

CHAPTER 6 DEVELOPMENT PLAN

6.1 Model Projects

6.1.1 Concept of the Model Projects

As mentioned in Section 5.2, model projects will be formulated first, to experiment the implementing arrangements with local participation. The model projects include, as components, minimal structural or physical measures that can be planned in detail and implemented immediately by LGED within its capacities, as well as flood warning and evacuation system, set of support services for livelihood development, and saving and credit system. Implementation of the model projects should be monitored under the same implementing arrangements, and the monitored results, including beneficiaries' response, the degree of participation, etc., will be evaluated and fed back to further project implementation for replication in other areas based on the basic strategy established in Chapter 5. In this monitoring and feedback process, unsuitable factors in the model projects can be detected and eliminated before the replication stage. These factors may include structure and membership of some organizations involved in implementing arrangements as well as technical factors related flood-proofing and/or livelihood activities.

Thus, the model projects would be more cost-effective involving less bureaucratic or administrative procedures due to the smaller size of implementing arrangements manageable by the local people. Besides, at the replication stage, projects in other areas can be formulated and implemented more efficiently with a better chance of success, based on the feedback and evaluation results of achievement of the model projects.

Unit of model project area

A key to the successful implementation of the proposed project is to establish proper implementing arrangements with the local people initiative, guided by LGED and supported by NGOs. Administrative units such as union, gram and para may be used to facilitate the guidance for the local people, but to ensure consensus among them on the implementing arrangements, local leadership would be a prerequisite. A model project area should be selected in such a way that the local leadership would function effectively.

The lowest administrative level linked directly with the Central Government is the Union Parishad. Every Union Parishad consists of nine male and three female members elected directly by the local people, representing the grams within its jurisdiction. A Union Parishad usually has about ten grams with 20,000-30,000 people. This population size is beyond the scope where any local leadership can function effectively, and thus would not be amenable to consensus.

With the representation at the union level, a gram would be the smallest administrative unit where coordinated actions with the local initiative and the guidance by the Government are expected. It is, therefore, natural to select target areas for government projects with the local initiative by gram.

Within any grams, however, only limited areas and people suffer from serious flood damages and/or dire poverty. Only those people in such areas have strong motivation to organize themselves for flood-proofing and/or poverty mitigation measures.

Based on these considerations, the model project formulation for the Study uses grams to select target areas, and takes para or a small group of paras as a unit to organize the local people. This is also the practice adopted by other projects such as the FPP by CARE and the Haor Development Project by Concern-Bangladesh.

6.1.2 Priority Areas

The basic strategy for the rural development in flood-prone Char and Haor areas is to focus first on more promising areas for flood-proofing, where minimal structural or physical measures and support services for livelihood development would be combined and implementing arrangements with local participation would be experimented. Priority areas are identified for Char and Haor, based on the typology of Char and Haor reported in Subsection 5.3.1. Priority areas for the model projects are selected as follows.

(1) Principles for selecting priority areas

To select priority areas for model projects effectively given limited time for the Study, a pragmatic approach is taken. That is, priority areas for model projects are specified first at the Upazila level for both Char and Haor, then specific villages (each with population of 1,000 – 2,500) are selected within each Upazila, and finally paras are targeted for model project formulation. To enhance the replicability of model projects to other areas, such Upazila that contains two basic types defined in Subsection 5.3.1 is selected respectively for Char and Haor. Two model projects are thus formulated, one each in Char and Haor areas corresponding to the selected Upazila of Char and Haor, respectively.

More specifically in Char areas, such Upazila that contains type A1 and type B1 or B2 is selected. This selection would allow formulation of different measures for Attached Char (A) and Island Char (B) and also for Stable Char (1) and Unstable Char (2) of 7 – 20 years observed stability. In Haor areas, such Upazila that contains types A1 and A2 is selected to allow formulation of different measures depending on the means of transportation: land (1) or water (2). Upazila with Deep Haor (B) is excluded from the selection in view of cost-effectiveness required for model projects, as expected measures for wave protection works and elevated shelters for Deep Haor would be costly.

(2) Criteria for prioritization

Willingness of the people to participate in the project and their actions to help themselves for flood proofing and livelihood improvement are the two most important criteria to be applied for selection of priority areas. Further, the criteria shall evaluate the fact whether there is any serious impediments in the areas or not. Due to the limitation of the available data and information

concerning the above and also taking fully the applicability of experienced approaches, however, it is noted that the following criteria has been designed and applied under the present study.

Eight (8) common criteria are introduced to assess Upazila in Char and Haor areas for prioritization. The following criteria are common for both Char and Haor areas.

- 1) Upazila containing two basic types of Char and Haor respectively specified above (prerequisite).
- 2) Area of Upazila: larger Upazila allows more flexible and appropriate selection of villages for model projects.
- 3) Population of Upazila: total beneficiary population would be larger for the model projects and their replications for Upazila of larger population.
- 4) Effects of 1998 flood: Upazila with a higher ratio of flood victims and a longer inundation period has higher priority.
- 5) Poverty level: Upazila having higher ratio of poor people with the annual household income below Tk20,000 has higher priority due to its vulnerability to floods.
- 6) Village population: Upazila having larger population per village has higher priority for cost-effectiveness.
- 7) Existence of shelters: Upazila with existing shelters has higher priority as the utilization of existing facilities and the establishment of flood warning and evacuation system are necessary for such Upazila.
- 8) Infrastructure: Upazila with lower levels of infrastructure and public investments has higher priority for cost effectiveness; the following indices are used to evaluate the level of infrastructure development, and a score of 1 (the lowest) to 4 (the highest) is given to each and summed over all the indices for a total score:
 - (1) rural road density,
 - (2) number of launch ghat existed,
 - (3) growth center density,
 - (4) number of dry yard with rice milling,
 - (5) number of food storage,
 - (6) college/high school density,
 - (7) mardrasha/primary school density,
 - (8) rural electrification coverage,
 - (9) drinking water coverage,
 - (10) number of hospitals, and
 - (11) number of projects implemented.

In addition for Haor areas, the following consideration is reflected in the prioritization.

- 9) Population density of village mounds: Upazila having a larger number of village mounds with relatively low population density has higher priority for effectiveness of mound raising and expansion measures.

Of these criteria, the first three criteria 1), 2) and 3) are used for pragmatic reasons to enhance the chance of selecting such model project areas that would have larger demonstration effects. They

are applicable only for the Study purpose. The criteria 4) and 5) are relevant in the sense that those suffering more from flooding and poverty have stronger motivation to participate in the model projects to mitigate their problems. The criteria 6), 7) and 8) are efficiency criteria by which such areas that would realize larger effects by smaller investments are likely to be selected.

As a whole, this set of criteria are used at this time to enhance the chance of selecting such model project areas that would have larger demonstration effects at smaller costs and better chance of success with stronger motivation of people. Applying these criteria, therefore, represents a pragmatic approach applicable to selecting model project areas. For prioritization of implementation for villages, more specific criteria should be applied such as demonstrated intention of people to participate and help themselves and presence of positive political will without adverse interventions.

(3) Evaluation

For each of the nine criteria introduced above, Upazila in Char and Haor areas is ranked either “high” (a) or “low” (b). Thresholds to divide between high and low ranks are taken to be the average levels in the entire Study Area as defined below for Char and Haor areas and for different criteria.

Criteria	Unit	Char Areas	Haor Areas
1) Typology	-	A1/B1 or A1/B2=a	A1/A2 or A1/A2//B1=a
2) Area	ha	B<10,000<a	b<20,000<a
3) Population	nos.	B<70,000<a	b<120,000<a
4) Inundation - affected population - duration period	% month	b<90<a b<1.8<a	b<50<a b<2.0<a
5) Poverty incidence	% of population	b<60<a	b<40<a
6) Village density	population/village	B<1,300<a	b<1,000<a
7) Existing shelter	Nos.	b<4<=a	b<5<=a
8) Infrastructure	Point	b<30<a	b<30<a
9) Village mound density	Population/mound Population/km ²	- -	both densities of popu./mound and popu./km ² are below 730 and 33,000 respectively =a, if not =b

(4) Results

Upazila in Char and Haor areas is assessed by the criteria, and results are summarized in Table 6.1 for Char and Table 6.2 for Haor. The number of criteria by which each Upazila is ranked high is found out for overall ranking of Upazila. For Char areas, Upazila of Fulchhari, Nageshwari and Chauhali have the highest ranking with seven criteria that ranked each Upazila high. For Haor areas, Upazila of Ajmiriganj and Nikli have the highest ranking with eight criteria favoring it,

followed by Upazilas of Austagram, Derai and Dharampasha with seven criteria. Considering the accessibility for demonstration effects, the following are finally selected as priority areas for model projects:

Char areas: Fulchhari Upazila, Gaibandha District, and

Haor areas: Nikli Upazila, Kishoreganj District.

Table 6.1 Selection of Priority Upazila for Char Area

No. District No. Upazila	1)Typology A1/A2 B1/B2	2)Charland Area (ha) (source:JICA team)	3)Charland Population (source:JICA team)	4)Inundation in 1998		5)Porverty Incidence (%) (source:RLCS)	6)Village Density Nos. of Popu_ Villages Villages (capita) (source:JICA team)	7)No. of Existing Shelter (no.) (source:LGED)	8)Infra. dev't level (source:JICA team)	Overall Ranking Total a								
				Affected Population (%) (source:JICA team)	Inundated Period (month) (source:JICA team)													
32. Gaibandha District		26,259	201,051	188,520	(94)		101	1,991	4									
21 Fulchhari	A1/B2/B3	a 15,925	a 91,547	a 90,632	(99) a	1.40	b	(84)	a	52	1,761	a	0	b	36	a	7	
24 Gaibandha Sadar	A1/B3	b 2,348	b 24,049	b 24,049	(100) a	1.87	a	(82)	a	12	2,004	a	1	b	31	a	5	
88 Saghatta	A1	b 5,147	b 61,133	b 49,518	(81) b	2.11	a	(80)	a	26	2,351	a	1	b	35	a	4	
91 Sundarganj	A1/B3	b 2,840	b 24,321	b 24,321	(100) a	1.06	b	(39)	b	11	2,211	a	2	b	34	a	3	
39. Jamalpur District		36,891	377,128	355,838	(89)			258	1,462	21								
15 Dewanganj	A1	b 17,378	a 148,392	a 130,585	(88) b	2.21	a	(85)	a	116	1,279	b	2	b	25	b	4	
29 Islampur	A1/B3	b 4,721	b 66,132	b 50,922	(77) b	2.31	a	(80)	a	49	1,350	a	10	a	22	b	4	
58 Madarganj	A1	b 6,719	b 74,161	a 71,195	(96) a	1.53	b	(50)	b	41	1,809	a	6	a	24	b	4	
85 Sarishabari	A1/B3	b 8,073	b 88,442	a 83,136	(94) a	1.02	b	(38)	b	52	1,701	a	3	b	28	b	3	
49. Kurigram District		50,949	335,291	310,249	(93)			370	906	8								
08 Char Rajibpur	A1/B3	b 6,537	b 47,550	b 39,467	(83) b	1.98	a	(70)	a	49	970	b	0	b	26	b	2	
09 Chilmari	A1/B2/B3	a 9,222	b 51,029	b 47,457	(93) a	1.81	a	(49)	b	79	646	b	0	b	37	a	4	
52 Kurigram Sadar	A1/B3	b 4,168	b 20,806	b 19,766	(95) a	1.89	a	(72)	a	30	694	b	1	b	33	a	4	
61 Nageshwari	A1/B2/B3	a 12,894	a 109,223	a 100,485	(92) a	1.89	a			104	1,050	b	4	a	33	a	7	
79 Raumari	A1/B2/B3	a 6,350	b 45,109	b 41,501	(92) a	1.89	a			50	902	b	3	b	27	b	3	
94 Ulipur	A1/B2/B3	a 11,776	a 61,573	b 61,573	(100) a	1.91	a	(69)	a	58	1,062	b	0	b	34	a	6	
88. Sirajganj District		43,671	485,710	458,976	(94)			346	1,404	30								
11 Belkuchi	A1/A3	b 4,768	b 96,576	a 96,576	(100) a	2.45	a	(58)	b	46	2,099	a	5	a	36	a	6	
27 Chauhali	A1/B2/B3	a 14,643	a 116,642	a 111,976	(96) a	1.88	a	(48)	b	101	1,155	b	4	a	40	a	7	
50 Kazipur	A1/B2/B3	a 15,014	a 129,180	a 111,095	(86) b	1.46	b	(32)	b	96	1,346	a	9	a	35	a	6	
67 Shahjadpur	A1/B2/B3	a 4,401	b 63,750	b 60,562	(95) a	1.88	a			40	1,594	a	7	a	34	a	6	
78 Sirajganj Sadar	A1/B3	b 4,845	a 79,561	a 78,766	(99) a	1.86	a	(56)	a	63	1,263	b	5	a	35	a	6	
Total		157,770	1,399,180	1,293,582				1,075		63								
Average		8,304	73,641	(92)		1.81		(62)		3.3			3.3		32			
A1	b	10,000 <a	70,000 <a	90% <a	1.8months <a	% of population	1,300 <a	4 <a	30 <a									
A1+A3	b	10,000 >b	70,000 >b	90% >b	1.8months >b	with annual HH	1,300 >b	4 >b	30 >b									
A1+B3	b	A: Attached Char a 1: Stable Char				% of population with annual HH income below Tk. 20,000 60% <a 60% >b												
B2+B3	b	B: Island Char 2: Unstable Char-I (7-20 years)																
A1+B2+B3	a	3: Unstable Char-II (1-7 years)																

