

PART B MASTER PLAN

CHAPTER 3 THE STUDY AREA

3.1 Area and Population

The Study Area consists of two flood prone areas of Char and Haor. The total area is 9,167 km², with the total population of 4.9 million, as shown in Table 3.1.

Table 3.1 Area and Population of the Study Area

District	District			Study Area			
	Area of district (km ²)	Estimated Population*, 2001 ('000)	Population density (nos./km ²)	Area (km ²)	Area's share	Estimated population*, 2001 ('000)	Population density (nos./km ²)
Char							
Gaibandha	2,179	2,417	1,109	504	(23%)	201	399
Jalalpur	2,032	2,282	1,123	528	(26%)	377	715
Kurigram	2,296	1,972	859	854	(37%)	335	392
Sirajganj	2,498	2,745	1,099	779	(31%)	486	623
Char Total	9,005	9,416	1,046	2,665	(30%)	1,399	525
Haor							
Habiganj	2,581	1,828	708	1,394	(54%)	749	538
Kishoreganj	2,689	2,787	1,037	1,694	(63%)	1,255	741
Netrokuna	2,796	2,102	752	701	(25%)	272	387
Sunamganj	3,669	2,009	547	2,713	(74%)	1,201	443
Haor Total	11,735	8,726	744	6,502	(55%)	3,477	535
Study Area Total	20,740	18,142	874	9,167	(44%)	4,876	532

Remarks: * Estimated based on 1991 Population Census, BBS

Source: JICA Study Team based on the Map Survey.

The Char area comprises parts of four districts, having a total area of 2,665 km² with 1.4 million people, while the Haor area is also composed of four districts, occupying 6,502 km² with 3.5 million. Population density of the both areas is lower than the district average, 525 people/km² for Char and 535 people/km² for Haor, respectively, compared to 1,046 people/km² for Char districts and 744 people/km² for Haor districts, respectively.

3.2 Natural Conditions

3.2.1 Char

(1) General Description

Char lands (or sand banks) are unique features in the flood land topography of Bangladesh. The formation of Char areas is interplay of erosion and accretion dynamics in a river channel, leading to so-called 'island' chars (those that develop within the river channel) and 'attached chars' (chars formed along the river banks), both exhibiting different features of hydro-morphological

characteristics.

The Char areas comprise under the Brahmaputra-Jamuna river system extending from Sirajganj in the south to Kurigram area in the north. The rivers themselves flow in broad braided channels, which become a series of sandy or silty islands or Chars at low water periods, and completely submerged during the wet season (from June to October). The braided riverine charlands may be regarded as the active flood plains within which the rivers are constantly changing courses.

The active flood plains are bounded by levees or by riverbanks of several feet high, usually 5-10 ft (1.5 to 3 m). In the case of the Brahmaputra-Jamuna, the riverbed between the banks may range from a few kilometers to tens of kilometers wide. The sandier banks of the Brahmaputra-Jamuna are a factor in the greater width and instability of its channel. In many cases course changes occur annually sweeping away villages and creating new char lands. Bank erosion notwithstanding, charlands are eroded as well as accreted - some vanishing others emerging as island or attached chars within the channel according to river dynamics. This is a regular feature seen in a braided stream composed of several channels formed by a number of island as well as attached chars.

However, the effects of riverbank erosion and widening of the channel have been significant in char morphology. As well, the land erosion has been of greater problem than the flooding in many char areas. The life style of the farmers has been adjusted to the duration and magnitude of flooding. Flood is thus at once a productive resource, watering and fertilizing the land, and a hazard leading to large-scale destruction of life and properties. However, the advantages of living in char areas seem to far outweigh the harmful effects. It is regarded by the people as a normal annual event stimulating agricultural settlement in the char areas over a long period of time. It is the abnormal flood, the extreme event that is considered as the actual hazard in the context of Bangladesh.

(2) Hydrology and Climate

The flood season commences in the month of June-July and lasts till October, coinciding with true wet season. Apart from the wet season, nor'wester squalls in the month of April-May, causes heavy rainfall accompanied by the thunderstorm and hail. Tornadoes often occur in many of the char areas. This is the hottest season, specially the month of April, when temperatures often rise to 35°C or more. The nor'wester rainfall is a boon to the agriculturist. Because the bhadoi season activity starts with the downpour of the nor'wester rain, the delay in the arrival of the nor'westers delays agricultural activities, especially for those of non-irrigating farming. The winter season (November-March) known as rabi season, is dry and cool, the major constraint is the lack of water for irrigation. The Char areas, it may be pointed out that, even though bounded on all sides by river courses or channels, suffer from lack of water for irrigation. Some form of dry farming is practiced at best.

Monthly rainfall record in two locations of Char area in 1997 is shown in Table 3.2.

Table 3.2 Monthly Rainfall Record in Two Stations near Char in 1997

(Unit:mm)

Month Station	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Bogra	10	11	9	140	102	199	298	245	220	29	2	27	1,292
Rangpur	19	14	3	113	230	276	523	338	467	16	2	27	2,028

Source : Bangladesh Meteorological Department

(3) Land Resources

The elevation of the major part of the flood plains of the area varies 3 meters to 14 meters above mean sea level. As shown in Table 3.3, except for the area of water bodies, which account for 30% of the total area, medium high land shares 37% of the total Char land, followed by Medium low land with 20%.

Table 3.3 Distribution of Area by Land Type in Char

Land Type	High Land F ₀ *	Medium High Land F ₁ *	Medium Low Land F ₂ *	Low Land F ₃ *	Very Low Land F ₄ *	Homestead and Water bodies	Total
Share of the area (%)	5	37	20	8	0	30	100

Remarks: *: Agricultural Land Classification: F₀: no fear of inundation; F₁: the lands where normal flood depth is up to 0.9 m; F₂: up to 1.8 m; F₃: up to 3 m; F₄: more than 3 m.

Source: FAO/ UNDP, 1988. Report 2: Land Resources Appraisal of Bangladesh for Agricultural Development

The Char area as a whole is fallen into Agro-Ecological Zone (AEZ) - 7. This zone comprises the belt of unstable alluvial land, which is constantly being formed and eroded by shifting river channels. It has an irregular relief of broad and narrow ridges and depressions.

The area is occupied by sandy and silty alluvial soils, which are rich in minerals with slightly alkaline. Of the six general soil types found in the area, Non-calcareous alluvium predominates. Due to its coarse and/or medium in texture, water and nutrient holding capacities are low. Nitrogen is the most critical nutrient limiting crop growth followed maybe by potassium. Sulfur may be another critical nutrient for ensuring normal crop growth.

(4) Flora and Fauna

The aquatic or wetland floral diversity in the Char area changes day-by-day and season-to-season according to the river flow. In the dry season floral diversity is minimum. The common Char land flora are: Katanota (*Amaranthus spinosus*); Lippia nodiflora; Hatishoore (*Heliotropium indicum*); Kash (*Cyperus* spp.); etc.

3.2.2 Haor**(1) General Description**

A basin topography encompassing low-lying areas, Haor areas abound in innumerable rivers,

mostly branches of the Meghna and Kusiara in addition to beels and khals of local origin. The changing courses of the rivers are as apparent as the cultural practices of the people living in the basin area which is inundated by about 3 to 5 meters during the normal wet season with only the settlements located on higher grounds or the natural levees remaining above the water level. The rest of the season is dry, but for the beels some of which contain water with varying depths of about 1.5-3 meters. Major economic activities begin immediately after the cession of floodwater. Spread over 6,500 km², the Haor area is the most inaccessible and the least developed area in Bangladesh.

A distinct geographic unit, Haor area on a topo map looks almost like a triangle with its apex pointing towards south, the base paralleling to the southern flank of the Shillong plateau. In its immediate north is the Khasia-Jaintia hills, and the south and southeast is bordered by the Old Meghna estuarine flood plain. The Surma-Kusiara floodplains of alluvial deposits and older alluvium of the Madhupur Tracts lie respectively to the southeastern and southwestern fringes of the Haor basin. The Brahmaputra flood plain and the greater extent of the Madhupur Tract dominate the western part of the basin.

The origin of the beels and other depressions or for that matter basin characteristic of the Haor area still remains unexplained although there are several geo-morphological explanations offered for the observed characteristics of the area. As observed, in Mymensingh and Sylhet the Meghna depression, containing many low-lying permanent Lakes or Haors, is probably due impart to tectonic subsidence.

Geologically speaking, the entire south Bengal has been reclaimed from the sea at a late date in the history of India by the rapid southward advance of the Ganges and the Brahmaputra delta through the deposition of enormous loads of silt. Only about 5,000 years ago the sea washed the Rajmahal Hills and that the country around Sylhet was a lagoon of that sea, as was also a part of the former province of Bengal at a later date. The cities of lower Bengal became established as the ground became desiccated enough to be habitable only about one thousand years ago- the sea receding gradually to the south to the existing coastal margin of the Bay of Bengal.

The other view is that the area bordered on the north, northeast and south by the tertiary hills, and the faults of the Madhupur Tract to the west has undergone tectonic subsidence. Furthermore, the Haor area, being located so close to the north-eastern hills, noted for the heaviest rainfall region of the world, suffers from heavy monsoon rainfall as well as the flash floods, on account of which people lead a life of total misery. However, the large amount of sediments deposited by rivers as well as flash floods caused by the heavy rainfall of the adjoining area have caused subsidence as well as compaction through increased pressure of successive overlying layers of accumulated riverine sediments.

(2) Hydrology and Climate

The Haor area is completely overlaid with alluvial deposits. Thus, the formation of land has been dependent on the interplay of sediment deposits, flooding, drainage and the basin characteristics.

The shifting of the meander loops has played important roles in human habitat. It has been observed that the meander loops have shifted from time to time and from place to place, leaving behind remnants of old levees and meander scars on the ground which stand above the general level of the floodplain.

According to the geomorphic-fluvial characteristics, land levels of the Haor areas are distinguished; natural levees, meander scars, ridges, old abandoned levees forming what can be referred to as high lands, and beels, khals, ox-bows, cut-offs and old river channels as low lands. The almost flat intermediate level is represented by the luxuriant pastures over which cattle graze. Each level of land exhibits certain characteristics, on which their use is determined. Settlements are invariably located on higher grounds, while low-lying areas including beels, khals, and cut-off lands allow fishing, only after the recession of floodwater in October-November. Dugout ponds are important cultural features in the local area, not only for fishing but also for supplying of soils for raising homesteads, ails or flood protection bunds in emergency.

The beels seasonally vary in size and in their depths. During the monsoon or even pre-monsoon season, beels are deeply inundated owing to nor'wester squalls. The entire Haor area including beels or khals is deeply inundated in the wet season by more than 5 meters, as the rivers criss-crossing the area provide water routes to every direction. The settlements in normal flooding, as it may be seen, stand like islands. After the recession of flood water in October-November the beels gradually dry up and shrink in size, some of the big beels will hold water throughout the dry season, the depths varying from 5-10ft (1.5 to 3 m). Apart from the beels, water bodies such as ponds, khals, abandoned channels or cut offs provide water source for the area. Many of the beels, especially the big ones are connected to each other by means of khals or abandoned channels of the rivers of Meghna and Surma, both are outflows of the rivers originating in the Meghalaya hills.

The rains of the summer monsoon dominate the seasons in Bangladesh. Rainfall in the months from March to May and again from September to October rather than the total determines the fortunes of the agriculturists. However, the map of mean annual rainfall indicates a range of total rainfall extending from under 1,500 mm in the west to over 3,000 mm in Sylhet, the wettest district in Bangladesh, just adjacent to the Meghalaya hills and below the Cherapunjee range, noted for the heaviest rainfall in the world (more than 10,000 mm).

The three rainfall regimes coincide with the three seasons in Bangladesh. March to May is the season of nor'wester squall when rain (about 375 mm on average) with thunderstorm lashes areas. Sylhet area receives the nor'wester rain earliest than any other area in Bangladesh, the amount being over 700 mm (22%). This is the summer period, temperatures often rising to about 37°C. Temperatures are highest in April and that flash floods from Meghalaya and Tripura hills inundate areas abruptly. The relative humidity is often high reaching 70% or more on average.

More frequently less severe hazards are associated with the 'nor'westers' of March and April. Strong local winds occasionally occurring as tornadoes can cause heavy damage, but more substantial losses are incurred as a result of hail accompanying such storms. In Sylhet area hail and

the flash floods are particularly feared.

The rainy season spreads over the months from June to October when the Sylhet area receives about 2,500 mm (72%) of rainfall inundating vast areas including Haor areas. Temperature goes down a little bit with the increase of rainfall. The humidity rises further and cloud cover becomes heaviest all over, but more particularly to the north. Wave action in the Haor areas become more pronounced during the rainy season, which is truly the summer monsoon in Bangladesh.

The dry season lasts from November to March when Sylhet area experiences about 200 mm (6%) of rainfall on an average. The dry season is cool, the mean minimum temperature often going below 10°C, with fogs prevailing in the high lying areas. In much the same time water recedes from the Haor area with beels still filled up with water. Monthly rainfall record in two locations of Haor area in 1997 is shown in Table 3.4.

Table 3.4 Monthly Rainfall Record in Two Stations near Haor in 1997

(Unit:mm)

Month Station	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Sylhet	1	27	112	170	347	797	678	492	947	31	23	19	3,644
Mymensingh	1	12	31	172	131	410	524	424	488	8	11	20	2,232

Source : Bangladesh Meteorological Department

(3) Land Resources

There are two main landform units found in the Haor area: (i) Flood basin and (ii) Lowland flood plains. The Flood basin unit is characterized by the large saucer-shaped seasonally flooded, interfluvial area, known as haors, which has small, permanent lakes, called beels. Flood basin is the dominant unit in the Haor area, covering some two-thirds of the area. The basin is believed to have evolved as an alluvial and shallow lacustrine deposition into a rapidly subsiding trough. Land elevations are low, typically ranging from 3 m to 7 m PWD. As shown in Table 3.5, More than 60% of the land is fallen into the land type categories of Low land (F3) and Very low land (F4).

Table 3.5 Distribution of Area by Land Type in Haor

	High Land F ₀ *	Medium High Land F ₁ *	Medium Low Land F ₂ *	Low Land F ₃ *	Very Low Land F ₄ *	Homestead and Water bodies	Total
Share of the area (%)	< 1	4	19	43	23	11	100

Remarks: *: Agricultural Land Classification: F₀: no fear of inundation; F₁: the lands where normal flood depth is up to 0.9 m; F₂: up to 1.8 m; F₃: up to 3 m; F₄: more than 3 m.

