Government of the People's Republic of Bangladesh

Ministry of Irrigation, Water Development and Flood Control
Flood Plan Coordination Organization

BANGLADESH ACTION PLAN FOR FLOOD CONTROL

COMPARTMENTALIZATION PILOT PROJECT (FAP 20)

SIRAJGANJ CPP INTERIM REPORT

ANNEX 9: MULTI-CRITERIA ANALYSIS (SUPPORTING DATA)

(FINAL DRAFT)

June 1993

Euroconsult/Lahmeyer International/Bangladesh Engineering & Technological Services/House of Consultants

under assignment to

DIRECTORAAT GENERAAL INTERNATIONALE SAMENWERKING
Government of the Netherlands

and

KREDITANSTALT FÜR WIEDERAUFBAU
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GENERAL REMARKS

GENERAL REMARKS

For the benefit of more convenient reading of the descriptive part of the Multi Criteria Analysis in the main report, all tables, with the exception of the Table 8.1, summarizing the results in order to allow a quick overview, have been concentrated in this Annex.

A further justification is given by the fact, that more detailed analytical data may be presented this way, which would otherwise be difficult to present in the main report. Finally, this way even easier examination of all data will be possible, as crosschecking of interrelated information may be practised more efficiently.

The Annex is consequently divided into three main sections:

Section 1: Multi Criteria Analysis - 3 detailed tables per option,

Section 2: General Information informing on data used in damage assessement, fishery development and prices and conversion factors applied in the economic analysis,

Section 3: Detailed Information on agricultural parameters at present and their development without and with project (tables 1 to 7). The remaining tables (8 to 12) inform on details on cost and benefit criteria.

SECTION 1

MULTI-CRITERIA ANALYSIS

MULTI-CRITERIA ANALYSIS

Data Type	Variable	Unit	OPTION 1
1. Economic	EIRR	%	5.9
	NPV	m.Tk	-73.4
	Benefit/Cost Ratio		0.69
2. Quantitative			
2.1 Construction: (financial values)	Investment	m.Tk	230.2
	Time for completion	years	3
	Labour intensity	man/d/a	2,873
	Foreign exchange as % of total investment	%	39.0
2.2 Operation & Maintenance	Total cost	m.Tk/a	7.5
	Labour intensity	man/d/a	153.3
	Labour cost as per cent of total O&M costs	%	80.7
2.3 Agriculture	Value added	m.Tk/a	24,287
	Employment generation	man/d/a	126,273
	Diversification 1)	ratio	1.12
	Draught power requirements	pair/d/a	12,553
	Ratio HYV/local varieties in rice production	ratio	3.1
2.4 Fishery	Capture fish	Tons/a	19
	Aquaculture	Tons/a	0
2.5 Damage Prevention	Physical infrastructure	m.Tk/a 2)	3.5
	Private property	m.Tk/a 2)	0.5
	Crop production	m.Tk/a 2)	2.9
2.6 Mitigation Measures	Adjacent areas (financial)	m.Tk	7.1
	Non-structural (financal)	m.Tk	9.5

1) rice crops to non-rice crops

2) on compartment

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 1 - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative		
3.1 Natural resources and environment	Flood plain nutrient recharge	
	Flood plain sand deposits	
	Waterway sedimentation 1)	
	Groundwater availability	
	Surface water quantity	
	Surface water quality * Sirajganj town	
	* rural areas	
	Flora diversity	
	Fauna diversity	
	Wetland protection	
	Common resourc. availability	
3.2 Agriculture	Dependency on agricultural services 1)	
	Seasonal distribution of labour	
	Livestock	
	Soil fertility	
	Homestead and gardening	
3.3 Fisheries	Nutritional impact on subsistence level	
	Fish recruitment	

1) inside compartement

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 1 - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative (cont`d)		
3.4 Women	Additional work load	
	Social mobility	
3.5 Communication	Road transport	
	Internal navigation	
3.6 Health	Nutrition	
	Domestic water supply	
	Vector-borne diseases	
	Water based diseases	
3.7 Institutions	Institutional requirements on local level	
	Interdepartmental dependancy	
3.8 Social issues	Social conflict	
	Income distribution	
3.9 Others	Flood retention	
	Cultural heritage	

MULTI-CRITERIA ANALYSIS

Data Type	Variable	Unit	OPTION 2 A
1. Economic	EIRR	%	15.7
	NPV	m.Tk	56.6
	Benefit/Cost Ratio		1.18
2. Quantitative			
2.1 Construction: (financial values)	Investment	m.Tk	280.6
	Time for completion	years	3
	Labour intensity	man/d/a	3,311
	Foreign exchange as % of total investment	%	37.6
2.2 Operation & Maintenance	Total cost	m.Tk/a	13.2
	Labour intensity	man/d/a	232.0
	Labour cost as per cent of total O&M costs	%	82.8
2.3 Agriculture	Value added	m.Tk/a	24,450
	Employment generation	man/d/a	371,637
	Diversification 1)	ratio	1.17
	Draught power requirements	pair/d/a	43,168
	Ratio HYV/local varieties in rice production	ratio	4.6
2.4 Fishery	Capture fish	Tons/a	-3
	Aquaculture	Tons/a	0
2.5 Damage Prevention	Physical infrastructure	m.Tk/a 2)	3.5
	Private property	m.Tk/a 2)	0.5
	Crop production	m.Tk/a 2)	2.9
2.6 Mitigation Measures	Adjacent areas (financial)	m.Tk	7.1
	Non-structural (financal)	m.Tk	9.5

1) rice crops to non-rice crops

2) on compartment

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 2 A - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative		
3.1 Natural resources and environment	Flood plain nutrient recharge	
	Flood plain sand deposits	
	Waterway sedimentation 1)	
	Groundwater availability	
	Surface water quantity	
	Surface water quality * Sirajganj town	
	* rural areas	
	Flora diversity	
	Fauna diversity	
	Wetland protection	
	Common ressourc. availability	
3.2 Agriculture	Dependency on agricultural services	
	Seasonal distribution of labour	
	Livestock	
	Soil fertility	
	Homestead and gardening	
3.3 Fisheries	Nutritional impact on subsistence level	
	Fish recruitment	

1) inside compartement

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 2 A - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative (cont`d)		
3.4 Women	Additional work load	
	Social mobility	
3.5 Communicat.	Road transport	
	Internal navigation	
3.6 Health	Nutrition	
	Domestic water supply	
	Vector-borne diseases	
	Water based diseases	
3.7 Institutions	Institutional requirements on local level	
	Interdepartmental dependancy	
3.8 Social issues	Social conflict	
	Income distribution	
3.9 Others	Flood retention	
	Cultural heritage	

MULTI-CRITERIA ANALYSIS

Data Type	Variable	Unit	OPTION 2 B
1. Economic	EIRR	%	15.2
	NPV	m.Tk	51.6
	Benefit/Cost Ratio		1.15
2. Quantitative			
2.1 Construction: (financial values)	Investment	m.Tk	297.6
	Time for completion	years	3
	Labour intensity	man/d/a	3,494
	Foreign exchange as % of total investment	%	35.7
2.2 Operation & Maintenance	Total cost	m.Tk/a	13.8
	Labour intensity	man/d/a	243.0
	Labour cost as per cent of total O&M costs	%	82.2
2.3 Agriculture	Value added	m.Tk/a	24,581
	Employment generation	man/d/a	396,694
	Diversification 1)	ratio	1.21
	Draught power requirements	pair/d/a	43,545
	Ratio HYV/local varieties in rice production	ratio	6.4
2.4 Fishery	Capture fish	Tons/a	-18
	Aquaculture	Tons/a	0
2.5 Damage Prevention	Physical infrastructure	m.Tk/a 2)	3.5
	Private property	m.Tk/a 2)	0.5
	Crop production	m.Tk/a 2)	2.9
2.6 Mitigation Measures	Adjacent areas (financial)	m.Tk	7.1
	Non-structural (financal)	m.Tk	9.5

1) rice crops to non-rice crops
2) on compartment

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 2 B - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative		
3.1 Natural resources and environment	Flood plain nutrient recharge	
	Flood plain sand deposits	
	Waterway sedimentation 1)	
	Groundwater availability	
	Surface water quantity	
	Surface water quality * urban regions	
	* rural regions	
	Flora diversity	
	Fauna diversity	
	Wetland protection	
	Common resourc. availability	
3.2 Agriculture	Dependency on agricultural services 1)	
	Seasonal distribution of labour	
	Livestock	
	Soil fertility	
	Homestead and gardening	
3.3 Fisheries	Nutritional impact on subsistence level	
	Fish recruitment	

1) inside compartement

MULTI-CRITERIA ANALYSIS

Data Type	Variable	OPTION 2 B - Scale + 5 4 3 2 1 0 1 2 3 4 5
3. Qualitative (cont`d)		
3.4 Women	Additional work load	
	Social mobility	
3.5 Communication	Road transport	
	Internal navigation	
3.6 Health	Nutrition	
	Domestic water supply	
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3.9 Others	Flood retention	
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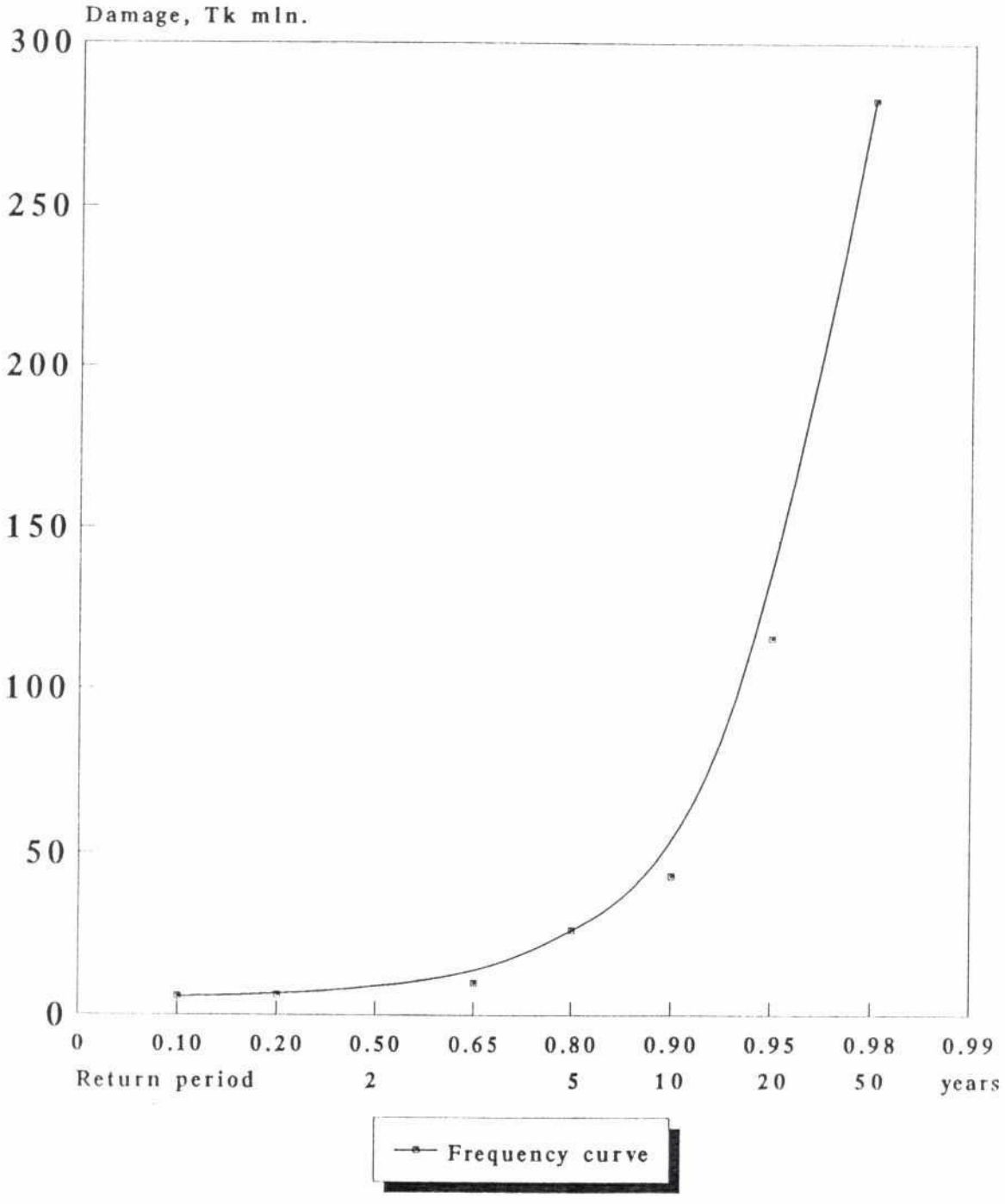
SECTION 2

GENERAL INFORMATION

Graph 1: Damage - Frequency Curve

CPP - Sirajganj (FAP 20)



damage based on (adapted) official data

Table 1 : Flood damages in Sirajganj Thana

Items damaged	Unit	Year			
		1987	1988	1990	1991
Affected area	Sq.km	144	520	90	174
Union	No	10	10	10	10
Village	No	250	NA	61	192
Population	000	121.20	234.70	25.40	43.90
Human losses	No	2	5	2	16
Crop damage					
- fully damaged	ha.	8340	14500	3318	3022
- partly damaged	ha.	10053	0	3798	4346
- fully damaged	m.Tk	68.15	118.50	18.71	22.58
- partly damaged	m.Tk	41.07		4.22	4.82
Private rural house					
- fully damaged	No	2486	16450	4910	2335
- partial damaged	No	7361	49350	9335	5380
- fully damaged	m.Tk	3.77	24.92	4.91	3.54
- partial damaged	m.Tk	0.97	6.48	1.23	0.71
Public property					
- Embankment	Km		19		2.50
- Rural schools	No	32	162	44	14
Total	m.Tk	1.12	18.20	0.50	0.70
- Roads					
earth	Km	162	233	85	117
paved	Km	NA	33	15.78	NA
total	m.Tk	81.00	280.00		38.25
- Bridges	No	9	11		11
	m.Tk	2.88	3.52		3.52
Infrastructures (Municipality)			21.38		
Total damage (Tk)	**m.Tk**	**199.25**	**473.76**	**45.35**	**74.16**
Crop damage	m.Tk	109.22	118.50	22.93	27.40
Livestock & poultry	m.Tk	0.29	0.76		0.04
Private rural house	m.Tk	4.74	31.40	6.14	4.25
Infrastructures	m.Tk.	85.00	323.10	16.28	42.47

Source : Sirajgan Thana Project Implementation Office (PIO) and Sirajganj Pourashava Flood Damage Record of Flood 1988

Table 2: Flood Frequencies and Damages

Return perlod years	Freq.	Damage m.Tk	Added Freq.	Mean Damage m.Tk	Weighted Damage m.Tk	Yearly prevented Damage m.Tk
			0.10	2.8	0.3	
1.1	0.10	5.6				0.3
			0.10	5.9	0.6	
1.3	0.20	6.1				0.9
			0.47	8.0	3.7	
3.0	0.67	9.8				4.6
			0.13	18.0	2.3	
5.0	0.80	26.2				6.9
			0.10	34.5	3.4	
10.0	0.90	42.8				10.4
			0.05	79.0	3.9	
20.0	0.95	115.1				14.3
			0.03	198.9	5.4	
50.0	0.98	282.6				19.7