Table 6.2 Selection of Priority Upazila for Haor Area

Classification No. District No. Upazila	1)Typology A1/A2 B1/B2	2)Haor Area (ha) (source:JICA team)	3)Haor Area Population (source:JICA team)	4)Inundation in 1998		5)Porverty Incidence (%) (source:RLCS)	6)Village Density Nos. of Popul. Village Village (capita) (source:JICA team)	7)Existing Shelter (no.) (source:JICA team)	8)Infra. dev't level (source:JICA team)	9)Village Mound Desity				Overall Rank Total a
				Affected Population (%) (source:JICA team)	Inundated Period (month) (source:JICA team)					(no.)	(ha)	popu. no.	popu. km ²	
36. Habiganj District		139,389	773,227	333,424 (43)			753 1,027	37		1,068 2,405 724 32,157				
02 Ajmiriganj	A1/A2 a	22,399 a	101,744 b	60,029 (59) a	2.86 a	(78) a	111 917 b	9 a	38 a	211 495 482 20,556 a		8		
05 Bahubal	A1 b	5,915 b	28,596 b	12,296 (43) b	1.16 b		56 511 b	2 b	22 b	75 213 381 13,408 a		1		
11 Baniachang	A1 b	42,957 a	202,586 a	111,422 (55) a	1.39 b	(50) a	244 830 b	4 b	36 a	265 568 764 35,654 b		5		
44 Habiganj Sadar	A1 b	13,586 b	90,750 b	39,022 (43) b	1.16 b		89 1,020 a	6 a	35 a	120 400 756 22,696 b		3		
68 Lakhai	A1/A2 a	19,655 b	134,742 a	29,643 (22) b	0.90 b	(43) a	63 2,139 a	4 b	37 a	193 365 698 36,871 b		5		
71 Madhabpur	A1 b	10,861 b	101,243 b	43,534 (43) b	1.16 b		65 1,558 a	3 b	35 a	17 37 5,955 270,451 b		2		
77 Nabiganj	A1 b	24,016 a	113,567 b	37,477 (33) b	2.10 a	(45) a	125 909 b	9 a	36 a	187 325 607 34,903 b		5		
48. Kishoreganj District		169,377	1,230,321	530,123 (43)			852 1,444	40		942 1,948 1,306 63,161				
02 Austagram	A2 b	35,555 a	167,704 a	114,039 (68) a	4.27 a	(47) a	74 2,266 a	5 a	25 b	90 753 1,863 22,279 b		7		
06 Bajitpur	A1/A2 a	14,463 b	153,786 a	93,809 (61) a	0.86 b	(33) b	121 1,271 a	3 b	37 a	84 101 1,831 152,000 b		5		
33 Itna	A1/A2 a	40,195 a	154,901 a	20,137 (13) b	0.97 b	(36) b	118 1,313 a	4 b	34 a	270 324 574 47,844 b		5		
42 Karimganj	A1 b	20,051 a	281,529 a	118,242 (42) b	1.01 b		184 1,530 a	4 b	39 a	50 94 5,631 299,848 b		4		
49 Kishoreganj Sadar	A1 b	7,361 b	117,929 b	49,530 (42) b	1.01 b		64 1,843 a	0 b	32 a	120 202 983 58,279 b		2		
59 Mithamain	A2 b	22,292 a	141,788 a	28,358 (20) b	0.88 b	(41) a	129 1,099 a	19 a	27 b	80 142 1,772 100,101 b		5		
76 Nikli	A1/A2 a	21,168 a	124,100 a	91,834 (74) a	5.00 a	(51) a	119 1,043 a	3 b	36 a	128 202 970 61,330 b		8		
92 Tarail	A1 b	8,291 b	88,585 b	14,174 (16) b	1.33 b	(37) b	43 2,060 a	2 b	30 b	120 130 738 68,143 b		1		
72. Netrokona District		70,122	271,563	161,167 (59)			288 943	14		523 882 519 30,781				
38 Khaliajuri	A2 b	29,764 a	83,649 b	83,649 (100) a	2.26 a	(29) b	66 1,267 a	2 b	25 b	181 405 462 20,669 a		5		
40 Kalmakanda	A1 b	12,870 b	63,992 b	37,116 (58) a	2.55 a		97 660 b	3 b	37 a	164 265 390 24,104 a		4		
56 Madan	A1/A2 a	13,131 b	61,208 b	14,690 (24) b	3.54 a	(48) a	54 1,133 a	5 a	30 b	53 86 1,155 71,341 b		5		
63 Mohanganj	A1 b	14,357 b	62,714 b	25,713 (41) b	1.57 b	(35) b	71 883 b	4 b	31 a	125 126 502 49,668 b		1		
90. Sunamganj District		271,305	1,201,929	545,681 (45)			1,629 738	66		2,218 5,310 542 22,635				
18 Bishwambarpur	A1/B1/B2 b	11,057 b	56,936 b	25,052 (44) b	1.13 b		86 662 b	3 b	28 b	200 643 285 8,848 a		1		
23 Chhatak	B1 b	22,663 a	128,939 a	56,733 (44) b	2.20 a		203 635 b	9 a	25 b	497 1,144 259 11,270 a		5		
29 Derai	A1/A2 a	42,094 a	207,114 a	111,841 (54) a	3.94 a	(48) a	233 889 b	8 a	26 b	307 609 675 34,027 b		7		
32 Dharampasha	A1/A2/B2 a	47,342 a	158,774 a	74,624 (47) b	3.48 a	(46) a	274 579 b	6 a	32 a	193 391 823 40,655 b		7		
33 Dowarabazar	B1 b	5,076 b	28,568 b	12,570 (44) b	1.13 b		47 608 b	6 a	22 b	202 801 141 3,565 a		2		
47 Jagannathpur	A1 b	18,992 b	76,507 b	33,663 (44) b	2.20 a		107 715 b	9 a	26 b	147 488 520 15,688 a		3		
50 Jamalganj	A1/A2/B2 a	33,876 a	123,115 a	54,171 (44) b	2.34 a	(34) b	165 746 b	6 a	25 b	147 263 838 46,874 b		5		
86 Sulla	A2 b	26,073 a	113,680 b	37,514 (33) b	3.35 a	(40) a	114 997 b	4 b	27 b	232 376 490 30,269 a		4		
89 Sunamganj Sadar	A1/B1/B2 b	40,149 a	211,750 a	93,170 (44) b	2.20 a		255 830 b	9 a	33 a	67 149 3,160 142,181 b		5		
92 Tahirpur	A2/B1/B2 b	23,982 a	96,548 b	46,343 (48) b	1.13 b	(41) a	145 666 b	6 a	30 b	226 447 427 21,590 a		4		
Total		650,192	3,477,041	1,570,394			3,522	157		4,751 10,545				
Average		22,420	119,898	(45)	2.0	(43)	987	5	31	732 32,974				
A: Shallow Haor		20,000 <a	120,000 <a	50% <a	2months <a	% of population with annual HH income below Tk. 20,000	1,000 <a	5 <a	30 <a	both densities of popu./mound and popu./km are below				
B: Deep Haor		20,000 >b	120,000 >b	50% >b	2months >b		1,000 >b	5 >b	30 >b	730 and 33,000 respectively =a, if not = b				
1: Land Transport dominant		A1: b	B1/B2: b	A1/A2/B2: a										
2: Water Transport dominant		A2: b	A1/B1: b	A1/B1/B2: b										
		B1: b	A1/B2: b	A2/B1/B2: b										
		A1/A2: a	A2/B2: b											

6-7

6.1.3 Model Projects

(1) Procedure for selecting grams for model project planning

The objective grams for formulating model projects will be selected from the priority Upazilas identified for Char and Haor, in Subsection 6.1.2. The grams will be selected according to the following steps considering the cost-effectiveness structural measures and chance of successful flood-proofing and livelihood development in line with the basic strategy presented in Section 5.2.

1) Step 1: Preliminary selection of grams

Candidate grams for model project formulation are preliminarily selected based on the Upazila base maps prepared by LGED and population census data by BBS. The scale of gram will not be much smaller than the average size to ensure demonstration effects and replicability. The following are reference data for the average size.

	Average area (ha)	Average population
Char gram	300	1,800
Haor gram	180	1,000

Candidate grams are selected as shown below.

JL.	Name of Gram	Area (ha)	Total (H/H)	Population (nos.)	Density pop./km ²
Char area	Fulchhari UZ				
	Erendabari Union	6,540	3,450	22,494	344
	Algar char	821	507	3,297	402
	Dakatiar char	389	332	2,095	539
	Vatia char	240	152	1,019	425
	Char harichandi	188	155	1,114	592
Haor area	Nikli UZ				
	Gurai Union	2,308	4,736	24,744	1,072
	Gurai Moja	1,642	2,444	12,748	776
	Gurai	-	1,270	6,428	-
	Chetra	-	501	2,634	-
	Daulatpur	-	673	3,686	-

Source: JICA Study Team based on Population Census 1991, BBS.

2) Step 2: Final selection of villages

Most important criteria are the willingness of people to participate and help themselves for flood proofing and livelihood development, and sound and positive political will to help people.

Due to the limitation of the available data and information concerning the above and also taking

fully the applicability of experienced approaches, however, it is noted that the following criteria has been designed and shall be applied under the present study.

Any model project will be implemented in an area where the chance of the successful flood-proofing is high. In other words, model project areas should not have serious constraints to rural development. With this in view, the following criteria are applied. Villages for the model project planning are finally selected through a field survey.

Type of village to be given priority

- History: Older villages
- Community activities: Villages that have active community organizations
- Access to resources: Villages that have larger agricultural area per capita, more fish ponds, easier access to market, and easier access to Union Parishad
- Past flood damages: Villages that have experienced more serious damages (e.g., number of houses destroyed, number of evacuees, etc.)
- Sheltering place: Villages that have sheltering places

Older villages tend to be more settled and established, and thus the villagers are likely to be more motivated to protect and further enhance their social and livelihood activities. This may also be reflected in the presence of more active community organizations.

Easier access to production resources such as farmland is a key factor for successful livelihood development. With the provision of reasonable flood-proofing, the chance is higher for those with easier access to resources to develop their livelihood activities and increase their income levels to allow continued efforts for further flood-proofing. Larger damages by floods in the recent past would give a stronger incentive for the local people to provide flood mitigation measures. The presence of sheltering places would make flood evacuation practice more effective at smaller costs. Other conditions are also reflected in the selection as noted through the field survey such as security problems and local politics.

For each selection criterion, those grams that have particularly favorable conditions are noted. Also, those with particularly unfavorable conditions are noted, if any, for any criterion. The results are summarized in the table below.

Gram	Char (Erendabari, Fulchhari Upazila)				Haor (Gurai, Nikli Upazila)		
	Algar Char	Dakatiar Char	Vatia Char	Char Harichandi	Chetra	Gurai	Daulatpur
1. History of gram	+					+	
2. Community activities		+			+	+	
3. Resources							
- Farm land (ha/person)			+		+	+	
- Fish pond (nos., ha)	+					+	
- Access to market (hours)				+		+	
- Access to Union Parishad (hours)	+					+	
- Richness of vegetation	+	+					
4. Past flood damages							
1) 1989 damaged house nos. of evacuees	+		+			+	
2) 1999 damaged house nos. of evacuees	+		+		+		
5. Sheltering Place	+			+		+	
6. Security (Crimes)				-			-
Score (Total)	9+	2+	3+	2+	5+	9+	1-

As seen from the table, two grams, one each in Char and Haor, have favorable conditions by the largest number of criteria. Two grams are found to have serious security problems. Finally, Algar Char gram in Erendabari Union, Fulchhari Upazila, Gaibandha District and Gurai gram in Gurai Union, Nikli Upazila, Kishoreganj District have been selected for the model project formulation for Char and Haor, respectively.

Social constraints in the Study Area include poor community activities, hierarchical social system and to some extent political unrest. However, the selected grams have comparatively less social constraints judging from the following perspectives.

Algar Char gram

Generally in the Algar Char gram people are rather cooperative. When they have any disaster, they face it together. For example, boats are very scarce in the gram, but when there is a need of evacuation during the flood, the Matabbars who own boats invite other people to use their boats for evacuation.

In the Algar Char gram, each Para is named after the name of Matabbar or names of their forefathers. Traditionally, Matabbars play an important role in any social event. In any crisis, people act all together conducted by the Matabbars. In this way, evacuation during the flood, repairing of roads, facing epidemic are tackled in common.

It has been observed that people are very cooperative in any activities that is good for the gram. In this regard, CARE projects are the best example. People are organized and participating enthusiastically in all project activities.

Gurai gram

During the occasions of field visits and discussions with the people of the gram, it has been observed that friendly relationship between major political parties is very notable. For the development of their gram they work together despite of their political differences.

As the Gurai gram is very vulnerable to the waves, people are accustomed to organize within a short notice and make all efforts to protect any part of the village that becomes under the threat of waves. It has been seen that existing protection wall covering only about 200 m was damaged by the waves, however, people repaired it by themselves.

Existing development work of local Bazaar is also another example regarding people's participation and cooperation of the gurai people. In the Bazaar development project, huge earth work for pond and mound raising, shed and protection wall construction have mainly done by the active participation of the Gurai people.

Moreover, crime rate in both Grams is very low.

(2) Prioritization for other villages

A set of five broad criteria and 13 specific criteria were used to select grams for model project formulation. The five broad criteria and also the security criterion may be generally applicable to the prioritization of other villages for subsequent project formulation and implementation. Specific criteria, however, need to be derived through field surveys.

The PRA would naturally reveal in its process the willingness of people and adverse interventions among others.

NGOs may be mobilized to conduct the PRA to clarify existing conditions including community activities and flood-related conditions, villagers' aspiration for livelihood development, access to various resources and constraints as perceived by villagers.

The procedure for prioritisation of villages for subsequent project formulation and implementation may be as follows.

- 1) Preselection of project villages jointly by LGED and NGOs,
- 2) Identification of lead NGOs for the selected project villages respectively,
- 3) Conduct of the PRA by the lead NGOs,
- 4) Establishment of prioritisation criteria based on the PRA results, and
- 5) Priority assessment for the selected villages.

6.1.4 Operations Plan

The model projects as formulated should not be taken as a gift for villagers, but rather provide the basis for discussion to elicit their ideas. Therefore, the LGED Upazila officer should take the initiative to conduct a series of community workshops by mobilizing local or international NGOs having good track records for rural development in Bangladesh. At these workshops, the model projects as formulated would be presented first, emphasizing their concepts and expected outcomes. Another important function of these initial workshops is to identify all the stakeholders to be involved in project implementation, including traditional community leaders, matabbars, local politicians, village committee representatives and concerned aid organizations as well as local people. All the issues involved in the implementation of model projects would be identified through discussions.

To be clarified also at the workshops are division of responsibilities among stakeholders in general and contribution of resources in kind and in cash by them. In particular, the local people should be made aware of costs involved in the project and their sharing expected in the project implementation and management. Some project components may be modified in accordance with ability and willingness to share costs by the local people.

Implementation of the model projects would start upon successful people organizing through detailed planning for the structural/physical measures, the flood warning and evacuation system, and the saving and credit scheme. The latter would include the preparation and submission of initial proposals for new livelihood activities by local people supported by NGOs, extension workers or community leaders. Operation and management of the flood warning and evacuation system and the saving and credit system may be modified through initial implementation. The model projects will be monitored by LGED, organized people and NGOs. To check the progress of model projects and to discuss and resolve on modifications, a project management office (PMO), a centrally based institution to promote local interests, should be established. Under the PMO, Project Implementation Unit (PIU) will be organized by the participation of representatives of all the stakeholders (Subsection 6.3.3).

The outline of operations plan for the projects is shown in Figure 6.1, assuming its commencement in a dry season. Main activities are i) formation of consensus on the model projects, ii) administrative procedures, iii) institutionalization, iv) design work, v) construction by LGED with participation of local communities for earthwork, etc., vi) supporting activities for livelihood development, vii) O&M (operation and maintenance) to be conducted by villagers under the guidance of PMO and viii) monitoring and evaluation activities, and ix) commencement of replication processes.

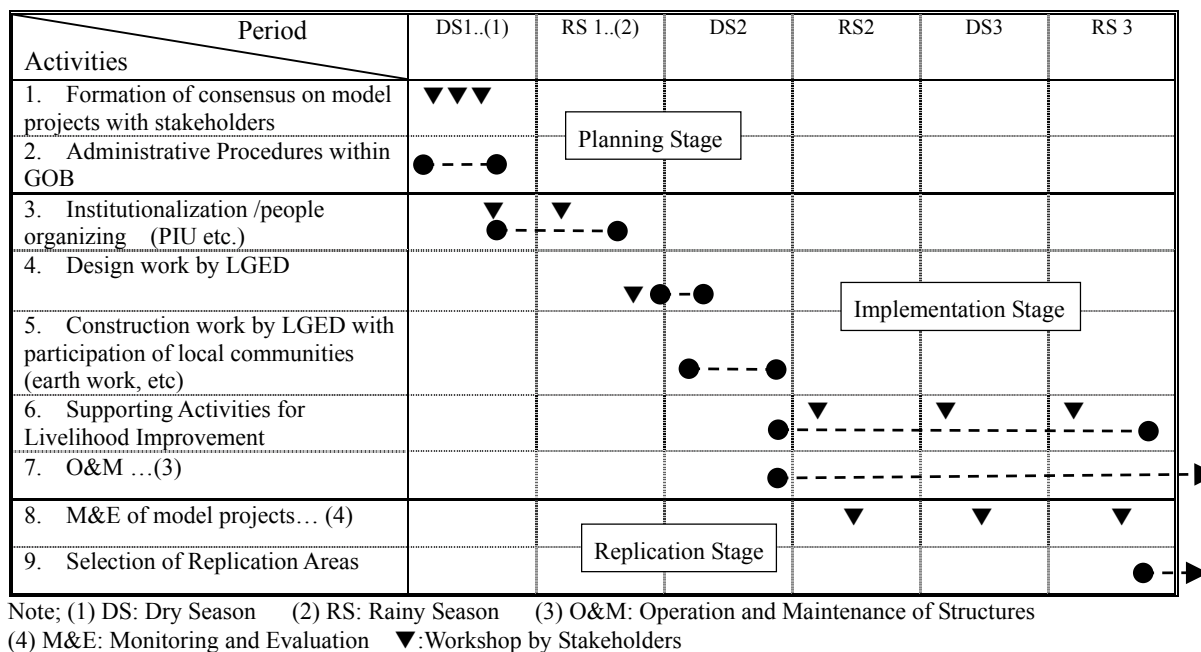


Figure 6.1 Typical Operations Plan

As shown in the figure, typical project period will be three years including the preparatory works. Construction period will be within one dry season and preparatory works should start at least one year in advance. These factors, however, will be modified, if necessary, based on the achievement of the model projects including reactions/responses from stakeholders.