Source: FAO/ UNDP, 1988. Report 2: Land Resources Appraisal of Bangladesh for Agricultural Development

Much of the land is traversed by distributary spill channels and other old partially infilled channels which at one time connected the Surma river system to the Kushiya river. The unit of Lowland Floodplains has been created as a result of deposition and erosion from the Surma and Kushiya

rivers.

The area belongs to AEZ-21: Sylhet Basin. Soils in the area are grey clays in the wet basins and silty clay loams and clay loam on the higher parts which dry out seasonally. Noncalcareous Floodplain soils and Acid Basin Clays are the major components of the general soil types. The soils are acidic in general and have moderate content of organic matter. Thanks to the supply of nutrients with loaded sediments by flood water as well as high nutrient holding capacity of soils, the fertility level of soils is medium to high. However, for ensuring high crop performance, application of potassium and sulfur is preferable.

(4) Flora and Fauna

The Haor area supports two types of wetland: permanent wetland including rivers, canals, perennial water bodies like beels and fishponds; and seasonal wetland. Most of the Haor area are seasonal wetland. While permanent wetland provides refuge and shelter for most of the aquatic flora and fauna, the seasonal wetland serve as the grazing ground for fish and other aquatic animals like freshwater turtles. It may also provide substratum of many species of turtles to lay eggs. The changes in the physical characteristics of wetland have direct impacts on its dependent flora and fauna.

Once the Haor areas were rich in biodiversity. It supports a wide range of a variety of wildlife and fishes and floral diversity included wetland flora. Every year the Haor areas inundate for several months. The depth of water varies from place to place with average water level of 3.0 to 4.5 meters from the ground. Different types of aquatic flora grown in the Haor basin. The dominant and indicator plants of the Haor basin were Hijal (*Barringtonia anutangula*), Koroch (*Pongamia pinnata*), Makna (*Euryale ferox*), Barun (*Crataeva nurbala*); Bongolap (*Rosa involucrate*), etc. Unfortunately these four plants have been depleted at an alarming rate due to the agricultural development activities. The agricultural development as well as indiscriminate fishing and hunting of wildlife adversely affect fauna. Critically endangered, endangered and threatened wildlife and fishes in the area include: Palla's Fish Eagle (*Haliaeetus leucoryphus*); Swamp Francolin (*Francolinus gularis*); Common Batagur (*Batagur baska*); Genges Soft Shell (*Aspideretes gangeticus*); Dark-bellied Marsh Snake (*Xenochrophis cerasogaster*); Striped Keelback (*Amphicesma stolata*); Rat Snake (*Ptyas mucosus*); Fishing Cat (*Prionathrus benghalesis*); Common Otter (*Lutra lutra*); etc.

3.3 General Demographic Characteristics

3.3.1 Household Characteristics

Average household size of the Char and Haor areas is 6.6 for Char and 6.9 for Haor, respectively, as shown in Table 3.6.

Table 3.6 Average Household Size of Char and Haor

Char Districts (Nos. of village surveyed)	Average household size	Haor Districts (Nos. of village surveyed)	Average household size
Gaibandha (25)	6.4	Habiganj (35)	6.3
Jalalpur (25)	6.5	Kishoreganj (36)	7.0
Kurigram (34)	6.7	Netrokona (33)	6.5
Sirajganj (31)	6.6	Sunamganj (37)	7.4
Char total (115)	6.6	Haor total (141)	6.9

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

There is not much difference in the size among districts in the Char, while Sunamganj of the Haor have bigger households size with 7.4 on average.

The average share of the female headed households in the total households is 14.1% in the Char, while 8.6% in the Haor, as shown in Table 3.7.

Table 3.7 Share of Female Headed Households in Char and Haor

Char Districts (Nos. of village surveyed)	Female headed household rate (%)	Haor Districts (Nos. of village surveyed)	Female headed household rate (%)
Gaibandha (25)	13.9	Habiganj (35)	8.9
Jalalpur (25)	11.9	Kishoreganj (36)	7.6
Kurigram (34)	16.1	Netrokona (33)	9.4
Sirajganj (31)	14.5	Sunamganj (37)	8.3
Char total (115)	14.1	Haor total (141)	8.6

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Female households are found more in the Char area than in the Haor area. Higher rate of female-headed households in the Char may imply more difficult living environment there.

There is much difference in the rate of female headed households among villages within a district. In Kurigram, for example, the average rate was 16.1%, ranging from 3.7% to 45.7%.

3.3.2 Migration

(1) Occurrence of migration

Total number of in- or out- migrated households in the surveyed villages in the last 5 years is shown in Table 3.8.

Table 3.8 Number of Households Migrated in and out of Char and Haor in Last Five Years

District (nos. of surveyed village)	Nos. of villages without		Nos. of villages		Nos. of households	
	Out-migration	In-migration	In > Out	Out > In	In-migrated	Out-migrated
Char						
Gaibandha (25)	5	2	16	9	1,778	794
Jamalpur (25)	10	2	18	7	1,222	1,287
Kurigram (34)	18	6	21	13	1,170	1,054
Sirajganj (31)	11	6	22	9	3,094	1,490
Char total (115)	44	16	77	38	7,264	4,625
Haor						
Habiganj (35)	9	6	16	16	225	234
Kishoreganj (36)	14	13	11	19	240	709
Netrokona (33)	13	12	12	16	174	143
Sunamganj (37)	18	9	19	13	194	156
Haor total (141)	54	40	58	64	833	1,242

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

As for the Char, 7,264 households were in-migrated while 4,625 out-migrated during the last 5 years. Although the number of in-migrated households surpassed out-migrated in two-thirds of surveyed villages of all districts, the total number of in-migrated households is not much different from that of out-migrated in Jamalpur and Kurigram. It may imply that out-migration is taken place in larger scale in these districts. Some 38% of surveyed villages or 44 villages did not experience out-migration while 14% or 16 villages did not experience in-migration.

On the other hand, the Haor area experienced less number of both in- and out- migrations. During the last 5 years, 833 households were reported to be in-migrated, and 1,242 were out-migrated. Out-migration is prominent in Kishoreganj with 709 households, or 57% of the total out-migrated. Out-migration surpassed in-migration in 64 villages out of surveyed 141 villages in the Haor, while in 58 villages in-migration surpassed. Total of 54 villages out of 141 surveyed experienced no out-migration while 40 villages did not experience in-migration.

From the findings, it can be said that migration is taken place more dynamic in the Char area than the Haor. Simple calculation shows that more than 12 households per village migrate in annually and that 8 households per village migrate out. While in the Haor, in-migration is less than 2 households per village annually, and out-migration is only one.

Migration is a part of life of the Char dwellers. Char areas are the abode of helpless, poverty-stricken and unfortunate paupers who, finding no other alternative means of life, have to make home in adverse environmental conditions. Population pressure on land being severe, exceeding the carrying capacity, people are often forced to migrate to chars making their habitat in the marginal and disaster prone areas. The riverine tract with attached and island chars force people to build their shelters in these chars.

The shifting of the river course is another phenomenon causing people to live on chars and

riverbanks vulnerable to vagaries of river action. The fact is that erosion is a major hazard for the char dwellers. Many households are forced to move away from the homesteads due to such erosive action of rivers – people having no alternative but to migrate away to new territory. In case of a forced move due to erosion, people migrate with their household and livestock to take shelter in the public places like roads or embankments according to their accessibility. But very rarely do they migrate to mainland because not much land is available there, unless they become completely helpless to find places in urban areas as refugees.

Generally, people try to stay as close to their former settlements as possible. One reason can be to stick to their social structures as long as it is possible. Other options relate to their hopes that deposition of sediments might follow the erosion process and might restore lost land. Moving to the home of relations is another choice left to them.

There is no regular tendency in migration pattern of Haor villages in the last five years. Out-migration predominates in some villages while in-migration surpasses in other villages. There are also villages both in- and out-migration occurred.

But the number of migrated households is small in general. Some 80% of the villages surveyed by RLCS experienced in- or out- migration with less than 10 households during the last five years. 17 villages out of surveyed 141 villages experienced no-migration during the same period.

Reasons for migration differ between in- and out- migration. The main reason for in-migration is the marriage/kinship ties, followed by seeking better employment and landlessness. While, the out-migration occurs due mainly to landlessness, flood/erosion, and better employment. The fact that landlessness and better employment are the major reasons for both in- and out- migrations may explain the difficult living conditions of people in the area.

(2) Causes of migration

As to the phenomenon of in-migration, the marriage or kinship ties and better employment (65%) have figured prominently, as shown in Table 3.9. Social attributes, especially the kinship ties have as much strong a factor as the behavioral attributes in the char areas – feeling for other distressed people is a common behavioral phenomenon, to be precise. The favorable water and soil conditions often lead to development of settlement, even if constrained by the physical causes. Apart from the physical advantages, the attitude to help others in distress, coupled with building shelters – *Asrayan Prokolpo*, or building projects for the landless people for example – with compelling community organisation including a strong sense of territory in fact prevail upon in-migration.

Table 3.9 Principal Causes of Migration

Causes	Char				Haor			
	In-Migration		Out-Migration		In-Migration		Out-Migration	
	No. of Occurrences	% of total	No. of Occurrences	% of total	No. of Occurrences	% of total	No. of Occurrences	% of total
Erosion	75	4.7	399	27.3	48	4.1	87	7.9
Flood	41	2.5	283	19.4	55	4.7	247	22.5
Landlessness	102	6.3	349	23.9	241	20.8	340	30.9
Better employment	500	31.0	214	14.7	247	21.3	288	26.2
Marriage/ Kinship ties	540	33.4	172	11.8	468	40.3	88	8.0
Socially victimized/ conflict	44	2.7	28	1.9	67	5.8	22	2.0
Others	312	19.3	15	1.0	34	2.9	27	2.5
Total	1,614	100.0	1,460	100.0	1,160	100.0	1,099	100.0

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

In the Haor area, in addition to flooding and erosion, landlessness and seeking better employment elsewhere have provoked out-migration (nearly 88% of the occurrences). Marriage/kinship ties including social victimisation or conflicts often lead to sporadic out-migration.

As in the Char areas, the institutions of marriage and kinship ties play a major role in causing in-migration (40.3% or 468 occurrences) in Haor areas.

3.4 Socio-Economic Conditions

3.4.1 Description of the Rural Life

Average rural life in the Char and Haor area is described in the following. Table 3.10 for Char and Table 3.11 for Haor are also provided to clarify the change in the activities by category of activities by season.

(1) Char Area

Dry Season

Most people in the Char area are engaged in agricultural activity in the dry season. Depending on the soil moisture conditions and irrigation availability, they cultivate various crops like boro rice, wheat, chilies, groundnuts, beans, vegetables, etc. However, their land holding size being very small or none, the amount of harvest is not sufficient to feed all the household members. Livestock like cow, goat and sheep are commonly seen in the Char area. They are grazed in the sandy area where natural grasses grow.

The staple food in the area is rice and wheat. They also take dal (lentil curry), vegetables, fish, potatoes, chillies, etc., as subsidiary food. Although many of them keep animals, they rarely eat their meat but rather sell them in exchange for daily necessities. Daily food intake depends on the availability of food. Some take three meals a day while others take one or two times only.

Division of works seems well established between men and women. Male are responsible for economic activities outside such as farming, daily labor, fishermen, rickshaw puller, business, etc. While, women usually stay at home engaging household work and backyard livestock keeping, although the involvement of women in the economic activities has been increasing in recent years. Children help their parents in doing farming, fishing, household works, etc.

Children go to school when they are free from agricultural works. Social services delivery like health and agricultural extension becomes normal, although the frequency of the delivery never satisfies local people's demand due to lack of allowances as well as scattered settlement pattern.

The local people chronically suffer from mal-nutrition, vitamin deficiency, anemia, etc., because of insufficient amount of food as well as imbalanced dietary food habit. Partly due to the physical weakness, they also tend to get sick frequently.

Communication becomes difficult in the dry season as water level of the Jamuna river goes down. Settlements are established generally in the higher part of Chars, ferry-landing sites become far from settlements in the dry season. Walk is the sole means of transport as road is not constructed in most Chars. They often have to walk several kilometers on sandy soils from their house to ferry landing site to carry their goods for marketing in the mainland. Also they have to walk for long distance carrying purchased items from landing site to their houses.

The people use dry leaves, cow dung, crop residues including rice straw, wheat straw, jute stalks, dhaincha (leguminous plants for fencing and fuel) stalks, etc., as cooking energy sources, while kerosene as lightening. Hygiene conditions become better in the dry season although the sanitary latrines have not been well extended. They use pit latrine and open yard in general.

Credit facilities are available on either formal or informal basis. But in most cases they borrow money from informal channel, local moneylenders despite they demand very high interest rate. They extend credit for any purposes such as housing, wedding ceremony, etc. Formal credit from banks is hardly utilized due to long distance to the location as well as requirement of collateral and complicated process for application. NGOs also provide credit to specific target groups with specific objectives. People also borrow small amount of money from relatives with nominal or no interests. Credit is mainly used for purchasing agricultural inputs like seeds, fertilizer, pesticides, etc. NGOs often provide credits for income generating activities.