Source: FAP 20 Flood model and official data adapted to project area

Table 3: Fishproduction affected by CPP

Species	Present Situation	Future Situation without CPP	Future situation with CPP			Market price	Impact					
			Option 1	Option 2A	Option 2B		Option 1		Option 2A		Option 2B	
	To/yr	To/yr	To/yr	To/yr	To/yr	Tk/kg	Production To/yr	Value Tk mln.	Production To/yr	Value Tk mln.	Production To/yr	Value Tk mln.
Major Carp	60.9	56.1	57.6	56.0	56.0	80.0	1.50	0.12	-0.10	-0.01	-0.10	-0.01
Minor Carp	10.0	6.9	8.4	7.0	7.0	70.0	1.50	0.11	0.10	0.01	0.10	0.01
Catfish	64.6	42.0	44.2	42.0	42.0	45.0	2.20	0.10	0.00	0.00	0.00	0.00
Live Fish	11.6	6.6	7.7	6.0	6.0	45.0	1.10	0.05	-0.60	-0.03	-0.60	-0.03
Hilsa	23.8	15.5	15.5	15.0	15.0	100.0	0.00	0.00	-0.50	-0.05	-0.50	-0.05
Macrobrachium	3.4	2.2	2.2	2.0	2.0	100.0	0.00	0.00	-0.20	-0.02	-0.20	-0.02
Small Shrimp	7.9	4.7	5.4	5.0	5.0	30.0	0.70	0.02	0.30	0.01	0.30	0.01
Miscellaneous	517.4	247.7	259.6	246.0	231.0	30.0	11.90	0.36	-1.70	-0.05	-16.70	-0.50
Total	**699.6**	**381.7**	**400.6**	**379.0**	**364.0**		**18.90**	**0.75**	**-2.70**	**-0.14**	**-17.70**	**-0.59**

Table 4 : Economic Prices - Conversion Factors

Crop	Market price	By-product	Seed	Labour Man/d	Ox/d	Urea	Fertilizer TSP	MP	Plant protect.	Irrig.
Boro HYV	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Boro local	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Aman HYV	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Aman (T)	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Aman (DW)	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Aus HYV	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Aus local	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Jute	1.06	0.87	1.06	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Potato	0.87	0.87	0.87	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Wheat	1.29	0.87	1.29	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Mustard	0.88	0.87	0.88	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Pulses	0.87	0.87	0.87	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Vegetables	0.87	0.87	0.87	0.75	0.87	1.45	1.88	2.02	0.87	0.63
Other crops	0.87	0.87	0.87	0.75	0.87	1.45	1.88	2.02	0.87	0.63

Source: FPCO, Guidelines for Project Assessment (1992)

Table 5: Agricultural Prices (In Tk/Kg)

Crop	Market price	By-product	Seed	Labour Man/d	Ox/d	Urea	Fertilizer TSP	MP	Plant protect.	Irrig. Tk/ha
Boro HYV	6.21	0.7	10.0	50.0	45.0	4.58	5.40	4.05	504.0	6,561
Boro local	6.21	1.0	10.0	50.0	45.0	4.58	5.40	4.05	504.0	3,281
Aman HYV	6.44	0.7	10.0	50.0	45.0	4.58	5.40	4.05	504.0	0
Aman (T)	6.44	1.0	10.0	50.0	45.0	4.58	5.40	4.05	504.0	0
Aman (DW)	6.44	1.0	10.0	50.0	45.0	4.58	5.40	4.05	504.0	0
Aus HYV	6.07	0.7	8.5	50.0	45.0	4.58	5.40	4.05	504.0	0
Aus local	6.07	1.0	10.5	50.0	45.0	4.58	5.40	4.05	504.0	0
Jute	8.01	2.6	24.0	50.0	45.0	4.58	5.40	4.05	504.0	0
Potato	4.58	0.0	8.5	50.0	45.0	4.58	5.40	4.05	504.0	1,312
Wheat	6.31	0.4	12.0	50.0	45.0	4.58	5.40	4.05	504.0	984
Mustard	13.47	0.6	19.0	50.0	45.0	4.58	5.40	4.05	504.0	984
Pulses	14.92	0.7	13.2	50.0	45.0	4.58	5.40	4.05	504.0	984
Vegetables	4.10	0.0	500.0	50.0	45.0	4.58	5.40	4.05	504.0	3,281
Sugarcane	1.01	0.0	0.3	50.0	45.0	4.58	5.40	4.05	504.0	0
Other crops	6.20	0.0	26.9	50.0	45.0	4.58	5.40	4.05	504.0	2,484

Source: FPCO, Guidelines for Project Assessment (1992)

SECTION 3

DETAILED INFORMATION

PRESENT SITUATION

Table 1 : Land utilization in the CPP area, Sirajganj - base situation

Sub-Compartment	Gross area Ha	Non cultivable area Ha	% 1)	Cultivable area Ha	% 1)	Fallow Ha	% 2)	Cropped area Ha	Single crop Ha	% 3)	Double crop Ha	% 3)	Triple crop Ha	% 3)	Cropping intensity %
1	873	123	14.1	750	85.9	35	4.7	1,343	118	20.4	566	75.5	31	4.1	179
2	797	88	11.0	709	89.0	12	1.7	1,333	65	10.9	628	88.6	4	0.6	188
3	1,061	168	15.8	893	84.2	15	1.7	1,506	256	30.3	616	69.0	6	0.7	169
4	1,371	239	17.4	1,132	82.6	27	2.4	2,237	39	5.8	1,000	88.3	66	5.8	198
5	2,012	356	17.7	1,656	82.3	15	0.9	2,969	320	20.2	1,314	79.3	7	0.4	179
6	1,455	259	17.8	1,196	82.2	19	1.6	2,314	62	6.8	1,093	91.4	22	1.8	193
7	1,283	212	16.5	1,071	83.5	54	5.0	2,026	13	6.3	999	93.3	5	0.5	189
8	2,319	338	14.6	1,981	85.4	90	4.5	3,728	99	9.5	1,747	88.2	45	2.3	188
9	886	695	78.4	191	21.6	36	18.9	214	96	69.1	59	30.9	0	0.0	112
Total	12,057	2,478	20.6	9,579	79.4	303	3.2	17,670	1,068	11.1	8,022	83.7	186	1.9	184

Source: based on CPP Landuse survey

Table 2 : Area of rice crops in the CPP area, Sirajganj

Sub-Compartment	Boro area						Aman area						Deep Water Aman area						Aus area						Total rice area	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 2)
1	396	100.0	0	0.0	396	29.5	99	25.1	295	74.9	394	29.3	0	0.0	0	0.0	0	0.0	0	0.0	4	100.0	4	0.3	794	59.1
2	483	100.0	0	0.0	483	34.7	108	26.8	295	73.2	403	30.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	886	65.0
3	338	100.0	0	0.0	338	22.5	120	34.8	225	65.2	345	22.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	684	45.4
4	643	100.0	0	0.0	643	28.7	222	34.5	422	65.5	644	28.8	0	0.0	0	0.0	0	0.0	0	0.0	3	100.0	3	0.1	1,290	57.7
5	702	100.0	0	0.0	702	23.6	207	33.2	417	66.8	624	21.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,326	44.7
6	580	100.0	0	0.0	580	25.5	179	34.1	346	65.9	525	22.7	0	0.0	0	0.0	0	0.0	0	0.0	6	100.0	6	0.3	1,121	48.4
7	384	100.0	0	0.0	384	19.4	124	35.3	227	64.7	351	17.3	0	0.0	0	0.0	0	0.0	0	0.0	6	100.0	6	0.3	751	37.1
8	845	100.0	0	0.0	845	22.7	133	19.6	547	80.4	680	18.2	0	0.0	0	0.0	0	0.0	0	0.0	7	100.0	7	0.2	1,532	41.1
9	129	100.0	0	0.0	129	60.3	44	67.7	21	32.3	65	30.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	194	90.7
Total	4,501	100.0	0	0.0	4,501	25.5	1,236	30.7	2,795	69.3	4,031	22.8	0	0.0	0	0.0	0	0.0	0	0.0	26	100.0	26	0.1	8,556	48.4

Source: based on CPP Landuse Survey

1) of specific rice-crop area

2) of total cropped area

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Table 3 : Rice production (Paddy) in the CPP area, Sirajganj

Sub-Compartment	Boro						Aman						Deep Water Aman						Aus						Total production	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha
1	1,680	4,242	0	0	1,680	4,242	147	1,489	262	667	409	1,038	0	0	0	0	0	0	0	0	5	1,150	5	1,150	2,094	2,637
2	1,964	4,242	0	0	1,964	4,242	161	1,489	262	667	422	1,048	0	0	0	0	0	0	0	0	0	1,150	0	0	2,387	2,756
3	1,436	4,242	0	0	1,436	4,242	179	1,489	200	667	378	1,096	0	0	0	0	0	0	0	0	0	1,150	0	0	1,816	2,655
4	2,728	4,242	0	0	2,728	4,242	331	1,489	374	667	705	1,095	0	0	0	0	0	0	0	0	3	1,150	3	1,150	3,436	2,664
5	2,978	4,242	0	0	2,978	4,242	308	1,489	370	667	678	1,087	0	0	0	0	0	0	0	0	0	1,150	0	0	3,656	2,757
6	2,503	4,242	0	0	2,503	4,242	267	1,489	307	667	573	1,092	0	0	0	0	0	0	0	0	7	1,150	7	1,150	3,083	2,750
7	1,671	4,242	0	0	1,671	4,242	185	1,489	201	667	386	1,100	0	0	0	0	0	0	0	0	7	1,150	7	1,150	2,064	2,749
8	3,584	4,242	0	0	3,584	4,242	198	1,489	485	667	683	1,005	0	0	0	0	0	0	0	0	8	1,150	8	1,150	4,276	2,791
9	547	4,242	0	0	547	4,242	66	1,489	19	667	84	1,295	0	0	0	0	0	0	0	0	0	1,150	0	0	631	3,254
Total	19,093	4,242	0	0	19,093	4,242	1,840	1,489	2,479	667	4,320	1,072	0	0	0	0	0	0	0	0	30	1,150	30	1,150	23,443	2,739

Source: based on CPP Landuse Survey

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Table 4.1 : Non-rice-crops in the CPP area, Sirajganj

Sub-Compartment	Potato				Sugarcane				Wheat				Jute			
	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *
1	6	59	9,790	0.4	192	9,546	49,720	14.3	116	287	2,428	8.8	123	174	1,418	9.2
2	4	39	9,790	0.3	124	6,165	49,720	9.3	110	267	2,428	8.3	110	156	1,418	8.3
3	15	147	9,790	1.0	404	20,087	49,720	26.8	135	328	2,428	9.0	135	191	1,418	9.0
4	79	773	9,790	3.5	268	13,325	49,720	12.0	175	425	2,428	7.8	172	244	1,418	7.7
5	123	1,204	9,790	4.1	809	40,223	49,720	27.2	130	316	2,428	4.4	130	184	1,418	4.4
6	163	1,596	9,790	7.0	460	22,871	49,720	19.9	110	267	2,428	4.8	104	147	1,418	4.5
7	186	1,821	9,790	9.2	565	28,082	49,720	27.9	51	124	2,428	2.5	52	74	1,418	2.6
8	209	2,046	9,790	5.6	872	43,356	49,720	23.4	126	306	2,428	3.4	140	199	1,418	3.8
9	0	0	9,790	0.0	0	0	49,720	0.0	1	2	2,428	0.5	1	1	1,418	0.5
Total	785	7,685	9,790	4.4	3,694	183,666	49,720	20.9	956	2,321	2,428	5.4	967	1,371	1,418	5.5

Source: based on CPP Landuse Survey

*) of total cropped area

Table 4.2 : Non-rice-crops in the CPP area, Sirajganj

Sub-Compartment	Mustard				Pulses				Vegetables 2) b				Other 3)				Total non-rice-crops	
	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)
1	49	3.6	39	790	41	3.1	42	1,030	8	0.6	29	3,611	12	0.9	62	5,180	549	40.9
2	74	5.6	58	790	27	2.0	28	1,030	18	1.4	65	3,611	0	0.0	0	5,180	467	35.0
3	11	0.7	9	790	84	5.8	87	1,030	38	2.5	137	3,611	0	0.0	0	5,180	822	54.6
4	106	4.7	84	790	68	3.1	71	1,030	59	2.6	222	3,759	19	0.8	98	5,180	947	42.3
5	153	5.2	121	790	254	8.6	262	1,030	44	1.5	176	4,008	0	0.0	0	5,180	1,843	55.3
6	156	6.7	123	790	142	6.1	146	1,030	39	1.7	176	4,508	19	0.8	98	5,180	1,193	51.6
7	127	6.3	100	790	225	11.1	232	1,030	24	1.2	95	3,975	45	2.2	233	5,180	1,275	62.9
8	484	13.0	382	790	185	5.0	191	1,030	119	3.2	762	6,402	61	1.6	316	5,180	2,196	58.9
9	18	8.4	14	790	0	0.0	0	1,030	0	0.0	0	0	0	0.0	0	5,180	20	9.3
Total	1,178	6.7	931	790	1,227	5.8	1,058	1,030	349	2.0	1,662	4,763	156	0.9	808	5,180	9,112	51.6

Source: based on CPP Landuse Survey

1) of total cropped area

2) cabbage, cauliflower, radish, onion, garlic

3) tobacco

Table 5: Crop Production - Economic Parameters (economic prices) (base case)

Crop	Output			variable costs														Irrigat.	Total var. costs	Gross margin	Value added
	Yield	By-prod.	Gross return	Seed		Urea	Fertilizer TSP	MP 2)	Sub-total	Plant protection		family labour	ratio	Labour hired labour		oxen labour					
	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	Kg/ha	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	m/d/ha	% 3)	m/d/ha	Tk/ha	ox/d/ha	Tk/ha	Tk/ha	Tk/ha	Tk/ha
Boro HYV	4,242	3,394	26,583	30	264	237	91	103	3,340	1.0	438	126	85	107	4,016	35	4,133	13,563	13,021	21,762
Boro local	0	0	0	0	0	0	0	0	0	0.0	0	0	50	0	0	0	0	0	0	0
T Aman HYV	1,489	1,340	9,777	32	282	120	66	50	1,876	1.0	438	96	80	77	2,880	25	0	6,455	3,322	9,802
T Aman local	887	1,153	6,179	25	220	66	53	31	1,325	0.4	175	87	60	52	1,958	25	0	4,657	1,523	6,743
DW Aman broad.	0	0	0	0	0	0	0	0	0	0.0	0	0	60	0	0	0	0	0	0	0
DW Aman transpl.	0	0	0	0	0	0	0	0	0	0.0	0	0	65	0	0	0	0	0	0	0
Aus HYV	0	0	0	0	0	0	0	0	0	0.0	0	0	75	0	0	0	0	0	0	0
Aus local	1,150	1,610	7,758	44	407	25	24	18	557	0.2	88	95	55	52	1,959	20	0	3,794	3,964	9,488
Jute	1,418	1,418	13,463	10	254	61	52	29	1,170	0.0	0	102	120	122	4,590	23	0	6,915	6,548	14,963
Potato	9,790	0	39,009	370	2,736	102	121	54	2,348	1.0	438	100	85	85	3,188	22	827	10,398	28,612	35,549
Wheat	2,428	2,185	21,955	74	1,146	92	71	41	1,667	0.0	0	82	10	8	308	21	820	4,562	17,393	20,776
Mustard	790	948	10,310	10	167	90	97	42	1,926	0.0	0	64	10	6	240	15	820	3,541	6,770	9,410
Pulses	1,030	1,339	14,709	35	402	0	0	0	0	0.0	0	48	0	0	0	16	820	1,648	13,060	14,860
Vegetables 1)	4,763	0	17,003	1	218	120	50	30	2,100	0.5	219	120	140	168	6,300	24	2,067	11,843	5,160	15,960
Sugarcane	49,720	0	43,775	29,000	7,569	261	178	167	4,907	0.0	0	100	170	170	6,375	25	0	19,829	23,946	34,071
Other crops	5,180	0	27,924	57	1,343	83	57	36	1,424	0.4	163	71	81	58	2,159	18	1,565	7,356	20,568	25,381

Source: Data for yields and inputs according to official statistics, project land-use and input use-survey. Data set for yield includes also yield on partially damaged crop.