6.2 Long-term Development Direction

As is described in previous sections, the model projects are inter-agency projects involving components in multiple sectors. Project implementation would be replicated in other areas, applying in principle the same form of implementing arrangements as modified by feeding back monitored results to fit also to specific local conditions of different project areas. Once the coordinating mechanism among sector-wise implementing agencies is well established, and the numbers of replicated projects have increased to some extent, planning and implementation of various project components may be more effectively and efficiently carried out under the management of respective sector agencies rather than being managed exclusively by LGED. Effectiveness of these projects would be enhanced if the projects are implemented under the flood-proof conditions brought about by the proposed rural development projects as discussed in Subsection 5.3.3. Furthermore, effectiveness of livelihood development may be enhanced by these complementary projects, and vice versa.

6.2.1 Program Approach

In line with the above, to indicate a direction of long-term development involving various project components and related projects in other sectors, 11 long-term development programs are defined. Each program gives the direction to pursue and the scope of work to be covered in respective sector in order to attain the development objectives in the long run for the entire Study Area. These long-term development programs are as follows, corresponding to the four development objectives defined in Subsection 5.1.3.

Protection of human lives and household properties - Objective (1)

1. Flood Proofing Program (1-1)
2. Sheltering System Establishment Program (1-2)

Living environment improvement - Objective (2)

3. Primary Health Care Promotion Program (2-1)
4. Rural Electrification Expansion Program (2-2)

Livelihood development - Objective (3)

5. Communication Activation Program (3-1)
6. Appropriate Farming Technologies Introduction Program (3-2)
7. Community Based Fishery Development and Management Program (3-3)
8. Growth Center Construction Program (3-4)
9. Skill Training Program (3-5)
10. Primary Education Strengthening Program (3-6)

Capacity building - Objective (4)

11. Social Mobilization and Institutional Building Program (4-1)

These long-term development programs are expected to evolve from the model projects and some sector projects to complement the model project implementation as illustrated in Figure 6.2. Only viable forms of project components would be replicated/expanded into the long-term development programs.

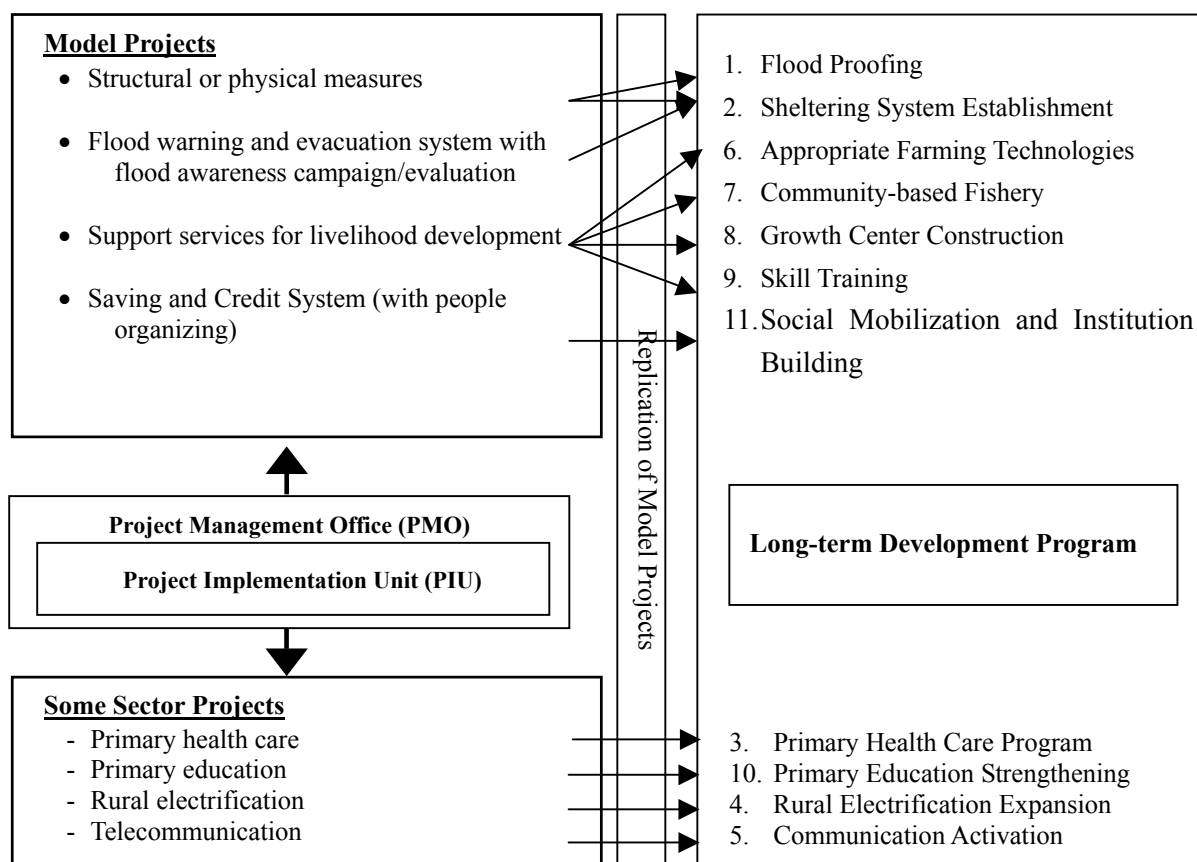


Figure 6.2 Formation Process of Long-term Development Programs

6.2.2 Profiles of Long-term Development Programs

Profiles of the 11 long-term development programs are included in Section 6.5. Each profile defines objectives, expected effects, implementing agencies, and project features and components. In general, implementation of these long-term development programs would be subject to the following conditions:

- Successful implementation of the model projects and their replications covering different types of Char and Haor areas identified for priority implementation by the procedure described in Subsection 6.1.4,
- Establishment of viable saving and credit system or the like with proven performance records in priority areas, and
- Establishment of a management organization for each of project areas and local support base with organized people.

6.2.3 Problems and Countermeasures

As is described in previous sections, the model projects and long-term development programs are defined, corresponding to the four development objectives and the four basic strategies which are based on the analyses of problems and constraints in Chapter 4.

Thus, the model project and long-term development programs are set that can be settled the problems and constraints in the Study Area as much as practicable.

Problem structure and countermeasures are illustrated in Figure 6.3, and problems and countermeasures are shown in Table 6.3.

Table 6.3 Problems and Countermeasures

Problems	Countermeasures		
	Long-term development programs	Model projects	
		Algar char gram	Gurai gram
<ul style="list-style-type: none"> • Disruption of livelihood and uneasy life • Large damages/losses by flooding 	• Flood Proofing Program	• Homestead raising	• Mound protection
<ul style="list-style-type: none"> • Limited information on floods • Large damages/losses by flooding 	• Sheltering System Establishment Program	<ul style="list-style-type: none"> • Sheltering place by raising school ground • Approach road to sheltering place • Flood warning and evacuation 	• Flood warning and evacuation
<ul style="list-style-type: none"> • Low level of health service • Malnutrition and prevalence of diseases • Reduced working time and large health expenditure 	• Primary Health Care Promotion Program	<ul style="list-style-type: none"> • Raised hand tubewell • Home gardening promotion with nutrition education 	<ul style="list-style-type: none"> • Raised hand tubewell • Home gardening promotion with nutrition education
<ul style="list-style-type: none"> • Insufficient opportunities for income generation • Low skill levels 	• Skill Training Program	• Support services for livelihood development	• Support services for livelihood development
<ul style="list-style-type: none"> • Lack of motivation for improving living environment and livelihood • Poor community activities • Lack of community based alternatives for flood mitigation measures and livelihood development 	• Social Mobilization and Institutional Building Program	<ul style="list-style-type: none"> • Establishment of para committee • Appropriate facilitation by NGOs and LGED 	<ul style="list-style-type: none"> • Establishment of para committee • Appropriate facilitation by NGOs and LGED
<ul style="list-style-type: none"> • Low levels of economic activities and productivity • Malnutrition and prevalence of diseases • Limited information on marketing • Difficulty in marketing and input procurement • Poor support services (extension) 	<ul style="list-style-type: none"> • Appropriate Farming Technologies Introduction Program • Community Based Fishery Development and Management Program 	<ul style="list-style-type: none"> • Livelihood development <ul style="list-style-type: none"> - Poultry promotion - Skill training on hand weaving - Mulberry plantation and cocoon production 	<ul style="list-style-type: none"> • Livelihood development <ul style="list-style-type: none"> - Poultry promotion - Nursery development for social forestry - Technical training on fish culture - Training on entrepreneurship and business management
• Poor support services (credit)	[Expanding savings and credit scheme]	• Savings and credit scheme	• Savings and credit scheme
• Low levels of economic activities and productivity	• Rural Electrification Expansion Program	—	[Gram is electrified]
• Inadequate communication infrastructure (road, launch ghat, etc.)	• Communication Activation Program	[1 km to Union Parishad]	[Union Parishad in gram]
• Low levels of economic activities and productivity	• Growth Center Construction Program	[Existence of Bazaar in gram]	[Existence of Growth Center in gram]
<ul style="list-style-type: none"> • Low level of education • Low literacy rates 	• Primary Education Strengthening	[Existence of 2 primary schools, 1 secondary girls' school and 1 madrasa]	[Existence of 5 primary schools and 2 madrasa]
• Insufficient attention/interests by NGOs	[Assurance of flood proofing serve incentives for NGOs]	<ul style="list-style-type: none"> [5 NGOs active in gram] [LGED addresses NGOs to participate in Project] 	<ul style="list-style-type: none"> [2 NGOs active in gram] [LGED addresses NGOs to participate in Project]
<ul style="list-style-type: none"> • Land conflicts and insecure land ownership • Land lord-tenancy relationship 	[Project will be formulated for area without serious land conflict]	[No serious land conflict and less crime rate so far]	[No serious land conflict and less crime rate so far]
• Lack of social cohesiveness	[Projects will be formulated for area without feudal oppression]	[Existence of Matabbars of high reputation]	<ul style="list-style-type: none"> [Existence of Matabbars of high reputation] [Villagers tackle the problems of wave action by indigenous means]

[]: Some factors to minimize problems

6.3 Institutional Measures

The bulk of projects and related measures proposed by the Master Plan may be further planned in more detail and/or implemented within the existing institutions. To facilitate coordinated project planning and implementation and to enhance effectiveness of projects/measures, however, some aspects of the existing institutions are expected to be modified/reformed. In this section, key issues involved in the reform of the existing institutions are identified, as related to the rural development and the flood-proofing, strategy for institutional reforms established, and proposed measures to facilitate the implementation of the rural development with flood-proofing recommended. Local administrative reforms undertaken at the national level are briefly mentioned, as they would affect the medium to long-term implementation of the Master Plan.

6.3.1 Key Institutional Issues

Institutional issues associated with rural development in Bangladesh are identified through case studies (Section 3.11) as well as discussions with government officials, NGOs and others. Key issues are described.

(1) Inconsistent decentralization policy

Despite various measures introduced for decentralization since the colonial times, constant changes imposed by the Central Government on local government institutions (LGIs) in the past decades have undermined the credibility of the decentralization policy, resulting in weak organizations for rural development.

(2) Intervention of political interests in local governance

The structure of local governance with multiple tiers has not been well established due to intervention of political interests. While Gram (village) Parishad is legislative, it does not reflect village people's intentions as development related information at the village level is monopolized by rural elites. Union Parishad has no fiscal autonomy and depends on development grants from the Government. Upazila Parishad faces political opposition, although a modified Upazila system has been passed. Of the four tiers of local government institutions, only Union Parishad is active. Gram and Zila (district) Parishads Acts have been passed, but no election has been held.

(3) Limited administrative and financial capacities of local governments

Even Zila and Upazila (Thana) Parishads depend heavily on the Central Government grants. Union Parishad has limited sources of revenue, which barely covers wages and salaries of staff, and relies on government grants for development expenditures. Zila Parishad spends 20-30% of its own revenue on administrative costs. Most donor funding is provided centrally, although there have been recent attempts to ensure disbursement through LGIs.

There has been no major change in the total amount of subsidies from the Central Government to

local governments in terms of subsidies for development of local areas and salaries for executive officers of local governments at the Upazila level. In the Ershad period, more executive officers of Upazila were employed to strengthen Upazila administration. As a result, a significant change occurred in the ratio between development expenditure and salaries for executive officers, and Upazila's finance was much stressed. During the 1980's and 1990's, annual expenditure of Upazila decreased while that of the Central Government doubled. In addition, the portion of development expenditure including general administrative expenditure in annual expenditure of Upazila shrank from some 50% to a 30% level, further squeezing development expenditure of Upazila. It is clear that the actual decrease in the total amount of subsidies and development expenditure in Upazila in the 1980's and 1990's was due to the government policy of administrative devolution. On the other hand, subsidies from Union to Upazila were used for ordinary expenditure including payments for Union Parishad members and small development expenditure. The amount of these subsidies was about Tk90,000 per year in the 1980's and Tk50,000 in the 1990's. The levy of Union taxes was based on the agreement of Union Parishad members. Differential taxes depending on the socio-economic standing were applied: for example, Tk15 per year from the rickshaw puller household, and Tk50 per year from the middle and upper class farmer. The tax revenue, which amounts to 0.1-0.2% of the total income of Union, is incorporated into the general account of Union, and used to compensate Union Parishad members.

Local governments have very limited human resources. According to the FFYP, DPHE and LGED are required to provide technical support to LGIs, but constrained by limited financial and human capacities.

(4) Poor quality of public services

Operating principles of LGIs have made them mere local branches of the Central Government. This has resulted not only in poor quality of public services in rural areas but also in inequitable distribution of development projects and public services delivery, affected by interests of political parties and rural elites.

Most village people, for example, do not know the agricultural extension workers though villagers need their services. The visiting schedule of agricultural extension workers is often not announced to the village people in advance. There is no office of agricultural extension at the union level. The lack of information regarding administrative services is a common problem.

(5) Limited beneficiary participation

At present, Union Parishad decides its development plan only by its members without local participation. Gram Parishad has been legislative, but village people's ideas and intentions are not reflected in its development plan as relevant information is monopolized by rural elites constituting Union Parishad. Also various information related to development projects as well as flood warning do not reach the village level.

In the Study Area, additional institutional issues are identified as follows.

(6) Poor coverage by various government services

Char and Haor villages in the Study Area are poorly covered by various government services. According to the results of the social survey, government services in the Study Area focus mainly on health and family planning, education, and relief and rehabilitation, followed by credit programs and agricultural extension. Coverage of villages is very limited for forestry and horticulture, fishery, livestock and poultry, social welfare, and cooperatives. Moreover, service delivery tends to be biased for specific groups. Service information of local governments seldom reaches village people.

(7) Small-scale development projects dominated by influential persons

Union Parishad is in charge of implementing small-scale projects such as rural roads and irrigation with its own budget. The planning of these projects, however, is controlled by influential officers and other individuals.