Table 3.10 Description of Daily Life of People in Char

Issues	Dry season	Pre flood	During flood	Post Flood
Occupation	Agriculture Business Service Day labor	Same as dry season	Almost all profession disrupted during flood except jute business in boat, fishing, weaving works, etc. Those who have boat hawk some essential commodities in high prices. Some person migrate outside for employment.	Migration in and every person back in their normal profession. Farmer start to repair for dry season crops.
Agricultural	Chillies, Wheat, Paddy, Vegetable	IRRI, Jute	In normal flooding, jute and paddy survived	Aus, IRRI, Rabi crops
Education	Normal	Normal	Disrupted, school closed	Restored normal situations.
Health care	Health condition become as usual, if otherwise not happened. Health worker visit the village.	Same as dry season	Contaminated flood water causes many hazards. People go to hospital by boat, but it's difficult to arrange boat urgently in char island and patient must wait 5 or 6 hours to take boat. Health and FP worker do not visit village.	Some times disaster comes Diarrhea, out break widely, other water born disease occurred.
Sanitation	Sanitation is very low and unhygienic. Peoples use pit latrine mostly. Some person use open field. Elder men and women also use open field at night.	Same as dry season	Existing sanitation system totally disrupted. Men generally use boat, women done their natural calls in night time.	After flooding again they restored the sanitation system as before they had.
Food	Rice, wheat, sweet potato, chili, pulses, vegetables, fish, milk, fruit, etc.	Same as dry season	People reduced cooking due to fuel. They cook once in a day and usually take it once or twice in a day. They eat dry foods, fish and wheat, etc.	Food scarcity occurred. People get some relief from government and other agencies. Gradually people comeback in normal situation.
Transportation	Mainly on foot. Few people use rickshaw, bicycle.	Same as dry season	Boat, vella	Same as dry season
Housing	Most of the dwelling houses are made of CI sheet in the roof with bamboo fence, straw, jute stock etc. No pucca house in the village. Floor of the all houses are katcha.	Same as dry season	Almost all the houses inundated during flood. Some person sifted in the high land or embankment in far away. Others stay in their houses with making fence.	Villagers repaired their damaged houses and homestead.
Safety	No safety assistance villagers get from government. Villagers must arrange their own security.	Same as dry season	Villagers take attention to their children, property and other materials. The more caution is needed for snakes.	Same as dry season
Migration	In every year some people migrated in. They are coming back their old village.	Same as dry season	Some villagers take temporary shelter in the embankment or in the flood shelter outside or inside of village.	After flood, peoples come back their home and repaired the homestead.
Fuel for cooking	People usually use waste leaves, cow dung, branches of chili, wheat straw, dhaincha, jute sticks. People store fuels for use in the flood period.	Same as dry season	They use the stored fuel. They save their fuel by reducing cooking time.	Fuel scarcity occurs some times. They again collect fuels.
Income	Villagers main income sources are agriculture, daily labor, small scale business, services such as shop holder.	Same as dry season	Income level decreased. They migrate outside for jobs.	Gradually they come back in their normal profession.
Credit	Money lender Agriculture loan from BKB (a very few person) NGO provides credit to their group members.	Same as dry season	Only local money lender extend loan with high interest rate.	Peoples apply for loan to local money lender to repair their home stead and purchase food, and other necessities.
Role of men and women	Both men and women done their routine works. Women stored fuel for cooking during flood time.	Same as dry season	When male goes out for jobs, female have to do all the works including protection of houses and properties, domestic animals, children etc.	They come back their normal work. Women repaired their homestead.
Social norms and customs	Normal	Normal	Disturbed they avoid and stops social festivals	Normal
Communities role	Other than judiciary works done by village leaders and elite, no community roles are existing.	Same as dry season	They patrolled in the night jointly to protect their properties from robbery.	Same as dry season
Government role	VGD Elderly pension	Same	Police some times patrolled in the river to protect robbery.	Some times relief goes to village.
Role of NGOs	In some village, NGO provide credit to their group members.	Same	In some village, NGO provide rescue service if necessary.	In some village, NGO provide relief and rehabilitation work..

Source: JICA Study Team based on the Rapid Rural Appraisal by DICS, 2001

Pre-flood season

Towards the rainy season, nor'wester storms often attack the Char areas. Strong wind accompanied with thunder, and heavy rain damages the houses and crops. Sometimes hailstorms also are experienced.

People harvest dry season crops and start cultivation of wet season crops like jute, aus rice, dhaincha (leguminous crops as materials for fencing and cooking fuel), etc. Most dry season crops are stored in their houses, and some are sold in market to obtain cash. Women are busy in preparing cooking fuels by cow dung and grasses for the wet season.

They also prepare for the wet season in enforcing house structure by tying poles by jute ropes and in raising their homestead area including the plinth of house, so that the damage by flood could be minimized. They also raise the mound for livestock they keep to avoid inundation. Residues of dry season crops such as rice straw and wheat straw are collected and piled up in their homestead for feeding animals during wet season.

As people are busy in preparing for the wet season, children tend to be absent from schools and help their parents.

Wet season

In the wet season, living environment of the Char area changed totally. Many char lands including agricultural lands and homestead area are submerged during flooding.

When water depth increases to certain level, people decide to take action to take shelters. Flood warning system does not exist or function. While many people migrate to take shelters in mainland such as embankment, raised road, other people remain their house under the submerged conditions to look after their houses as well as kept animals because they do not have transportation means to carry all their properties and because it is difficult to find sheltering place. Those who remain in their homestead construct simple raised floor by bamboo poles inside houses to stay as well as store food, fuel, etc.

Economic activities are almost disrupted as agricultural land is submerged. Rice and jute can survive only in normal flood year. Male change their occupation from agriculture to daily labor, rickshaw puller, fishermen, craftsmen, boatmen, etc. But unemployment also increases much in this season.

Living environment in the Char area becomes worse. Drinking water is not available due to submergence of hand tubewells. Living space is limited even inside the house. Many of them take meal only once a day as cooking fuel is limited. Country boat and vella (a boat made of banana trunks) is used for transport and defecation. Social services delivery like health, education, etc. almost stops in this season. Women experience extremely hard time in case of delivery.

Only communication becomes convenient in rainy season. Ferry landing sites are moved to close to their settlements. So unloading and loading of people as well as commodities become easier.

Post-flood season

In post flood time, after wet season, when water level of the Jamuna river goes down, those who migrated to take shelters and work comes back to their houses to restore their ordinary life. Men start preparation for the cultivation of dry season crops as well as repair their homesteads. They go to local moneylenders asking for credits for purchasing agricultural inputs, livestock as well as repairing houses. Women also help their husbands in repairing their homestead and continue household works. Children help their parents either in the field or at home.

The hygiene conditions become worst when water becomes stagnant and hand tubewells are still not usable. As soils around houses are still muddy, defecation is done surroundings of their houses. Water born diseases including diarrhea and dysentery tend to break out.

Schooling resumes, as teachers come back to visit schools regularly, although attending rate is not so high because children are busy in helping their parents either in the field or at home.

(2) Haor Area

Dry season

Most of the local people are busy in agricultural activities in the field, especially crop cultivation, as the agriculture is the major source of their livelihood. Boro rice is by far the dominant crop here. Other crops, if any cultivated, include beans and vegetables. Other sources of livelihood are daily labor, fishing, shop keeping, etc.

The staple food in the area is rice. Subsidiary foods include fish, pulses and small quantity of vegetable, especially chillies. All these food items are harvested by themselves. Although many of them keep animals including cow, goat and poultry, they rarely eat their meat but rather sell them to purchase other daily necessities. Usually they take meals three times a day, but in lean months of February to May, harvesting season of boro, they take less food in terms of quantity and frequency.

Male are the main players in the field while female tend to stay at home engaged in house works and backyard livestock. Men also make their plinth of homestead high by earth materials from riverbed nearby, to prepare for coming flood season. Children go to school when they are free from field works. Communication is very difficult in the dry season due to long distance to urban center and to disconnection of road network by canal and small rivers. Transportation means are almost limited to walk.

Government services like health and agricultural extension are seldom reached due to difficult communication and insufficient travel allowance. Only family planning officers and health officers visit villages to provide immunization.

Table 3.11 Description of Daily Life of People in Haor

Item	Dry season	Pre flood	During flood	Post flood
Occupation	Farmer and daily labor work in the field. Some businessmen are busy in their business. Some are digging, fishing, teaching, village doctor are also busy in their work.	Farmers and daily labors are busy in harvesting. Boatmen are also busy in bringing paddy from field to mainland. Fishermen sell fish in bazaar.	During flood, farmer and daily labor have no work. But boatmen, fishermen, service holder and handicraft maker are busy in their own occupation. Some person migrate to district town for taking job of rickshaw puller etc.	Farmers and daily labors start to prepare for cultivation in the field. Women are busy for vegetable gardening. Those who work in district town during flood return home.
Agricultural	Bean, Paddy cultivation, small quantity of vegetables cultivation.	Harvesting time, farmer and daily labor are very busy.	Nothing can produce.	Preparation for cultivation and plantation
Education	Students attend teaching when they are free from agricultural work.	Roads become submerged and slippery. So attendance rate in this season is very low.	Difficult to attend school for some students because boat is not available. Some times school is inundated and teaching is stopped.	Field work starts and students cannot go to school. Roads are slippery, not only children but also teacher don't go to school regularly.
Health care	Receive treatment from Village Doctor. Family planning and health officer often come to provide immunization. No service from Union Hospital is provided.	People get health service from village doctor. Road condition change to worse, health worker don't come.	Usually go to Village doctor. Communication change to ease due to water, people go to Upazila hospital by boat in emergency case. But family planning and health worker don't come due to flood.	After flood, some diseases, diarrhea and other water-born diseases, break out and doctor and health workers are busy in this season.
Sanitation	People use open field. Some villagers use handy latrine.	Same as dry season	Villagers use handy latrine and open water by boat.	Same as dry season
Food	Villagers take meal three times a day. Most of the time they take meal with rice. They take fish and vegetable for lunch and dinner.	Villagers take meal three times in a day with rice and fish. They cannot take enough vegetables in this season.	Due to fuel scarcity, people take food 1 or 2 times a day. Dry food, fish, etc are available. During flood, they receive some relief food.	Villagers take meal three times in a day with rice and fish. They cannot take enough vegetables in this season.
Transportation	By boat and foot	Same as dry season. To bring paddy from field to dry yard, they use boat.	Those who have boat can communicate easily, otherwise they must take rent or asked for boatmen.	Navigation becomes difficult. Road are also slippery to walk.
Housing	Villagers make and repair their house in this season. Some villagers make their homestead high and put fence around their homestead to protect from wave.	When early flood start, villagers make high roof with bamboo and tin to take shelter during flood. Some villagers start to save their property and prepare to migrate other place.	When their house start to be inundated, they take refuge in the raised roof. Sometimes strong wave strike their homestead and their land is ruined.	Some villagers need to repair their house. Some of them make their homestead high after flood.
Safety	No arrangement for the security purposes are provided.	No arrangement for the security purposes are provided.	No any arrangement for the security are prepared. But some villagers do it by their own initiative, because criminals from other village start robbery. Generally cattle and household properties are looted.	Villagers don't have any civil security guard in this period.
Migration	No Migration in general.	Some villagers start to prepare for temporarily migration.	Some person (especially male) migrate to nearby district town for employment such as rickshaw pulling or other temporarily labors.	Those people who migrate temporarily, come back.
Fuel for cooking	Villagers use cow dung cake, waste leaves, black soil, dry wood. They make big wheel by straw and cow dung as fuel for cooking.	Same as dry season.	Villagers use their reserved fuel.	Fuel is scarce in this season. Some villagers have to buy it from market or others with high prices. They use old and broken fence and bamboo as fuel.
Income	Villagers' main income sources are irrigation, daily labor and fishing. A few women earn by sewing kantha and some other things. Some sell vegetable and egg, banana etc.	Villagers are very busy in harvesting crops. Villagers' main income sources are working in the crop field as daily labor, selling paddy in the market.	Farmer and daily labor has nothing to do in this seasons. Only fishermen and service holder, handicraft maker, boatmen can earn.	Farmers need to take credit from local money lender for farming. Fishermen can get money by selling fish.
Credit	Villagers take credit from money-lender for irrigation with high interest. Some NGO provide a little credit for their group member to solve their housing problem.	Usually nobody take credit from money-lender in this season. Farmers return their credit by selling their crops.	Usually nobody can get any credit facility. Some villagers get some credit from money lender to buy fishing boat and fishing net in this season.	Some take credit from local money-lender for farming with high interest. It is difficult for farmers to borrow money from Bank, because they require collateral and Few women get some credit facility from NGO.
Role of men and women	Women cook food and look after the children, rearing poultry and cattle, collect fuel item, sweep their house. Men work in the crop field. Man make fence to protect their homestead. Both men and women make fishing net, useful handicrafts.	Women collect different kinds of fuel like cow dung, waste leaves, dry wood etc. and reserve them for rainy season's use. Both men and women are busy in harvesting. Men bring crops from the field and women boil paddy and dry it up. Fishermen make fishing net.	It is very hard time for the women to look after their children and cook food for their family under uneasy conditions. During flood or rainy season, men has no work in the field except fishermen and boatmen, doctor etc. Some farmers and daily labor go to outside of village to get job.	Men become busy to repair their house, and to cultivate for dry seasons crop. Women also busy to collect fuel for cooking.
Social norms and customs	There are an Islamic tradition for boy to do Khatna (circumcision) in this season. People celebrate Bengali new year.	Some villagers celebrate harvest festival. They make many variety of food with new rice.	Some villagers get married in this season because boat communication becomes easy.	After flood, villager's economical condition becomes weak, so they don't do any celebration in this season.
Community role	There are no village organization, but villagers helps each other before flood to protect their homestead from wave action by using one kind of grass. When somebody falls into any trouble, villagers band together and help them.	There are no village organization, but if anybody falls into any trouble, villagers band together and help them.	Villagers jointly organize the safety measures to protect their properties, and help each other when anybody falls into any trouble	There are no village organization, but if anybody falls into any trouble, villagers band together and help them
Government's role	Government provide rehabilitation services. Some villagers are provided VGD, poverty allowance, widow allowance	Villagers get VGD, poverty allowance, widow allowance old age allowance.	During flood, villagers get some relief food, some medical services, VGD, Poverty allowance, widow allowance, supply of water purifier tablet	Some villagers get credit facilities from Agriculture Bank. Some are provided VGD, old age allowance, poverty allowance, widow allowance.
Role of NGOs	NGO provide their services only for their members.	Same as dry season.	During flood season, NGO are not performing any special performance except for members.	Same as dry season.

Source: JICA Study Team based on the Rapid Rural Appraisal by DICS, 2001

They use dry leaves and cow dung as cooking energy, while kerosene is used for lighting. Hygiene conditions are better as wide-open land is available for defecation and as hanging latrines are constructed in the lower land.

Although credit facilities are available on either formal or informal basis, majority people go to local moneylender, despite of high interest rates, due to simple process for application. Formal credit is extended through BKB or agricultural bank, but the requirement of collateral for application hinders poor villagers from approaching. Some NGOs provide micro credit to specific target group with specific objectives.

Although there is no formal village organization established, villagers help each other to construct fence by bamboo and local grass to protect their homestead land from wave action.

Pre-flood season

Towards the rainy season, men are busy in harvesting boro rice to avoid flash flood, which suddenly attack and destroy crops at maturity. Men bring the crops from the field, and women thresh, boil, dry and store them. Boatmen are also busy in bringing harvested paddy from villages to market.

Women are also busy in preparing for cooking fuel by waste leaves, cow dung, dry wood, etc. and in reserving them for use in the rainy season. Some people make high roof with bamboo and tin to take shelter during flood, while other people start to save their property and prepare for migrating out of the village.

After harvesting, those who obtained credit return the borrowed money to money lenders by selling their harvest.

When rainfall starts, road becomes slippery and some portion get submerged, which makes road transportation difficult. Rivers flowing in the area overflow, and lowland area become submerged.