1) incl. manure (veg. = 1,100 Kg ? 0.5 Tk/kg, local T.Aman = 190 Kg)

2) inluding Gypsum in Boro and T.Aman HYV, T.Aman local, Wheat and Sugarcane

3) of family labour

Value added TK/ha average	19,985

Table 6: Summary of Impact on Agricultural Production (base situation)

Criteria	Base situation Area ha	Product. tons	Yield Kg/ha	Future situation Area ha	Product. tons	Kg/ha	Changes Area ha	%	Production tons	%	Yield %
Cultivated area	9,579			9,579				0.0			
Cropped area	17,670			17,670			0	0.0			
Fallow	303			303			0	0.0			
Crop intensity %	184			184				0.0			
Rice area											
- total	8,558	23,443	2,739	8,558	23,443	2,739	0	0.0	0	0.0	0.0
- Boro	4,501	19,093	4,242	4,501	19,093	4,242	0	0.0	0	0.0	0.0
* HYV	4,501	19,093	4,242	4,501	19,093	4,242	0	0.0	0	0.0	0.0
* local	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- T.Aman	4,031	4,320	1,072	4,031	4,320	1,072	0	0.0	0	0.0	0.0
* HYV	1,236	1,840	1,489	1,236	1,840	1,489	0	0.0	0	0.0	0.0
* local	2,795	2,479	887	2,795	2,479	887	0	0.0	0	0.0	0.0
- DW.Aman	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* broadcasted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* transplanted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- Aus	26	30	1,150	26	30	1,150	0	0.0	0	0.0	0.0
* HYV	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* local	26	30	1,150	26	30	1,150	0	0.0	0	0.0	0.0
- Jute	967	1,371	1,418	967	1,371	1,418	0	0.0	0	0.0	0.0
- Potato	785	7,685	9,790	785	7,685	9,790	0	0.0	0	0.0	0.0
- Sugarcane	3,694	183,666	49,720	3,694	183,666	49,720	0	0.0	0	0.0	0.0
- Wheat	956	2,321	2,428	956	2,321	2,428	0	0.0	0	0.0	0.0
- Mustard	1,178	931	790	1,178	931	790	0	0.0	0	0.0	0.0
- Pulses	1,027	1,058	1,030	1,027	1,058	1,030	0	0.0	0	0.0	0.0
- Vegetables	349	1,662	4,763	349	1,662	4,763	0	0.0	0	0.0	0.0
- Other crops	156	808	5,180	156	808	5,180	0	0.0	0	0.0	0.0
Ratio											
Local/HYV (rice)		1 : 2.03			1 : 2.03						
Dry season/monsoon rice		1 : 1.12			1 : 1.12						
Rice/Non-rice crops		1 : 1.06			1 : 1.06						

Source: Project computations

Table 7 : Incremental Benefit (agricultural) (base situation)

Crops	Additional Production			Additional Labour			Add. animal traction		
	tons	Value added Tk/ha	million Tk	addit. area ha	m/d/ha	total year man/d	addit. area ha	Oxen/ day/ha	total year pair/d
- Boro									
* HYV	0	21,762	0.00	0	233	0	0	35	0
* local	0	0	0.00	0	0	0	0	0	0
- T. Aman									
* HYV	0	9,802	0.00	0	173	0	0	25	0
* local	0	6,743	0.00	0	139	0	0	25	0
- DW. Aman									
* broadcasted	0	0	0.00	0	0	0	0	0	0
* transplanted	0	0	0.00	0	0	0	0	0	0
- Aus									
* HYV	0	0	0.00	0	0	0	0	0	0
* local	0	9,486	0.00	0	147	0	0	20	0
Total rice 1)	0	15,092	0.00	0	193	0	0	30	0
- Jute	0	14,963	0.00	0	224	0	0	23	0
- Potato	0	35,549	0.00	0	185	0	0	22	0
- Sugarcane	0	34,071	0.00	0	270	0	0	25	0
- Wheat	0	20,776	0.00	0	90	0	0	21	0
- Mustard	0	9,410	0.00	0	70	0	0	15	0
- Pulses	0	14,860	0.00	0	48	0	0	16	0
- Vegetables	0	15,960	0.00	0	288	0	0	24	0
- Other crops	0	25,381	0.00	0	128	0	0	18	0
Total			0.00	0		0	0		0
$US (000)	38		0.00		addition. empl. No.	0		addition pairs	0

Source: Project computations

1) value added, man/day/ha and oxen/pair/ha are average values for rice

FUTURE SITUATION

WITHOUT PROJECT

Table 1 : Land utilization in the CPP area, Sirajganj - future situation without project

Sub-Compartment	Gross area Ha	Non cultivable area Ha	% 1)	Cultivable area Ha	% 1)	Fallow Ha	% 2)	Cropped area Ha	Single crop Ha	% 3)	Double crop Ha	% 3)	Triple crop Ha	% 3)	Cropping intensity %
1	873	123	14.1	750	85.9	20	2.7	1,370	122	18.9	577	76.9	32	4.2	183
2	797	88	11.0	709	89.0	8	1.2	1,349	57	9.2	640	90.3	4	0.6	190
3	1,061	168	15.8	893	84.2	10	1.2	1,523	249	29.0	628	70.3	6	0.7	171
4	1,371	239	17.4	1,132	82.6	21	1.9	2,264	25	4.0	1,019	90.0	67	5.9	200
5	2,012	356	17.7	1,656	82.3	13	0.8	3,001	294	18.6	1,339	80.9	10	0.6	181
6	1,455	259	17.8	1,196	82.2	15	1.2	2,340	45	5.0	1,114	93.1	22	1.9	196
7	1,283	212	16.5	1,071	83.5	35	3.2	2,065	13	4.5	1,018	95.1	5	0.5	193
8	2,319	338	14.6	1,981	85.4	61	3.1	3,792	94	7.8	1,780	89.9	46	2.3	191
9	886	695	78.4	191	21.6	31	16.0	221	100	68.5	60	31.5	0	0.0	115
Total	12,057	2,478	20.6	9,579	79.4	214	2.2	17,925	999	10.4	8,175	85.3	192	2.0	187

Source: based on CPP Landuse survey

Table 2 : Area of rice crops in the CPP area, Sirajganj - future situation without project

Sub-Compartment	Boro area						Aman area						Deep Water Aman area						Aus area						Total rice area	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 2)
1	396	100.0	0	0.0	396	28.9	99	24.6	304	75.4	403	29.4	0	0.0	0	0.0	0	0.0	0	0.0	4	100.0	4	0.3	802	58.6
2	463	100.0	0	0.0	463	34.3	108	26.2	304	73.8	412	30.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	875	64.9
3	339	100.0	0	0.0	339	22.3	120	34.1	232	65.9	352	23.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	691	45.4
4	643	100.0	0	0.0	643	28.4	222	33.8	435	66.2	657	29.0	0	0.0	0	0.0	0	0.0	0	0.0	3	100.0	3	0.1	1,302	57.5
5	702	100.0	0	0.0	702	23.4	207	32.5	430	67.5	637	21.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,339	44.6
6	580	100.0	0	0.0	580	25.2	179	33.4	356	66.6	535	22.9	0	0.0	0	0.0	0	0.0	0	0.0	5	100.0	5	0.2	1,131	48.3
7	394	100.0	0	0.0	394	19.1	124	34.7	234	65.3	358	17.3	0	0.0	0	0.0	0	0.0	0	0.0	5	100.0	5	0.3	757	36.7
8	845	100.0	0	0.0	845	22.3	133	19.1	563	80.9	696	18.4	0	0.0	0	0.0	0	0.0	0	0.0	6	100.0	6	0.2	1,548	40.8
9	129	100.0	0	0.0	129	56.5	44	67.0	22	33.0	66	29.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	195	88.2
Total	4,501	100.0	0	0.0	4,501	25.1	1,236	30.0	2,879	70.0	4,115	23.0	0	0.0	0	0.0	0	0.0	0	0.0	23	100.0	23	0.1	8,639	48.2

Source: based on CPP Landuse Survey

1) of specific rice-crop area

2) of total cropped area

Table 3 : Rice production (Paddy) in the CPP area, Sirajganj - future situation without project

Sub-Compartment	Boro						Aman						Deep Water Aman						Aus						Total production	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha
1	1,807	4,564	0	0	1,807	4,564	155	1,563	275	905	430	1,067	0	0	0	0	0	0	0	0	4	1,185	4	1,185	2,241	2,793
2	2,113	4,564	0	0	2,113	4,564	169	1,563	275	905	444	1,077	0	0	0	0	0	0	0	0	0	1,185	0	0	2,557	2,923
3	1,547	4,564	0	0	1,547	4,564	188	1,563	210	905	397	1,129	0	0	0	0	0	0	0	0	0	1,185	0	0	1,945	2,815
4	2,935	4,564	0	0	2,935	4,564	347	1,563	393	905	740	1,127	0	0	0	0	0	0	0	0	3	1,185	3	1,185	3,678	2,824
5	3,204	4,564	0	0	3,204	4,564	324	1,563	389	905	712	1,119	0	0	0	0	0	0	0	0	0	1,185	0	0	3,916	2,926
6	2,693	4,564	0	0	2,693	4,564	280	1,563	322	905	602	1,125	0	0	0	0	0	0	0	0	6	1,185	6	1,185	3,302	2,920
7	1,798	4,564	0	0	1,798	4,564	194	1,563	212	905	405	1,133	0	0	0	0	0	0	0	0	6	1,185	6	1,185	2,210	2,919
8	3,857	4,564	0	0	3,857	4,564	208	1,563	510	905	718	1,031	0	0	0	0	0	0	0	0	7	1,185	7	1,185	4,582	2,961
9	589	4,564	0	0	589	4,564	68	1,563	20	905	88	1,346	0	0	0	0	0	0	0	0	0	1,185	0	0	677	3,479
Total	20,544	4,564	0	0	20,544	4,564	1,932	1,563	2,605	905	4,537	1,103	0	0	0	0	0	0	0	0	28	1,185	28	1,185	25,108	2,906

Source: based on CPP Landuse Survey

Table 4.1 : Non-rice-crops in the CPP area, Sirajganj - future situation without project

Sub-Compartment	Potato				Sugarcane				Wheat				Jute			
	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *
1	6	61	10,142	0.4	196	9,932	50,714	14.3	117	291	2,488	8.5	121	171	1,418	8.8
2	4	41	10,142	0.3	126	6,414	50,714	9.4	109	271	2,488	8.1	108	153	1,418	8.0
3	15	154	10,142	1.0	412	20,886	50,714	27.1	134	333	2,488	8.8	132	186	1,418	8.7
4	80	809	10,142	3.5	273	13,863	50,714	12.1	173	431	2,488	7.7	169	239	1,418	7.4
5	124	1,260	10,142	4.1	825	41,849	50,714	27.5	129	320	2,488	4.3	127	181	1,418	4.2
6	165	1,670	10,142	7.0	469	23,795	50,714	20.1	109	271	2,488	4.7	102	145	1,418	4.4
7	188	1,905	10,142	9.1	576	29,227	50,714	27.9	50	126	2,488	2.4	51	72	1,418	2.5
8	211	2,141	10,142	5.6	889	45,107	50,714	23.5	125	310	2,488	3.3	137	195	1,418	3.6
9	0	0	10,142	0.0	0	0	50,714	0.0	1	2	2,488	0.4	1	1	1,418	0.4
Total	793	8,041	10,142	4.4	3,788	191,086	50,714	21.0	946	2,355	2,488	5.3	948	1,344	1,418	5.3

Source: based on CPP Landuse Survey

*) of total cropped area

Table 4.2 : Non-rice-crops in the CPP area, Sirajganj - future situation without project

Sub-Compartment	Mustard				Pulses				Vegetables 2) b				Other 3)				Total non-rice-crops	
	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)
1	50	3.6	41	814	41	3.0	44	1,082	9	0.6	31	3,799	29	2.1	156	5,326	568	41.4
2	75	5.6	61	814	27	2.0	29	1,082	18	1.4	70	3,799	6	0.4	31	5,326	474	35.1
3	11	0.7	9	814	84	5.5	91	1,082	39	2.5	147	3,799	5	0.3	25	5,326	832	54.6
4	108	4.6	88	814	69	3.0	75	1,082	60	2.7	238	3,955	30	1.3	159	5,326	982	42.5
5	156	5.2	127	814	254	8.5	275	1,082	45	1.5	189	4,217	2	0.1	13	5,326	1,663	55.4
6	159	6.8	129	814	142	6.1	154	1,082	40	1.7	189	4,742	24	1.0	126	5,326	1,209	51.7
7	130	6.3	105	814	225	10.9	243	1,082	24	1.2	102	4,182	63	3.0	334	5,326	1,307	63.3
8	494	13.0	402	814	185	4.9	200	1,082	121	3.2	818	6,735	82	2.2	435	5,326	2,244	59.2
9	18	8.3	15	814	0	0.0	0	1,082	0	0.0	0	0	6	2.5	30	5,326	26	11.8
Total	1,202	6.7	978	814	1,027	5.7	1,111	1,082	356	2.0	1,784	5,011	246	1.4	1,310	5,326	9,285	51.8

Source: based on CPP Landuse Survey

1) of total cropped area 2) cabbage, cauliflower, radish, onion, garlic 3) tobacco...

Table 5: Crop Production - Economic Parameters (economic prices) (future situation without project)

Crop	Output			variable costs														Irrigat.	Total var. costs	Gross margin	Value added
	Yield	By-prod.	Gross return	Seed		Urea	Fertilizer TSP	MP 2)	Sub-total	Plant protection		family labour	ratio	Labour hired labour		oxen labour					
	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	Kg/ha	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	m/d/ha	% 3)	m/d/ha	Tk/ha	ox/d/ha		Tk/ha	Tk/ha	Tk/ha	Tk/ha
Boro HYV	4,564	3,652	28,604	30	264	237	91	103	3,340	1.0	438	126	85	107	4,016	35		4,133	13,583	15,041	23,782
Boro local	0	0	0	0	0	0	0	0	0	0.0	0	0	50	0	0	0		0	0	0	0
T Aman HYV	1,583	1,407	10,265	32	282	120	66	50	1,876	1.0	438	96	80	77	2,880	25		0	6,455	3,811	10,291
T Aman local	905	1,176	6,303	25	220	66	53	31	1,325	0.4	175	87	60	52	1,958	25		0	4,657	1,646	6,866
DW Aman broad.	0	0	0	0	0	0	0	0	0	0.0	0	0	60	0	0	0		0	0	0	0
DW Aman transpl.	0	0	0	0	0	0	0	0	0	0.0	0	0	65	0	0	0		0	0	0	0
Aus HYV	0	0	0	0	0	0	0	0	0	0.0	0	0	75	0	0	0		0	0	0	0
Aus local	1,185	1,658	7,990	44	407	25	24	18	557	0.2	88	95	55	52	1,959	20		0	3,794	4,197	9,719
Jute	1,418	1,418	13,463	10	254	61	52	29	1,170	0.0	0	102	120	122	4,590	23		0	6,915	6,548	14,963
Potato	10,142	0	40,414	370	2,736	102	121	54	2,348	1.0	438	100	85	85	3,188	22		827	10,398	30,016	36,953
Wheat	2,489	2,240	22,504	74	1,146	92	71	41	1,667	0.0	0	82	10	8	308	21		620	4,562	17,942	21,324
Mustard	814	976	10,619	10	167	90	97	42	1,926	0.0	0	64	10	6	240	15		620	3,541	7,079	9,719
Pulses	1,082	1,406	15,444	35	402	0	0	0	0	0.0	0	48	0	0	0	16		620	1,648	13,796	15,596
Vegetables 1)	5,011	0	17,587	1	218	120	50	30	2,100	0.5	219	120	140	168	6,300	24		2,067	11,843	6,044	16,844
Sugarcane	50,714	0	44,651	29,000	7,569	261	178	167	4,907	0.0	0	100	170	170	6,375	25		0	19,829	24,822	34,947
Other crops	5,326	0	28,708	57	1,343	83	57	36	1,424	0.4	163	71	81	58	2,159	16		1,565	7,356	21,351	26,164

Source: Data for yields and inputs according to official statistics, project land-use and input use-survey, Data set for yield includes also yield on partially damaged crop.