Every Union receives a grant in kind (wheat) called Test Relief (TR) from its Upazila to install or repair small-scale public facilities in the Union. In general, the amount of TR is determined by the population size and valued at Tk40,000-50,000. However, it falls short of the need of any Union. Besides, TR delivered to Union may not be properly used. Moreover, Union Parishad is not obligated to submit a development plan in advance to Upazila office. Union Parishad members decide on the use of TR generally without the knowledge of the village people. Upazila officers visit Union to check the use of delivered wheat later. However, they do not investigate whether or not the relief was actually used for the purported purposes since they are not familiar with the local situation. Unless the situation is improved, mere increase of TR would be fruitless.

(8) Limited NGO support

NGO support for villages is particularly limited in the Study Area due to the characteristic unstable livelihood of Char and Haor. NGO activities for flood-proofing in the Study Area are carried out mostly by CARE and CONCERN in Haor areas and CARE and RDRS in Char areas.

(9) Inactive village organizations

Cooperative movements are virtually lacking in the Study Area without farmers', the asset-less and women's cooperatives in villages covered by the survey on village organizations. School committees exist in almost all the villages surveyed, but most of them are inactive.

As mentioned previously, local government organization is very weak in terms of human and other resources and finance. Currently, local government administration is divided into Region, District, Upazila, Union, and Gram, and formal administrative services only exists at the Upazila level. No Gram Parishad exists though a law to establish it has already passed. Accordingly, there is neither

system for handling complaints, requests and opinions from local residents nor system for disseminating public information to them under the current Gram administrative organization. Therefore, the local people are isolated from administrative services and government development plans. The local development fund only reflects the intention of Union Parishad and some rural elites, with no input or feedback from village people taken into consideration at present.

6.3.2 Institutional strategy

Of the key institutional issues identified above, some would call for actions at the central level for resolution. These actions may be taken as part of the ongoing administrative reforms carried out by the Government for further decentralization. In particular, the following are conceived already and expected to be realized under the consistent decentralization policy:

- Decentralization of budget administration to the Upazila level, and
- Institutionalization of local participation at the Gram level.

These measures would take time to become effective. In the meantime, complementary measures that could be taken locally are conceived under the institutional strategy for rural development with flood-proofing. The strategy aims at enhancing the capacities of local people to pursue development on their own through participation in development planning and implementation. This strategy would be supported by several components as follows.

People organizing

While institutionalization of local participation at the Gram level takes time, local participation could be effected on a project-wise basis. The rural development with flood-proofing would present opportunities for village people to participate first in planning for flood mitigation and livelihood development. For the village people to act against various political and other impediments, they need to be organized for concerted actions. People organizing would be supported by NGOs, village organizations, and local government institutions (LGIs) as follows.

NGO support

NGO support for village people is limited at present particularly in the Study Area due to unstable and transient characteristics of Char and Haor livelihood. Once a certain level of flood-proofing is assured, NGOs would be willing to apply their knowledge and experiences to encourage village people to take on activities for the improvement of their livelihood. Moreover, NGOs would utilize planning and implementation of flood-proof measures as opportunities for strengthening people organizing.

Revitalization of village organizations

Cooperative movements in the Study Area are confined to a few activities, such as farmers' cooperatives, school and religious committees and other village organizations. To better utilize

them for the improvement of villagers' life, these activities need to be revitalized and expanded. Supported by the Rural Development and Cooperatives Division of MLGRD&C and other relevant agencies, members of the respective organizations should review and evaluate the activities of the existent local organizations to see if they serve the interests of village people. Based on the review, their functions should be redefined if necessary, and only those organizations deemed most important and promising would be revitalized.

Government support

Local government institutions (LGIs) should support people organizing and project planning with participation by local people. Most LGIs, however, lack sufficient technical and manpower capacities. As stipulated in the current Five Year Plan, DPHE and LGED are required to provide technical support to LGIs. Each agency has offices at the Zila level already. In the longer term, staff of these agencies would be deployed to LGIs, perhaps at the Zila level. During early stages, however, line agency staff would be encouraged to provide technical advice and project management services to LGIs for development projects within the jurisdictions of LGIs. Performance assessment and career prospects of line agency staff are expected to reflect the quality of support that they provide to LGIs.

6.3.3 Implementing Arrangements

(1) Conditions for implementing arrangements

Through the case studies of ongoing rural development projects in Char/Haor areas supported by international aid organizations and NGOs, conditions for successful implementation of such projects have been clarified as follows. First, the basic condition is the establishment/activation of a local implementing body with people's participation. The Village Organization (VO) is often used for the purpose, but for some projects, ad hoc arrangements have been made such as the Local Project Society for the FPP by CARE and the Project Implementation Committee for the Environmental Management Projects by CNRS. These are established as ultimate implementing agencies representing the beneficiary to cultivate the sense of ownership for the respective projects. Therefore, they are placed commonly at the village or smaller para level.

Second, some management functions are placed at a higher level than the village level for coordination of activities by various agencies involved in the project implementation and integration of different project components. Usually, training for the beneficiary is also provided more effectively at this level. The level and functions differ from project to project. Examples are a ward-level organization (Polli Shomaj) with leadership training for the Rural Development Program by BRAC, the Union Coordination Committee with support and coordination for project formulation for the Participatory Rural Development Project by BRDB, and the Community Development Center at Upazila with Samitee support functions for the Rural Development Project by Shapla Neer. For the Haor Rural Development Project by CONCERN Bangladesh, a federation of VOs provides support functions for group formation, management of savings and loan

accounts, and promotion of income-generating activities. For most other projects, a central organization such as the Project Management Office in Dhaka provides these functions through its local offices.

Third, a self-managed credit program is another key condition for successful project implementation. This is more than just cost sharing for project implementation, but instrumental in sustaining project activities. For the South Asia Poverty Alleviation Program, UNDP provided seed capital to establish a fund, but it is expected to be managed and operated by the beneficiary, supported by NGOs, as a revolving fund. Such a program supports income-generating activities of villagers by providing loans and/or finances O&M of project facilities. Savings by the beneficiary are prerequisites for the establishment and operation of such a fund, but to make it revolve, some self-generating mechanism needs to be established. For the Environmental Management Projects by CNRS, villagers raise funds through the sales of seedlings of indigenous trees.

Fourth, income-generating activities are involved directly or indirectly in every project/program. At the minimum, training for income-generating activities is included in most projects, and sometimes micro-credit is provided to support various livelihood and economic activities more directly. Ultimately, such a credit scheme is established by the contribution of the beneficiary with a revolving fund that would be continuously replenished by the income-generating activities of villagers.

As described above, the four conditions need to be satisfied by the implementing arrangements of rural development in flood-prone Char and Haor areas. These are (1) participatory system at the village level, (2) management functions at higher levels, (3) self-managed credit scheme, and (4) income-generating activities. Of these, the conditions (3) and (4) are specified for the model projects in Support service for livelihood development, and Savings and credit scheme. It is proposed that the condition (2) be satisfied at two levels: the central level with the Project Management Office and the local level with the Project Implementation Unit. These and the participatory system are proposed in the subsequent sections.

(2) Participatory system

As the local implementing agency, a para committee should be established. The para committee (PC) is composed in principle of all the households in the project para and instrumental in the entire implementing arrangements from the planning stage through implementation and O&M of the model project. It should be organized by the local initiative but NGOs may facilitate its organizing and functioning. First, the NGO facilitator, in cooperation with LGED, would explain the model projects at the first meeting of PC, clarifying concepts, expected outcomes and participation expected. At the meeting, all the stakeholders and all the issues involved in the project implementation would be identified. Detailed planning would be conducted by a participatory approach through a series of meetings, at which the identified issues would be discussed and resolved and the division of responsibilities among the stakeholders established in

relation to the project components.

Among the issues to be discussed and resolved at PC meetings are O&M arrangements for physical/structural measures, flood warning and evacuation system, and savings and credit scheme, livelihood projects to be supported by the model project and training needs, and cost sharing in cash and in kind for construction works and the establishment of the savings and credit scheme. Issues to be resolved at higher levels would also be identified by PC. Initial proposals for livelihood projects would be prepared and submitted by PC for coordination and evaluation at higher levels.

(3) Project management office (PMO)

A key to effecting the institutional strategy described above is to establish a project management office (PMO). It is a centrally based institution to promote local interests and should have full authority to execute projects. PMO should be established within LGED in Dhaka, and headed by an Executive Engineer or a higher-ranking engineer of LGED, who will act as the Project Director. The Project Director would be assisted by one Executive Engineer, one senior socio-economist, and supporting staff specialized in relevant fields. PMO may be initially supported also by consultants and NGOs to augment its technical and management capacities.

A possible organizational structure with PMO for the implementation of rural flood-proofing development is illustrated in Figure 6.4.

The functions of PMO will include but not be limited to the following:

- Coordinating with concerned ministries and agencies;
- Coordinating with NGOs;
- Preparing an overall implementation plan and annual project budgets;
- Initiating and supervising necessary monitoring and technical investigations;
- Ensuring a smooth transition to operation and maintenance as the works are constructed;
- Transferring skills, for instance, in planning and construction;
- Supervising LGED District Offices in implementation and relating matters; and
- Monitoring and evaluating environmental impact and project benefits.

DOE will assist LGED in carrying out monitoring of environmental impact.

Under close guidance and supervision of PMO, the LGED District offices in the model project areas will be responsible for day-to-day implementation with assistance from LGED Upazila offices. Each district office should be headed by District Executive Engineer who will be assisted by a socio-economist and Upazila engineering staff.

Initial steps for the establishment of PMO for model projects are as follows.

Step	Action	By who
1	Nomination of the PMO Project Director (PD)	LGED
2	Appointment of two senior staff of PMO	LGED, PMO PD
3	Identification of cooperating NGOs	Upazila Office
4	Organization of PMO with supporting staff and NGOs	PMO PD
5	Establishment of People's Organization	NGOs
6	Preparation of a draft implementation program	PMO
7	Conduct of workshops	PMO, NGOs
8	Finalization of the implementation program	PMO
9	Preparation of budget proposals	PMO
10	Approval of budget proposals	MLGRD&C

(4) Project implementation unit

The Project Implementation Unit (PIU) consists of LGED Upazila offices, Upazila office, NGOs, Union Parishad (including Union Coordination Committee), and para committees (PCs). The structure of PIU for the implementation of the rural flood-proofing development is illustrated in Figure 6.4.

The LGED Upazila office is the main promoter of the project implementation under the guidance of LGED District office supported by NGOs and Upazila Office. The LGED Upazila office's main functions for the project implementation are as follows:

- Coordinating with NGOs and Upazila Office according to the guidance of LGED District office;
- Selecting the target paras in cooperation with gram;
- Preparing an implementation plan and project budget of each project;
- Facilitating the establishment of PCs in cooperation with NGOs;
- Explaining the necessity of projects to Union Parishad members and the people in the model project areas;
- Facilitating participatory development of the model project areas in cooperation with NGOs;
- Transferring skills to PCs in planning and construction;
- Training PCs in operation and maintenance after implementation; and
- Coordinating between Union Parishad and PCs.

NGOs' main functions in PIU are as follows:

- Facilitating the establishment of PCs in cooperation with LGED Upazila offices; and

- Providing training and education in each livelihood program for PCs;

Upazila Office’s main function in PIU is as follows:

- Supporting LGED Upazila offices in terms of each division’s speciality and services.

Union Coordination Committee’s main task at PIU is:

- Securing village people’s consent to the model projects and the model project areas in cooperation with LGED Upazila offices.

PCs are basically composed of all the households in para to enhance their sense of ownership. PCs main functions in PIU are as follows:

- Participating in the model projects from the planning stage to the O & M stage;
- Sharing the project costs by providing labor for construction; and
- Serving as the main entity of operation and maintenance after the project implementation.

PC members receive various training and education for O & M and livelihood programs.

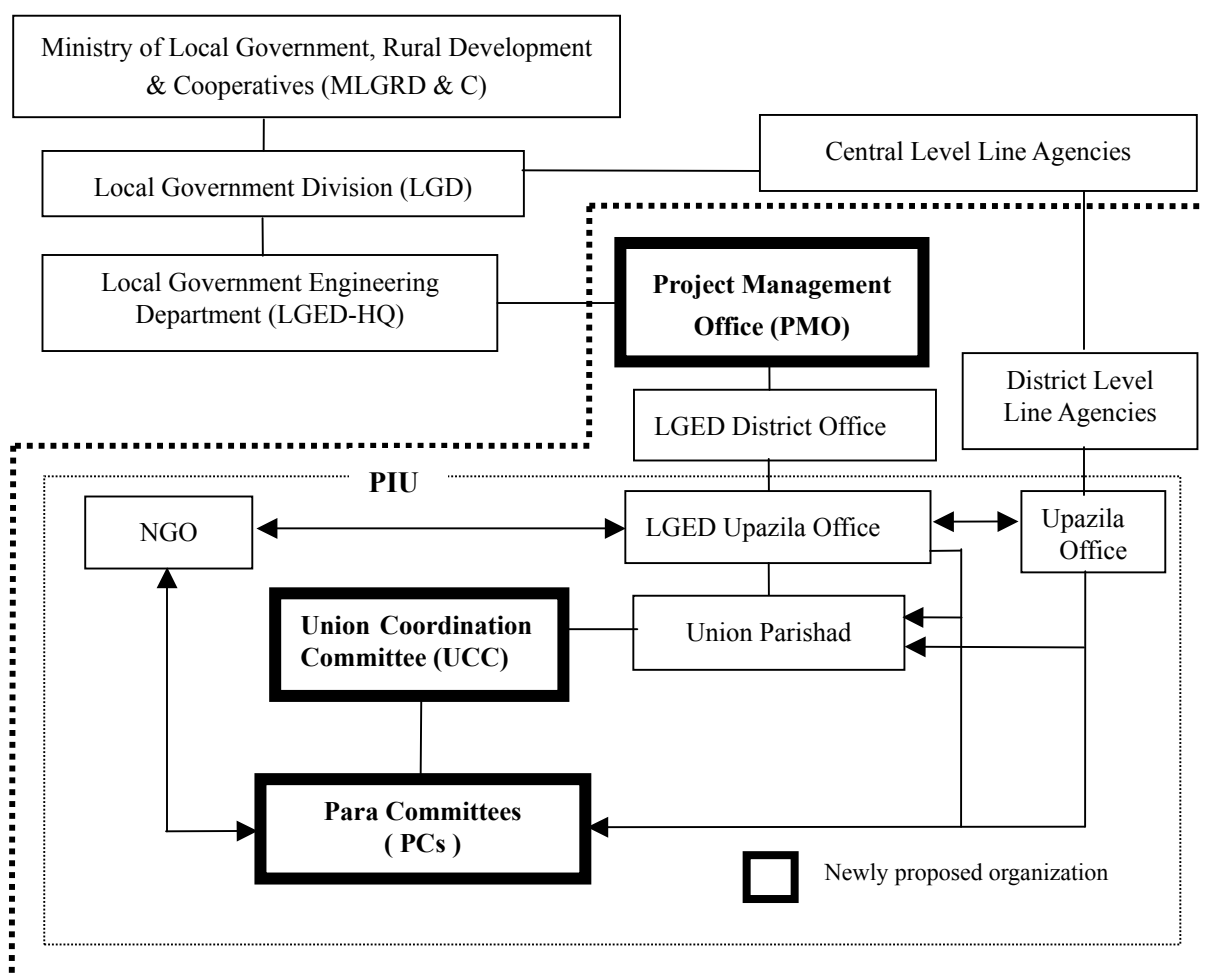


Figure 6.4 Project Implementing Arrangements

6.4 Initial Environmental Examination (IEE)

6.4.1 Objectives, Scope and Procedure of IEE

An initial environmental examination (IEE) has been conducted as part of the Study for Rural Development Focusing on Flood Proofing in Char and Haor areas. Objectives of the IEE in general are:

- to identify the project's key environmental issues,
- to evaluate potentially significant impact,
- to recommend possible mitigation/abatement measures, and
- to formulate a monitoring program for the significant environmental issues.