Wet season

In the rainy season, the life of local people in the Haor changes drastically, and they spend uneasy days. When the surrounding of the mounds is submerged, living spaces of local people are almost restricted within the mounds they live.

Those who work for agriculture lose job because of inundation of agricultural land. Income sources of villagers in the locality are almost limited to boatmanship and fishing if available. Many are idle staying in the village while some go out to nearby towns or big cities like Dhaka, Sylhet, Mymensingh, etc., to seek job opportunities.

In windy days, which sometimes last weeks, waves reach to the mounds and gradually erode the edge of mounds. Villagers remaining in the mounds try to mitigate erosion damages by constructing bamboo fence and setting along the edge of mounds facing to the Haor area. Grasses

are filled between mound and bamboo fence to avoid direct contact of water with soils of mounds. In some village, when wave is big enough to reach to their houses, women and children block waves by standing at their backs facing to the Haor.

Meal is taken one to two times a day just to save fuel for cooking, as stored fuels are not sufficient. Sanitation condition is getting worse due to too much population including animals in a limited space, difficulty in obtaining drinking water, unavailable sanitary latrine. Family planning and health workers stopped coming. Hard living conditions lead local people to easily get diseases. In most cases people consult village doctor who is locally available in case of diseases, and go to Upazila health complex by boat in case of emergency.

Schools are closed in many places because of the inundation of school facilities, lack of transportation means, absence of teachers, etc.

Good thing in the wet season is that communication becomes easier. People can access to various destinations by using boats. Many navigation routes open connecting major upazila centers. The flow of bulky commodities including construction materials increases in this season. Weddings are more commonly taken place, making use of easy communication conditions. On the other hand, cases of thieves and dacoits also increase in this season. Livestock kept in groups are main target. In some village, livestock keepers sleep with their animals to prevent them from thieves.

Victims of thieves and/or dacoits, in several villages, do not report the case, because the thieves are often connected with local influential people. People are not interested to go to police because it demands much money for investigation.

Post-flood season

After the wet season, when water level of haor goes down, people moves out of their limited living space gradually. Those who migrated outside for work come back and start preparing for the cultivation of boro rice. Many people go to local moneylenders to ask for loan for purchasing agricultural inputs like seed and fertilizer, as well as rehabilitation of their homesteads. Some also apply for agricultural loan to BKB.

Men also repair their homesteads damaged by wave action/rain while women are engaged in normal domestic works including collection of fuel. Children help their parents either in the field or at home. They re-start to take three meals a day, although cooking fuel still lacks. They sometimes have to purchase fuel at the market or from other villagers with high prices.

While navigation becomes difficult with reduced level of flood water, road communication is still difficult due to muddy and slippery conditions. Being busy as well as difficult to move, children are not able to go to school regularly. Under such conditions health workers and village doctors are busy in visiting villages to look after patients.

3.4.2 History

(1) Char Area

The formation of the Char areas is interplay of erosion and accretion dynamics in a river channel, leading to so-called ‘island char’ (those that develop within the river channel) and ‘attached chars’ (chars formed along the river banks). In many cases the course of the Jamuna river change every year, sweeping away villages and creating new char lands. So, the history of villages in the Char area is short. According to the results of the Rural Living Conditions Survey, two-thirds of the 115 surveyed villages have less than 30 years of history.

(2) Haor Area

The Haor villages, on the other hand, have long history. Their establishment dates back to 18th to 19th century. In those days when population size was still small, the Haor area was blessed with the abundant flora and fauna. Many trees and aquatic grasses protected their homestead from erosion caused by wave action, while abundant fish resources provided protein food to local people. Being remote from other areas, unique culture like folk songs have developed there.

As population increased, they utilized the natural resources for their living at faster speed, and development activities including infrastructure and agriculture, i.e. boro rice cultivation have almost wiped out those resources. Nowadays, many villages have serious problems such as over-population and erosion of their homestead area by wave action in the flood season.

3.4.3 Religion and Ethnic Groups

Almost all Char villages surveyed by RLCS are Muslim dominant, while significant number of Haor villages are Hindu dominant, as shown in Table 3.12.

Table 3.12 Share of Households by Religious Groups in Char and Haor

Unit: number of village

Religion	Percentage of household						Total
	0 %	0-10 %	10-25 %	25-50 %	50-75 %	>75 %	
Char							
Muslim	0	1	0	0	1	113	115
Hindu	82	28	3	1	0	1	115
Christian	115	0	0	0	0	0	115
Buddhist	115	0	0	0	0	0	115
Haor							
Muslim	31	1	6	6	15	82	141
Hindu	63	12	7	13	6	40	141
Christian	138	0	0	1	2	0	141
Buddhist	140	1	0	0	0	0	141

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Out of 115 villages surveyed in the Char, only one village is Hindu dominant, and the rests are all Muslim dominant. There are only two religions found in Char, according to the RLCS.

While in the Haor, 82 villages or 58% of the surveyed villages by RLCS are Muslim dominant, as more than 75% of the village households are Muslims, while 40 villages or 28% of the total are Hindu dominant. There are also three villages where Christian live and one village where Buddhists live.

3.4.4 Common Social Ceremonies

Eid, the major Muslim festival is taken place at all the Char villages surveyed. Other important socio-religious ceremonies include Milad (93%), and Mohharam (39%). Puja, the major Hindu festival, on the other hand, is observed only some 20% of the surveyed villages. As for social ceremonies, marriage is the most important observed in 99% of the surveyed villages. Other social ceremonies like birth/death anniversary, national days and Akika, are also observed in significant number of villages, not as much as marriage, though.

Ceremonies held in the Haor area can be categorized on the basis of religion, social ceremonies, and national days and village fairs. RLCS survey revealed that Eid, the major Muslim festival, is observed in 70% of the village, owing to the predominance of the Muslim population. Other important Muslims festivals include Milad (68%) and Moharram (29%). Puja, the major Hindu festival is observed in 51% of the villages in Haor, owing to the prevalence of Hindu population in those villages.

As to social ceremonies, marriage is the most important as it is observed in 90% of the surveyed Haor villages. Marriage is arranged by parents and the ceremony is conducted in the rainy season from July to October in general, when the communication is easy. Dowry is prevailing in the area. Child marriage is also common in the area. Akika, a Muslim festival held in connection with giving a name to the newborn baby, is also important, observed in 52% of the surveyed villages, followed by birth/death anniversary observed in 32% of the surveyed.

National day observation is also an important event, observed in 25% of the surveyed Haor villages, but people go to market or towns to participate in the function rather than spend the day in their own village. Village fair seems to be more important event in Haor areas, presumably due to abundance of Hindu population.

3.4.5 Land Tenure

There are largely five types of tenancy in the Char and Haor area, as shown in Table 3.13.

Table 3.13 Land Tenure Pattern in Char and Haor

District (nos. of sample village)	Land tenure pattern (percent)					Total
	Owner farmer	Absentee landlord	Owner cum tenant	Tenant	Others	
Gaibandha (25)	21.5	0.8	33.2	42.8	1.8	100.0
Jalpur (25)	29.9	1.9	39.0	29.2	0.0	100.0
Kurigram (34)	23.1	0.4	29.6	26.5	20.4	100.0
Sirajganj (31)	29.7	1.8	25.3	18.1	25.0	100.0
Char Total (115)	26.7	1.4	32.0	28.5	11.4	100.0
Hobiganj (35)	19.3	1.2	29.1	21.6	28.9	100.0
Kishoreganj (36)	18.5	1.3	36.2	15.8	28.1	100.0
Netrokona (33)	16.6	0.8	25.2	16.6	40.9	100.0
Sunamganj (37)	24.0	0.7	35.3	18.8	21.2	100.0
Haor Total (141)	19.4	1.1	31.9	17.9	29.8	100.0

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

(1) Char

The owner farmers cultivate their own land either with family labor only or with help of hired labor and occasionally by family labor. Some 27% of the farmers in the surveyed villages fall in this category.

A land ownership classification has two other tenure classes: (i) absentee landlords and (ii) owner-cum-tenants. Absentee landlords get income from the land without doing farming by them. However, the absentee landlords are few in the Char area with 1.4% only. Owner-cum-tenants cultivate a portion of land and rent the remaining portion to other cultivators. More than 30% of the farmers in the surveyed villages are the owner-cum-tenants.

The tenant farmers include share-croppers and land lessees. Tenant farmers do not own land nor can they acquire right to the land they rent. They are always dictated on the tenancy conditions by their landowners. Not having access to modern inputs and institutionalized credit facilities, the tenant group relies on big landowners for credit at high interest rates. The tenant farmers account for 28.5% of the farmers in the surveyed villages. The Gaibandha district has the highest share of tenant with 42.8% while the Sirajganj shows the lowest share with 18.1%.

“Others” includes those lands cultivated by some farmers belonging to the government (locally known as *Khas* land). In addition, some farmers may be pleased to allow people in dire need of using land for their livelihood. Those people are found so often in Sirajganj and Kurigram, with 25.0% and 20.4%, respectively.

(2) Haor

The owner farmers may be defined as those cultivating their own land with family labor only. Besides, under the owner-manager system, lands are cultivated with the help or hired labor and occasionally by family labor. Some 19% of the farmers in the surveyed 141 villages are under this category.

There are not many absentee landlords in Haor area. More than 90% of the surveyed villages have absentee landlords with less than 5% of total households. Overall share of absentee landlords is merely 1.1%. Owner-tenants cultivate a portion of land and rent the remaining portion to other cultivators. More than 30% of the farmers in the surveyed villages are owner-tenants.

The share of tenant farmers including sharecropper and land lessees in the surveyed Haor villages are nearly 18%. People with other tenure accounts for as high as some 30%.

3.4.6 Land Holding

Land holding size per household is generally very small. Some 57% of the households in the surveyed Char villages, and 46% of the households in the Haor villages, respectively, are landless having less than 0.49 acres of land, as shown in Table 3.14.

Table 3.14 Distribution of Households by Land Holding Size in Char and Haor

District	Nos. of village surveyed	Absolute landless (no land)	Functionally landless (0.01-0.04 acres)	Landless (0.05-0.49 acres)	Marginal (0.5-0.99 acres)	Small (1-2.49 acres)	Medium (2.5-7.49 acres)	Large (7.5 acres and over)	Total
Char									
Gaibandha	25	39.8%	14.9%	15.8%	13.8%	10.7%	3.7%	1.3%	100.0%
Jamalpur	25	27.5%	18.5%	13.7%	12.4%	17.7%	7.9%	2.3%	100.0%
Kurigram	34	32.1%	12.1%	13.0%	17.8%	13.2%	8.2%	3.6%	100.0%
Sirajganj	31	21.4%	9.9%	10.6%	15.6%	20.3%	18.7%	3.5%	100.0%
Char Total	115	30.2%	13.8%	13.3%	14.9%	15.5%	9.6%	2.7%	100.0%
Haor									
Hobiganj	35	12.0%	22.2%	17.8%	21.0%	13.6%	9.5%	3.9%	100.0%
Kishoreganj	36	11.2%	16.9%	16.3%	15.5%	17.0%	16.7%	6.5%	100.0%
Netrokona	33	11.2%	17.9%	16.6%	18.4%	15.2%	14.3%	6.5%	100.0%
Sunamganj	37	8.0%	14.9%	18.6%	20.2%	20.5%	13.3%	4.5%	100.0%
Haor Total	141	10.7%	17.9%	17.2%	18.3%	16.6%	13.8%	5.5%	100.0%
Bangladesh	68,000	28.6%	5.2%	18.8%	13.7%	20.4%	11.6%	1.7%	100.0%

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001 for District and 1996 Agricultural Census for Bangladesh

It is noteworthy that in Gaibandha 70% of the households are landless with 40% absolute landless. While, in Sirajganj land holding size per households is bigger. Landless households share some 41%, and the households having medium and large scale land sizes with over 2.5 acres account for 22.2 %.

Haor people seem to take more advantage than Char people in terms of land holding size: less absolute landless, more medium and large land holding. Actually, the share of landless (absolute, functional and landless) in the Haor is less than the national average with 52.6%. However, agricultural activities in the Haor area are often interrupted by flood in the wet season.

There is no crop cultivation activity in the wet season in Haor, because all the agricultural area is submerged for several months in this season. Cropping intensity of the Haor area is merely 105%, compared to the national average of 174%. Advantage of the Haor people with relatively wider land holding size is, therefore, offset by the low cropping intensity.

3.4.7 Landownership and Land Lease System

People in the Muslim community get their land through ancestral process. When a head of household dies, the wife gets one-eighth of land and the remaining was distributed to son and daughter at a proportion of 2:1. As a result of this custom, most of the land is owned by male, and the size of land becomes smaller. In Hindu community, female do not have an access to land. Only male can inherit land.

There are largely three land lease systems: mortgage, yearly lease and share-cropping. Under the mortgage system, a lessee deposits certain amount of money to landowner to obtain a right for cultivating land. The lessee can cultivate the land until the landowner gives the paid money back to the lessee. The conditions of mortgage vary from place to place, ranging from Tk.3,000 to Tk.5,000 per one bigha (33 decimals or 0.33 acre) land. In some case, a landowner deducts certain amount of money from the deposited each year. The conditions of mortgage become more difficult when the land is highly productive. For example, if one wants to cultivate a paddy area where high yielding varieties (HYV) are introduced, the landlord demands Tk.20,000 per bigha with Tk.500 deduction every year. Another example in sugarcane farm is Tk.12,000 per bigha with Tk.200 yearly deduction.

Yearly lease and share-cropping are one-year contract between a land lessee and a landowner. Conditions of lease also vary. For yearly lease system, the conditions range from Tk.500 to Tk.1,200 per bigha, while for share-cropping, harvest will be shared at 50:50 between a land lessee and landowner with all the production costs shouldered by lessee.

3.4.8 Occupational Pattern

Men play major role on economic activities while women are engaged in house works, as shown in Table 3.15. As the cultivated lands are submerged for several months in wet season, occupational pattern drastically changes between dry and wet seasons.