1) incl. manure (veg = 1.100 Kg ? 0.5 Tk/kg, local T.Aman = 190 Kg)

2) inluding Gypsum in Boro and T.Aman HYV, T.Aman local, Wheat and Sugarcane

3) of family labour

Value added TK/ha average	20,933

Table 6: Summary of Impact on Agricultural Production

(future situation without projec

Criteria	Base situation Area ha	Product. tons	Yield Kg/ha	Future situation Area ha	Product. tons	Kg/ha	Changes Area ha	%	Production tons	%	Yield %
Cultivated area	9,579			9,579				0.0			
Cropped area	17,670			17,925			255	1.4			
Fallow	303			214			-89	-29.5			
Crop intensity %	184			187				1.4			
Rice area											
- total	8,558	23,443	2,739	8,639	25,109	2,906	81	0.9	1,666	7.1	6.1
- Boro	4,501	19,093	4,242	4,501	20,544	4,564	0	0.0	1,451	7.6	7.6
* HYV	4,501	19,093	4,242	4,501	20,544	4,564	0	0.0	1,451	7.6	7.6
* local	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- T.Aman	4,031	4,320	1,072	4,115	4,537	1,103	84	2.1	217	5.0	2.9
* HYV	1,236	1,840	1,489	1,236	1,932	1,563	0	0.0	92	5.0	5.0
* local	2,795	2,479	887	2,879	2,605	905	84	3.0	125	5.1	2.0
- DW.Aman	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* broadcasted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* transplanted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- Aus	26	30	1,150	23	28	1,185	-3	-10.0	-2	-7.3	3.0
* HYV	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* local	26	30	1,150	23	28	1,185	-3	-10.0	-2	-7.3	3.0
- Jute	967	1,371	1,418	948	1,344	1,418	-19	-2.0	-27	-2.0	0.0
- Potato	785	7,685	9,790	793	8,041	10,142	8	1.0	356	4.6	3.6
- Sugarcane	3,694	183,666	49,720	3,768	191,086	50,714	74	2.0	7,420	4.0	2.0
- Wheat	956	2,321	2,428	946	2,355	2,489	-10	-1.0	34	1.5	2.5
- Mustard	1,178	931	790	1,202	978	814	24	2.0	47	5.1	3.0
- Pulses	1,027	1,058	1,030	1,027	1,111	1,082	0	0.0	53	5.0	5.0
- Vegetables	349	1,662	4,763	356	1,784	5,011	7	2.0	121	7.3	5.2
- Other crops	156	808	5,180	246	1,310	5,326	90	57.6	502	62.1	2.8
Ratio:											
Local/HYV (rice)		1 : 2.03			1 : 1.98						
Dry season/monsoon rice		1 : 1.12			1 : 1.09						
Rice/Non-rice crops		1 : 1.06			1 : 1.07						

Source: Project computations

Table 7 : Incremental Benefit (agricultural)

(future situation without project)

Crops	Additional Production			Additional Labour			Add. animal traction		
	tons	Value added Tk/ha	million Tk	addit. area ha	m/d/ha	total year man/d	addit. area ha	Oxen/ day/ha	total year pair/d
- Boro									
* HYV	1,451	23,782	0.00	0	233	0	0	35	0
* local	0	0	0.00	0	0	0	0	0	0
- T. Aman									
* HYV	92	10,291	0.00	0	173	0	0	25	0
* local	125	6,866	0.58	84	139	11,672	84	25	2,096
- DW. Aman									
* broadcasted	0	0	0.00	0	0	0	0	0	0
* transplanted	0	0	0.00	0	0	0	0	0	0
- Aus									
* HYV	0	0	0.00	0	0	0	0	0	0
* local	-2	9,719	-0.03	-3	147	-383	-3	20	-52
Total rice 1)	1,666	16,177	0.55	81	193	11,289	81	30	2,044
- Jute	-27	14,963	-0.29	-19	224	-4,340	-19	23	-445
- Potato	356	36,953	0.29	8	185	1,452	8	22	173
- Sugarcane	7,420	34,947	2.58	74	270	19,948	74	25	1,847
- Wheat	34	21,324	-0.20	-10	90	-862	-10	21	-201
- Mustard	47	9,719	0.23	24	70	1,659	24	15	353
- Pulses	53	15,596	0.00	0	48	0	0	16	0
- Vegetables	121	16,844	0.12	7	288	2,010	7	24	168
- Other crops	502	26,164	2.35	90	128	11,542	90	18	1,612
Total			5.63	255		42,697	255		5,552
$US (000)	38		148.12		addition. empl. No.	142		addition. pairs	63

Source: Project computations

1) value added, man/day/ha and oxen/pair/ha are average values for rice

FUTURE SITUATION

WITH PROJECT - OPTION 1

ECONOMIC PRICES

FINANCIAL PRICES

Table 1 : Land utilization in the CPP area, Sirajganj - future situation with project

Option 1

Sub-Compartment	Gross area Ha	Non cultivable area Ha	% 1)	Cultivable area Ha	% 1)	Fallow Ha	% 2)	Cropped area Ha	Single crop Ha	% 3)	Double crop Ha	% 3)	Triple crop Ha	% 3)	Cropping intensity %
1	873	123	14.1	750	85.9	5	0.7	1,387	136	18.8	576	76.8	33	4.4	185
2	797	88	11.0	709	89.0	8	1.2	1,373	48	7.9	634	89.4	19	2.7	194
3	1,061	168	15.8	893	84.2	8	0.9	1,658	160	18.8	677	75.8	48	5.4	186
4	1,371	239	17.4	1,132	82.6	10	0.9	2,216	79	7.9	992	87.6	51	4.5	196
5	2,012	356	17.7	1,656	82.3	13	0.8	3,188	202	13.0	1,337	80.7	104	6.3	192
6	1,455	259	17.8	1,196	82.2	13	1.1	2,320	68	6.8	1,093	91.4	22	1.8	194
7	1,283	212	16.5	1,071	83.5	3	0.3	2,094	82	7.9	946	88.3	40	3.7	196
8	2,319	338	14.6	1,981	85.4	22	1.1	3,796	167	9.5	1,747	88.2	45	2.3	192
9	886	695	78.4	191	21.6	11	6.0	290	74	44.5	101	52.9	5	2.6	152
Total	12,057	2,478	20.6	9,579	79.4	93	1.0	18,323	1,016	10.6	8,103	84.6	367	3.8	191

Source: based on CPP Landuse survey

Table 2 : Area of rice crops in the CPP area, Sirajganj - future situation with project Option 1

Sub-Compartment	Boro area						Aman area						Deep Water Aman area						Aus area						Total rice area	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 2)
1	404	100.0	0	0.0	404	29.1	237	64.9	128	35.1	365	26.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	769	55.4
2	448	100.0	0	0.0	448	32.6	98	25.3	290	74.7	388	28.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	836	60.9
3	346	100.0	0	0.0	346	20.9	285	74.4	98	25.6	383	23.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	729	44.0
4	643	100.0	0	0.0	643	29.0	202	32.9	412	67.1	614	27.7	0	0.0	0	0.0	0	0.0	0	0.0	3	100.0	3	0.1	1,260	56.9
5	716	100.0	0	0.0	716	22.5	497	73.3	181	26.7	678	21.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,394	43.7
6	578	100.0	0	0.0	578	24.9	169	33.4	337	66.6	506	21.8	0	0.0	0	0.0	0	0.0	0	0.0	6	100.0	6	0.3	1,080	47.0
7	392	100.0	0	0.0	392	18.7	303	75.4	99	24.6	402	19.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	794	37.9
8	945	100.0	0	0.0	945	22.3	133	20.0	532	80.0	665	17.5	0	0.0	0	0.0	0	0.0	0	0.0	7	100.0	7	0.2	1,517	40.0
9	132	100.0	0	0.0	132	45.4	112	92.6	9	7.4	121	41.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	253	87.1
Total	4,504	100.0	0	0.0	4,504	24.8	2,036	49.4	2,086	50.6	4,122	22.5	0	0.0	0	0.0	0	0.0	0	0.0	16	100.0	16	0.1	8,842	47.2

Source: based on CPP Landuse Survey

1) of specific rice-crop area 2) of total cropped area

Table 3 : Rice production (Paddy) in the CPP area, Sirajganj - future situation without project Option 1

Sub-Compartment	Boro						Aman						Deep Water Aman						Aus						Total production	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha
1	1,909	4,725	0	0	1,909	4,725	897	3,786	252	1,967	1,149	3,148	0	0	0	0	0	0	0	0	0	1,150	0	0	3,058	3,976
2	2,117	4,725	0	0	2,117	4,725	371	3,786	570	1,967	941	2,426	0	0	0	0	0	0	0	0	0	1,150	0	0	3,058	3,656
3	1,635	4,725	0	0	1,635	4,725	1,079	3,786	193	1,967	1,272	3,320	0	0	0	0	0	0	0	0	0	1,150	0	0	2,907	3,987
4	3,038	4,725	0	0	3,038	4,725	765	3,786	810	1,967	1,575	2,565	0	0	0	0	0	0	0	0	3	1,150	3	1,150	4,617	3,884
5	3,383	4,725	0	0	3,383	4,725	1,881	3,786	356	1,967	2,237	3,300	0	0	0	0	0	0	0	0	0	1,150	0	0	5,621	4,032
6	2,731	4,725	0	0	2,731	4,725	640	3,786	663	1,967	1,303	2,574	0	0	0	0	0	0	0	0	7	1,150	7	1,150	4,041	3,707
7	1,852	4,725	0	0	1,852	4,725	1,147	3,786	195	1,967	1,342	3,338	0	0	0	0	0	0	0	0	0	1,150	0	0	3,194	4,023
8	3,993	4,725	0	0	3,993	4,725	503	3,786	1,046	1,967	1,550	2,331	0	0	0	0	0	0	0	0	8	1,150	8	1,150	5,551	3,659
9	624	4,725	0	0	624	4,725	424	3,786	18	1,967	442	3,650	0	0	0	0	0	0	0	0	0	1,150	0	0	1,065	4,211
Total	21,282	4,725	0	0	21,282	4,725	7,708	3,786	4,103	1,967	11,810	2,865	0	0	0	0	0	0	0	0	18	1,150	18	1,150	33,111	3,831

Source: based on CPP Landuse Survey

Table 4.1 : Non-rice-crops in the CPP area, Sirajganj - future situation without project Option 1

Sub-Compartment	Potato				Sugarcane				Wheat				Jute			
	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *
1	9	98	10,680	0.8	208	10,853	52,176	15.0	89	255	2,866	6.4	100	177	1,775	7.2
2	4	43	10,680	0.3	159	8,296	52,176	11.6	102	292	2,866	7.4	101	179	1,775	7.4
3	22	235	10,680	1.3	472	24,627	52,176	28.5	102	292	2,866	6.2	108	192	1,775	6.5
4	79	844	10,680	3.6	273	14,244	52,176	12.3	159	456	2,866	7.2	183	269	1,775	7.4
5	95	1,015	10,680	3.0	804	41,950	52,176	25.2	106	304	2,866	3.3	113	201	1,775	3.5
6	163	1,741	10,680	7.0	472	24,627	52,176	20.3	102	292	2,866	4.4	99	176	1,775	4.3
7	266	2,841	10,680	12.7	389	20,816	52,176	19.1	42	120	2,866	2.0	45	80	1,775	2.1
8	294	3,140	10,680	7.7	1,028	53,637	52,176	27.1	102	292	2,866	2.7	122	217	1,775	3.2
9	0	0	10,680	0.0	0	0	52,176	0.0	1	3	2,866	0.3	1	2	1,775	0.3
Total	932	9,954	10,680	5.1	3,815	199,052	52,176	20.8	805	2,307	2,866	4.4	852	1,512	1,775	4.7

Source: based on CPP Landuse Survey

*) of total cropped area

Table 4.2 : Non-rice-crops in the CPP area, Sirajganj - future situation without project Option 1

Sub-Compartment	Mustard				Pulses				Vegetables 2)				Other 3)				Total non-rice-crops	
	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)
1	84	6.1	71	850	60	4.3	67	1,120	17	1.2	84	4,941	51	3.7	292	5,736	616	44.6
2	89	6.5	76	850	27	2.0	30	1,120	16	1.2	79	4,941	39	2.8	221	5,736	537	39.1
3	49	3.0	42	850	53	3.2	59	1,120	80	4.8	395	4,941	43	2.6	246	5,736	929	56.0
4	116	5.2	99	850	69	3.1	77	1,120	59	2.7	292	4,941	38	1.7	218	5,736	956	43.1
5	201	6.3	171	850	373	11.7	418	1,120	92	2.9	455	4,941	10	0.3	55	5,736	1,794	56.3
6	156	6.7	133	850	132	5.7	148	1,120	39	1.7	193	4,941	67	2.9	383	5,736	1,230	53.0
7	167	8.0	142	850	331	15.8	371	1,120	50	2.4	247	4,941	0	0.0	2	5,736	1,300	62.1
8	484	12.7	411	850	124	3.3	139	1,120	119	3.1	588	4,941	6	0.2	37	5,736	2,279	60.0
9	30	10.3	25	850	0	0.0	0	1,120	0	0.0	0	0	5	1.9	32	5,736	37	12.9
Total	1,376	7.5	1,170	850	1,169	6.4	1,309	1,120	472	2.6	2,332	4,941	260	1.4	1,488	5,736	9,681	52.8

Table 5: Crop Production - Economic Parameters (economic prices)

Option 1

Crop	Output			variable costs														Total var. costs	Gross margin	Value added
	Yield	By-prod.	Gross return	Seed		Urea	Fertilizer TSP	MP 2)	Sub-total	Plant protection		family labour	ratio	Labour hired labour		oxen labour	Irrigat.			
	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	Kg/ha	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	m/d/ha	% 3)	m/d/ha	Tk/ha	ox/d/ha	Tk/ha	Tk/ha	Tk/ha	Tk/ha
Boro HYV	4,725	3,780	29,611	30	264	264	101	115	3,721	1.1	488	126	85	107	4,016	35	4,133	13,993	15,618	24,359
Boro local	0	0	0	0	0	0	0	0	0	0.0	0	0	50	0	0	0	0	0	0	0
T Aman HYV	3,786	3,407	24,855	32	282	166	91	69	2,599	1.0	456	96	80	77	2,880	25	0	7,195	17,660	24,140
T Aman local	1,967	2,557	13,700	25	220	66	53	31	1,325	0.5	229	87	60	52	1,958	25	0	4,710	8,990	14,210
DW Aman broad.	0	0	0	0	0	0	0	0	0	0.0	0	0	60	0	0	0	0	0	0	0
DW Aman transpl.	0	0	0	0	0	0	0	0	0	0.0	0	0	65	0	0	0	0	0	0	0
Aus HYV	0	0	0	0	0	0	0	0	0	0.0	0	0	75	0	0	0	0	0	0	0
Aus local	1,150	1,610	7,758	44	407	25	24	18	557	0.2	88	95	55	52	1,959	20	0	3,794	3,964	9,486
Jute	1,775	1,775	16,851	10	254	76	65	36	1,465	0.0	0	102	120	122	4,590	23	0	7,210	9,641	18,056
Potato	10,680	0	42,555	370	2,736	111	132	59	2,561	1.1	478	100	55	55	3,188	22	827	10,651	31,904	38,842
Wheat	2,866	2,579	25,914	74	1,146	109	84	48	1,968	0.0	0	82	10	8	308	21	620	4,863	21,051	24,434
Mustard	850	1,020	11,093	10	167	97	104	45	2,072	0.0	0	64	10	6	240	15	620	3,687	7,406	10,046
Pulses	1,120	1,456	15,994	35	402	0	0	0	0	0.0	0	48	0	0	0	16	620	1,648	14,346	16,146
Vegetables 1)	4,941	0	17,637	1	218	127	53	32	2,189	0.5	232	120	140	168	6,300	24	2,067	11,945	5,693	16,493
Sugarcane	52,176	0	45,938	29,000	7,569	274	187	175	5,149	0.0	0	100	170	170	6,375	25	0	20,072	25,866	35,991
Other crops	5,736	0	30,917	57	1,343	95	64	41	1,619	0.4	179	71	81	58	2,159	18	1,565	7,567	23,350	28,163