The project subject to the IEE is broadly defined as the rural development project with flood-proofing in Char and Haor areas of the Study Area. The primary requirement of any IEE is to delineate the geographic boundaries of the "project area" and the "impact area". The project area is the physical location of the project, while the impact area encompasses the geographic extent of any significant environmental and socio-economic impact resulting from implementation of the project. The latter could extend considerably to the outside of the Study Area for the project. For the present IEE, the examination will focus on the area where immediate impact of project activities will be directly felt.

The Study Area encompasses 48 Upazila in eight districts, consisting of 19 Upazila in four districts of Char areas and 29 Upazila in four districts of Haor areas as listed in Table 6.4. A team of experts for the IEE have visited 20 Upazila consisting of nine in Char areas and 11 in Haor areas as shown also in Table 6.4. During the field visits, the team had discussions with local government officials and groups of local people including farmers as well as field observations. Based primarily on information obtained through the field visits, possible effects of the project on different environmental aspects/factors were assessed at a preliminary level. The assessment was made into four classes: A for significant impact, B for slight impact, C for impact unclear/unknown, and D for no possibility of impact. For each environmental aspect/factor, possible effects were differentiated for Char and Haor. For those environmental aspects/factors having some adverse impact foreseen, possible mitigation/abatement measures have been conceived.

Table 6.4 List of the Upazilas within the Study Area

Sl. No.	Name of the District	Name of the Upazila
Char Area		
1	Gaibandha	*Sadar
2		*Fulchari
3		Saghatta
4		Sundarganj
5	Jamalpur	*Dewanganj
6		Islampur
7		Madarganj
8		*Sarishabari
9	Kurigram	Char Rajibpur
10		*Chimari
11		*Kurigram Sadar
12		*Nageshwari
13		Raumari
14		Ulipur
15	Sirajganj	*Belkuchi
16		Chauhali
17		Kazipur
18		Shahjadpur
19		*Sirajganj Sadar
Haor Area		
20	Habiganj	*Ajmariganj
21		Bahubal
22		*Baniachang
23		*Habiganj Sadar
24		Lakhai
25		Madhabpur
26		Nabiganj
27	Kishoreganj	Austagram
28		*Bajitpur
29		Bhairab
30		Itna
31		Karimganj
32		*Mithamain
33		Nikli
34		*Tarail
35	Netrokona	Atpara
36		*Barhatta
37		Khaliajuri
38		Kalmakanda
39		*Madan
40		Mohanganj
41	Sunamganj	Bishwambarpur
42		*Derai
43		Dharampasha
44		Jagannathpur
45		*Jamalganj
46		Sulla
47		*Sunamganj Sadar
48		Tahirpur

*: Visited by the IEE team of the JICA Study Team.

6.4.2 Summary of IEE

Results of the IEE are summarized in Table 6.5. Only those environmental aspects/factors having possible adverse effects in either Char or Haor areas are included in the table, together with mitigation measures.

As seen from Table 6.5, the most significant impact is foreseen as the deterioration of soil fertility in Char areas. This may be caused by flood-proofing that would prevent nutrient rich silt to deposit and enrich light and low fertility Char soil. Other possible adverse effects include more serious soil erosion in other areas due to changes in water flow patterns caused by flood proofing, increased sedimentation outside the flood-proof areas and water logging, destruction of wetland and peat land by construction of structures, and changes in wetland flora and reduced floral diversity as well as various socio-economic changes.

Table 6.5 Environmental Impact Identification and Mitigation Measures

SL No.	Categories of Environmental Impact	Char Area	Haor Area	Remarks/ Evaluation Basis	Mitigation Measures
1.	Planned Residential Settlement	B	B	Beneficial impact is anticipated to the floating, landless or shifting cultivators.	Careful planning and adequate compensation through the involvement of the local people
2.	Substantial Changes in the Way of Life	B	B	Substantial positive changes in the way of life of the people are anticipated, particularly in the role of women through the implementation of the project through their involvement in different development activities	Appropriate planning and proper monitoring particularly regarding the role of women
3.	Changes in Social and Institutional Structures	B	B	Social and institutional structures will be developed along with improved living standard of people	Need proper attention during establishment or modification of rural organizations
4.	Changes in Existing Institutions and Customs	B	B	Changes in existing institutions and customs are expected due to the involvement of development activities. As a result existing societal and family harmony may be disrupted	Adequate social movement and preparation of social management structure, with monitoring provision
5.	Increased Use of Agrochemicals	B	D	Present use of agrochemical is low in the Study Area. There will be increase in cropping intensity and crop diversification; hence use of agrochemical may increase in the haor area due to project development activities.	Adopt integrated crop management and use of biofertilizer

SL No.	Categories of Environmental Impact	Char Area	Haor Area	Remarks/ Evaluation Basis	Mitigation Measures
6.	Change in vegetation	B	B	Wetland flora is affected by the monoculture practice in the haor area. Floral diversity has been lost by the encroachment in the haor and char area. Also felling of plants in the haor and char areas causes the change in vegetation.	Introduce green manuring crops and proper crop rotation. Proper monitoring for cutting plants and soil protection against erosion with appropriate intervention
7.	Degradation of ecosystems with biological diversity	B	B	Sedimentation, river bank erosion, use of agrochemicals and land use conversion will cause degradation of ecosystem with biodiversity	Water tolerant trees plantation in the haor area, protection of hunting wildlife, use of biofertilizer, protection of erosion
8.	Destruction of wetlands and peat lands	D	B	Special features of wetlands have been destroyed in the haor area due to construction of roads, embankment, etc.	Proper planning should be required for any new construction
9.	Soil erosion	B	B	Water flow will be reduced inside of the embankment/road but will increase in the surrounding area outside, which may wash the soil	Adequate planning, design and monitoring.
10.	Deterioration of soil fertility	A	C	Char soil is light textured, low in plant nutrients; silt from the flood will enrich soil but flood proofing will deprive it. Haor soil is normally rich; flood proofing will decrease silt deposit but little change of soil fertility may occur, which need further study	Maintain soil fertility through use of soil mulch, green manuring crops and adequate planning and monitoring
11.	Devastation or desertification of land	D	B	Flood proofing will increase land productivity inside the project char area. In haor area inside the flood proofing, land productivity will increase but may increase silt deposit outside, which may cause water logging.	Careful planning and adequate design including monitoring
12.	Devastation of hinterland	B	B	Water flow in the surrounding will increase and cause soil erosion	Careful planning and adequate design including monitoring
13.	Inundation and flooding	B	B	Due to heavy rain and flash flood, there may be inundation and flooding within the flood protected area	Careful planning and design with the provision of adequate drainage system including monitoring
14.	Sedimentation	B	B	Sediment deposition will be increased outside, which will cause land level rising and subsequent water logging	Adequate planning, design, implementation and monitoring

6.4.3 Overall Evaluation

It is clear that the flood-proofing would bring some adverse impact on natural and living environments as outlined above. It is also true that complete flood-proofing is not feasible. Any flood-proofing interventions would better aim at protecting and enhancing livelihood of the Study Area by some adequate level of flood-proofing. This level for farmers may be to prevent crop losses due to early and flash floods rather than major flood events. Such minimal flood-proofing interventions would better be combined with improved drainage and irrigation, and some support measures.

As shown in Table 6.5, most adverse effects foreseen would be mitigated through careful planning and adequate compensations. Further project development should incorporate these proposed mitigation measures. As locations and intervention measures are specified through further project development, a comprehensive environmental impact assessment (EIA) needs to be carried out. Some important issues to be addressed during the EIA include (1) involuntary settlement, (2) increase in domestic and other wastes, (3) changes in vegetation, (4) degradation of ecosystem with bio-diversity, (5) negative impact on important flora and fauna, (6) destruction of wetland, (7) soil erosion, (8) changes in hydrological regimes, and (9) sedimentation.

Extensive surveys would need to be carried out as part of the EIA. They should cover (i) water quality for surface water and groundwater (ii) sanitation conditions, (iii) flora and fauna, (iv) soil fertility, (v) fish resources, (vi) health conditions, and others.

6.5 Profiles of Long-term Development Programs

The profiles of the 11 long-term development programs are prepared and compiled as shown in the following pages with implementing agencies, program objectives, expected effects, and project descriptions. These programs are preliminary ones, and they need further study for implementation. The list of the 11 long-term development programs is shown in Table 6.6, and Table 6.7 shows the standard costs of the long-term development programs.

Table 6.6 List of 11 Long-term Development Programs

Long-term Development Programs	Char/Haor
1. Protection of Human Lives	
1-1 Flood Proofing Program	
1-1-1a Raising Plinth of Homestead Area	Char
1-1-2a Clustering Houses on High Platforms	Char
1-1-1b Raising Plinth of Village Mounds with Protection	Haor
1-1-2b Expanding Area of Village Mounds	Haor
1-1-3b Protection Measures against Wave Action	Haor
1-2 Sheltering System Program	
1-2-1 Constructing Multi-purpose Flood Shelter	Char and Haor
1-2-2 Establishing Effective Flood Warning System	Char and Haor
1-2-3 Propagation of Flood Preparedness Awareness	Char and Haor
2. Living Environment Improvement	
2-1 Primary Health Care Promotion Program	
2-1-1 Enhancing Education of Nutrition & Health Care	Char and Haor
2-1-2 Constructing Hand Tube-wells and Community Latrines	Char and Haor
2-1-3 Providing Health Training	Char and Haor
2-2 Rural Electrification Expansion Program	
2-2-1 Extending Electricity Line	Char and Haor
3. Livelihood Development	
3-1 Communication Activation Program	
3-1-1 Strengthening Rural Road Network	Char and Haor
3-1-2 Constructing Pontoon Transport and Submersible Bridges	Char and Haor
3-1-3 Improving Pontoon Launch Ghats	Char and Haor
3-1-4 Provision of Tele/ radio Communication Network	Char and Haor
3-2 Appropriate Farming Technologies Introduction Program	
3-2-1 Introducing Appropriate Farming Technologies	Char and Haor
3-2-2 Constructing Submersible Embankment	Haor
3-3 Community Based Fishery Development and Management Program	
3-3-1 Introducing Fish Farm Technology	Char and Haor
3-3-2 Developing Pilot Fish Farm	Char and Haor
3-4 Growth Center Construction Program	
3-4-1 Constructing Growth Center	Char and Haor
3-4-2 Strengthening Low Income Women's Groups	Char and Haor
3-5 Skill Training Program	
3-5-1 Provision of Skill Training Program	Char and Haor
3-5-2 Provision of Credit for Starting Business	Char and Haor
3-6 Primary Education Strengthening Program	
3-6-1 Reorganizing School Committees/Provision of School Lunch/Monitoring Absentee School Children	Char and Haor
3-6-2 Rehabilitation of School Facilities	Char and Haor
4. Capacity Building	
4.1 Social Mobilization and Institutional Building Program	
4-1-1 Organizing Villagers	Char and Haor
4-1-2 Establishment of Bottom-up Planning System from Village Level to Upazila	Char and Haor

1-1a Flood proofing Program for Char areas

- 1. PROGRAM TITLE:** Flood proofing Program for Char Areas
- 2. LOCATION:** Char Areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:**
- (1) To provide safe living space free from the normal flood; and
 - (2) To encourage multiple use of the flood-proof space.
- 5. EXPECTED EFFECTS:**
- (1) Flood damages on human life, household property are decreased; and
 - (2) Foods, fuels and forage are safely stored.
- 6. PROGRAM DESCRIPTION:**

In Char areas, the inundation of households and the erosion of the Char itself make dwellers more vulnerable to floods, often resulting in the shifting of the households. They may move to a nearby flood free place temporarily till the flood recedes. In case of erosion of their homestead, they may settle in a nearby location waiting indefinitely for the eroded Char to re-emerge. The houses built in the Char use such materials as can be moved easily in time of need. None of the villages in Chars is protected from flooding of any degree nor are from river erosion of the Char itself. River erosion in Chars is as prime a hazard as flood inundation.

The program will provide flood-proofing for a maximum number of people in Char areas by combining raising of plinths in homestead areas and clustering of houses. The raising of plinths aims at securing flood-free homestead area with courtyard during the normal flood, if necessary recouping the earth lost by rainfall and erosion, so that household works and some livelihood activities can be undertaken without being confined to houses for months. The plinth raising would be undertaken only for stable Char areas which have not been affected by flood-induced erosion for at least 20 years. The clustering of houses would increase the number of beneficiaries from the flood-proofing and also enhance the effectiveness of common service facilities such as hand tubewells, latrines, storage for food, fuels and forage, and bio-gas plant.

In consideration with the above, following programs are proposed;

- 1-1-1a Raising plinth of homestead area
1-1-2a Clustering houses on high platforms

Possibility for implementation

In Char areas, the human life, house property, livestock, fowl and so on, have been lost due to flood of Brahmaputra river. The erosion of the Charland due to flood makes dwellers more vulnerable to flood resulting in repeated sifting of living places and make them unable to save their property.

Even though the conditions are cruel, the dwellers have been living with flood for a long period. However, the villager's self-help activities against flood disaster are insufficient and encountered difficulties not only to develop their livelihood but even maintain present living conditions.

The Government of Bangladesh has made good investment in order to protect the mainland by constructing embankments for flood control, drainage and irrigation (FCD/I) projects under the supervision of BWDB. However, the investment for Charland has not been made at all because of less cost-effectiveness.

Using structural measures for flood-proofing, CARE Bangladesh carried out Flood proofing project in Char areas as pilot basis through the year 1996 to 1999. Through these pilot projects, CARE has gained experience through "Try and Error" in the implementation of such as 1) Raising homestead area above flood level, 2) Clustering houses etc. CARE is currently implementing a 5-years Flood proofing Project with modified pilot project in 700 villages of Char areas.

The proposed long-term development Program in this Study is similar with structural measures of CARE project, so that it has a high possibility to become successful.

Priority for implementation

The plinths raising would be undertaken only for stable island Char areas initially. The clustering of houses would be undertaken first for homestead areas on high platforms, followed by those areas protected by the plinth raising.

1-1b Flood proofing Program for Haor area

- 1. PROGRAM TITLE:** Flood proofing Program for Haor
- 2. LOCATION:** Haor Areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:**
 - (1) To mitigate damages of wave actions and
 - (2) To expand safe living space.
- 5. EXPECTED EFFECTS:**
 - (1) Flood damages on human life, household property and homestead mounds, caused by wave actions are decreased; and
 - (2) Storage space for foods, fuels and forage is secured.

6. PROGRAM DESCRIPTION:

Haor areas are deeply flooded during the monsoon months (May-September) with varying depths. Raised platforms of three to six meters in height are constructed on higher lands with homes clustered on them. In earlier days, people had the resources (access to labor time away from paid or other directly productive employment) to undertake the annual earthwork maintenance of their homesteads. Homesteads used to be on average larger and located on higher land than today. The areas had significant coverage of swamp forest, which served to lessen the effect of wave actions.

Now the swamp forest has disappeared due to felling of trees by local people. The villages have come to be composed of small and low homesteads, exposed to wave actions. The people occupying these homesteads are unable to carry out maintenance earthwork due to increasing economic hardship.

The program will provide flood-proofing for a maximum number of people in Haor areas against the normal flood by protecting and expanding village mound areas. Protection methods range from earthworks with or without compaction and turfing to brick or CC blocks. Vegetative protection would better be combined for sustainability of village mounds in the long run.

Under the guidance of LGED, local people would choose proper protection methods and implement protection works by providing voluntary labor with technical supports by LGED. Earthworks with compaction by using clayey alluvial soil would be the minimal measure. Indigenous protection by “Chailla” (Hamatheria Protensa) may be added before the monsoon comes, for more effective protection of windward slopes of village mounds. In case that clayey soil is not available in sufficient quantity, earth filled bags (preferably made of jute) would be laid on top of compacted soil. Revetment works and protection walls by brick or CC blocks would provide more durable protection. These options, however, are more costly, and tend to make the people and the livelihood more vulnerable to large floods, especially if the proper and timely maintenance is

not made. They should not be adopted unless the local people are well organized with sufficient flood awareness for effective maintenance works.