Table 3.15 Occupational Pattern by Sex and Season in Char and Haor

Unit: %

Occupation	Char				Haor			
	Male		Female		Male		Female	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Farmer	50.5	27.3	0.9	0.5	27.2	2.0	0.1	0.0
Share-cropper	18.1	15.7	0.5	0.7	13.7	5.3	0.1	0.1
Agri-labor	9.4	9.2	1.7	0.9	21.2	5.1	1.1	0.6
Day labor	6.4	12.3	3.1	1.8	12.8	13.2	1.9	1.2
Fisherman	1.9	4.3	0.5	0.1	7.5	21.8	0.9	0.5
Business/shop	1.4	2.2	0.3	0.1	3.8	4.6	0.2	0.1
Rickshaw/van puller	1.9	5.2	0.1	0.0	2.6	3.4	0.1	0.0
Boatman	0.7	2.2	0.1	0.0	1.1	3.4	0.1	0.1
Service (informal)	1.4	2.0	0.8	0.8	2.9	2.7	1.2	1.2
Teacher	0.3	0.4	0.2	0.2	0.8	0.7	0.2	0.2
TBA	0.1	0.0	0.4	0.6	0.0	0.0	0.5	0.5
Village doctor	0.1	0.1	0.0	0.0	0.4	0.4	0.1	0.0
Craftsman	2.0	2.9	0.4	0.4	1.1	1.4	0.7	2.4
Household work	1.4	2.5	84.0	87.0	1.1	2.3	86.4	86.0
Beggar	0.2	0.3	0.7	0.7	0.6	1.1	1.0	1.0
Unemployment	2.4	13.3	6.3	6.1	1.8	26.1	3.2	3.5
Others	1.8	0.1	0.0	0.00	1.4	6.5	2.1	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

From the table above, the followings can be said.

- In both Char and Haor areas, agriculture related activities (farmer, share-cropper and agri-labor) are the main occupation in the dry season. In Char, 78% are engaged in these activities while 62% in Haor.
- Other occupations include daily labor, fishermen, business/shop keeping, rickshaw puller, etc. Occupations are more diversified in Haor than in Char.
- Women have few chances to participate in the economic activity.
- In wet season, agriculture related activities are interrupted. While many people lose their income source, some other people change their occupation to earn money. Unemployment is more serious in Haor area with 26% unemployed, while in Char, the figure is 13%.
- Important occupations in wet season are: agriculture related activities, daily labor, rickshaw/van puller, fishermen, etc. in Char area, and fishermen, daily labor, agriculture related activities, business/shop keeping, rickshaw/van puller, boatmen, etc. in Haor area.

3.4.9 Cottage Industry

The number of villages and involved villagers by type of industry is shown in Table 3.16.

Table 3.16 Number of Villages and Persons Involved in Cottage Industry in Char and Haor

District (nos. of sample village)	Cane and bamboo			Pottery			Food processing			Mat making		
	Nos. Village	Male	Female	Nos. Village	Male	Female	Nos. Village	Male	Female	Nos. Village	Male	Female
Char												
Gaibandha (25)	-	-	-	-	-	-	-	-	-	-	-	-
Jalalpur (25)	1	10	5	-	-	-	-	-	-	-	-	-
Kurigram (34)	4	14	-	1	1	-	1	2	-	-	-	-
Sirajganj (31)	4	20	-	-	-	-	-	-	-	-	-	-
Total (115)	9	44	5	1	1	-	1	2	-	-	-	-
Haor												
Habiganj (35)	13	195	142	1	2	1	7	48	64	-	-	-
Kishoreganj (36)	14	125	86	1	11	14	3	8	25	-	-	-
Netrokona (33)	10	153	80	1	45	51	1	4	8	2	123	91
Sunamganj (37)	6	33	9	-	-	-	1	1	1	-	-	-
Total (141)	43	506	317	3	58	66	12	61	98	2	123	91

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Cottage industry has not developed in both Char and Haor areas. Especially in Char, out of 115 surveyed villages, there are only 11 cottage industries in 11 villages with the total employees of merely 52. In Haor area, out of 141 surveyed villages, there are 60 cottage industries in 50 villages with total employment of 1,320.

The type of industries is limited to cane and bamboo craft, pottery, food processing and mat making, of which cane and bamboo craft is by far the popular one.

3.4.10 Average Annual Household Income

Based on the data collected through RLCS, average annual income level of household is summarized by district, as shown in Table 3.17.

More than 80% of the Char households and nearly 70% of Haor households earn not more than Tk.30,000 annually. Per capita income of a household with annual income of Tk.30,000 is not more than Tk.4,290, or US\$80 annually, which is less than 30% of the national average (Tk.15,400 or US\$280). Surprisingly, those households that earn more than national average are merely 1% in Char and 4% in Haor, respectively.

Table 3.17 Average Annual Household Income Level in Char and Haor

Unit: %, household

District (sample village number)	Annual average household income (Taka)					
	<10,000	10,000-20,000	20,000-30,000	30,000-50,000	50,000-100,000	>100,000
Char						
Gaibandha (25)	41	31	16	10	2	0
Jamalpur (25)	32	27	20	16	4	1
Kurigram (34)	33	34	22	8	3	0
Sirajganj (31)	14	35	29	15	6	2
Char Total (115)	29	32	22	12	4	1
Haor						
Habiganj (35)	23	28	24	15	7	3
Kishoreganj (36)	11	30	27	18	10	4
Netrokona (33)	12	23	29	21	12	3
Sunamganj (37)	18	25	25	18	9	5
Haor Total (141)	16	27	26	18	9	4

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

People in Char are poorer than those in Haor in terms of income level, as 61% of the total household are under the bracket of annual income with less than Tk.20,000, while 43% under the same category in Haor.

3.4.11 Expenditure Pattern

Most households in the Char and Haor areas spend much on food, as shown in Table 3.18.

Table 3.18 Distribution of Expenditure by Items in Char and Haor

Unit: %

District	Expenditure items						
	Food	Clothing	Housing	Education	Health	Transport	Others
Char							
Gaibandha	83	3	4	2	3	3	3
Jamalpur	77	4	5	3	4	2	5
Kurigram	83	3	4	2	3	3	3
Sirajganj	81	3	4	2	3	3	4
Total	81	3	4	2	3	3	4
Haor							
Habiganj	65	6	7	5	6	5	6
Kishoreganj	75	4	7	2	4	3	5
Netrokona	77	4	5	3	4	3	4
Sunamganj	75	3	6	3	3	4	6
Total	73	4	6	3	4	4	6

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

The income being low, the share of food in the total expenditure is very high in both Char and Haor areas. More than 80% of total expenditure goes to food in Char, while 73% in Haor.

Other expenditure items are housing, clothing, health, transport and education. It is suggested that higher share of housing may be due to the necessary rehabilitation works from flood damage.

3.4.12 Housing

House building in Char and Haor areas has to be as expeditious as possible. It is imperative that people in Char should be prepared to react quickly and to move to another place with household and livestock, in case their houses are about to be eroded.

In Haor areas on the other hand, the prime necessity is to save their cluster of homesteads throughout the period of flood season. The houses in the Haor area are built on earthen platforms so that water cannot overtop the houses during normal flood. Every year the people improve and repair the platforms including rising of mounds in order to protect from erosion in the wet season.

Unlike other areas in the mainland, typical raw materials for house construction have been mud, thatch, potters tile, bamboos, reeds, *chaila* grass and CI sheets. Understandably, bricks, save for a few cases in Haor areas, are not in use. The entire structure is to be fixed by jute ropes and houses should be such that they can be dismantled within a short time in case of emergency.

Table 3.19 Types of Houses in Char and Haor

Unit: %

District	Type of House							Total
	CI+Wood	CI+bamboo	CI+CI	CI+brick	CI+mud	Thatched	Others	
Char								
Gaibandha	1	31	9	0	0	59	0	100
Jamalpur	1	33	29	0	0	37	0	100
Kurigram	0	26	7	0	0	67	0	100
Sirajganj	0	46	32	0	0	22	0	100
Total	1	34	19	0	0	46	0	100
Habiganj	0	47	17	4	2	30	0	100
Kishoreganj	0	49	18	0	0	33	0	100
Netrokona	0	41	16	0	0	42	0	100
Sunamganj	0	39	11	1	1	48	0	100
Total	0	46	16	1	1	36	0	100

Remarks: CI: Corrugated iron

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

In the Char Area, some 46% of houses are thatched, and 34% are made of CI plus bamboo. More people in Kurigram and Gaibandha live in the thatched houses, while in Sirajganj CI plus bamboo is the most common. House type in the Haor Area is similar to that in the Char. The major types of house in the area are of corrugated iron (CI) sheet (tin plate) plus bamboo and thatched.

3.4.13 Gender Balance

(1) Division of Works

Due to the socio-cultural norms that favor men, women suffer severe forms of discrimination. Islamic and Hindu inheritance laws, and the practice of marriage dowry to the groom by the bride's family are typical example. Being regarded as "low" social status, women and girl children have limited access to resources including education, health, food/nutrition and finance throughout their life cycle. Decision making in the family is overwhelmingly done by men. Women are to stay at home engaging house works such as cooking, washing, house cleaning, child care, post harvest works, backyard livestock/poultry raising, water collection and fuel collection, as shown in Table 3.20.

Table 3.20 Division of Labor by Sex and Children in Char and Haor

Work Item	Char			Haor		
	Men	Women	Children	Men	Women	Children
Farming	114	7	100	141	9	45
Harvesting	115	50	110	141	11	43
Post harvesting	115	109	109	138	137	114
Fishing	108	6	94	136	0	50
Livestock care	112	109	108	138	96	118
Marketing products	68	1	12	132	36	7
Shopping	115	0	96	141	0	22
Cooking	0	115	62	1	140	18
Washing dishes	7	115	59	1	141	62
Washing clothes	29	115	61	12	141	22
Child care	30	113	53	28	141	33
Water collection	27	115	93	9	141	69
Fuel collection	91	111	100	111	124	87
House cleaning	13	115	62	2	141	52
Others	0	0	0	10	11	0

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Children also play important roles on various works assisting their parents. Such works include farming, harvesting, post harvesting, fishing, shopping, water collection and fuel collection.

There is common tendency in division of works between Char and Haor villages. However, it is observed that more women are participated in harvesting work in the Char while Haor women are more active in marketing products. Also children in Char help their parents in the field or at home more than those in Haor.

(2) Working Hours

Women work longer than men, having less time for resting and/or recreation, as shown in Table 3.21.

Table 3.21 Working Hours of People in Char and Haor

District	Working hours																Resting hours	
	9-10		10-11		11-12		12-13		13-14		14-15		15 & over		Average		M	F
	M*	F*	M	F	M	F	M	F	M	F	M	F	M	F				
Char																		
Gaibandha	7	5	6	5	8	10	1	4	0	0	0	0	0	0	10.4	11.1	2.2	1.7
Jalapur	16	7	4	6	0	8	0	0	1	1	0	1	1	0	10.1	10.8	2.1	1.8
Kurigram	9	8	14	2	8	21	1	2	0	0	0	0	0	0	10.2	10.9	2.3	1.8
Sirajganj	14	10	14	8	0	9	0	1	0	0	0	0	0	0	9.9	10.4	2.1	1.8
Total	46	30	38	21	16	48	2	7	1	1	0	1	1	0	10.1	10.8	2.2	1.7
Haor																		
Habiganj	3	1	9	2	13	8	4	15	5	7	0	1	1	0	11.5	12.2	n.a	n.a
Kishoreganj	0	0	3	1	17	7	11	22	5	6	0	0	0	0	11.9	12.4	n.a	n.a
Netrokona	0	0	17	0	10	19	3	11	1	1	2	2	0	0	11.1	12.0	n.a	n.a
Sunamganj	0	2	18	3	13	13	3	14	3	4	0	1	0	0	11.0	11.8	n.a	n.a
Total	3	3	47	6	53	47	21	62	14	18	2	4	1	0	11.4	12.1	n.a	n.a

Remarks: M: male; F: female

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

In the Char, average daily working hours is 10.1 hours for men, and 10.8 hours for women, respectively. Majority of men work for between 9 and 11 hours while many female work for 11 to 12 hours. On the contrary, resting hours are longer for men with 2.2 hours on average than for female with 1.7 hours.

In the Haor, average daily working hours is 11.4 hours for men and 12.1 hours for women, respectively. Majority male works for between 10 and 12 hours a day, while female works for between 11 hours and 13 hours.

(3) Domestic violence

Cases of violence against women are reported due to insufficient dowry to husband, and poorer the households are, more cases of women abuse cases reported.

(4) Labor Wage

Data presented in Table 3.22 are based on village survey, which are converted into averages for the districts as a whole.

There is a slight difference in wage rate between agricultural and non-agricultural activities, the former being higher by some 10%. The wage rate is almost the same among districts of the Char and Haor areas except for Kurigram in which the wage rate is 30% cheaper.

Table 3.22 Average Wage Rate by Sex and Activities in Char and Haor

Unit: Taka/day

District	Agriculture		Non-Agriculture	
	Male	Female	Male	Female
Char				
Gaibanda	50.00	25.00	45.00	20.00
Jamalpur	50.00	30.00	50.00	30.00
Kurigram	35.00	20.00	35.00	15.00
Sirajganj	55.00	35.00	50.00	25.00
Char Average	47.50	27.50	45.00	22.50
Haor				
Hobiganj	50.00	24.00	45.00	20.00
Kishoreganj	55.00	25.00	50.00	25.00
Netrokona	55.00	25.00	50.00	25.00
Sunamganj	50.00	26.00	45.00	25.00
Haor Average	52.50	25.00	47.50	23.75

Source: JICA Study Team based on a village survey, 2001

The difference in wage rate between male and female is remarkable. Female worker can earn almost half of the wage male earn. Although the physical strength is different male and female, such a big difference in wage rate can be a sort of discrimination against female.

3.4.14 Types of Incidences Occurred During Last Two Years

Given the fact that people in the char and haor areas live in adverse environmental conditions, subsistence being the major aim, the untoward incidences occur owing to unstable social system and the group conflicts out-witting and out-competing others. Also the phenomenon of depriving others including abuse of power is rampant. The table 3.23 lists a number of incidences, as indicated by key informants (7 per village), occurred during the last two years.

Table 3.23 Types of Incidence Reported in Char and Haor in Last Two Years

Type of Incidence	Char		Haor	
	Nos. of incidences	Nos. of villages	Nos. of incidences	Nos. of villages
Child labor	16,733	115	13,432	139
Child marriage	1,944	110	661	70
Dowry	2,234	114	1,914	122
Trafficking	3	2	8	5
Acid throwing	5	1	0	0
Suicide	49	13	18	13
Disability*	2,963	101	614	90
Others	19	6	1	3

Note: number of incidences are total of incidences collected from each of 115 villages for Char and 141 villages for Haor, respectively.

Remarks: *, persons who are mentally or physically handicapped and are not able to work or walk normally. They may as well be deaf and dumb.