Source: Data for yields and inputs according to official statistics, project land-use and input use-survey . Data set for yield includes also yield on partially damaged crop

1) incl. manure (veg. = 1,100 Kg ? 0.5 Tk/kg, local T.Aman = 190 Kg)

2) inluding Gypsum in Boro and T.Aman HYV, T.Aman local, Wheat and Sugarcane

3) of family labour

Value added TK/ha average	24,287

Table 6: Summary of Impact on Agricultural Production

Option 1

Criteria	Base situation Area ha	Product. tons	Yield Kg/ha	Future situation Area ha	Product. tons	Kg/ha	Changes Area ha	%	Production tons	%	Yield %
Cultivated area	9,579			9,579				0.0			
Cropped area	17,670			18,323			653	3.7			
Fallow	303			93			-210	-69.2			
Crop intensity %	184			191				3.7			
Rice area											
- total	8,558	23,443	2,739	8,642	33,111	3,831	84	1.0	9,668	41.2	39.9
- Boro	4,501	19,093	4,242	4,504	21,282	4,725	3	0.1	2,189	11.5	11.4
* HYV	4,501	19,093	4,242	4,504	21,282	4,725	3	0.1	2,189	11.5	11.4
* local	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- T.Aman	4,031	4,320	1,072	4,122	11,810	2,865	91	2.3	7,491	173.4	167.4
* HYV	1,236	1,840	1,489	2,036	7,708	3,786	800	64.7	5,867	318.8	154.2
* local	2,795	2,479	887	2,086	4,103	1,967	-709	-25.4	1,623	65.5	121.7
- DW.Aman	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* broadcasted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* transplanted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- Aus	26	30	1,150	16	18	1,150	-10	-38.5	-12	-38.5	0.0
* HYV	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* local	26	30	1,150	16	18	1,150	-10	-38.5	-12	-38.5	0.0
- Jute	967	1,371	1,418	852	1,512	1,775	-115	-11.9	141	10.3	25.2
- Potato	785	7,685	9,790	932	9,954	10,680	147	18.7	2,269	29.5	9.1
- Sugarcane	3,711	184,511	49,720	3,815	199,052	52,176	104	2.8	14,541	7.9	4.9
- Wheat	956	2,321	2,428	805	2,307	2,866	-151	-15.8	-14	-0.6	18.0
- Mustard	1,178	931	790	1,376	1,170	850	198	16.8	239	25.7	7.6
- Pulses	1,027	1,058	1,030	1,169	1,309	1,120	142	13.8	251	23.8	8.7
- Vegetables	349	1,662	4,763	472	2,332	4,941	123	35.2	670	40.3	3.7
- Other crops	139	720	5,180	260	1,489	5,736	121	86.7	769	106.7	10.7
Ratio											
Local/HYV (rice)		1 : 2.03			1 : 3.11						
Dry Season/Monsoon rice		1 : 0.90			1 : 0.92						
Rice/non-rice crops		1 : 1.06			1 : 1.12						

Source: Project computations

Table 7 : Incremental Benefit (agricultural) Option 1

Crops	Additional Production			Additional Labour			Add. animal traction		
	tons	Value added Tk/ha	million Tk	addit. area ha	m/d/ha	total year man/d	addit. area ha	Oxen/ day/ha	total year pair/d
- Boro									
* HYV	2,189	24,359	0.07	3	233	699	3	35	105
* local	0	0	0.00	0	0	0	0	0	0
- T. Aman									
* HYV	5,867	24,140	19.31	800	173	138,240	800	25	20,000
* local	1,623	14,210	-10.07	-709	139	-98,693	-709	25	-17,725
- DW. Aman									
* broadcasted	0	0	0.00	0	0	0	0	0	0
* transplanted	0	0	0.00	0	0	0	0	0	0
- Aus									
* HYV	0	0	0.00	0	0	0	0	0	0
* local	-12	9,486	-0.09	-10	147	-1,473	-10	20	-200
Total rice 1)	9,668	21,830	9.21	84	196	38,774	84	30	2,180
- Jute	141	18,056	-2.08	-115	224	-25,806	-115	23	-2,645
- Potato	2,269	38,842	5.71	147	185	27,195	147	22	3,234
- Sugarcane	14,541	35,991	3.74	104	270	28,080	104	25	2,600
- Wheat	-14	24,434	-3.69	-151	90	-13,620	-151	21	-3,171
- Mustard	239	10,046	1.99	198	70	13,939	198	15	2,970
- Pulses	251	16,146	2.29	142	48	6,816	142	16	2,272
- Vegetables	670	16,493	2.03	123	288	35,424	123	24	2,952
- Other crops	769	28,163	3.39	121	128	15,471	121	18	2,161
Total			22.61	653		126,273	653		12,553
$US (000)	38		594.92		addition. empl. No	421		addition pairs	14.3

Source: Project computations

1) value added, man/day/ha and oxen/pair/ha are average values for rice

Table 9: Investment costs - Economic costs (in Tk min.) Option 1.0

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	4.3	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	16.5	40.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	10.1	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	30.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	5.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	30.9	95.0	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	1.5	4.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	33.3	100.6	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Economic (in Tk mln.) **Option** **1.0**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.37	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Embankment	0.00	0.26	0.26	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Drainage channels	0.00	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Regulators	0.00	0.50	1.70	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
BRE retired embankment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buildings	0.00	0.02	0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	1.38	3.98	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14
TECHNICAL STAFF	0.23	0.46	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
OVERHEADS	0.02	0.05	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
MISCELLANEOUS	0.00	0.07	1.56	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
TOTAL REC. COSTS	0.25	1.95	6.31	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: Total costs - Economic (in Tk mln.) Option 1.0

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	33.3	100.6	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	5.0	15.1	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.3	2.0	6.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Land aquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-struct.interventions	4.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	5.8	17.6	4.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Total costs	49.0	138.9	37.8	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6

1) excluding land aquisition and production foregone and non-structural interventions

Table 12: Benefits - Economic (Tk min.) **Option** **1.0**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	12.41	12.78	13.17	13.56	13.97	14.39	14.82	15.26	15.72	16.19	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	0.74	0.75	0.77	0.78	0.80	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Farmers contribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	0.66	0.68	1.02	1.05	1.08	1.11	1.13	1.15	1.17	1.20	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Total benefits	0.00	13.81	14.21	21.46	22.03	22.61	23.21	23.66	24.13	24.61	25.11	25.62	25.62	25.62	25.62	25.62	25.62	25.62	25.62	25.62

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk min.)	-49.0	-125.1	-23.6	12.8	13.4	14.0	14.6	15.0	15.5	16.0	16.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
IRR %		5.9																		
NPV mTk		-73.4																		
Cost/Benefit ratio		1.44																		

Table 8 : Investment cost (Financial) - Option 1

Component	Unit	No	Unit cost 000 Tk	Investment schedule year 1	year 2	year 3	Total cost Tk mln.	Break down of Investment local %	local Tk mln	foreign %	foreign Tk mln
EMBANKMENTS											
- Ichamuti embankment	1000 m3	0	0.0003	0.0	0.0	0.0	0.0	95.0	0.0	5.0	0.0
- Sub compartm. embankm.	1000 m3	299	0.0003	6.6	0.0	2.4	9.0	95.0	8.5	5.0	0.4
Sub-Total		299		6.6	0.0	2.4	9.0	95.0	8.5	5.0	0.4
REGULATORS											
- new regulators											
* 3 Vent regulat.	Ls	3	6,000	0.0	18.0	0.0	18.0	35.0	6.3	65.0	11.7
* 5 Vent regulat.	Ls	5	8,000	16.0	24.0	0.0	40.0	35.0	14.0	65.0	26.0
* 5 Inlet BRE	Ls	3	3,000	3.0	3.0	3.0	9.0	35.0	3.2	65.0	5.9
- improving existing	Ls	1	1,000	0.0	1.0	0.0	1.0	50.0	0.5	50.0	0.5
Sub-Total				19.0	46.0	3.0	68.0	35.2	24.0	64.8	44.1
ROADS and BRIDGES											
- Roads	1000 m3	200	0.0003	0.0	0.0	6.0	6.0	85.0	5.1	15.0	0.9
- Bridges	Pcs	1	2,000	0.0	0.0	2.0	2.0	30.0	0.6	70.0	1.4
DRAINAGE CHANNELS	1000 m3	986	0.0003	15.6	10.1	0.0	25.6	95.0	24.4	5.0	1.3
EROSION PROTECTION											
- Breach protection	Ls	1	2,500	0.0	1.3	1.3	2.5	85.0	2.1	15.0	0.4
- Breach protection	Ls	6	1,500	0.0	4.5	4.5	9.0	85.0	7.7	15.0	1.4
FIELDLEVEL WATERMANA											
- Chawk improvement	Ls	1	5,000	0.0	5.0	0.0	5.0	80.0	4.0	20.0	1.0
- Waterretention structures	Ls	15	1,000	0.0	15.0	0.0	15.0	95.0	14.3	5.0	0.8
- Irrigation inlets	Ls	10	1,000	0.0	10.0	0.0	10.0	35.0	3.5	65.0	6.5
- Culverts	Pcs	20	500	0.0	10.0	0.0	10.0	65.0	6.5	35.0	3.5
Sub-Total				0.0	40.0	0.0	40.0	70.6	28.3	29.4	11.8
MITIGATION MEASURES											
- Resettlement	Ls	1	2,000	0.0	2.0	0.0	2.0	95.0	1.9	5.0	0.1
- Temporary embankments	Ls	5	500	0.0	2.5	0.0	2.5	95.0	2.4	5.0	0.1
- Excavation Ichamuti	1000 m3	100	0.0003	0.0	2.6	0.0	2.6	95.0	2.5	5.0	0.1
Sub-Total				0.0	7.1	0.0	7.1	95.0	6.7	5.0	0.4
BRE - RETIRED EMBANKM	Km	0	2,000	0.0	0.0	0.0	0.0	90.0	0.0	10.0	0.0
SIRAJGANJ TOWN DEVEL											
- Flushing sluice	Pcs	2	3,000	0.0	3.0	3.0	6.0	30.0	1.8	70.0	4.2
- Bridges	Pcs	3	2,000	0.0	3.0	3.0	6.0	28.0	1.7	72.0	4.3
- Ecavat. Katakhali Khal	1000 m3	100	0.0003	0.0	1.3	1.3	2.6	95.0	2.5	5.0	0.1
- Erosion protect. sluice	Pcs	2	2,000	0.0	2.0	2.0	4.0	35.0	1.4	65.0	2.6
Sub-Total				0.0	9.3	9.3	18.6	39.5	7.4	60.5	11.3
TOTAL				**41.1**	**118.2**	**28.4**	**187.8**	**61.0**	**114.6**	**39.0**	**73.2**

1) considered to be maintenance costs

Table 9: Investment costs - Financial costs (in Tk mln.) Option 1.0

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	6.6	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	19.0	46.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	15.6	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	9.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	41.1	118.2	28.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	2.1	5.9	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	44.2	125.1	30.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Financial (in Tk min.) **Option** **1.0**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.58	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Embankment	0.00	0.39	0.39	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Drainage channels	0.00	0.93	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54
Regulators	0.00	0.57	1.95	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.29	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
BRE retired embankment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buildings	0.00	0.02	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	1.92	5.21	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67
TECHNICAL STAFF	0.27	0.53	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
OVERHEADS	0.03	0.05	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
MISCELLANEOUS	0.00	0.09	2.04	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
TOTAL REC. COSTS	0.29	2.59	8.13	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65	9.65

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: Total costs - Financial (in Tk min.) Option 1.0

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	44.2	125.1	30.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	6.6	18.8	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.3	2.6	8.1	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6
Land aquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-structural interventions	5.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	7.7	22.0	6.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Total costs	64.1	172.7	50.2	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1

1) excluding land aquisition and production foregone and non-structural interventions

Table 12: Benefits - Financial (Tk mln.) **Option** **1.0**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	14.59	15.02	15.48	15.94	16.42	16.91	17.42	17.94	18.48	19.03	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	0.62	0.63	0.64	0.65	0.67	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Farmers contribution	0.00	0.13	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	0.77	0.80	1.15	1.19	1.22	1.25	1.27	1.30	1.33	1.35	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Total benefits	0.00	16.10	16.86	24.25	24.89	25.55	26.22	26.75	27.30	27.87	28.45	29.05	29.05	29.05	29.05	29.05	29.05	29.05	29.05	29.05

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk mln.)	-64.1	-156.6	-33.3	13.2	13.8	14.5	15.1	15.7	16.2	16.8	17.4	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
IRR %		4.3																		
NPV mTk		-114.8																		
Cost/Benefit ratio		1.52																		

FUTURE SITUATION

WITH PROJECT - OPTION 2A

ECONOMIC PRICES

FINANCIAL PRICES

Table 1 : Land utilization in the CPP area, Sirajganj - future situation with project Option 2 A

Sub-Compartment	Gross area Ha	Non cultivable area Ha	% 1)	Cultivable area Ha	% 1)	Fallow Ha	% 2)	Cropped area Ha	Single crop Ha	% 3)	Double crop Ha	% 3)	Triple crop Ha	% 3)	Cropping intensity %
1	873	123	14.1	750	85.9	7	0.9	1,429	113	15.9	576	76.7	55	7.3	191
2	797	88	11.0	709	89.0	-25	-3.5	1,414	75	7.0	639	90.1	21	2.9	199
3	1,061	168	15.8	893	84.2	-64	-7.1	1,696	274	23.5	626	70.1	56	6.3	190
4	1,371	239	17.4	1,132	82.6	2	0.2	2,434	-31	-2.5	1,017	89.8	144	12.7	215
5	2,012	356	17.7	1,656	82.3	-191	-11.6	3,386	410	13.2	1,336	80.7	101	6.1	204
6	1,455	259	17.8	1,196	82.2	-44	-3.6	2,590	8	-2.9	1,111	92.9	120	10.0	217
7	1,283	212	16.5	1,071	83.5	-110	-10.3	2,325	101	-0.8	1,016	94.8	64	6.0	217
8	2,319	338	14.6	1,981	85.4	-20	-1.0	4,095	66	2.3	1,776	89.7	159	8.0	207
9	886	695	78.4	191	21.6	16	8.1	300	64	41.5	99	51.7	13	6.9	157
Total	12,057	2,478	20.6	9,579	79.4	-430	-4.5	19,670	1,080	11.3	8,196	85.6	733	7.6	205

Source: based on CPP Landuse survey

Note: Figures on "fallow" for this option are confusing for some sub-compartments, as the global assumptions used on on the total compartment do not always match the special conditions in individual sub-compartments. The results shown are the true conditions as set by the model.