In consideration with the above, following programs are proposed;

1-2-1b Raising plinths of village mounds with protection

- 1) Earth-only protection with vegetation
- 2) Retaining wall of the erosion-affected village mound

1-2-2b Expanding areas of village mounds

1-2-3b Protection measures against wave action

- 1) Establishing a vegetative protection by Hijal and Koroch
- 2) Provision RCC retaining wall

Possibility for implementation

It is said that people has been living in Haor areas since 1600's. In the beginning, the land in this area was covered with rich forest, the wave action, therefore, was not a threat to the villagers. The influx of people into this rich and fertile land had started since the beginning of 1900's. The people started and continued the reckless deforestation and farmland development, so that the Haor areas have reached the present situation. The villagers in this area adapt themselves to live in the severe conditions of inundation and wave action from year to year. However, the villager's self-help preparation against inundation and waves are insufficient and they face financial and laborious difficulties to maintain the mound and house properties.

The Government of Bangladesh has invested to construct protection embankment along the natural flow rivers. However, it has not been very effective because of budget constraint.

As the structural measures for flood-proofing, CARE Bangladesh carried out Flood proofing project in Char areas as pilot basis through the year 1996 to 1999. From these pilot projects, CARE has experienced through "Try and Error" the implementation of 1) Raising homestead above flood level, 2) Protection works of village mound etc. CARE is currently implementing a 5-years Flood proofing Project with modified pilot project in 325 villages of Haor areas.

The proposed long-term development Program in this Study is similar to that of CARE's project, so that it has a high possibility of success.

Priority for implementation

Priority for protection and expansion of village mounds would be given to shallow Haor areas for cost-effectiveness. Improved earth works with compaction and turfing would be the minimal measures, possibly to be combined with earth-filled bags depending on the location and morphology of village mounds and the availability of alluvial clayey soil. At the same time, afforestation with "Hijal" and "Koroch" would be initiated immediately to provide vegetative protection against wave actions in the long run. Communal ownership or use right would be given to villagers for those plantations to motivate them for proper management.

1-2a Sheltering System Establishment Program for Char Area

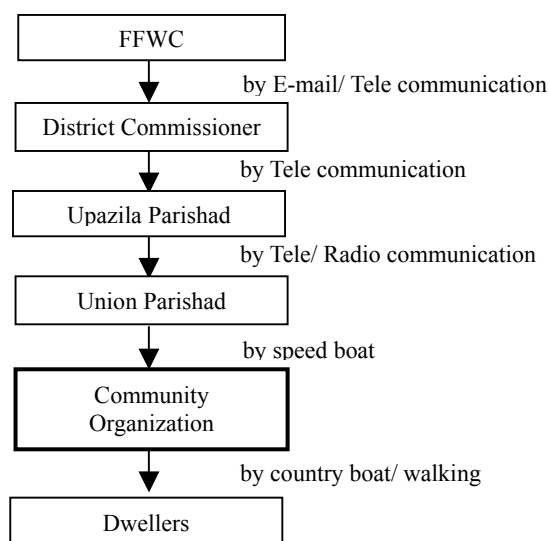
- 1. PROGRAM TITLE:** Sheltering System Program for Char areas
- 2. LOCATION:** Char Areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:** To provide safe life during flood season;
- 5. EXPECTED EFFECTS:**
- (1) The basis of life are secured;
 - (2) Flood damages on human life, household property are decreased; and
 - (3) Safe space of refuge for villagers and their livestock are established;

6. PROGRAM DESCRIPTION:

The severe flood in Char areas occurred in 1998 inflicted tremendous crop damages and property losses as well as 32 cases of human death, while only one or two people die during the normal flood in ordinary year. Large floods come suddenly in case of Char areas through the Brahmaputra river. Shelter facilities, together with warning system and flood awareness are very essential in these areas. While more than 200 flood shelters with a total capacity for about 60,000 refugees have been constructed in the last 20 years, and NGOs like CARE, CONCERN, etc. have been promoting the flood preparedness, a few dwellers in Char areas have been just saved during floods.

The flood evacuation system to be established by the program consists not only of shelter facilities but also of flood forecasting and warning, information and warnings dissemination to the village level, and campaign/education to enhance awareness for flood preparedness. While existing shelter facilities should be utilized to the maximum, new shelters, if they should be constructed, would serve multiple purposes. A refuge platform would accommodate shelter buildings, open-air evacuees, livestock, hand tubewells, latrines and storage for seed grains as well as health care and community facilities. During the normal flood, when homestead areas are not inundated, these platforms could be used for crop drying and other purposes.

BWDB has a Flood Forecasting and Warning Center (FFWC) to disseminate information and warning to the whole flood-prone areas of the Country, but proper information does not reach village people. The forecasting is announced only as a point level prediction, which tends to confuse people. To deliver the flood warning information issued by FFWC properly to villagers, the following channel would be newly established.



To deliver the flood warning information issued by FFWC properly to villagers the following channel has been recommended in the Seminar held in connection with the 3 Pilot UZs.

Flood Forecasting and Warning Project, BWDB, the entire flood prone areas of the country will be brought under Flood Forecasting and warning system by the year 2004. And the dissemination process will further be extended to other UZs in near future. As the project is DANIDA-funded and is already on-going, it can be inferred that the expectation of the Project Director is based on reality and therefore the work is possible and feasible.

The efficiency of the system in the three UZ pilot dissemination programs, as mentioned in Section 3.7.6, however could be tested only in a limited scale due to absence of severe flood in the pilot areas in 2001. Notwithstanding, it is expected that the piloted system of dissemination will be successful in case of a severe flood situation due to increasing availability of mobile networks, telecommunications, village level roads, engine boats etc.

In consideration with the above, following programs are proposed;

- 1-2-1 Constructing multi-purpose flood shelter
- 1-2-2 Establishing effective flood warning system
- 1-2-3 Propagation of flood preparedness awareness

Possibility of implementation

The Table 3.65 in Chapter 3 shows the number of existing flood sheltering facility in the Char area. In Section 3.7.5, it is advocated that the present available shelters are too meager. CARE (Bangladesh) and CONCERN worked in the Char area in providing shelters (with or without schools). In the cyclone prone areas of Bangladesh, many Cyclone shelters have been built and maintained. LGED has already implemented many school cum shelters in the char areas. Therefore it can be said that implementing Shelters under the present Study is possible and feasible.

Priority for implementation

Evacuation planning would be conducted by LGED in cooperation with local people supported by NGOs. Involvement of local people in the planning would serve also for flood awareness enhancement. An evacuation plan would be prepared in relation to location and capacity of existing shelters, and new shelters may be planned as well. Flood awareness training would be provided to selected villagers by mobilizing NGOs to make them change agents for their respective communities.

1-2b Sheltering System Establishment Program for Haor Area

- 1. PROGRAM TITLE:** Sheltering System Program for Haor Areas
- 2. LOCATION:** Haor Areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:** To provide safe life during flood season;
- 5. EXPECTED EFFECTS:**
 - (1) The basis of life are secured;
 - (2) Flood damages on human life, household property are decreased;
 - (3) Safe space of refuge for villagers and their livestock are established

6. PROGRAM DESCRIPTION:

Severe inundation in Haor areas occurred in 1998 inflicted tremendous crop damages and properties losses as well as 58 dead people, while fewer than 10 people died during the normal flood in ordinal year. Considering wave actions as the most serious threat for villages in the areas, refuge facilities and propagation of flood preparedness awareness are very essential in this Area. While more than 150 flood shelters with a total capacity of about 45,000 refugees have been constructed in the last 20 years and NGOs like CARE, CONCERN, etc. have been promoting the flood preparedness, few dwellers in the areas have been secured.

This program is formulated by applying basically the same concept as the previous program (1-2a) to Char areas. Only significant difference is that refuge platforms should adopt different design standards, as the main force applied to the platforms is due to wave actions. Also, RCC flood shelters may be directly installed on elevated level as an option.

In consideration with the above, following programs are proposed;

- 1-2-1 Constructing multi-purpose flood shelter
- 1-2-2 Establishing effective flood warning system
- 1-2-3 Propagation of flood preparedness awareness

Possibility of implementation

The Table 3.65 in Chapter 3 shows the number of existing flood sheltering facility in the Haor area. In Section 3.7.5, it is advocated that the present available shelters are too meager and there should be more shelters built in order to be able to cope with the actual requirements. CARE (Bangladesh) provided shelters (with or without schools) in the Haor areas since 1996. In the cyclone prone areas of Bangladesh, many Cyclone shelters have been built and maintained. LGED has already implemented some school cum shelters in the Char and Haor areas. Therefore it can be said that implementing Shelters under the present Study is possible and feasible.

Priority for implementation

Evacuation planning and flood awareness training would be implemented as described in the previous program.

2-1 Primary Health Care Promotion Program

- 1. PROGRAM TITLE:** Primary Health Care Promotion Program
- 2. LOCATION:** Char and Haor Areas
- 3. IMPLEMENTING AGENCIES:** Ministry of Health & Family Welfare (MoHFW),
Local Government and local community; and
Department of Public Health & Engineering (DPHE)
- 4. OBJECTIVES:**
- (1) To establish disease proof environment;
 - (2) To improve in nutrition status of local people, especially for women and children;
 - (3) To improve health condition and personal hygiene.
- 5. EXPECTED EFFECTS:**
- (1) Nutritional conditions of women and children are improved;
 - (2) Safety drinking water is provided;
 - (3) Sanitary latrine is provided;
 - (4) Knowledge of villagers for cope with diarrhea and dysentery are increased; and
 - (5) Knowledge of doctors for appropriate medical treatment and medicine are increased.

6. PROGRAM DESCRIPTION:Health care

Medical care including medicines and health facilities is one of the top needs of local people in both Char and Haor areas. Indeed, people in the Study Area have been suffering from various diseases. The reasons for this are various including: (i) unfavorable sanitary and hygiene conditions; (ii) lack of medicines; (iii) lack of health facilities; (iv) local people's lack of knowledge on disease preventive measures; (v) poverty; (vi) disruption of regular visits by health workers in the wet season; and (vii) mal-nutrition in women and children.

Major diseases reported in these areas are diarrhea, dysentery, flu/fever, etc., and many people die of these diseases. However, many of these diseases can be prevented or cured if proper measures are taken at the local level.

Ante-natal care as well as post-natal care is also inadequate in the Study Area due to irregular visits by health workers and insufficient medical care. Iron tablet prescription and tuberculin test are almost all services that health workers extend. Deliveries are in most cases done at their homes under the support of untrained TBA and relatives. Post-natal care is not provided at all.

Nutrition status

Malnutrition prevails in the Study Area, which has brought about the increase in the number of diseases. The causes of the malnutrition are various including: (i) unfavorable food habit in terms of nutrition due to limited food crops cultivated; (ii) food shortage due to poverty; (iii) lack of knowledge on nutrition; and (iv) uneven distribution of food among family members favoring men.

Mal-nutrition brings about physical weakness of people, who tend to suffer vitamin deficiency symptoms including anemia, night blindness, angular stomatitis, goiter, etc. Pregnant women who suffer iron deficiency tend to die at delivery time due to bleeding as well as weakness. Mal-nutrition during childhood adversely affects the normal growth at subsequent stages. Improvement of nutrition status will therefore be the basic condition for promoting health care.

2-1-1 Enhancing education on nutrition and health care for women's group:

Health care

The program aims at establishing a health care system at the local level through: (i) re-training of local health staff such as health workers and mid-wives; (ii) training of local health volunteers; (iii) provision of health education to local people; (iv) establishment of sanitary latrines; (v) rehabilitation and re-construction of hand tubewells; (vi) establishment of local health center and its operation; and (vii) establishment of local health fund for medicine.

Communities would be responsible for the operation and maintenance of respective local health centers and purchasing medicines. Medicines would be purchased by accumulating funds from community people, and the fund would be revolved for continued and stable purchase of medicines.

Nutrition status improvement

The program aims at improving nutrition status and living standard of local people in both Char and Haor areas. It has three components: (i) promotion of home gardening including vegetable cultivation; (ii) provision of education on nutrition; and (iii) provision of education on cooking. All of these components are targeted to women, who are the main players at domestic works as well as main beneficiaries from the program.

Prior to the implementation of the program, women's groups would be established as target groups within a community under the authorization of Union Parishad. Technology extension of home gardening would be made by agricultural extension worker at the local level, while education on nutrition and cooking conducted by health and family welfare officers.

The program implementation would be monitored periodically by the number of deficiency symptoms as well as children's physical growth.

2-1-2 Constructing hand tubewells and community latrines:

The government policy mentioned in the NWMP states that the number users per tubewell be reduced from 105 (average at the present) to 50 in the year 2020. According to a survey conducted by the JICA Study Team, density of tubewells in Char areas has been already achieved the target. It is reported, however, that many tubewells existing in Char areas are inundated during floods, which should be considered for planning. On the other hand, the number of hand tubewells in Haor areas is short of the required number. Another important issue of wide-ranging presence of arsenic in shallow well water in Haor areas should also be taken into consideration.

1) Provision of hand tubewells

Taking the numbers of existing tubewells into consideration and in line with the NWMP, the required number would be summed up for both Char and Haor areas. While the density of existing tubewells in Char areas has already achieved the target mentioned above, required numbers of tubewells is calculated by assuming 70% of existing tubewells are inundated during floods based on hearings during field surveys.

It is recommended that the depth of each tubewell, especially in Haor areas should be more than 800 ft to avoid effects of arsenic as defined by DPHE. As the depth of 800 ft, however, is not the absolute depth for avoiding arsenic, it is strongly proposed that water quality should be examined during the construction of hand tubewells in order to achieve a safe depth. Construction cost of a standard deep tubewell specified by DPHE is about Tk.50,000, but if villagers' community contributes 10% of construction cost, DPHE subsidizes the balance.

2) Provision of sanitary latrines

According to the policy described in the NWMP, one sanitary latrine should be installed in each household in the near future. Based on the Rural Living Conditions Survey (RLCS), the number of households requiring latrines has been estimated at 193,361 in Char areas, and 453,947 in Haor areas. It is proposed, however, that one sanitary latrine with sewerage system should be constructed for one village in Char and Haor areas due to limitation of residential areas.

Possibility for implementation

The Government of Bangladesh (GOB) has, in cooperation with UNICEF, prepared a Master Plan for a Program of Services for Children and Women. The Master Plan consists of five programs of: (i) health and nutrition, (ii) water and environment sanitation, (iii) development of children, (iv) planning and monitoring based on protection and rights, and (v) communication. Under each program, two to four projects have been planned and implemented.

The program components proposed in this Study coincides with a part of each projects under UNICEF and GOB. In this sense, this program is technical implementable.

Considering the harsh living environment in the Study Area, early implementation of this program to the villages where flood-proof environment have been attained is highly recommended.

Priority for implementation

Since the establishment of a health care system at the local level and the education on nutrition as proposed above would call for active involvement of local communities and women's groups, priority for implementation would better be given to priority areas for the model projects where people organizing is conducted with the support of NGOs as a prerequisite for project implementation. New hand tubewells and latrines need to be provided under reasonable flood-proof conditions. Priority areas, therefore, would include the model project areas.

2-2 Rural Electrification Expanding Program

1. **PROGRAM TITLE:** Rural Electrification Expanding Program
2. **LOCATION:** Char and Haor areas
3. **IMPLEMENTING AGENCIES:** Rural Electrification Board (REB)
4. **OBJECTIVES:** To activate rural economy
5. **EXPECTED EFFECTS:**
 - (1) Public offices in Union parishads are electrified; and
 - (2) Rural electrification is promoted.

6. PROGRAM DESCRIPTION:

At present, only Upazila parishads are connected with electricity lines in the Study area. Most Union parishads located in island Chars and Haor areas are isolated from the existing lines. Electrification coverage rate within both areas are much lower with 8% and 11% respectively, compared to 31% and 37% in respective Districts. Villagers in Char and Haor generally use kerosene for lighting and storage batteries for electric goods just as in other rural areas not electrified.