Source: RLCS by DICS, 2001

It is evident that the unlawful use of child labor is quite common in both Char (all 115 surveyed villages) and Haor (139 villages out of 141 surveyed). In addition to the phenomenon of child labor, child marriage and dowry system have been prevalent, much more in Char areas than Haor areas. A child labor in the context of Bangladesh cannot have a precise or formal definition. A boy or a girl who gives his/her services to others at a tender age without going to schools accepting nominal payment (cash or kind), often has to work long hours, be it in the fields or at households, or in industries or at restaurants. In many cases household incomes are augmented by making these unfortunate boys and girls' work for others.

While incidences of women and children trafficking and acid throwing are few and far between, suicide cases in both Char (13 villages) and Haor (13 villages) areas are worth mentioning. But the most important of all incidents, disability is an unfortunate phenomenon in the economic set up of a poor societal system, as in Char (101 villages) and Haor (90 villages) areas. Human miseries and resource abuses are seen to be more prevalent in char areas compared to haor areas, in general.

3.4.15 Literacy Rate and Education

(1) Literacy Rate

In spite of the Government's efforts to increase literacy rate of the populace through channels of primary education and non-formal education, improvement of literacy rate in the Study Area is not remarkable.

Results of Rapid Rural Appraisal (RRA) reveals the modest improvement of literacy rate in 32 villages of the Char and Haor areas (16 villages each) on an average, as compared with the 1991 Census. But overall literacy rate is far lower than national average literacy rate of 51% as of 1997, as well as that in rural area with 38% in the same year.

Table 3.24 Change in Literacy Rate in Char and Haor

District	RRA		1991 Census	
	Male	Female	Male	Female
Char				
Gaibandha (4 villages)	24.5%	9.3%	12.2%	3.8%
Jamalpur (4 villages)	26.3%	17.0%	17.0%	8.9%
Kurigram (4 villages)	23.3%	9.5%	10.4%	1.6%
Sirajganj (4 villages)	26.3%	8.8%	17.3%	10.4%
Char average	25.1%	11.2%	14.2%	6.2%
Haor				
Habiganj (4 villages)	21.5%	12.5%	33.7%	24.0%
Kishoreganj (4 villages)	27.0%	16.8%	13.5%	2.5%
Netrokona (4 villages)	45.0%	24.5%	33.3%	24.2%
Sunamganj (4 villages)	34.8%	17.8%	35.0%	20.5%
Haor average	32.1%	17.9%	28.8%	17.8%

Source: JICA Study Team based on the Rapid Rural Appraisal by DICS, 2001 and 1991 Population Census, BBS

Still there is also a big gap in literacy rate between male and female in both Char and Haor. While the literacy rate of male show about 25% for Char and 32% for Haor, respectively, that of female is 11% for Char and 18% for Haor respectively.

(2) Education

The number of primary school of both registered and un-registered, pupils and teachers as well as drop out rates in Char and Haor Areas is shown in Table 3.25.

Table 3.25 Number of Primary Schools, Pupils and Teachers and Dropout Rates in Char and Haor

District	Village with PS	Nos. of Primary School	Nos. pupils		Nos. Teachers		Pupil/teacher ratio	Dropout rate (%)	
			Male	Female	Male	Female		Male	Female
Char									
Gaibandha (25)	21	26	3,063	2,273	79	9	61:1	33	37
Jamalpur (25)	24	32	5,036	3,700	83	25	81:1	30	36
Kurigram (34)	24	26	3,136	2,517	98	7	54:1	19	23
Sirajganj (31)	24	36	5,764	4,818	109	25	79:1	31	35
Total (115)	93	120	17,000	13,308	368	65	69:1	-	-
Haor									
Hobiganj (35)	26	27	1,893	1,929	62	20	47:1	27	29
Kishoreganj (36)	27	30	3,070	3,004	75	20	64:1	51	61
Netrokona (33)	25	25	2,500	2,643	68	18	60:1	28	29
Sunamganj (37)	30	31	2,138	2,218	63	38	43:1	36	41
Total (141)	108	113	9,601	9,794	268	96	53:1	-	-

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

The number of village having primary school is 93 out of 115 for Char and 108 out of 141 in Haor, respectively. The number of existing primary schools is 120 for Char and 113 for Haor, respectively. The ratio of male: female pupil is 56:44 for Char and 50:50 for Haor respectively. The average number of pupils per school is calculated at 252 for Char while 172 for Haor, showing that scale of school is much bigger in Char than in Haor. Teachers are male dominant in both Char and Haor. Of the total, 85% are male in Char and 74% in Haor. Pupil/teacher ratio in Char is 69:1 on average, while 53:1 in Haor. Drop out rate is high for both male and female in both Areas. The dropout rate ranges from 19% to 37% in Char, and from 27% to 61% in Haor, respectively.

There are also NGO schools in the Char and Haor Areas. There are 63 NGO schools in 30 villages in Char and 67 in Haor, respectively, as shown in Table 3.26.

Table 3.26 Number of NGO Schools, Pupils and Teachers and Dropout Rates in Char and Haor

District	Village with PS	Nos. of PS	Nos. students		Nos. Teachers		Pupil/teacher ratio	Dropout rate (%)	
			Male	Female	Male	Female		Male	Female
Char									
Gaibandha (25)	7	13	211	215	7	6	32:1	7	7
Jamalpur (25)	8	33	1136	956	22	15	57:1	8	10
Kurigram (34)	12	15	314	262	15	4	30:1	4	4
Sirajganj (31)	3	3	134	112	3	5	32:1	4	4
Total (115)	30	63	1,795	1,545	47	30	43:1	-	-
Haor									
Hobiganj (35)	14	25	665	705	18	21	35:1	4	3
Kishoreganj (36)	5	6	77	103	2	3	36:1	10	8
Netrokona (33)	8	30	662	714	25	32	24:1	16	25
Sunamganj (37)	5	6	121	133	2	6	32:1	2	3
Total (141)	32	67	1,525	1,655	47	62	29:1	-	-

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Unlike primary schools, male and female pupils as well as teachers are well balanced in NGO schools. The average students/teacher ratio is 43:1 for Char and 29:1 for Haor, respectively, much lower than that in primary school. Drop out rate is also kept lower between 4% and 10% in Char and between 2% and 25% in Haor, respectively.

3.4.16 Health and Sanitation

(1) Health Conditions

Malnutrition is generally seen among children and female due to socio-cultural practices of uneven distribution of foods in favor of men. Being deficient in calorie and vitamin intake induces high incidence of anemia, angular stomatitis, night blindness, goiter, etc.

The major diseases reported include cold/fever, dysentery, diarrhea, jaundice, etc. The causes of these diseases are related with unhygienic conditions as well as low nutritious status of people.

(2) Health Facilities and Accessibility

Utilization of major health facilities available in the Char and Haor areas during the year 2000 is shown by district in Table 3.27.

A variety of health facilities are available in the Char and Haor area, ranging from public and private clinics to indigenous way of treating patients. Facilities available at government clinics/hospitals are too inadequate, to say the least. People often are required to buy medicine from the market, but such medicines prescribed by doctors are often not available locally.

Table 3.27 Access to Health Facilities in Char and Haor in Last Year

Unit: percentage of utilization

District	Type of facilities							
	Satellite Clinic	Union HFWC	Upazila HC	Sadar Hosp.	Private clinic	Village doctor	Kabiraj	Others
Char								
Gaibandha	17.9	4.6	12.5	4.8	2.2	27.8	18.7	11.7
Jamalpur	8.0	10.9	13.0	2.3	0.5	34.9	21.7	9.0
Kurigram	4.4	59.9	6.2	3.2	8.4	6.7	0.9	9.5
Sirajganj	13.1	3.1	5.6	5.3	3.9	52.3	6.0	10.9
Total	11.1	19.6	9.3	3.8	3.7	30.5	11.8	10.3
Haor								
Habiganj	8.4	10.6	11.7	6.5	7.0	39.5	5.0	11.5
Kishoreganj	8.9	4.0	14.5	2.1	0.7	48.1	6.2	15.8
Netrokona	11.0	2.9	17.3	2.3	0.7	41.5	14.3	10.2
Sunamganj	7.4	11.8	15.9	0.9	3.2	37.3	5.7	17.9
Total	8.9	7.4	14.9	2.9	2.9	41.6	7.6	13.9

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Utilization of health facilities varies from district to district and also village to village, depending on the availability of the facilities, distance, type of treatment, etc. On average, Village doctors are most accessible by local people. Some 30% of the total treated people went to the village doctors in Char, while in Haor, 42% went to the village doctors.

Second important facility in Char was union health and family welfare center with nearly 20%, followed by Kabiraj with some 12%, satellite clinic with 11%, Upazila health complex with 9%, etc. Union health and family welfare center is the most accessible in Kurigram (60%) while Kabiraj (18 to 23 %) is more important than UHFWC in Gaibandha and Jamalpur.

Upazila Health Complex is the second most important health facility in Haor with the utilization of nearly 15%. Followed by satellite clinic, Kabiraj and UHFWC with 8.9%, 7.6% and 7.4%, respectively.

Problems related to health services include no regular visit by health workers, hard access to upazila health complex in the dry season, unavailability of medicine, unpracticed preventive measures against diseases by local people, physical weakness of people due to malnutrition, etc.

(3) Maternal and Infant Mortality

The incidences of maternal and infant death during the last year in the surveyed Char and Haor villages are shown in Table 3.28.

Table 3.28 Maternal and Infant Deaths in Char and Haor in Last Year

District	Maternal deaths					Infant deaths					
	Average number of death per village	Nos. of deaths with nos. of village				Average number of death per village	Nos. of deaths with nos. of villages				
		0	0-2	2-5	>5		0	0-2	2-5	5-10	>10
Char											
Gaibandha	0.8	16	3	6	0	4.2	1	2	17	3	2
Jalalpur	2.8	7	3	12	3	7.4	2	0	12	3	8
Kurigram	0.7	20	6	8	0	3.8	1	4	19	8	2
Sirajganj	1.2	18	5	7	1	5.9	4	0	15	5	7
Total	1.4	61	17	33	4	5.4	8	6	62	26	14
Haor											
Habiganj	0.8	13	18	4	0	5.9	3	3	13	12	4
Kishoreganj	0.5	24	10	2	0	7.9	0	9	11	7	9
Netrokona	0.5	22	10	1	0	4.5	4	6	14	5	4
Sunamganj	0.2	33	3	1	0	5.5	2	8	12	9	6
Total	0.5	92	41	8	0	6.0	9	26	50	33	23

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Although ante-natal care is given to pregnant women by health workers, no service is extended after the delivery of child. There were 151 maternal death cases in 54 villages and 605 infant death cases in 107 villages of Char, while 84 maternal deaths in 49 villages and 888 infant deaths in 131 villages of Haor. Although the causes of infant deaths are not known, some 6 infants per village died.

(4) Sanitation

Type of latrines used is an important indicator related not only to the status of hygiene but also to the state of environment vis-à-vis the diseases caused thereof. The major types of latrines used in the Char villages are shown in Table 3.29.

Table 3.29 Types of Latrine Used in Char and Haor

Unit: %

District	Villages having no sanitary latrine	Season	Type of Latrine			
			Sanitary	Pit	Hanging	Open air/field
Char						
Gaibandha	16 out of 25 surveyed	Dry	9.5	8.2	7.4	74.4
		Wet	6.8	3.2	7.2	83.5
Jamalpur	17 out of 25 surveyed	Dry	1.0	15.6	25.0	58.8
		Wet	0.9	11.9	16.2	70.1
Kurigram	23 out of 34 surveyed	Dry	1.4	8.5	3.6	86.5
		Wet	0.9	2.5	3.7	92.8
Sirajganj	17 out of 31 surveyed	Dry	6.2	18.2	28.0	47.6
		Wet	6.0	6.6	14.5	73.0
Total	73 out of 115 surveyed	Dry	4.5	12.6	16.0	66.8
		Wet	3.7	6.0	10.4	79.8

Haor						
Habiganj	12 out of 35 surveyed	Dry	10.2	27.1	47.0	15.4
		Wet	10.1	20.6	57.7	11.3
Kishoreganj	16 out of 36 surveyed	Dry	2.9	8.3	66.2	22.6
		Wet	3.0	4.8	77.2	15.0
Netrokona	20 out of 33 surveyed	Dry	1.5	4.8	47.0	46.7
		Wet	1.4	3.5	46.1	49.0
Sunamganj	18 out of 37 surveyed	Dry	5.2	13.4	68.0	13.4
		Wet	5.2	10.1	75.5	9.2
Total	66 out of 141 surveyed	Dry	5.0	13.5	57.4	24.1
		Wet	5.0	9.9	64.5	20.5

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Surprisingly, most local people in the Char area do not use any type of latrine. Nearly 67% of local people defecate open air/field in dry season. The figure even increase to 80% in wet season. In Kurigram, about 90% of people use open air/field. Hanging latrines are used more in Sirajganj and Jamalpur. Sanitary latrines have yet been extended widely in the Char area. 63% of the surveyed villages do not have sanitary latrine.

On the other hand, majority people in Haor use hanging latrine. In Netrokona, however, some 50% use open field for defecation. Pit latrines are also important in Habiganj and Sunamganj.

3.4.17 Water Source by Utilization Purpose

People in the Char and Haor areas use water from different sources according to purposes and season, as shown in Table 3.30.

Table 3.30 Source of Water by Utilization Purpose and Season in Char and Haor

Unit: %

District	Purpose of utilization	River/canal/pond/ditch		HTW/STW/DTW	
		Dry	Wet	Dry	Wet
Char					
Gaibandha	Drinking	0.8	7.2	99.8	94.6
	Cooking	6.2	24.8	94.3	76.4
	Bathing	33.6	89.7	68.6	8.7
Jamalpur	Drinking	5.0	13.8	96.8	82.8
	Cooking	6.6	33.4	93.6	68.2
	Bathing	31.9	86.8	68.5	13.2
Kurigram	Drinking	7.0	22.2	92.6	77.5
	Cooking	13.2	35.0	86.6	64.4
	Bathing	55.6	96.3	53.5	3.3
Sirajganj	Drinking	2.9	9.3	93.6	88.4
	Cooking	4.9	20.0	94.7	79.3
	Bathing	34.9	94.8	65.0	7.1
Total	Drinking	3.9	13.1	95.7	85.8
	Cooking	7.7	28.3	92.3	72.1
	Bathing	39.0	91.9	61.4	8.1

Haor					
Habiganj	Drinking	5.0	8.3	95.0	91.7
	Cooking	54.8	70.9	45.2	29.1
	Bathing	84.5	92.0	15.5	8.0
Kishoreganj	Drinking	6.1	7.9	93.8	92.1
	Cooking	56.5	76.7	43.5	23.4
	Bathing	85.8	96.6	14.2	3.4
Netrokona	Drinking	15.3	23.1	84.6	76.9
	Cooking	67.4	83.0	32.6	17.1
	Bathing	95.9	99.4	4.1	0.6
Sunamganj	Drinking	7.6	11.6	92.4	88.4
	Cooking	65.4	85.7	34.6	14.3
	Bathing	87.6	92.5	12.4	7.5
Total	Drinking	8.4	12.5	91.6	87.4
	Cooking	61.0	79.1	38.9	20.8
	Bathing	88.3	95.1	11.7	4.9

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

Hand tubewells have been well established in the Char area. More than 90% of people in the surveyed villages depend their water for drinking as well as cooking on well water in the dry season. More than 60% of local people also use well water for bathing in the dry season.