Table 2 : Area of rice crops in the CPP area, Sirajganj - future situation with project

Option 2 A

Sub-Compartment	Boro area						Aman area						Deep Water Aman area						Aus area						Total rice area	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 2)
1	416	100.0	0	0.0	416	29.1	218	56.2	170	43.8	388	27.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	804	56.3
2	487	100.0	0	0.0	487	34.4	238	58.3	170	41.7	408	28.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	895	63.3
3	356	100.0	0	0.0	356	21.0	264	67.1	130	32.9	394	23.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	750	44.2
4	676	100.0	0	0.0	676	27.8	489	66.8	243	33.2	732	30.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,408	57.9
5	738	100.0	0	0.0	738	21.8	456	65.5	240	34.5	696	20.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,434	42.4
6	820	100.0	0	0.0	820	23.9	394	66.4	200	33.6	594	22.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,214	46.9
7	414	100.0	0	0.0	414	17.8	273	67.6	131	32.4	404	17.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	818	35.2
8	888	100.0	0	0.0	888	21.7	293	48.1	315	51.9	608	14.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,497	36.5
9	136	100.0	0	0.0	136	45.1	97	88.9	12	11.1	109	36.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	245	81.4
Total	4,731	100.0	0	0.0	4,731	24.1	2,722	62.8	1,612	37.2	4,334	22.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	9,065	46.1

Source: based on CPP Landuse Survey

1) of specific rice-crop area

2) of total cropped area

Table 3 : Rice production (Paddy) in the CPP area, Sirajganj - future situation with project

Option 2 A

Sub-Compartment	Boro						Aman						Deep Water Aman						Aus						Total production	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha
1	1,967	4,725	0	0	1,967	4,725	825	3,786	335	1,967	1,160	2,988	0	0	0	0	0	0	0	0	0	1,150	0	0	3,127	3,887
2	2,300	4,725	0	0	2,300	4,725	900	3,786	335	1,967	1,235	3,027	0	0	0	0	0	0	0	0	0	1,150	0	0	3,535	3,951
3	1,684	4,725	0	0	1,684	4,725	1,000	3,786	255	1,967	1,256	3,187	0	0	0	0	0	0	0	0	0	1,150	0	0	2,938	3,917
4	3,194	4,725	0	0	3,194	4,725	1,851	3,786	479	1,967	2,329	3,181	0	0	0	0	0	0	0	0	0	1,150	0	0	5,523	3,922
5	3,487	4,725	0	0	3,487	4,725	1,726	3,786	473	1,967	2,199	3,157	0	0	0	0	0	0	0	0	0	1,150	0	0	5,686	3,984
6	2,930	4,725	0	0	2,930	4,725	1,492	3,786	392	1,967	1,885	3,174	0	0	0	0	0	0	0	0	0	1,150	0	0	4,815	3,967
7	1,957	4,725	0	0	1,957	4,725	1,034	3,786	257	1,967	1,291	3,196	0	0	0	0	0	0	0	0	0	1,150	0	0	3,248	3,970
8	4,197	4,725	0	0	4,197	4,725	1,109	3,786	620	1,967	1,729	2,842	0	0	0	0	0	0	0	0	0	1,150	0	0	5,926	3,980
9	641	4,725	0	0	641	4,725	367	3,786	24	1,967	391	3,584	0	0	0	0	0	0	0	0	0	1,150	0	0	1,031	4,216
Total	22,355	4,725	0	0	22,355	4,725	10,305	3,786	3,170	1,967	13,475	3,109	0	0	0	0	0	0	0	0	0	0	0	0	35,830	3,953

Source: based on CPP Landuse Survey

Table 4.1 : Non-rice-crops in the CPP area, Sirajganj - future situation with project

Option 2 A

Sub-Compartment	Potato				Sugarcane				Wheat				Jute			
	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *
1	9	94	10,680	0.6	203	10,574	52,178	14.2	89	256	2,866	6.3	99	176	1,775	7.0
2	6	63	10,680	0.4	131	6,829	52,178	9.3	83	239	2,866	5.9	89	158	1,775	6.3
3	22	236	10,680	1.3	426	22,249	52,178	25.1	102	293	2,866	6.0	109	194	1,775	6.4
4	116	1,242	10,680	4.8	283	14,759	52,178	11.6	133	380	2,866	5.4	139	247	1,775	5.7
5	181	1,934	10,680	5.3	854	44,553	52,178	25.2	98	282	2,866	2.9	105	186	1,775	3.1
6	240	2,564	10,680	9.3	486	25,333	52,178	18.7	83	239	2,866	3.2	84	149	1,775	3.2
7	274	2,925	10,680	11.8	596	31,116	52,178	25.7	39	111	2,866	1.7	42	75	1,775	1.8
8	308	3,287	10,680	7.5	920	48,023	52,178	22.5	95	273	2,866	2.3	113	201	1,775	2.8
9	0	0	10,680	0.0	0	0	52,178	0.0	1	2	2,866	0.3	1	1	1,775	0.3
Total	1,156	12,348	10,680	5.9	3,899	203,436	52,178	19.8	724	2,075	2,866	3.7	781	1,386	1,775	4.0

Source: based on CPP Landuse Survey

*) of total cropped area

Table 4.2 : Non-rice-crops in the CPP area, Sirajganj - future situation with project

Option 2 A

Sub-Compartment	Mustard				Pulses				Vegetables 2) b				Other 3)				Total non-rice-crops	
	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)
1	67	4.7	57	850	56	3.9	63	1,120	16	1.1	59	3,818	86	6.0	495	5,665	824	43.7
2	101	7.2	86	850	37	2.6	41	1,120	35	2.5	133	3,818	38	2.7	213	5,665	520	36.7
3	15	0.9	13	850	115	8.8	128	1,120	74	4.3	281	3,818	83	4.9	468	5,665	946	55.8
4	145	6.0	123	850	94	3.9	105	1,120	114	4.7	455	3,975	1	0.1	8	5,665	1,026	42.1
5	210	6.2	178	850	347	10.2	388	1,120	85	2.5	362	4,238	72	2.1	408	5,665	1,952	57.8
6	214	8.2	182	850	194	7.5	217	1,120	76	2.9	361	4,766	1	0.0	4	5,665	1,377	53.1
7	174	7.5	148	850	307	13.2	344	1,120	47	2.0	196	4,203	29	1.2	161	5,665	1,507	64.8
8	663	16.2	563	850	252	6.2	283	1,120	231	5.6	1,563	6,770	16	0.4	89	5,665	2,588	63.5
9	25	8.2	21	850	0	0.0	0	1,120	0	0.0	0	0	30	9.8	166	5,665	56	18.6
Total	1,613	8.2	1,371	850	1,401	7.1	1,569	1,120	677	3.4	3,410	5,037	354	1.8	2,004	5,665	10,805	53.9

Source: based on CPP Landuse Survey

*) of total cropped area

2) cabbage, cauliflower, radish, onion, garlic

3) tobacco..

Table 5: Crop Production - Economic Parameters (economic prices) (future situation with project) Option 2 A

Crop	Output			variable costs															Irrigat.	Total var. costs	Gross margin	Value added
	Yield	By-prod.	Gross return	Seed		Urea	Fertilizer TSP	MP 2)	Sub-total	Plant protection		family labour	ratio	Labour hired labour		oxen labour						
	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	Kg/ha	Kg/ha	Kg/ha	Tk/ha	Kg/he	Tk/ha	m/d/ha	% 3)	m/d/ha	Tk/ha	ox/d/ha	Tk/ha	Tk/ha	Tk/ha	Tk/ha	Tk/ha
Boro HYV	4.725	3,750	29.611	30	264	264	101	115	3,721	1.1	488	126	85	107	4,016	35	4,133	13,993	15,618	24,359
Boro local	0	0	0	0	0	0	0	0	0	0.0	0	0	50	0	0	0	0	0	0	0
T Aman HYV	3.756	3,407	24.855	32	282	166	91	69	2,599	1.0	456	96	80	77	2,880	25	0	7,195	17,660	24,140
T Aman local	1,967	2,557	13.700	25	220	66	53	31	1,325	0.5	229	87	60	52	1,958	25	0	4,710	8,990	14,210
DW Aman broad.	0	0	0	0	0	0	0	0	0	0.0	0	0	60	0	0	0	0	0	0	0
DW Aman transpl.	0	0	0	0	0	0	0	0	0	0.0	0	0	65	0	0	0	0	0	0	0
Aus HYV	0	0	0	0	0	0	0	0	0	0.0	0	0	75	0	0	0	0	0	0	0
Aus local	0	0	0	44	407	25	24	18	557	0.2	88	95	55	52	1,959	20	0	3,794	0	0
Jute	1.775	1,775	15.851	10	254	78	65	36	1,465	0.0	0	102	120	122	4,590	23	0	7,210	2,641	18,056
Potato	10.680	0	42.555	370	2,736	111	132	59	2,561	1.1	478	100	85	85	3,188	22	827	10,651	31,904	38,842
Wheat	2.866	2,579	25.914	74	1,146	109	84	48	1,968	0.0	0	82	10	8	308	21	620	4,863	21,051	24,434
Mustard	850	1,020	11.093	10	167	97	104	45	2,072	0.0	0	64	10	6	240	15	620	3,687	7,406	10,046
Pulses	1.120	1,456	15.994	35	402	0	0	0	0	0.0	0	48	0	0	0	16	620	1,648	14,346	16,146
Vegetables 1)	5.037	0	17.979	1	218	127	53	32	2,189	0.5	232	120	140	168	6,300	24	2,067	11,945	6,034	16,834
Sugarcane	52.176	0	45.938	29,000	7,569	274	187	175	5,149	0.0	0	100	170	170	6,375	25	0	20,072	25,866	35,991
Other crops	5.865	0	30.538	57	1,343	95	64	41	1,619	0.4	179	71	81	58	2,159	18	1,565	7,567	22,971	27,784

Source: Data for yields and inputs according to official statistics, project land-use and input use-survey, Data set for yield includes also yield on partially damaged crop.

1) incl. manure (veg. = 1.100 Kg ? 0.5 Tk/kg, local T Aman = 190 Kg)

2) inluding Gypsum in Boro and T.Aman HYV, T Aman local, Wheat and Sugarcane

3) of family labour

Value added TK/ha average	24,450

Table 6: Summary of Impact on Agricultural Production (future situation with project) Option 2 A

Criteria	Base situation Area ha	Product. tons	Yield Kg/ha	Future situation Area ha	Product. tons	Kg/ha	Changes Area ha	%	Production tons	%	Yield %
Cultivated area	9,579			9,579				0.0			
Cropped area	17,670			19,670			2000	11.3			
Fallow	303			132			-171	-56.4			
Crop intensity %	184			205				11.3			
Rice area											
- total	8,558	23,443	2,739	9,065	35,830	3,953	507	5.9	12,387	52.8	44.3
- Boro	4,501	19,093	4,242	4,731	22,355	4,725	230	5.1	3,262	17.1	11.4
* HYV	4,501	19,093	4,242	4,731	22,355	4,725	230	5.1	3,262	17.1	11.4
* local	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- T.Aman	4,031	4,320	1,072	4,334	13,475	3,109	303	7.5	9,155	211.9	190.1
* HYV	1,236	1,840	1,489	2,722	10,305	3,786	1,486	120.2	8,464	459.9	154.2
* local	2,795	2,479	887	1,612	3,170	1,967	-1,183	-42.3	691	27.9	121.7
- DW.Aman	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* broadcasted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* transplanted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- Aus	26	30	1,150	0	0	0	-26	-100.0	-30	-100.0	0.0
* HYV	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* local	26	30	1,150	0	0	0	-26	-100.0	-30	-100.0	0.0
- Jute	967	1,371	1,418	781	1,386	1,775	-186	-19.2	15	1.1	25.2
- Potato	785	7,685	9,790	1,156	12,346	10,680	371	47.3	4,661	60.6	9.1
- Sugarcane	3,694	183,666	49,720	3,899	203,436	52,176	205	5.6	19,770	10.8	4.9
- Wheat	956	2,321	2,428	724	2,075	2,866	-232	-24.3	-246	-10.6	18.0
- Mustard	1,178	931	790	1,613	1,371	850	435	36.9	440	47.3	7.6
- Pulses	1,027	1,058	1,030	1,401	1,569	1,120	374	36.4	511	48.3	8.7
- Vegetables	349	1,662	4,763	677	3,410	5,037	328	94.0	1,747	105.1	5.7
- Other crops	156	808	5,180	354	2,004	5,665	198	126.8	1,196	148.0	9.4
Ratio:											
Local/HYV (rice)		1 : 2.03			1 : 4.62						
Dry season/monsoon rice		1 : 1.12			1 : 1.09						
Rice/Non-rice crops		1 : 1.06			1 : 1.17						

Source: Project computations

Table 7 : Incremental Benefit (agricultural) (future situation with project) Option 2 A

Crops	Additional Production			Additional Labour			Add. animal traction		
	tons	Value added Tk/ha	million Tk	addit. area ha	m/d/ha	total year man/d	addit. area ha	Oxen/ day/ha	total year pair/d
- Boro									
* HYV	3,262	24,359	5.60	230	233	53,613	230	35	8,050
* local	0	0	0.00	0	0	0	0	0	0
- T. Aman									
* HYV	8,464	24,140	35.87	1,486	173	256,788	1,486	25	37,151
* local	691	14,210	-16.81	-1,183	139	-164,691	-1,183	25	-29,578
- DW Aman									
* broadcasted	0	0	0.00	0	0	0	0	0	0
* transplanted	0	0	0.00	0	0	0	0	0	0
- Aus									
* HYV	0	0	0.00	0	0	0	0	0	0
* local	-30	0	0.00	-26	147	-3,829	-26	20	-520
Total rice 1)	12,387	22,489	24.66	507	198	141,882	507	30	15,103
- Jute	15	18,056	-3.36	-186	224	-41,728	-186	23	-4,277
- Potato	4,661	38,842	14.41	371	185	68,633	371	22	8,162
- Sugarcane	19,770	35,991	7.38	205	270	55,355	205	25	5,125
- Wheat	-246	24,434	-5.67	-232	90	-20,928	-232	21	-4,872
- Mustard	440	10,046	4.37	435	70	30,626	435	15	6,526
- Pulses	511	16,146	6.04	374	48	17,954	374	16	5,985
- Vegetables	1,747	16,834	5.52	328	288	94,461	328	24	7,872
- Other crops	1,196	27,784	5.49	198	128	25,382	198	18	3,546
Total			58.85	2000		371,637	2,000		43,168
$US (000)	38		1,548.69		addition. empl. No.	1,239		addition. pairs	491

Source: Project computations

1) value added, man/day/ha and oxen/pair/ha are average values for rice

Table 9: Investment costs - Economic costs (in Tk mln.) Option 2 A

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	9.6	5.3	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	13.0	47.0	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	12.4	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	30.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	5.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	8.1	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	35.0	104.1	41.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	1.8	5.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	36.8	109.3	43.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Economic (in Tk mln.) **Option** **2 A**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.37	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Embankment	0.00	0.58	0.89	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
Drainage channels	0.00	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Regulators	0.00	0.39	1.80	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.32	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
BRE retired embankment	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	5.71	8.64	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56	10.56
TECHNICAL STAFF	0.30	0.61	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
OVERHEADS	0.03	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
MISCELLANEOUS	0.00	0.07	1.59	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
TOTAL REC COSTS	0.33	6.45	11.23	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24	13.24

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: Total costs - Economic (in Tk mln.) Option 2 A

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	36.8	109.3	43.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	5.5	16.4	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.3	6.5	11.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
Land aquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.2	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Non-struct.interventions	4.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	6.4	19.8	9.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total costs	53.6	155.8	70.7	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1

1) excluding land aquisition and production foregone and non-structural interventions

Table 12: Benefits - Economic (Tk mln.) Option 2 A

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	37.18	38.30	39.45	40.63	41.85	43.11	44.40	45.73	47.10	48.52	49.97	49.97	49.97	49.97	49.97	49.97	49.97	49.97	49.97
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15
Farmers contribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	1.85	1.91	2.29	2.36	2.42	2.49	2.56	2.62	2.69	2.76	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84
Total benefits	0.00	38.88	40.05	48.09	49.47	50.89	52.35	53.70	55.10	56.54	58.03	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk mln.)	-53.6	-116.9	-30.7	32.0	33.3	34.8	36.2	37.6	39.0	40.4	41.9	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
IRR %		15.7																		
NPV mTk		56.6																		
Cost/Benefit ratio		0.85																		

