, ST-DV BARIND SUB-TOTAL
(UNIT : MILLION TK)

YEAR	PROJECT COST		TOTAL	BENEFITS	RETURN	15 %		20 %		25 %	
	CAPITAL	O & M				(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1989	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
2 1990	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
3 1991	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
4 1992	0.0	0.0	0.0	0.0	-102.0	0.00	50.71	40.99	0.00	0.00	0.00
5 1993	102.0	1.9	103.9	10.8	-297.0	133.07	103.08	103.08	3.62	33.42	2.83
6 1994	305.9	7.6	313.5	46.7	-368.8	156.20	115.96	115.96	13.03	80.69	9.79
7 1995	407.9	15.3	423.2	102.0	-117.3	71.69	51.00	51.00	23.72	36.79	17.11
8 1996	204.0	19.1	223.1	142.5	-65.4	59.10	40.29	40.29	27.90	27.90	19.13
9 1997	188.8	27.4	216.2	203.1	-296.2	123.42	80.64	80.64	32.80	53.61	21.81
10 1998	471.9	48.2	520.1	339.0	7.7	71.21	44.59	44.59	45.63	29.12	29.12
11 1999	283.1	60.6	343.7	545.2	301.5	28.54	17.13	17.13	50.94	31.21	31.21
12 2000	92.1	88.8	180.9	682.9	242.3	48.60	27.95	27.95	28.46	29.76	29.76
13 2001	230.2	89.2	319.4	796.5	455.6	32.12	17.70	17.70	53.19	10.49	10.49
14 2002	138.1	101.5	239.6	836.7	695.0	12.47	6.59	6.59	51.70	30.03	30.03
15 2003	0.0	101.5	101.5	735.2	746.1	10.85	5.41	5.41	3.57	28.02	28.02
16 2004	0.0	101.5	101.5	847.6	746.1	9.43	4.57	4.57	2.86	23.55	23.55
17 2005	0.0	101.5	101.5	847.6	746.1	8.20	3.81	3.81	38.20	19.09	19.09
18 2006	0.0	101.5	101.5	847.6	746.1	7.13	3.18	3.18	31.84	15.27	15.27
19 2007	0.0	101.5	101.5	847.6	746.1	6.20	2.65	2.65	26.53	12.22	12.22
20 2008	0.0	101.5	101.5	847.6	746.1	5.39	2.21	2.21	22.11	9.77	9.77
21 2009	0.0	101.5	101.5	847.6	746.1	4.69	1.84	1.84	18.42	7.82	7.82
22 2010	0.0	101.5	101.5	847.6	746.1	4.08	1.53	1.53	15.35	6.25	6.25
23 2011	0.0	101.5	101.5	847.6	746.1	3.55	1.28	1.28	12.79	5.00	5.00
24 2012	0.0	101.5	101.5	847.6	746.1	3.08	1.06	1.06	10.66	4.00	4.00
25 2013	0.0	101.5	101.5	847.6	746.1	2.68	0.89	0.89	8.89	3.20	3.20
26 2014	0.0	101.5	101.5	847.6	746.1	2.33	0.74	0.74	7.40	2.56	2.56
27 2015	0.0	101.5	101.5	847.6	746.1	2.06	0.62	0.62	6.17	2.05	2.05
28 2016	0.0	101.5	101.5	847.6	746.1	1.81	0.53	0.53	5.14	1.64	1.64
29 2017	0.0	101.5	101.5	847.6	746.1	1.59	0.47	0.47	4.28	1.31	1.31
30 2018	0.0	101.5	101.5	847.6	746.1	1.40	0.42	0.42	3.57	1.05	1.05
31 2019	0.0	101.5	101.5	847.6	746.1	1.24	0.38	0.38	2.98	0.84	0.84
32 2020	0.0	101.5	101.5	847.6	746.1	1.10	0.35	0.35	2.48	0.67	0.67
33 2021	0.0	101.5	101.5	847.6	746.1	0.99	0.31	0.31	2.07	0.54	0.54
34 2022	0.0	101.5	101.5	847.6	746.1	0.89	0.28	0.28	1.72	0.43	0.43
35 2023	0.0	101.5	101.5	847.6	746.1	0.81	0.25	0.25	1.44	0.34	0.34
36 2024	0.0	101.5	101.5	847.6	746.1	0.75	0.22	0.22	1.20	0.28	0.28
37 2025	0.0	101.5	101.5	847.6	746.1	0.68	0.20	0.20	1.00	0.22	0.22
38 2026	0.0	101.5	101.5	847.6	746.1	0.62	0.18	0.18	0.83	0.18	0.18
39 2027	0.0	101.5	101.5	847.6	746.1	0.58	0.16	0.16	0.69	0.14	0.14
40 2028	0.0	101.5	101.5	847.6	746.1	0.50	0.14	0.14	0.58	0.11	0.11
41 2029	0.0	101.5	101.5	847.6	746.1	0.44	0.12	0.12	0.48	0.09	0.09
42 2030	0.0	101.5	101.5	847.6	746.1	0.39	0.11	0.11	0.40	0.07	0.07
43 2031	0.0	101.5	101.5	847.6	746.1	0.35	0.10	0.10	0.35	0.06	0.06
44 2032	0.0	101.5	101.5	847.6	746.1	0.32	0.09	0.09	0.28	0.05	0.05
45 2033	0.0	101.5	101.5	847.6	746.1	0.28	0.08	0.08	0.23	0.04	0.04
46 2034	0.0	101.5	101.5	847.6	746.1	0.25	0.07	0.07	0.19	0.03	0.03
47 2035	0.0	101.5	101.5	847.6	746.1	0.22	0.06	0.06	0.16	0.02	0.02
48 2036	0.0	101.5	101.5	847.6	746.1	0.19	0.05	0.05	0.13	0.01	0.01
49 2037	0.0	101.5	101.5	847.6	746.1	0.16	0.04	0.04	0.11	0.00	0.00
50 2038	0.0	101.5	101.5	847.6	746.1	0.14	0.03	0.03	0.09	0.00	0.00
TOTAL	2424.0	4973.5	7397.5	33246.6	25849.1	879.05	1274.74	581.28	626.89	403.49	337.76

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.45 (15%), 1.08 (20%), 0.84 (25%)

INTERNAL RATE OF RETURN (IRR) = 21.4 %

-87.70

-263.20

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