On the other hand, in wet season, more than 90% of the people depend on river water for bathing. Cooking water and drinking water are derived from wells, in principle, although the utilization rate decreases due to submergence of pumps in many areas in the wet season.

People in Haor use more natural water including river, pond, ditch and canal for cooking and bathing even in dry season. 61% use natural water for cooking, while 88% use for bathing. Tubewell water is used mainly for drinking purpose. In wet season, the utilization of tubewell water decreases irrespective of the purposes, due to inundation of tubewells as well as easily available natural water in this season.

3.4.18 Type of Fuel for Cooking

Availability of fuel for cooking has been the most pressing problem in the Char and Haor areas. Electricity or kerosene or gas not being available for widespread use, people have to rely on other sources of fuel. However, locally available energy for cooking is not easily available. Utilization of various resources for cooking by season is shown in Table 3.31.

Table 3.31 Type of Fuel Used for Cooking

Unit: % of utilization

District	Twigs		Waste leaves		Cow dung		Straw		Others	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Char										
Gaibandha	9.5	8.6	5.1	1.6	45.0	55.2	40.2	34.1	0.2	0.6
Jamalpur	17.2	11.4	13.1	5.5	47.5	56.6	21.2	24.2	1.0	2.3
Kurigram	4.3	4.1	3.6	0.2	37.1	40.0	54.9	54.2	0.2	1.6
Sirajganj	5.0	4.7	6.2	1.5	39.8	48.5	45.4	40.7	3.6	4.5
Total	8.3	6.8	6.6	2.0	41.8	49.2	42.0	39.8	1.3	2.3
Haor										
Habiganj	9.2	9.1	10.1	7.3	51.0	59.5	28.9	23.1	0.3	0.1
Kishoreganj	11.1	11.5	4.7	3.0	48.4	56.7	33.4	26.5	2.4	2.4
Netrokona	7.7	8.1	5.0	2.7	51.1	54.8	34.8	33.1	1.5	1.5
Sunamganj	11.2	9.3	7.6	3.7	52.5	60.9	23.6	20.1	5.2	6.2
Total	9.8	9.4	6.9	4.2	50.8	58.1	30.1	25.5	2.5	2.8

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

In both Char and Haor, cow dung and straw are by far the main fuel for cooking. Both resources account for more than 80% of the total fuel used for cooking in the surveyed villages. Other materials used as fuel include twigs and waste leaves. The share of cow dung in the total fuel resources increases in the wet season as other resources become scarce. People in Jamalpur of Char and Kishoreganj and Sunamganj of Haor, use more twigs for cooking than those in other districts.

Fuel becomes scarce in the wet season. More people in both Char and Haor areas feel that there is not enough fuel for cooking in the wet season, as shown in Table 3.32. More than 30% of people claim the needs of fuel. In fact, many people in Char and Haor decrease the frequency of daily cooking. It may be related to the much occurrence of diseases in this season.

Table 3.32 Local People's Feeling on the Abundance of Fuel Availability

Unit: %

District	Enough fuel available		Not enough fuel available	
	Dry	Wet	Dry	Wet
Char				
Gaibandha	87.7	68.2	12.3	31.5
Jamalpur	88.6	55.6	14.9	44.9
Kurigram	87.8	75.9	12.7	26.3
Sirajganj	89.8	74.7	10.9	25.6
Total	88.5	68.6	12.7	32.1
Haor				
Habiganj	76.9	67.9	23.1	32.0
Kishoreganj	75.4	61.6	24.6	38.4
Netrokona	74.5	59.7	25.5	40.9
Sunamganj	74.3	65.7	25.7	34.3
Total	75.2	63.7	24.8	36.3

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

3.4.19 Legislative and Judicial System

Every village has its own legislative and judicial systems, both of which are authorized to limited number of people. Mainly Chairman of a Union Parishad (UP) and its members are responsible for running local judicial system for mitigating disputes or maintaining local law and order situation. Village matbors and local elites also participate in the judicial judgments. Except crimes like killing, abduction, etc., most social disputes are addressed in this level. If they fail to solve the disputes, they go to Upazila and magistrate court with the help of UP members and chairman. The system of lodging complain are verbal in local and while written complain when go to the court.

Besides the local elites, local Members of Parliament (MPs) play great roles on controlling the local informal judicial system. Whenever they visit the villages, the disputes are solved by them. Even if UP Chairman or its member brings in any verdict, MPs can influence its judgment.

It is common that almost all the villages have similar type of leadership pattern who exercise the judicial authority. These persons belong to the rich class and backed by political parties. Generally the following four types of people exercise the judicial authority: (i) villagers who are literate and aged; (ii) member of Union Parishad; (iii) chairman of Union Parishad; and (iv) person having political power.

3.4.20 Village Organization

A village in Bangladesh is usually organized into certain well-known social groups, i.e. chula (household; defined as a group that share a common stove), bari (homestead that might include more than one related family), gushi or bangsho (household ties through marriage). A grouping of homesteads usually makes up a village neighborhood, or para. The neighborhood often center around patron-client ties to a prominent man, a leader referred to as a matabbar. Other important local groups are: religious congregations, Hindu castes, and voluntary organizations of several types such as cooperatives, credit associations, or youth clubs. There are several village organizations within the Char and Haor, as shown in Table 3.33.

Table 3.33 Situation of Village Organization in Char and Haor

	Char	Haor
Number of villages of some Organizations exist (excluding NGO groups)	30 villages	26 villages
KSS (Farmer's Cooperative Society)	0	2 villages
BSS (Assetless Cooperative Society)	0	0
MSS (Women's Cooperative Society)	0	0
Relevant school committee	27 villages	24 villages
Relevant religious committee	18 villages	17 villages
Youth Club	7 villages	5 villages

Note: The number of surveyed village is 32 for Char and 31 for Haor, respectively.

Source: JICA Study Team based on the Village Organization Survey, 2001

The cooperative movement that started nearly a century ago and expanded rapidly in the 1960s has been failed in the Study Area. KSS, for example, supported by BRDB is hardly found in the Study Area. The situation of village organization is almost same in both areas. Relevant school committee organization is found in almost all villages of both areas. However, their activity is almost dormant due to lack of motivation.

3.4.21 Law and Order Situation

The field survey carried out in the sample char and haor village's reveals wide ranging issues related to law and order situation. Conflicts arise mostly over the possession of land resulting in fights between contending parties.

Large tracts of land are owned by absentee landlords, and people who legally own land on the Chars as well as Haors are not able to control their use. Disputes over these property rights are endemic. While there are confusions over legislation or ownership of Char land (or *khas* land) and the reclamation of property rights by the original owners, the government programs attempting to distribute or re-distribute *khas* land to the landless or land-poor in both the Char and Haor areas have been largely enforced or are widely abused. In fine, the fact that the Char areas are occupied and controlled by the powerful and influential including local institutions using private guards and rendering the area *de facto* private property cannot be altogether overlooked.

3.4.22 Needs of Local People by Season

The results of needs survey conducted as a part of the Rural Living Conditions Survey, reflect the problems of the local people by season, in relation particularly to flood, as shown in Tables 3.34 and 3.35 for Char and Haor, respectively.

(1) Needs of Char People

(a) Needs before flood

In Char most people want to take measures against flood before flood comes. Among the measures, flood shelter is the top need which 297 respondents in 79 villages claimed. Next comes to raising homestead and embankment. Raising homestead are the idea of mitigating flood while staying at home, which is different perception from take shelters. Embankment may be a combined idea of mitigating flood damage as well as assuring sheltering place.

Flood warning is also ranked as one of the top five needs suggesting that they need timely information on flood. Other important needs in relation to flood preparedness include hand tube wells, food storage, high place, etc.

Table 3.34 Needs of Local People by Season in Char

Before Flood			During Flood			After Flood		
Needs Item	Nos. of Village	Score	Needs Item	Nos. of Village	Score	Needs Item	Nos. of Village	Score
Flood shelter	79	297	Boat	111	693	Seed	111	642
Road	59	292	Food	111	651	Medicine/health	109	575
Raise homestead	59	229	Medicine/health	103	579	Loan/money	107	650
Embankment	47	243	Flood shelter	100	493	Rehab. House	96	406
Flood warning	45	142	Money	47	223	Food	64	234
Money	37	129	Purewater	46	136	Irrigation	41	197
HTW	36	145	Fuel for cooking	16	43	Road	39	100
Latrine	35	147	Cloth	12	31	HTW	7	13
School	27	105	Saline	10	16	Livestock	2	4
Food storage	26	64	Graveyard	9	23	Cultivation	1	5
High place	24	75	Sanitation	3	8	Market	1	2
Food	14	31	Relief	3	4	Latrine	1	2
Electricity	11	36						
Health	9	30						
Boat	5	20						
Bridge & culvert	1	5						

Note: Total number of villages surveyed is 115. In each village seven (7) key informants were interviewed. So the full score is 805.

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

It is noteworthy that road is ranked as the second highest need of Char people before flood. People are busy in economic activities such as farming and shop keeping in dry season. As this is the season when water level of the Jamuna river is the lowest, people have to walk long distance on sandy soils from village to launch ghats to transport goods and farm products to mainland. Road network can assure easy and faster transportation by use of rickshaw and motorcycle, etc., and enhance the comings and goings of goods and people.

Other needs include money (or credit), hand tubewells (HTWs), latrine, school, etc.

(b) Needs during flood

Once flood comes, people's concern is concentrated mostly on how to survive. They are obliged to live under very hard conditions in terms of space, resources and environment.

Boat and food are most needed among Char people, followed by medicine/health care and flood shelter. The top two needs are supported by more than 80% of respondents while the third and fourth needs are supported by more than 60%. It means that basic human needs mostly lacks during flood.

Significant number of people claimed money and pure water as needs. Other needs supported by small number of people include cooking fuel, cloths, saline, graveyard, and latrine.

(c) Needs after flood

After flood with the receding floodwater, local people start restoring their living environment as well as cultivating land. Seed is the most needed to secure food for next season. Loan and/or money also needed to purchase agricultural inputs including seeds and irrigation devices.

Medicine/medical care, rehabilitation of house, and food are also ranked high as important needs to make their life easy. After the flood, still social services are not readily available. Loan and/or money is also utilized for procure necessities regarding daily life. Road is another high ranking needs to assure smooth communication.

(2) Needs of Haor People**Table 3.35 Needs of Local People by Season in Haor**

Before Flood			During Flood			After Flood		
Needs Item	Nos. of Village	Score	Needs Item	Nos. of Village	Score	Needs Item	Nos. of Village	Score
Embankment	110	618	Boat	139	858	Seed	116	665
Flood shelter	105	475	Medicine/health	131	761	Loan/money	111	617
Road	76	294	Food	110	593	Medicine/health	107	533
Protection Wall	61	343	Bamboo	84	360	Fertilizer	82	341
Dredging	52	244	Flood shelter	69	325	Food	71	288
Health	48	215	Relief	67	269	Rehabilitation	69	230
STW	35	134	Money	35	129	Livestock	60	196
Bridge	29	100	Water	31	76	Road	54	216
Floor raising	29	85	Fuel	25	72	Relief	41	129
Enforce house	29	79	Animal feed	24	45	STW	31	112
Boat	29	70	Cloth	22	79	Bamboo	26	74
Food stock	26	64	Wood	20	41	Latrine	22	77
Forest	23	78	Fishing net	11	31	Agr. Extension	14	29
Sluice Gate	21	75	Protect.	5	16	Work	7	29
Money	19	43	Animal shelter	4	8	Manure	5	14
Bamboo	14	53	Straw	3	10	Feed	5	10
School	12	47	Latrine	3	9	CI Sheet	4	5
Electricity	9	25	Livestock	2	5	DTW	3	6
High land	8	21	Embankment	2	3	Cloth	2	4
Fuel	7	17	Tin	2	3	Forestry	1	5

Note: Total number of villages surveyed is 141 In each village seven (7) key informants were interviewed. So the full score is 987.

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

(a) Needs before flood

Most people in Haor claimed the needs to cope with flood in various ways. The most claimed is embankment supported by more than 60% of respondents, followed by flood shelter and protection wall. Floor rising and enforcing houses are also claimed needs to protect or mitigate

flood damage. Other needs regarding flood preparedness include boat, food stock, bamboo, high land, etc.

Dredging rivers and/or streams is also among the highest needs to reduce flood damage. However, this need is for protecting early flash flood, which often damage boro crops, rather than for protecting human life. The other need with similar objective is sluice gate.

Roads and bridges are another important needs for local people to assure transportation means before flood comes. They want to have raised road with pavement that can be passable by rickshaw and motorcycle.

(b) Needs during flood

At flooding season, people have to survive under the difficult conditions. Living space is very limited to the higher part of mound, which is surrounded by water. Wave attacks the mound, at the edge of which is eroded gradually. Being isolated, almost no economic activity is found.

Under such conditions boat is the highest needs among local people with 87% of support, to secure transportation means. Medicine and health care, and food are second and third needs, respectively. The top three needs items are the same as Char.

It is interesting to note that bamboo comes to the fourth needs. Bamboo is the material for fencing, together with local grasses called *chaila*, to protect mounds from wave action. Flood shelter is ranked five, supported by some 33% of people. Many people also want relief activity to support them. Other needs items are money, water, fuel, animal feed, cloths, fishing net, wood, etc.

(c) Needs after flood

Immediately after floodwater recedes people start to make efforts to restore their life in normal conditions. Among others the top need is seeds for rabi season. In Haor area, boro rice is almost sole crop. As cropping season is limited to only one season due to long flooding, farmers are keen to cultivate boro rice. High yielding varieties that require a large amount of fertilizer dominate in the Area. Fertilizer is, therefore, also highly ranked among the needs. To procure seeds and fertilizers, loan and/or money is another need claimed by many people.