Table 8 : Investment cost (Financial) - Option 2 A

Component	Unit	No	Unit cost 000 Tk	Investment schedule year 1	2	3	Total cost Tk mln.	Break down of Investment local %	Tk mln	foreign %	Tk mln
EMBANKMENTS											
- Ichamuti embankment	1000 m3	876	0.0003	8.2	8.2	8.2	24.5	95.0	23.3	5.0	1.2
- Sub compartm. embankm.	1000 m3	299	0.0003	6.6	0.0	2.4	9.0	95.0	8.5	5.0	0.4
Sub Total		1176		14.8	8.2	10.6	33.5	95.0	31.8	5.0	1.7
REGULATORS											
- new regulators											
* 3 Vent regulat.	Ls	5	6,000	0.0	18.0	12.0	30.0	35.0	10.5	65.0	19.5
* 5 Vent regulat.	Ls	6	8,000	12.0	32.0	4.0	48.0	35.0	16.8	65.0	31.2
* 5 Inlet BRE	Ls	3	3,000	3.0	3.0	3.0	9.0	35.0	3.2	65.0	5.9
- improving existing	Ls	1	1,000	0.0	1.0	0.0	1.0	50.0	0.5	50.0	0.5
Sub-Total				15.0	54.0	19.0	88.0	35.2	31.0	64.8	57.1
ROADS and BRIDGES											
- Roads	1000 m3	200	0.0003	0.0	0.0	6.0	6.0	85.0	5.1	15.0	0.9
- Bridges	Pcs	1	2,000	0.0	0.0	2.0	2.0	30.0	0.6	70.0	1.4
DRAINAGE CHANNELS	1000 m3	986	0.0003	19.1	6.6	0.0	25.6	95.0	24.4	5.0	1.3
EROSION PROTECTION											
- Breach protection	Ls	1	2,500	0.0	1.3	1.3	2.5	85.0	2.1	15.0	0.4
- Breach protection	Ls	6	1,500	0.0	4.5	4.5	9.0	85.0	7.7	15.0	1.4
FIELDLEVEL WATERMANA											
- Chawk improvement	Ls	1	5,000	0.0	5.0	0.0	5.0	80.0	4.0	20.0	1.0
- Waterretention structures	Ls	10	1,500	0.0	15.0	0.0	15.0	95.0	14.3	5.0	0.8
- Irrigation inlets	Ls	10	1,000	0.0	10.0	0.0	10.0	35.0	3.5	65.0	6.5
- Culverts	Pcs	20	500	0.0	10.0	0.0	10.0	65.0	6.5	35.0	3.5
Sub-Total				0.0	40.0	0.0	40.0	70.6	28.3	29.4	11.8
MITIGATION MEASURES											
- Resettlement	Ls	1	2,000	0.0	1.0	1.0	2.0	95.0	1.9	5.0	0.1
- Temporary embankments	Ls	5	500	0.0	2.5	0.0	2.5	95.0	2.4	5.0	0.1
- Excavation Ichamuti	1000 m3	100	0.0003	0.0	2.6	0.0	2.6	95.0	2.5	5.0	0.1
Sub-Total				0.0	6.1	1.0	7.1	95.0	6.7	5.0	0.4
BRE - RETIRED EMBANKM	Km	0	2,000	0.0	0.0	0.0	0.0	90.0	0.0	10.0	0.0
SIRAJGANJ TOWN DEVEL											
- Flushing sluice	Pcs	2	3,000	0.0	3.0	3.0	6.0	30.0	1.8	70.0	4.2
- Bridges	Pcs	3	2,000	0.0	3.0	3.0	6.0	28.0	1.7	72.0	4.3
- Ecavat. Katakhali Khal	1000 m3	100	0.0003	0.0	1.3	1.3	2.6	95.0	2.5	5.0	0.1
- Erosion protect. sluice	Pcs	2	2,000	0.0	2.0	2.0	4.0	35.0	1.4	65.0	2.6
Sub-Total				0.0	9.3	9.3	18.6	39.5	7.4	60.5	11.3
TOTAL				48.8	129.9	53.6	232.3	62.4	145.0	37.6	87.4

1) considered to be maintenance costs

Table 9: Investment costs - Financial costs (in Tk mln.) Option 2 A

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	14.8	8.2	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	15.0	54.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	19.1	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	6.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	9.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	48.8	129.9	53.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	2.4	6.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	51.3	136.4	56.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Financial (in Tk mln.) Option 2 A

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.58	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Embankment	0.00	0.89	1.38	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Drainage channels	0.00	1.14	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54
Regulators	0.00	0.45	2.07	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.37	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.29	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
BRE retired embankment	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	6.48	10.21	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68	12.68
TECHNICAL STAFF	0.35	0.70	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
OVERHEADS	0.03	0.07	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
MISCELLANEOUS	0.00	0.10	2.08	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
TOTAL REC COSTS	0.38	7.35	13.44	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03	16.03

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: **Total costs - Financial** (in Tk mln.) Option **2 A**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	51.3	136.4	56.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	7.7	20.5	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.4	7.4	13.4	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Land aquisition	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.2	0.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Non-struct.interventions	5.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	8.9	24.6	11.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Total costs	94.3	193.2	90.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5

1) excluding land aquisition and production foregone and non-structural interventions

Table 12: **Benefits - Financial** (Tk mln.) **Option** **2 A**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	44.08	45.41	46.77	48.17	49.62	51.11	52.64	54.22	55.85	57.52	59.25	59.25	59.25	59.25	59.25	59.25	59.25	59.25	59.25
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13
Farmers contribution	0.00	0.37	0.67	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	2.22	2.30	2.70	2.77	2.85	2.93	3.01	3.09	3.17	3.25	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34
Total benefits	0.00	46.54	48.25	56.64	58.25	59.91	61.61	63.22	64.88	66.59	68.35	70.16	70.16	70.16	70.16	70.16	70.16	70.16	70.16	70.16

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk mln.)	-94.3	-146.7	-42.2	37.1	38.8	40.4	42.1	43.7	45.4	47.1	48.9	50.7	50.7	50.7	50.7	50.7	50.7	50.7	50.7	50.7
IRR %		13.2																		
NPV mTk		24.5																		
Cost/Benefit ratio		0.95																		

FUTURE SITUATION

WITH PROJECT - OPTION 2B

Table 1 : Land utilization in the CPP area, Sirajganj - future situation with project Option 2 B

Sub-Compartment	Gross area Ha	Non cultivable area Ha	% 1)	Cultivable area Ha	% 1)	Fallow Ha	% 2)	Cropped area Ha	Single crop Ha	% 3)	Double crop Ha	% 3)	Triple crop Ha	% 3)	Cropping intensity %
1	873	123	14.1	750	85.9	10	1.3	1,398	123	17.7	576	76.7	41	5.5	186
2	797	88	11.0	709	89.0	-25	-3.5	1,414	75	7.0	639	90.1	21	2.9	199
3	1,061	168	15.8	893	84.2	-64	-7.1	1,696	274	23.5	626	70.1	56	6.3	190
4	1,371	239	17.4	1,132	82.6	-1	-0.1	2,482	-49	-4.5	1,017	89.8	166	14.7	219
5	2,012	356	17.7	1,656	82.3	-191	-11.6	3,386	410	13.2	1,336	80.7	101	6.1	204
6	1,455	259	17.8	1,196	82.2	-52	-4.3	2,628	2	-4.2	1,111	92.9	135	11.3	220
7	1,283	212	16.5	1,071	83.5	-128	-12.0	2,360	111	-1.6	1,016	94.8	72	6.8	220
8	2,319	338	14.6	1,981	85.4	-20	-1.0	4,095	66	2.3	1,776	89.7	159	8.0	207
9	886	695	78.4	191	21.6	16	8.1	300	64	41.5	99	51.7	13	6.9	157
Total	12,057	2,478	20.6	9,579	79.4	-456	-4.8	19,760	1,075	11.2	8,196	85.6	765	8.0	206

Source: based on CPP Landuse survey

Note: Figures on "fallow" for this option are confusing for some sub-compartments, as the global assumptions used on on the total compartment do not always match the special conditions in individual sub-compartments. The results shown are the true conditions as set by the model.

Table 2 : Area of rice crops in the CPP area, Sirajganj - future situation with project

Option 2 B

Sub-Compartment	Boro area						Aman area						Deep Water Aman area						Aus area						Total rice area	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 1)	Ha	% 1)	Ha	% 2)	Ha	% 2)
1	404	100.0	0	0.0	404	28.9	252	66.3	128	33.7	380	27.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	784	56.1
2	472	100.0	0	0.0	472	33.4	275	68.2	128	31.8	403	28.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	875	61.9
3	346	100.0	0	0.0	346	20.4	305	75.7	98	24.3	403	23.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	749	44.2
4	656	100.0	0	0.0	656	26.4	585	75.5	183	24.5	748	30.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,404	56.6
5	716	100.0	0	0.0	716	21.1	527	74.4	181	25.6	708	20.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,424	42.1
6	802	100.0	0	0.0	802	22.9	456	75.2	150	24.8	606	23.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,208	46.0
7	402	100.0	0	0.0	402	17.0	316	76.2	98	23.8	414	17.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	816	34.6
8	862	100.0	0	0.0	862	21.0	338	58.7	238	41.3	576	14.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1,438	35.1
9	132	100.0	0	0.0	132	43.8	112	92.5	9	7.5	121	40.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	253	84.1
Total	4,591	100.0	0	0.0	4,591	23.2	3,146	72.1	1,215	27.9	4,361	22.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8,952	45.3

Source: based on CPP Landuse Survey

1) of specific rice-crop area

2) of total cropped area

Table 3 : Rice production (Paddy) in the CPP area, Sirajganj - future situation with project

Option 2 B

Sub-Compartment	Boro						Aman						Deep Water Aman						Aus						Total production	
	HYV		local		Total		HYV		local		Total		broadcasted		transplanted		Total		HYV		local		Total			
	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha	ton	Kg/ha
1	1,909	4,725	0	0	1,909	4,725	954	3,786	252	1,967	1,206	3,172	0	0	0	0	0	0	0	0	0	1,150	0	0	3,115	3,972
2	2,232	4,725	0	0	2,232	4,725	1,041	3,786	252	1,967	1,293	3,207	0	0	0	0	0	0	0	0	0	1,150	0	0	3,524	4,026
3	1,634	4,725	0	0	1,634	4,725	1,156	3,786	192	1,967	1,348	3,344	0	0	0	0	0	0	0	0	0	1,150	0	0	2,982	3,982
4	3,099	4,725	0	0	3,099	4,725	2,139	3,786	361	1,967	2,500	3,340	0	0	0	0	0	0	0	0	0	1,150	0	0	5,599	3,987
5	3,383	4,725	0	0	3,383	4,725	1,994	3,786	357	1,967	2,351	3,320	0	0	0	0	0	0	0	0	0	1,150	0	0	5,734	4,026
6	2,844	4,725	0	0	2,844	4,725	1,725	3,786	296	1,967	2,020	3,334	0	0	0	0	0	0	0	0	0	1,150	0	0	4,864	4,027
7	1,899	4,725	0	0	1,899	4,725	1,195	3,786	194	1,967	1,389	3,352	0	0	0	0	0	0	0	0	0	1,150	0	0	3,288	4,029
8	4,073	4,725	0	0	4,073	4,725	1,281	3,786	468	1,967	1,749	3,035	0	0	0	0	0	0	0	0	0	1,150	0	0	5,822	4,046
9	622	4,725	0	0	622	4,725	424	3,786	18	1,967	442	3,649	0	0	0	0	0	0	0	0	0	1,150	0	0	1,064	4,209
Total	21,893	4,725	0	0	21,893	4,725	11,908	3,786	2,390	1,967	14,296	3,279	0	0	0	0	0	0	0	0	0	0	0	0	35,992	4,021

Source: based on CPP Landuse Survey

Table 4.1 : Non-rice-crops in the CPP area, Sirajganj - future situation with project Option 2 B

Sub-Compartment	Potato				Sugarcane				Wheat				Jute			
	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *	Area ha	ton	Kg/ha	% *
1	8	84	10,680	0.8	208	10,827	52,176	14.8	97	277	2,866	6.9	107	190	1,775	7.8
2	5	56	10,680	0.4	134	6,983	52,176	9.5	90	258	2,866	6.4	96	170	1,775	6.8
3	20	211	10,680	1.2	437	22,782	52,176	25.7	110	316	2,866	6.5	117	208	1,775	6.9
4	104	1,109	10,680	4.2	290	15,113	52,176	11.7	143	410	2,866	5.8	150	266	1,775	6.0
5	162	1,727	10,680	4.8	874	45,621	52,176	25.8	106	305	2,866	3.1	113	201	1,775	3.3
6	214	2,286	10,680	8.2	497	25,940	52,176	18.9	90	258	2,866	3.4	90	161	1,775	3.4
7	245	2,611	10,680	10.4	611	31,881	52,176	25.9	42	120	2,866	1.8	45	80	1,775	1.9
8	275	2,934	10,680	6.7	942	49,174	52,176	23.0	103	295	2,866	2.5	122	216	1,775	3.0
9	0	0	10,680	0.0	0	0	52,176	0.0	1	2	2,866	0.3	1	2	1,775	0.3
Total	1,032	11,021	10,680	5.2	3,992	208,312	52,176	20.2	782	2,241	2,866	4.0	841	1,493	1,775	4.3

Source: based on CPP Landuse Survey

*) of total cropped area

Table 4.2 : Non-rice-crops in the CPP area, Sirajganj - future situation with project Option 2 B

Sub-Compartment	Mustard				Pulses				Vegetables 2) b				Other 3)				Total non-rice-crops	
	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)	ton	Kg/ha	Area ha	% 1)
1	84	4.6	55	650	60	4.3	68	1,120	17	1.2	64	3,818	54	3.9	306	5,665	814	43.9
2	97	6.9	62	650	40	2.8	44	1,120	38	2.7	144	3,818	39	2.8	223	5,665	539	38.1
3	14	0.9	12	650	123	7.3	138	1,120	80	4.7	304	3,818	45	2.7	256	5,665	847	55.8
4	139	5.6	118	650	101	4.1	114	1,120	124	5.0	491	3,975	28	1.1	157	5,665	1,078	43.4
5	201	5.9	171	650	373	11.0	416	1,120	92	2.7	391	4,236	40	1.2	229	5,665	1,962	57.9
6	205	7.8	174	650	209	7.9	234	1,120	82	3.1	389	4,766	33	1.3	189	5,665	1,420	54.0
7	167	7.1	142	650	331	14.0	370	1,120	50	2.1	211	4,203	54	2.3	305	5,665	1,543	65.4
8	635	15.5	540	650	272	6.6	305	1,120	249	6.1	1,687	6,770	58	1.4	333	5,665	2,857	64.9
9	24	7.9	20	650	0	0.0	0	1,120	0	0.0	0	0	22	7.5	127	5,665	48	15.9
Total	1,545	7.8	1,313	650	1,510	7.6	1,691	1,120	731	3.7	3,682	5,037	375	1.9	2,125	5,665	10,808	54.7

Source: based on CPP Landuse Survey

1) of total cropped area 2) cabbage, cauliflower, radish, onion, garlic 3) tobacco

Table 5: Crop Production - Economic Parameters (economic prices) (future situation with project) Option 2 B

Crop	Output			variable costs														Total var. costs	Gross margin	Value added
	Yield	By-prod.	Gross return	Seed		Urea	Fertilizer TSP	MP 2)	Sub-total	Plant protection		family labour	ratio	Labour hired labour		oxen labour	Irrigat.			
	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	Kg/ha	Kg/ha	Kg/ha	Tk/ha	Kg/ha	Tk/ha	m/d/ha	% 3)	m/d/ha	Tk/ha	ox/d/ha	Tk/ha	Tk/ha	Tk/ha	Tk/ha
Boro HYV	4,725	3,780	29,611	30	264	264	101	115	3,721	1.1	488	126	85	107	4,016	35	4,133	13,993	15,618	24,359
Boro local	0	0	0	0	0	0	0	0	0	0.0	0	0	50	0	0	0	0	0	0	0
T Aman HYV	3,786	3,407	24,855	32	282	166	91	69	2,599	1.0	456	96	80	77	2,880	25	0	7,195	17,660	24,140
T Aman local	1,967	2,557	13,700	25	220	66	53	31	1,325	0.5	229	87	60	52	1,958	25	0	4,710	8,990	14,210
DW Aman broad.	0	0	0	0	0	0	0	0	0	0.0	0	0	60	0	0	0	0	0	0	0
DW Aman transpl	0	0	0	0	0	0	0	0	0	0.0	0	0	65	0	0	0	0	0	0	0
Aus HYV	0	0	0	0	0	0	0	0	0	0.0	0	0	75	0	0	0	0	0	0	0
Aus local	0	0	0	44	407	25	24	18	557	0.2	88	95	55	52	1,959	20	0	3,794	0	0
Jute	1,775	1,775	16,851	10	254	76	65	36	1,465	0.0	0	102	120	122	4,590	23	0	7,210	9,641	16,056
Potato	10,680	0	42,555	370	2,736	111	132	59	2,561	1.1	478	100	85	85	3,188	22	827	10,651	31,904	38,842
Wheat	2,866	2,579	25,914	74	1,146	109	84	48	1,968	0.0	0	82	10	8	308	21	820	4,863	21,051	24,434
Mustard	850	1,020	11,093	10	167	97	104	45	2,072	0.0	0	64	10	6	240	15	820	3,687	7,406	10,046
Pulses	1,120	1,456	15,994	35	402	0	0	0	0	0.0	0	48	0	0	0	18	820	1,648	14,346	16,146
Vegetables 1)	5,037	0	17,979	1	218	127	53	32	2,189	0.5	232	120	140	168	6,300	24	2,067	11,945	6,034	16,834
Sugarcane	52,176	0	45,938	29,000	7,569	274	187	175	5,149	0.0	0	100	170	170	6,375	25	0	20,072	25,866	35,991
Other crops	5,665	0	30,538	57	1,343	95	64	41	1,619	0.4	179	71	81	58	2,159	18	1,565	7,567	22,971	27,784

Source: Data for yields and inputs according to official statistics, project land-use and input use-survey. Data set for yield includes also yield on partially damaged crop.