According to the Rural Electrification Board (REB) policy, 100% of the households in Bangladesh will be brought under electrification by the year 2020. For rural electrification, construction of transmission network with 11kV lines has been proposed. Due to topographical difficulties in some areas, it is proposed that transmission lines already existing in Upazila Parishads would be extended for connecting Union Parishads. Electrifying up to Union Parishad would contribute to activating socio-economic activities as well as improving living environment.

In consideration with the above, following programs are proposed;

2-2-1 Expanding electricity line

Possibility for implementation

According to the policy of Rural Electrification Board (REB), 100% of the households in Bangladesh will be brought under electrification by the year 2020. And for rural electrification, Bangladesh Power Development Board (BPDP) has a role for construction of 33KV/11KV substations and extension of transmission network with 11KV lines. The operation and maintenance for the constructed facilities and collection of electricity bill have been made by Palli Bidyut Samity(PBS) in district and/or region level.

REB has the Fifth Five Year Plan on schedule, which consists of the extension of 5,000km 11KV lines and construction of 88 substations for rural electrification, and rate of bill collection is very much high as 97%. However, new power supply by BPDP is not corresponded to new demand of 11% annual increase and fixing of troubles in substation connections (from 33KV lines) have been

delayed, so that it is difficult to expect an earlier achievement of their policy on rural electrification.

The rural electrification, however, would contribute to activating socio-economic activities, higher incomes, education and training as well as home industries by women. In the progress of expansion of Model Project, the more promotion of rural electrification would be requested.

The proposed long-term development program in consideration with the above has high possibility to be a success.

Priority for implementation

Priority for extension of the existing transmission network should in general follow the priority for rural road improvement. Thus, Union Parishad located along flood control embankments would receive the priority.

3-1a Communication Activation Program for Char Area

- 1. PROGRAM TITLE:** Communication Activation Program for Char Areas
- 2. LOCATION:** Char Areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED), Bangladesh Inland Water Transportation Agency (BIWTA)
- 4. OBJECTIVES:**
- (1) To improve rural accessibility; and
 - (2) To strengthen communication network.
- 5. EXPECTED EFFECTS:**
- (1) Accessibility to Union parishads, market, hospital, and other public facilities are improved;
 - (2) Visitation of social workers, family planning officers are increased; and
 - (3) Tele and radio-communication system in rural area is strengthened.

6. PROGRAM DESCRIPTION:

Communication infrastructure including rural road, water transport and tele-communications in Char areas are underdeveloped due to flood prone location outside the embankments of the Brahmaputra river. Thus, access to major facilities and socio-economic services as well as relevant information available at Upazila/ Union parishads and growth centers is very limited for villagers living in char lands. Specific problems include (i) underdevelopment of roads connecting Upazila and/or Union to Union parishads, (ii) lack of proper launch ghats and (iii) shortage of R-2 village trunk road.

The program aims at cost-effective provision of improved communication means to serve flood-prone Char areas. Three main components are involved : (1) strengthening of rural road network, (2) improvement of pontoon launch ghats for more effective water transport, and (3) extension of tele/radio-communication network. The strengthening of rural road network would be prioritized as follows. First, road connections between Upazila parishads and Union parishads located along flood control embankments would be prioritized. Second, connections between other Union parishads within Upazilas where are not dominant to island Chars would be improved by constructing submersible roads with bridges and culverts. Submersible village trunk roads, categorised by LGED as R-2, would be improved subsequently for better connection from villages to Union parishads or markets. For the improvement of pontoon launch ghats, the priority would be given to Upazilas where are dominant to island Chars. For the communication network, existing telephone lines would be extended to all the unserved Union Parishads, and a radio-communication system established for island Chars.

In consideration with the above, following programs are proposed;

- 3-1-1 Strengthening rural road network

- 1) Paving flood control embankment
- 3-1-2 Constructing pontoon transport and submersible bridges
 - 1) Pontoon transport
 - 2) Submersible bridges
- 3-1-3 Improving pontoon launch ghats
- 3-1-4 Provision of tele/ radio communication network
 - 1) Tele-communication
 - 2) Radio-communication

Possibility for implementation

In case of Char areas, there are two (2) types of Chars, Attached/ Setback chars and Island char as mentioned in Section “5.3.1 Typology of Char and Haor”. The definition is made so that the different development plans for communication activation should be considered. For the type of Attached/ Setback chars, measures of road and bridge improvement is effective for the rural development in approaching the mainland. On the other hand, approaching the mainland is not possible due to flow of Brahmaputra River for the type of Island char.

As the basic principle, taking this topographic condition into consideration, the priority would be given to the road improvement for Attached/ Setback chars and the improvement of launch ghat for Island Char. And for the communication network, the priority would be given the extension of tele-communication line for Attached/ Setback chars and radio-communication system for Island char.

As the first priority, the widening and surface pavement of existing roads connected between Upazila parishads and Union parishads located along the flood control embankments are prioritized for the Attached/ Setback chars, and the improvement of launch ghats and the radio-communication system established for Island char.

Then, in the course of expansion for Model Projects, the improvement of R-2 trunk roads connecting between villages and markets would be recommended under the Study in accordance with the policy of Rural Development Program (RDB) and Rural Infrastructure Development Program (RIDP).

The proposed Sector-wise program in consideration with the above has a high possibility to become successful.

Priority for implementation

Priority for rural improvement would be given to connections between Upazila Parishads and Union Parishads within Upazila where setback and stable Char are dominant. For the improvement of pontoon lunch ghats, priority would be given to Upazila with dominantly stable Char. For the communication network, the establishment of a radio-communication system would be undertaken for island Chars as a matter of urgency.

3-1b Communication Activation Program for Haor Area

- | | |
|----------------------------------|--|
| 1. PROGRAM TITLE: | Communication Activation Program for Haor Areas |
| 2. LOCATION: | Haor Areas |
| 3. IMPLEMENTING AGENCIES: | Local Government Engineering Department (LGED) |
| 4. OBJECTIVES: | (1) To improve rural accessibility; and
(2) To strengthen communication network. |
| 5. EXPECTED EFFECTS: | (1) Accessibility to Union parishads, market, hospital, and other public facilities are improved;
(2) Visitation of social workers, family planning officers are increased; and
(3) Tele-communication system in rural area is strengthened. |

6. PROGRAM DESCRIPTION:

Communication infrastructures including rural road, water transport and tele-communications in Haor are underdeveloped due to inundation during the wet season. Thus, accessibility to major facilities and socio-economic services as well as relevant information available at Upazila/Union Parishads and growth centers is very limited for villagers living in Haor areas. Specific problems include (i) underdevelopment of roads connecting Upazila and/or Union to Union Parishads, (ii) disruption of connecting roads by disturbance of cross canals/ khals, (iii) lack of proper launch ghats and (iv) shortage of R-2 village trunk road.

The program would provide improved communication means to serve Haor areas. It includes (1) strengthening of rural road network, (2) establishment of pontoon transportation system with submersible bridges, (3) improvement of pontoon launch ghats, and (4) extension of tele-communication network. The rural road network would be strengthened in steps as mentioned in the previous program for Char (3-1a). As submersible roads are constructed in Haor areas, a pontoon transportation system needs to be established to allow crossings of canals / khals without any disturbance to the traditional water transportation system. In addition, submersible bridges rather than pontoon installation would be constructed for small canals/khals where people face difficulty for crossing due to severely muddy conditions.

For the improvement of pontoon launch ghats, the priority would be given to Upzila in Haor areas where water transportation is the dominant means even during the dry season. For the communication network, existing telephone lines would be extended to all the unserved Union Parishads.

In consideration with the above, following programs are proposed;

- 3-1-1 Strengthening rural road network
- 1) Paving flood control embankment

- 2) Constructing submersible road
- 3-1-2 Constructing pontoon transport and submersible bridges
 - 1) Pontoon transport
 - 2) Submersible bridges
- 3-1-3 Improving pontoon launch ghats
- 3-1-4 Provision of tele/ radio communication network
 - 1) Tele-communication
 - 2) Radio-communication

Possibility for implementation

For Haor areas, two types of areas are defined as (1) the Haor area with dominant land transport during dry season and (2) the Haor area with dominant water transport during dry season as mentioned in Section “5.3.1 Typology of Char and Haor”. For the Haor area (2) in the above, improvement of road communication is not effective means for rural development even during the dry season.

As the basic principle, the priority would be given the improvement of rural road network for Haor area (1), and the improvement of launches ghats for Haor area (2).

As the first priority, the widening and surface pavement of existing roads connected between Upazila parishads and Union parishads located along the flood control embankments are prioritized. Then the construction of submersible roads for Haor area (1) and the improvement of launch ghats for Haor area (2) would be given second priority.

Furthermore, in the course of expansion for Model Projects, the improvement of R-2 trunk roads connecting between villages and markets would be recommended under the Study in accordance with the policy of Rural Development Program (RDB) and Rural Infrastructure Development Program (RIDP).

The proposed Sector-wise Program in consideration with the above has a high possibility for success.

Priority for implementation

Priority for rural roads would be given to connections between Upazila Parishads and Union Parishads along the flood control embankments. For the establishment of pontoon transportation system, priority would be given to Upazila in Haor areas accessible by road transportation during the dry season, while for Upazila relying on water transportation during the dry season, pontoon launch ghats would be improved on a priority basis.

3-2 Appropriate Farming Technologies Introduction Program

1. **PROGRAM TITLE:** Appropriate Farming Technologies Introduction Program
2. **LOCATION:** Char and Haor areas
3. **IMPLEMENTING AGENCIES:** Bangladesh Agricultural Development Corporation (BADC), Department of Agricultural Extension (DAE) and Local Government
4. **OBJECTIVES:** To uplift farmers' living standard
5. **EXPECTED EFFECTS:**

Char Areas

 - (1) Farmers' income is increased;
 - (2) Appropriate farming technologies are provided by DAE; and
 - (3) HYV seeds are stably provided by BADC.

Haor Areas

 - (1) Farmers' income is increased;
 - (2) Appropriate farming technologies are provided by DAE;
 - (3) HYV seeds are stably provided by BADC; and
 - (4) Flood damage on boro paddy is decreased.

6. PROGRAM DESCRIPTION:

Land use characteristics in Char areas show the similar pattern with cropping intensity of 171, while in Haor areas cropping intensity is only 105 due to inundation during the Kharif season. There is possibility to expand cropping intensity in Char areas, but farmers hesitate to extend cultivated area because flooding occurs frequently during the Kharif season. Shares of rice in the total harvested area are 58% in Char and 97% in Haor areas respectively, indicating mono-cropping in Haor areas and crop diversification in Char areas. The major problem in Haor areas is early flood, which occurs once in two to three years. It inflicts heavy damages to boro crops harvested only once through a year. Moreover, there are very few drying yards with parboiling plants and storage in both Char and Haor areas so that farmers are forced to sell their products to middlemen at low prices just after the harvest.

The program would support farmers to diversity crops, improve productivity, and increase value-added or sales value of their products through introducing appropriate farming technologies, providing drying yards and storage with parboiling plants, and producing boro crops in Haor areas with submersible embankments. Each component is further described.

3-2-1 Introducing appropriate farming technologies

Extension activities by Department of Agriculture Extension (DAE) are organized mainly through

regular visits by block supervisors to sub-blocks. In each sub-block there are contact farmers through which messages concerning improved practices are passed on to the farming community. In addition, the block supervisors attend training and conference sessions where farmers' problems are discussed. To enhance crop productivity through adoption of improved and/or appropriate farming technologies, following measures are proposed for both Char and Haor areas.

1) Introducing non-rice crops cultivation

Through extension workers from DAE as well as Thana (Upazila) Agriculture Officers (TAOs), non-rice crops such as homestead vegetables, pulses, spices and fruits are introduced at the raised plinth of homestead and mound proposed for flood-proofing. This will contribute to an increase in the homestead cultivation throughout the year with proper management and, in turn, will improve nutrition and increase household income. The raised platforms will also provide improved facilities for threshing and drying crops.

2) Improving provision of crop seeds and other agriculture input

Supplying HYV seeds, agricultural chemicals and fertilizer should be secured by BADC Upazila office. Usually, farmers save their seeds from the harvested crop. They sometimes exchange them among themselves. By ensuring supply of such agricultural input sufficient with proper quality, farmers can start cultivation on time.

3) Development of suitable crop varieties

Early-maturing varieties with high yield potential are needed in the project area. Cold tolerant boro rice varieties need to be developed for early transplantation. Suitable varieties of non-rice crops are also needed which can grow in the winter season before modern boro rice varieties can be transplanted.

3-2-2 Constructing submersible embankments

Early floods occur in April and May (end of dry season) in Haor areas. Early floods have given heavy damages to boro-crops just before the harvest time. This is a very serious problem because production of the boro paddy is almost the sole income source for majority of people in Haor areas. Submersible embankments are proposed for planning and implementation by BWDB.

Priority for implementation

Priority for support services and supply of agricultural input would be given to diversified crops to be cultivated in raised homestead and village mounds such as vegetables, pulses, spices and fruits. These crops are either high value crops that can be sold even in small quantity in nearby markets to increase income or food crops that can be exchanged in the neighbourhood to improve nutrition. In Haor areas, construction of submersible embankments is a priority to protect Boro rice from early floods, while applied research is conducted to develop winter crops.

3-3 Community Based Fishery Development and Management Program

1. **PROGRAM TITLE:** Community Based Fishery Development and Management Program
2. **LOCATION:** Char and Haor areas
3. **IMPLEMENTING AGENCIES:** Ministry of Fishery and Livestock (MoFL), and Local Government
4. **OBJECTIVES:** To assure livelihood of local small fishermen
5. **EXPECTED EFFECTS:**
 - (1) Fish products are stably provided from pilot fish farm;
 - (2) Fisherman's technologies are improved; and
 - (3) Fishermen's incomes are increased.

6. PROGRAM DESCRIPTION:

While fish has been one of the important protein sources for the people in Char and Haor areas, the fishery resources have decreased over the years. This is reported to be attributed to (i) indiscriminate fish catch; (ii) increase in commercial fishing; and (iii) lack of resource management efforts.

A significant number of people in Haor areas is engaged in fishing activities for their livelihood, but most of them are small in scale and do not have engine boats. Beels, major fishing places owned by the government, are not accessible for small fishermen, because fishing at beel areas requires fishing rights which needs much money to obtain. So small fishermen have to do fishing in rivers in dry season and Haor areas in the wet season using small fish nets with modest results. Their standard of living has become worse in terms of both economy and nutrition. In order to ensure small fishermen of steady fish catch as well as to improve nutrition conditions of local people, fish culture should be promoted at the community level.

The program aims at supporting small fishermen to increase and stabilize fish catch through the introduction and promotion of appropriate technologies. Specifically, the program would facilitate the introduction of fish farming technology at ponds, promotion of cage fishing, and development of pilot fish farms. MoFL in cooperation with local governments would encourage fishermen to organize themselves to take responsibility for operation and maintenance of fish culture facilities at ponds. Technical and management training would be provided to successfully organized fishermen groups. The program would extend credit to trained fishermen groups for starting fish culture at ponds. Credit may be provided to others for promoting cage fishing in open waters as well. A pilot fish farm would be developed to demonstrate the fish farm technology and also to serve for field training of fishermen.

In consideration with the above, following programs are proposed;

- 3-3-1 Introducing fish farm technology

3-3-2 Developing pilot fish farm

Priority for implementation

MoFL in cooperation with local governments would take the initiative to organize fishermen supported by NGOs. A successfully organized fishermen group would be made responsible for operation and management of existing fish culture facilities which would be improved through the program.