1) incl. manure (veg. = 1,100 Kg ? 0.5 Tk/kg, local T.Aman = 190 Kg)

2) including Gypsum in Boro and T.Aman HYV, T.Aman local, Wheat and Sugarcane

3) of family labour

Value added Tk./ha average	24,581

Table 6: Summary of Impact on Agricultural Production (future situation with project) Option 2 B

Criteria	Base situation Area ha	Product. tons	Yield Kg/ha	Future situation Area ha	Product. tons	Kg/ha	Changes Area ha	%	Production tons	%	Yield %
Cultivated area	9,579			9,579				0.0			
Cropped area	17,670			19,760			2090	11.8			
Fallow	303			132			-171	-56.4			
Crop intensity %	184			206				11.8			
Rice area											
- total	8,558	23,443	2,739	8,952	35,992	4,021	394	4.6	12,549	53.5	46.8
- Boro	4,501	19,093	4,242	4,591	21,693	4,725	90	2.0	2,600	13.6	11.4
* HYV	4,501	19,093	4,242	4,591	21,693	4,725	90	2.0	2,600	13.6	11.4
* local	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- T.Aman	4,031	4,320	1,072	4,361	14,298	3,279	330	8.2	9,979	231.0	206.0
* HYV	1,236	1,840	1,489	3,146	11,908	3,786	1,910	154.5	10,068	547.0	154.2
* local	2,795	2,479	887	1,215	2,390	1,967	-1,580	-56.5	-89	-3.6	121.7
- DW Aman	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* broadcasted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* transplanted	0	0	0	0	0	0	0	0.0	0	0.0	0.0
- Aus	26	30	1,150	0	0	0	-26	-100.0	-30	-100.0	0.0
* HYV	0	0	0	0	0	0	0	0.0	0	0.0	0.0
* local	26	30	1,150	0	0	0	-26	-100.0	-30	-100.0	0.0
- Jute	967	1,371	1,418	841	1,493	1,775	-126	-13.0	121	8.9	25.2
- Potato	785	7,685	9,790	1,032	11,021	10,680	247	31.5	3,336	43.4	9.1
- Sugarcane	3,694	183,666	49,720	3,992	208,312	52,176	298	8.1	24,646	13.4	4.9
- Wheat	956	2,321	2,428	782	2,241	2,866	-174	-18.2	-80	-3.5	18.0
- Mustard	1,178	931	790	1,545	1,313	850	367	31.1	383	41.1	7.6
- Pulses	1,027	1,058	1,030	1,510	1,691	1,120	483	47.0	633	59.8	8.7
- Vegetables	349	1,662	4,763	731	3,682	5,037	382	109.5	2,019	121.5	5.7
- Other crops	156	808	5,180	375	2,125	5,665	219	140.5	1,317	163.0	9.4
Ratio											
Local/HYV (rice)		1 : 2.03			1 : 6.37						
Dry season/monsoon rice		1 : 1.12			1 : 1.05						
Rice/Non rice crops		1 : 1.06			1 : 1.21						

Source: Project computations

Table 7 : Incremental Benefit (agricultural) (future situation with project) Option 2 B

Crops	Additional Production			Additional Labour			Add. animal traction		
	tons	Value added Tk/ha	million Tk	addit. area ha	m/d/ha	total year man/d	addit. area ha	Oxen/ day/ha	total year pair/d
- Boro									
* HYV	2,600	24,359	2.19	90	233	20,984	90	35	3,151
* local	0	0	0.00	0	0	0	0	0	0
- T. Aman									
* HYV	10,068	24,140	46.10	1,910	173	329,982	1,910	25	47,741
* local	-89	14,210	-22.45	-1,580	139	-219,899	-1,580	25	-39,493
- DW Aman									
* broadcasted	0	0	0.00	0	0	0	0	0	0
* transplanted	0	0	0.00	0	0	0	0	0	0
- Aus									
* HYV	0	0	0.00	0	0	0	0	0	0
* local	-30	0	0.00	-26	147	-3,829	-26	20	-520
Total rice 1)	12,549	22,904	25.84	394	199	127,239	394	30	10,878
- Jute	121	18,056	-2.28	-126	224	-28,274	-126	23	-2,898
- Potato	3,336	38,842	9.59	247	185	45,688	247	22	5,433
- Sugarcane	24,646	35,991	10.74	298	270	80,588	298	25	7,462
- Wheat	-80	24,434	-4.25	-174	90	-15,694	-174	21	-3,654
- Mustard	383	10,046	3.69	367	70	25,833	367	15	5,504
- Pulses	633	16,146	7.79	483	48	23,169	483	16	7,723
- Vegetables	2,019	16,834	6.43	382	288	110,020	382	24	9,168
- Other crops	1,317	27,784	6.09	219	128	28,126	219	18	3,929
Total			63.65	2090		396,694	2,090		43,545
$US (000)	38		1,674.99		addition. empl. No.	1,322		addition pairs	495

Source: Project computations

1) value added, man/day/ha and oxen/pair/ha are average values for rice

Table 9: Investment costs - Economic costs (in Tk min.) Option 2 B

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	12.6	8.4	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	16.5	43.5	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	12.4	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	30.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	5.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	8.1	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	41.6	103.7	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	2.1	5.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	43.6	108.9	46.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Economic (in Tk mln.) **Option** **2 B**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.37	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Embankment	0.00	0.76	1.26	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
Drainage channels	0.00	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Regulators	0.00	0.50	1.80	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.32	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
BRE retired embankment	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	6.00	9.00	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11	11.11
TECHNICAL STAFF	0.30	0.61	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
OVERHEADS	0.03	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
MISCELLANEOUS	0.00	0.09	1.60	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
TOTAL REC. COSTS	0.33	6.75	11.61	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: Total costs - Economic (in Tk mln.) Option 2 B

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	43.6	106.9	46.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	6.5	16.3	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.3	5.8	11.6	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
Land aquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.3	0.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Non-struct.interventions	4.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	7.6	19.5	9.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Total costs	62.7	156.7	75.7	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5

1) excluding land aquisition and production foregone and non-structural interventions

Table 12: Benefits - Economic (Tk mln.) **Option** **2 B**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	39.20	40.37	41.58	42.83	44.12	45.44	46.80	48.21	49.65	51.14	52.68	52.68	52.68	52.68	52.68	52.68	52.68	52.68	52.68
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64
Farmers contribution	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	1.93	1.99	2.37	2.44	2.51	2.58	2.65	2.72	2.80	2.87	2.95	2.95	2.95	2.95	2.95	2.95	2.95	2.95	2.95
Total benefits	0.00	40.48	41.72	49.82	51.26	52.75	54.28	55.71	57.19	58.71	60.27	61.88	61.88	61.88	61.88	61.88	61.88	61.88	61.88	61.88

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk mln.)	-62.7	-115.2	-34.0	32.3	33.8	35.3	36.8	38.2	39.7	41.2	42.8	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
IRR %		15.2																		
NPV mTk		51.5																		
Cost/Benefit ratio		0.87																		

Table 8 : Investment cost (Financial) - Option 2 B

Component	Unit	No	Unit cost 000 Tk	Investment schedule year 1	2	3	Total cost Tk mln.	Break down of Investment local %	Tk mln	foreign %	Tk mln
EMBANKMENTS											
- Ichamuti embankment	1000 m3	1380	0.0003	12.9	12.9	12.9	38.6	95.0	36.7	5.0	1.9
- Sub compartm. embankm.	1000 m3	299	0.0003	6.6	0.0	2.4	9.0	95.0	8.5	5.0	0.4
Sub-Total		1679		19.4	12.9	15.3	47.6	95.0	45.2	5.0	2.4
REGULATORS											
- new regulators											
* 3 Vent regulat.	Ls	5	6,000	0.0	18.0	12.0	30.0	35.0	10.5	65.0	19.5
* 5 Vent regulat.	Ls	6	8,000	16.0	28.0	4.0	48.0	35.0	16.8	65.0	31.2
* 5 Inlet BRE	Ls	3	3,000	3.0	3.0	3.0	9.0	35.0	3.2	65.0	5.9
- improving existing	Ls	1	1,000	0.0	1.0	0.0	1.0	50.0	0.5	50.0	0.5
Sub-Total				19.0	50.0	19.0	88.0	35.2	31.0	64.8	57.1
ROADS and BRIDGES											
- Roads	1000 m3	200	0.0003	0.0	0.0	6.0	6.0	85.0	5.1	15.0	0.9
- Bridges	Pcs	1	2,000	0.0	0.0	2.0	2.0	30.0	0.6	70.0	1.4
DRAINAGE CHANNELS	1000 m3	986	0.0003	19.1	6.6	0.0	25.6	95.0	24.4	5.0	1.3
EROSION PROTECTION											
- Breach protection	Ls	1	2,500	0.0	1.3	1.3	2.5	85.0	2.1	15.0	0.4
- Breach protection	Ls	6	1,500	0.0	4.5	4.5	9.0	85.0	7.7	15.0	1.4
FIELDLEVEL WATERMANA											
- Chawk improvement	Ls	1	5,000	0.0	5.0	0.0	5.0	80.0	4.0	20.0	1.0
- Waterretention structures	Ls	10	1,500	0.0	15.0	0.0	15.0	95.0	14.3	5.0	0.8
- Irrigation inlets	Ls	10	1,000	0.0	10.0	0.0	10.0	35.0	3.5	65.0	6.5
- Culverts	Pcs	20	500	0.0	10.0	0.0	10.0	65.0	6.5	35.0	3.5
Sub-Total				0.0	40.0	0.0	40.0	70.6	28.3	29.4	11.8
MITIGATION MEASURES											
- Resettlement	Ls	1	2,000	0.0	1.0	1.0	2.0	95.0	1.9	5.0	0.1
- Temporary embankments	Ls	5	500	0.0	2.5	0.0	2.5	95.0	2.4	5.0	0.1
- Excavation Ichamuti	1000 m3	100	0.0003	0.0	2.6	0.0	2.6	95.0	2.5	5.0	0.1
Sub-Total				0.0	6.1	1.0	7.1	95.0	6.7	5.0	0.4
BRE - RETIRED EMBANKM	Km	0	2,000	0.0	0.0	0.0	0.0	90.0	0.0	10.0	0.0
SIRAJGANJ TOWN DEVEL											
- Flushing sluice	Pcs	2	3,000	0.0	3.0	3.0	6.0	30.0	1.8	70.0	4.2
- Bridges	Pcs	3	2,000	0.0	3.0	3.0	6.0	28.0	1.7	72.0	4.3
- Ecavat. Katakhali Khal	1000 m3	100	0.0003	0.0	1.3	1.3	2.6	95.0	2.5	5.0	0.1
- Erosion protect. sluice	Pcs	2	2,000	0.0	2.0	2.0	4.0	35.0	1.4	65.0	2.6
Sub-Total				0.0	9.3	9.3	18.6	39.5	7.4	60.5	11.3
TOTAL				57.5	130.6	58.3	246.4	64.3	158.3	35.7	88.1

1) considered to be maintenance costs

Table 9: Investment costs - Financial costs (in Tk mln.) Option 2 B

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Embankments	19.4	12.9	15.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regulators	19.0	50.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roads and Bridges	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drainage channels	19.1	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Erosion protection	0.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fieldlevel watermanagmnt	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigation	0.0	6.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sirajganj town protection	0.0	9.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total	57.5	130.6	58.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	2.9	6.5	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INVESTMENT COSTS	60.4	137.1	61.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 10: Recurrent costs - Financial (in Tk mln.) **Option** **2 B**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O & M																				
Erosion protection	0.00	0.00	0.58	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Embankment	0.00	1.17	1.94	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
Drainage channels	0.00	1.14	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54
Regulators	0.00	0.57	2.07	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64	2.64
Bridges	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Mitigation	0.00	0.00	0.37	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Roads	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sirajganj development	0.00	0.00	0.29	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
BRE retired embankment	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Buildings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	0.00	6.88	10.78	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53
TECHNICAL STAFF	0.35	0.70	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
OVERHEADS	0.03	0.07	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
MISCELLANEOUS	0.00	0.12	2.10	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22
TOTAL REC. COSTS	0.38	7.77	14.03	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Table 11: Total costs - Financial (in Tk min.) **Option 2 B**

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment	60.4	137.1	61.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	9.1	20.6	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
O & M	0.4	7.8	14.0	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Land aquisition	37.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production foregone	0.0	0.4	1.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Non-struct.interventions	5.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical contingencies 1)	10.5	24.8	12.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Total costs	122.7	194.9	98.1	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3

1) excluding land aquisition and production foregone and non-structural interventions

D2C

Table 12: Benefits - Financial (Tk mln.) Option 2 B

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Agriculture	0.00	46.42	47.81	49.25	50.73	52.25	53.82	55.43	57.09	58.81	60.57	62.39	62.39	62.39	62.39	62.39	62.39	62.39	62.39	62.39
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fisheries	0.00	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53	-0.53
Farmers contribution	0.00	0.39	0.70	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Damage saved	0.00	0.00	0.00	6.50	6.63	6.76	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90
Miscellaneous	0.00	2.31	2.40	2.80	2.88	2.97	3.05	3.13	3.22	3.30	3.39	3.48	3.48	3.48	3.48	3.48	3.48	3.48	3.48	3.48
Total benefits	0.00	48.59	50.38	58.86	60.55	62.29	64.08	65.77	67.52	69.32	71.17	73.08	73.08	73.08	73.08	73.08	73.08	73.08	73.08	73.08

Note: Lifespan of project = 30 years, only 20 years shown for more convenient presentation

Cash Flow (Tk mln.)	-122.7	-146.3	-47.7	37.5	39.2	41.0	42.7	44.4	46.2	48.0	49.8	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7
IRR %		12.0																		
NPV mTk		0.0																		
Cost/Benefit ratio		1.00																		