3-4 Growth Center Construction Program

- 1. PROGRAM TITLE:** Growth Center Construction Program
- 2. LOCATION:** Char and Haor areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:** To uplift living standard of the local people
- 5. EXPECTED EFFECTS:**
 - (1) Trade amounts of products are increased;
 - (2) Sanitary conditions in the market are improved;
 - (3) Prices of products are increased through shipping to the market; and
 - (4) Incomes of low-income women's groups are increased.

6. PROGRAM DESCRIPTION:

A number of growth centers have been established by upgrading previous hat bazars to activate marketing, to improve sanitary environment and to promote participation of women's group. Both in Char and Haor areas, however, the establishment of growth centers has not been much promoted yet. This is due to transient/unstable nature of the livelihood in Char and Haor areas and inactive community organizations. As the flood-proofing is provided, marketing facilities need to be provided to exchange increased local products. The program would support particularly women's roles in marketing activities. Within upgraded hat bazars, women's corners would be established, and women's groups would be made responsible for allocating sales sheds among their members and managing the spaces.

In consideration with the above, following programs are proposed;

- 3-4-1 Constructing growth center
- 3-4-2 Strengthening low income women's group

Possibility for implementation

Planning Commission of GOB has listed 2,100 numbers of local market to be improved and expanded as the Growth center in the country after the marketing research survey in 1993, involving 204 local markets within Study area. The purposes of upgrading to Growth center are;

- 1) Providing efficient market outlet for the produces of small farmers with a view to stimulate production,
- 2) Increasing the cash income of rural people either by enabling them to sell their produces or obtaining the needed commodities as buyers through the creation of an efficient marketing system,
- 3) Facilitating the government procurement operation relating to rice, paddy, wheat, sugarcane, etc. by providing effective points for buying and selling and

- 4) Promoting social interaction among the rural people for exchange of ideas regarding use of irrigation, fertilizer or improved variety of seeds.

While the upgrading local markets to Growth center is in progress as RDP (Rural Development Program) by LGED, local markets in the both Char and Haor areas, therefore, would be developed effectively with expansion of Model projects in connection with rural road improvement projects by RIDP.

Priority for implementation

The program would start in Char and Haor villages having relatively high levels of flood protection already and comparatively large population of the landless. Trainees would be selected through interviews among the literate but landless together with identification of promising non-farm income generating activities.

3-5 Skill Training Program

- 1. PROGRAM TITLE:** Skill Training Program
- 2. LOCATION:** Char and Haor areas
- 3. IMPLEMENTING AGENCIES:** Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC), NGOs and Local Government
- 4. OBJECTIVES:**
 - (1) To increase options for income generating activities;
 - (2) To increase employment opportunities in wet season; and
 - (3) To raise income level of the local people.
- 5. EXPECTED EFFECTS:**
 - (1) Literacy rate of landless farmer is improved;
 - (2) Landless people obtain skills for income generation;
 - (3) Employment opportunities of landless farmers are increased; and
 - (4) Villagers can be provided loan services at appropriate timing.

6. PROGRAM DESCRIPTION:

Most people in Char and Haor areas suffer from low income. While they are mainly engaged in agricultural activities, most of them are landless with less than 0.5 acres of land, far from sufficient to obtain income to meet their requirements. In the wet season when flood water inundates agricultural land, most people become idle because there are few employment opportunities other than agriculture in the areas. Being isolated and remote from urban areas, there is very limited information on income generating activities available in the areas.

The program would support income-generating activities by local people during the off-farm period by providing skill training and credit. It would also provide literacy education for adults who have not completed literacy training as a basis for receiving skill training. Considering the limited living space especially during flooding and low level of infrastructure development in and around Char and Haor areas, skills to be required would be those not requiring large spaces, energy and investments. Those jobs include tailoring, fish net making, bamboo and cane craft, poultry and duck raising. Trainees would be selected through interviews among the literate but landless first. The illiterate landless would receive literacy training first, followed by skill training. Credit would be provided to those completed skill training for facilitating the start-ups of their non-farm business.

In consideration with the above, following programs are proposed;

- 3-5-1 Provision of skill training program

3-5-2 Provision of credit for starting business

Possibility for implementation

Post Literacy and Continuing Education Pilot Project have been implemented by the Directorate of Non-formal Education under Primary and Mass Education Division of the Ministry of Education. This project provides neo-literate with opportunity to continue literacy education through skill training so that they could keep literate and at the same time gain the skill to get job.

The program basically follows the concept of the pilot project, adding credit scheme for starting business as a package. Similar set-up has been seen in several rural development projects implemented by NGOs such as BRAC.

Priority for implementation

The program would start in Char and Haor villages having relatively high levels of flood protection already and comparatively large population of the landless. Trainees would be selected through interviews among the literate but landless together with identification of promising non-farm income generating activities.

3-6 Primary Education Strengthening Program

1. **PROGRAM TITLE:** Primary Education Strengthening Program
2. **LOCATION:** Char and Haor areas
3. **IMPLEMENTING AGENCIES:** Primary and Mass Education Division (PMED), Local Government and local community
4. **OBJECTIVES:**
 - (1) To strengthen primary education services;
 - (2) To provide education to all primary school children.
5. **EXPECTED EFFECTS:**
 - (1) Literacy rate of children is improved;
 - (2) Enrolment rate of primary school is increased; and
 - (3) Drop out rate are decreased.

6. PROGRAM DESCRIPTION:

The Study Area is characterized by lower level of education attainment as well as low literacy rate. Enrolment record of pupils at primary schools suggests very high drop out rate. This is attributable to dilapidation of school facilities, long distance from schools, lack of concerns by guardians and low income. Education is a basic right for all children, as the Government has set policy on “education for all”. Unless educated, children will partly lose their future possibilities by narrower the scope for employment opportunities requiring educational background. The program will aim at realizing education for all children even in most disadvantageous areas of Char and Haor.

Currently many school committees organized by the initiative of the Government are dormant. Most committees are headed by local leaders who have no incentive to lead respective committees. In order to activate the school committee, participation of guardians is a must. They will be real beneficiaries in the future, when their children get employed capitalizing on the educational attainment.

Local governments would take the initiative for reactivating school committees by inviting plans to improve education environment in respective villages. The plan may cover the rehabilitation of school buildings with latrines and tubewells and other facilities, supply of school equipment such as blackboards, desks and benches, introduction/strengthening of specific programs such as school lunch provision, and monitoring of education performance and attainment.

The school lunch program would be particularly effective in enhancing school attendance by children, as poverty is one of major reasons for high drop-out rates. School lunch would be prepared by active participation of guardians with food supplied by them. The participated guardians would in turn learn new recipes and better diet to improve the nutrition of their families. The guardians would participate also in the monitoring of absentee school children.

In consideration with the above, following programs are proposed;

- 3-6-1 1)Reorganizing school committees, 2)Provision of school lunch, 3)Monitoring absentee school children
- 3-6-2 Rehabilitation of school facilities

Possibility for implementation

Primary education is a right for all the children to receive.

At present, PMED has, in cooperation with UNICEF, been implementing a project entitled “Intensive District Approach to Education for All”. This project aims to improve attendance rate, decrease drop-outs, and improve literacy rate by enhancing interest of children and guardians on education. The project has such components as re-training of teachers, improvement of teaching materials, school catchment area mapping, monitoring of long absentee pupils, etc.

This program adopts a part of the IDEAL project, and also have rehabilitation and establishment of school facilities like water supply and latrines for female, considering the dilapidated conditions of many schools in the Study Area.

Besides the food for education which has been successful in increasing enrollment rate of girl pupils in the past, school lunch scheme is newly proposed for enhancing attendance rate of children further by providing school lunch prepared by guardians.

Monitoring of the implementation of IDEAL projects is under process by JICA experts, and the program may be modified according to the monitored results.

Priority for implementation

The Primary and Mass Education Division would call local governments for extending invitation for existing but inactive school committees to prepare plans to improve education environment on the condition that the plans would be used to assess priority for school buildings rehabilitation and related support measures. Specific ways of guardians’ participation would be an important criterion for the prioritization.

4-1 Social Mobilization and Institutional Building Program

- 1. PRORAM TITLE:** Social Mobilization and Institutional Building Program
- 2. LOCATION:** Char and Haor areas
- 3. IMPLEMENTING AGENCIES:** Local Government Engineering Department (LGED)
- 4. OBJECTIVES:**
- (1) To empower local people; and
 - (2) To acquire skills for participatory planning.
- 5. EXPECTED EFFECTS**
- (1) Village committees at grass-root level are established;
 - (2) Participatory planning system is established at grass-root level; and
 - (3) Capacity of the organization to conceive development ideas, and to plan activities is built.

6. PROGRAM DESCRIPTION:

Poor community activities in the Study Area allow locally funded projects to be decided at the mercy of members of Union Parishad. Social mobilization and capacity building at the grass-roots level is a prerequisite to realize bottom-up planning with the participation of local people. This program aims at empowering local people through participatory planning exercises.

A participatory planning exercise shall be conducted at the village level, inviting interested people from both sexes. They shall start with talking about their village from various points of view such as daily life, social affairs, power structure, decision making process, farming, education, health, diseases, nutrition, floods, etc., to identify problems they are facing, under the support of outsiders including a facilitator and several community organizers. Villagers themselves shall take the initiative in all the process of discussion. Such methods as key informant surveys, focus group discussions, transect walk, social mapping, Venn diagram, etc., shall be used for identifying characteristics of the village.

Various problems to be identified by the villagers shall be discussed further to find ways to solve them. In doing so, villagers shall be empowered to conceive development ideas and to plan for activities to be implemented.

In consideration with the above, following programs are proposed;

4-1-1 Organizing villagers

4-1-2 Establishing of bottom-up planning system from village level to Upazila

Possibility for implementation

UNDP has implemented the Poverty Alleviation Program in six South Asian countries for seven

years since 1994. In Bangladesh the program has been implemented in Kishoreganj Sadar Upazila. The program has components of organizing people, training, and saving and credit, and has been successful in increasing saving amount and high repayment rate, etc. However, the interim evaluation of the program recognized the importance of the capacity building of local people for further success of the program. On the basis of the interim evaluation results, training program for capacity building has been planned.

The proposed program has been formulated based on the lesson learned of the above project. In other words, it has been formulated recognizing the necessity of the capacity building of the people prior to the implementation of projects of any sort.

When the implementation of specific project is decided, this program will be implemented for the local people in the target area, so that the people could be called sense of participation.

Priority for implementation

The participatory planning exercise would be conducted first in several villages including those where the model projects are proposed. Indication of subsequent implementation of the model projects would definitely provide incentives for local people in the model project areas, but other conditions for successful participatory planning would be clarified through a comparative study.

Table 6.7 Standard Cost of Long-term Program

Long-term Development Program	Char/ Haor	Unit	Cost (Tk.)	Remarks
1. Protection of Human Lives				
1.1 Flood Proofing Program				
1-1-1a Raising Plinth of Homestead Area	Char	M3	50	Earth work only for 20 H/H, encl. Homestead raising, hand tubewell, community latrine, etc.
1-1-2a Clustering Houses on High Platforms	Char	Nos	2,000,000	
1-1-1b Raising Plinth of Village Mounds with Protection				
1) Earth-only protection with vegetation	Haor	mound	110,000	Cost for one mound of 250m length with vegetation
2) Retaining wall of the erosion-affected village mound	Haor	mound	5,000,000	Cost for one mound of 250m length with brick retaining wall
1-1-2b Expanding Area of Village Mounds	Haor	mound	6,900,000	One mound of 250m length and 3m height of brick retaining wall with hand tubewell, latrine, etc
1-1-3b Protection Measures against Wave Action				
1) Establishing a vegetative protection by Hijal and Koroch	Haor	mound	750,000	Cost for one mound of 250m length with wave protection by Hijal and/or Koroch
2) Provision RCC retaining wall	Haor		2,500,000	Cost for one mound of 250m length with RCC retaining wall
1-2 Sheltering system Program				
1-2-1 Constructing Multi-purpose Flood Shelter	C/H	Nos	11,000,000	Area 3,000 sq.m for people and cattles, incl. 2 shelter buildings, tubewell, community latrine clinic, etc.
1-2-2 Establishing Effective Flood Warning System	C/H	Gram	500,000	One Engine boats for 200 refugees and wireless radio for flood preparedness Training cost of Gram by NGO
1-2-3 Propagation of Flood Preparedness Awareness	C/H	gram	40,000	
2. Living Environment Improvement				
2-1 Primary Health Care Promotion Program				
2-1-1 Enhancing Education of Nutrition & Health Care	C/H	Gram	50,000	Nutrition and health care training to one Gram
2-1-2 Constructing Hand Tube-wells and community Latrines				
1) Provision of Hand Tube-well	C/H	nos	45,000	for one raised hand tubewell
2) Provision of Sanitary Latrine	C/H	nos	55,000	for one community sanitary latrines
2-1-3 Providing Health Training	C/H	gram	25,000	Health Training to Village doctor & Workers to one Gram
2-2 Rural Electrification Expansion Program				
2-2-1 Extending Electricity Line	C/H	km	1,600,000	for electricity line including substations/10 km
3. Livelihood Development (Objective 3)				
3-1 Communication Activation Program				
3-1-1 Strengthening Rural Road Network				
1) Paving flood control embankment	C/H	Km	1,900,000	RCC pavement on existing embankment
2) Constructing submersible road	Haor	Km	3,600,000	Embankment and RCC pavement with tree plantation
3-1-2 Constructing Pontoon Transport and Submersible Bridges				
1) Pontoon Transport	C/H	Nos	1,000,000	one set of steel floating pontoon
2) Submersible Bridge	C/H	Nos	500,000	25m length of submersible bridge with brick pier and RCC slab
3-1-3 Improving Pontoon Launch Ghats	C/H	Nos	10,000,000	steel floating pontoon ghat
3-1-4 Provision of Tele/radio Communication Network				
1) Tele-communication	C/H	Km	300,000	Cost of Telephone line extension
2) Radio-communication	C/H	nos	300,000	Cost of wireless radio
3-2 Appropriate Farming Technologies Introduction program				
3-2-1 Introducing Appropriate Farming Technologies				
1) Introducing to cultivate non-rice crops	C/H	Gram	75,000	for Training cost to one Gram by DAE, UAO
2) Improving provision of crop seeds and other inputs	C/H	Union	250,000	Cost of Seeds, fertilizer and other inputs supply to UP
3-2-2 Constructing Submersible Embankment	Haor	km	2,500,000	Earthen submersible embankment with regulating gate
3-3 Community Based Fishery Development and Management Program				
3-3-1 Introducing Fish Farm Technology	C/H	Union	100,000	for Training cost to one Gram by DOF, UFO
3-3-2 Developing Pilot Fish Farm	C/H	farm	2,500,000	Earth digging and soil cement Cost for one fish pond of area 3,750 sq.m
3-4 Growth Center construction Program				
3-4-1 Constructing Growth Center	C/H	G.C.	5,200,000	Area 2,000 sq.m of Growth center incl. Market shed and women's corner, tubewel, community latrines, etc.
3-4-2 Strengthening Low Income women's Groups	C/H	G.C.	50,000	Credit for starting women's group activity in one Growth center
3-5 Skill Training Program				
3-5-1 Provision of Skill Training Program	C/H	person	4,000	Education and skill training cost to one person
3-5-2 Provision of Credit for Starting Business	C/H	person	10,000	Credit for starting business to one person
3-6 Primary Education Strengthening Program				
3-6-1 Reorganizing School Committees/Provision of School Lunch/Monitoring Absentee School Children	C/H	Person	1,000	Cost of School lunch to one student for one year
3-6-2 Rehabilitation of School Facilities	C/H	nos	1,300,000	50% of one school construction cost incl. Building hand tubewell, community latrines
4. Capacity Building				
4-1 Social Mobilization and Institutional Building Program				
4-1-1 Organizing Villagers	C/H	Gram	300,000	Implementation cost of PLA in one Gram
4-1-2 Establishment of Bottom-up Planning system from Village Level to Upanila	C/H	Gram	300,000	Implementation cost of PLA in one Gram