Medicines and medical care are third ranked need among Haor people. Social delivery services including health services are almost interrupted during flood season as well as post-flood season due to difficult communication. Cases of diseases particularly water borne ones increases this time as the hygiene conditions are worsened this time because of receding flood water which washed excreta away.

As most economic activities stop during flood season and as many people are landless, food becomes scarce after flood, which bring food as amongst highest need.

Other important needs supported by local people include: rehabilitation of houses damaged by wave action/inundation, livestock for drafting as well as fattening, roads to secure easy communication, relief to support them, shallow tubewells to secure drinking water, bamboo to rehabilitate homestead, latrines to keep their mounds hygienic, agricultural extension to obtain technical assistance, work to earn cash, etc.

3.5 Agriculture and Marketing

3.5.1 Agriculture

(1) Agricultural Land Use

Agricultural land use in the Study Area is presented in Table 3.36, based on the sample survey.

Table 3.36 Land Use of Char and Haor

	Gross area (ha)	Cultivated area (ha)	Share (%)	Single cropped area (ha)	Double/triple cropped area (ha)	Gross cropped area (ha)	Cropping intensity (%)
Char							
Gaibandha	9,892	4,647	47.0	1,498	3,149	8,518	183
Jamalpur	12,189	5,936	48.7	2,830	3,106	9,407	158
Kurigram	16,931	6,419	37.9	2,385	4,034	11,440	178
Sirajganj	8,110	4,473	55.2	1,690	2,783	7,401	165
Char total	47,122	21,475	45.6	8,403	13,072	36,766	171
Haor							
Habiganj	11,250	8,944	79.5	8,084	1,735	9,819	110
Kishoreganj	25,096	19,348	77.1	18,333	2,166	20,499	106
Netrokona	12,649	8,009	63.3	7,799	419	8,218	103
Sunamganj	23,911	18,133	75.8	17,522	1,221	18,743	103
Haor total	72,906	54,434	74.7	51,738	5,541	57,279	105
Bangladesh*	147,540	66,646	45.2	20,587	46,059	119,313	179

Remarks: *: Area data in Bangladesh is presented in km².

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001, for Districts and 1996 Agricultural Census by BBS, for Bangladesh

The differences in land use between the two Areas are clearly shown in the Table. The Char area shows the similar land use pattern as Bangladesh as a whole. The share of agricultural land in the total area is some 46% with cropping intensity of 171. The Haor area, on the other hand, shows higher share of agricultural land in the total area, 75%, with very low cropping intensity of 105.

The distinct features of Haor area is reflected from the topographic conditions, characterized by huge flat low land area which is totally submerged in the wet season. It should also be noted that the Char area, although the land use pattern is similar to that in the nation as a whole, is subject to flood damage more often due to its locational disadvantage.

(2) Crops production

Cropping pattern

Cropping season in Bangladesh is divided into three: Kharif I, Kharif II and Rabi. Kharif I corresponds to pre-monsoon cropping season from mid-March to mid-June. Kharif II is the cropping in the wet season from mid-June to mid-October. Rabi crops are cultivated in the post-monsoon period or dry season, which lasts five months from mid-October to mid-March.

Crops cultivated in Kharif season are limited mostly to rice and jute, while in Rabi season, various kinds of crops including rice, wheat, pulses, oil seeds, vegetable, etc. are cultivated. Sugarcane is cultivated throughout the year.

In Char area, cropping pattern generally follows the principle mentioned above. In Haor area, on the other hand, Kharif season cropping is impossible due to submergence of the whole agricultural area during the wet season while Rabi season crop is almost paddy because of much water contents in soils and of heavy soil textures.

Harvested area

Harvested area of the crops in the Study Area is estimated on the basis of the results of the agricultural survey conducted in selected sample areas, as shown in Table 3.37 for Char and Table 3.38 for Haor, respectively.

Table 3.37 Harvested Area of Crops in Char

District Crops	Gaibandha		Jamalpur		Kurigram		Sirajganj		Char Total	
	Area (ha)	Share (%)	Area (%)	Share (%)	Area (ha)	Share (%)	Area (ha)	Share (%)	Area (ha)	Share (%)
Boro (LV*)	2,420	6%	4,779	15%	2,199	5%	1,632	3%	11,030	7%
Boro (HYV**)	9,426	25%	10,757	33%	6,658	16%	11,770	23%	38,611	23%
Wheat	3,515	9%	3,774	12%	7,294	17%	2,128	4%	16,711	10%
Pulses	644	2%	964	3%	2,662	6%	4,043	8%	8,313	5%
Groundnut	1,715	5%	2,368	7%	2,199	5%	2,198	4%	8,480	5%
Sugar Cane	387	1%	602	2%	695	2%	639	1%	2,323	1%
Oil Seeds	566	1%	1,325	4%	3,010	7%	5,177	10%	10,078	6%
Aus (LV*)	276	1%	843	3%	2,954	7%	2,837	5%	6,910	4%
Aus (HYV**)	1,434	4%	1,163	4%	116	0%	71	0%	2,784	2%
Jute	2,205	6%	2,931	9%	6,078	14%	12,411	24%	23,625	14%
Aman (LV*)	7,483	20%	1,525	5%	3,936	9%	9,361	18%	22,305	14%
Aman (HYV**)	7,692	20%	1,525	5%	4,284	10%	-	-	13,501	8%
Char Total	37,763	100%	32,556	100%	42,085	100%	52,267	100%	164,671	100%
Rice total***	28,731	76%	20,592	63%	20,147	48%	25,671	49%	95,141	58%

Remarks: *: Local variety; **: High yielding varieties; ***: Total of Boro, Aus and Aman.

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

In Char, cultivated crops are well diversified, although the rice is still the major crop. In the Char area, 164,671 ha were harvested, 58% of which or 95,141 ha was rice. Other important crops in

terms of harvested area include jute, wheat, oil seeds, groundnut and pulses. In Gaibandha, rice crop is by far the most important. It accounts for 76% of the total harvested area. In Jamalpur, wheat is of second most importance next to rice, followed by groundnut. In Kurigram and Sirajganj, the share of rice area in the total is less than 50%, although the most important. Wheat and jute are more important in Kurigram while oilseeds and jute are more planted in Sirajganj. Groundnut is cultivated in all the districts constantly, although the share is small, may due to its adaptability to sandy soils. Wheat does not require much water for its performance while pulses can grow under nitrogen deficient conditions through symbiotic nitrogen fixation of nodules in their root system.

Table 3.38 Harvested Area of Crops in Haor

District Crops	Habiganj		Kishoreganj		Netrokona		Sunamganj		Haor Total	
	Area (ha)	Share (%)	Area (ha)	Share (%)	Area (ha)	Share (%)	Area (ha)	Share (%)	Area (ha)	Share (%)
Boro (LV*)	242	0%	10,604	8%	11,104	27%	71,462	35%	93,412	19%
Boro (HYV**)	97,210	85%	106,185	83%	27,467	67%	119,105	58%	349,967	72%
Wheat	2,055	2%	137	0%	90	0%	-	-	2,282	0%
Spices	-	-	964	1%	453	1%	1,897	1%	3,314	1%
Oil Seed	1,572	1%	5,371	4%	1,496	4%	1,897	1%	10,336	2%
Aus (LV*)	3,869	3%	-	-	362	1%	422	0%	4,653	1%
Aus (HYV**)	1,209	1%	276	0%	-	-	-	-	1,485	0%
Aman (LV*)	1,209	1%	1,377	1%	228	1%	1,687	1%	4,501	1%
Aman (HYV**)	7,375	6%	3,307	3%	-	-	7,800	4%	18,482	4%
Haor Total	114,741	100%	128,221	100%	41,200	100%	204,270	100%	488,432	100%
Rice total***	111,114	97%	121,749	95%	39,161	95%	200,476	98%	472,500	97%

Remarks: *: Local variety; **: High yielding varieties; ***: Total of Boro, Aus and Aman.

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

In contrast to the Char area, crops in the Haor is very limited. The share of rice area in the total harvested area accounts for as high as 97%. As mentioned in the previous section, only Rabi crop can be cultivated in the Haor. Moreover, due to the land being low and flat, soils are clayey and contain much water, which restricts crop cultivation only to rice. Aus and aman rice are cultivated in limited land where floodwater depth is within the allowance of rice crop.

This is why the cultivated crop is dominated by Boro rice. Among the varieties of Boro rice, high yielding varieties are dominant due to their relatively shorter growth duration and to higher yield potential emerged when farm management is done properly.

Yield

Yield of the crops in the Study Area is shown in Table 3.39 for Char and Table 3.40 for Haor, respectively. Yield of Boro rice is generally higher than those of Aus and Aman. This is mainly due to higher dosage of fertilizer for Boro. Aus and Aman rice are vulnerable to flood, and people hesitate of invest much to those crops. On the other hand Boro rice is susceptible to drought, for which people have to spend more for irrigation to obtain higher yield besides fertilizer.

Sandy soil condition is a constraint for Char people to obtain higher yield. Natural fertility and water holding capacity being low, fertilizer requirement is high in general, and irrigation is necessary in the dry season.

Table 3.39 Yield of Crops in Char by Districts

Crops	Gaibandha	Jamalpur	Kurigram	Sirajganj	Char ave.
Boro (LV*)	2.1	3.2	2.3	2.2	2.6
Boro (HYV**)	4.2	4.0	4.6	5.1	4.5
Wheat	2.7	2.6	2.4	2.2	2.5
Pulses	1.3	1.1	1.5	1.3	1.3
Groundnut	3.7	4.5	4.4	2.6	3.8
Sugar cane	63.0	40.4	74.3	1.5	43.6
Oil Seeds	1.0	1.2	1.6	0.7	1.0
Aus (LV*)	2.1	3.0	2.0	1.8	2.0
Aus (HYV**)	3.4	5.0	3.1	2.0	4.1
Jute	2.2	2.8	2.9	1.5	2.1
Aman (LV*)	2.6	3.0	2.4	2.1	2.4
Aman (HYV**)	3.6	4.0	3.1	-	3.5

Note: Unit is ton/ha

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

In Haor, Boro crop yield, high yielding varieties (HYV) of boro rice is higher than those in Aus and Aman. Average yield of HYV of Boro in Haor as a whole reaches to 5.0 ton/ha. In particular, yield of HYV of Boro in Kishoreganj and Habiganj is 5.6 ton/ha, and 5.4 ton/ha, surpassing the yields of two other districts by more than 1.0 ton/ha.

Table 3.40 Yield of Crops in Haor by Districts

Crops	Habiganj	Kishoreganj	Netrokona	Sunamganj	Haor ave.
Boro (LV*)	3.0	3.1	3.3	2.5	2.7
Boro (HYV**)	5.4	5.6	4.3	4.4	5.0
Wheat	3.6	2.7	1.5	-	3.4
Spices	-	4.2	4.9	4.8	4.7
Oil Seed	2.4	1.2	1.5	1.7	1.5
Aus (LV*)	2.8	-	4.0	1.8	2.8
Aus (HYV**)	3.0	2.5	-	-	2.9
Aman (LV*)	3.0	2.2	4.0	2.4	2.6
Aman (HY**)	3.5	4.4	-	3.0	3.4

Note: Unit is ton/ha

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

Production

Production of crops in the Study Area is found in Table 3.41 for Char and Table 3.42 for Haor, respectively. In Char, paddy production in the Area totals some 328,000 tons, of which 62% come from Boro rice. Production of other crops is 41,3400 tons of wheat, 11,120 tons of pulses, 32,500 tons of groundnut, 101,300 tons of sugarcane, 10,500 tons of oilseeds, and 49,700 tons of jute.

Total production of paddy is equivalent to 213,000 tons of milled rice by applying conversion factor of 65%. Rice requirement in the Area is also estimated at 223,868 tons based on the estimated population and estimated per capita annual consumption rate of rice with 160 kg. The results show that only the Char in Gaibandha produce surplus of rice while the other districts are deficient in rice. It must be noted that dhaincha, an industrial crop for fencing as well as fuel is also planted widely in the Char area although it is not presented in the Table.

Considering the very low economic status of people in Char in general, cash crops cultivation such as jute and sugarcane is important as well as rice.

Table 3.41 Production of Crops in Char by Districts

Crops	Gaibandha	Jalalpur	Kurigram	Sirajganj	Char Total
Boro (LV*)	5,058	15,054	5,014	3,541	28,667
Boro (HYV**)	39,872	42,598	30,760	60,380	173,610
Wheat	9,385	9,888	17,506	4,596	41,375
Pulses	844	1,012	3,887	5,377	11,120
Groundnut	6,380	10,703	9,698	5,715	32,496
Sugar Cane	24,369	24,339	51,618	971	101,297
Oil Seeds	589	1,603	4,936	3,365	10,493
Aus (LV*)	591	2,495	5,967	5,107	14,160
Aus (HYV**)	4,933	5,850	362	143	11,288
Jute	4,851	8,148	17,809	18,865	49,673
Aman (LV*)	19,082	4,499	9,289	20,033	52,903
Aman (HYV**)	27,768	6,024	13,323	-	47,115
Paddy total	97,304	76,520	64,715	89,204	327,743
Rice equivalent***	63,248	49,738	42,065	57,983	213,034
Requirement in the Area****	32,168	60,340	53,647	77,714	223,868

Note: Unit is expressed in tons.

Remarks: *: Local varieties; **: High yielding varieties; ***: Converted from paddy with a milling rate of 65%;

****: Estimated based on the estimated population in 2001 and per capita rice consumption rate of 160 kg/year.

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

In Haor, paddy production totals as much as 2.1 million tons, of which 96% are from Boro. Other crops are 7,840 tons of wheat, 15,500 tons of spices and 15,900 tons of oilseeds.

Total production of paddy is equivalent to 1.37 million tons of milled rice, which is more than 2.4 times more than rice requirements in the Area. It can be said that the Haor area is the net rice surplus area, and rice is positioned as an important cash crop.

Table 3.42 Production of Crops in Haor by Districts

Crops	Habiganj	Kishoreganj	Netrokona	Sunamganj	Haor Total
Boro (LV*)	719	32,766	37,087	177,940	248,512
Boro (HYV**)	522,018	591,450	118,932	530,017	1,762,417
Wheat	7,336	369	135	-	7,840
Spices	-	4,078	2,202	9,200	15,480
Oil Seed	3,773	6,606	2,304	3,225	15,908
Aus (LV*)	10,756	-	1,430	743	12,929
Aus (HYV**)	3,627	679	-	-	4,306
Aman (LV*)	3,615	3,084	901	4,099	11,699
Aman (HY**)	25,444	14,518	-	23,478	63,440
Paddy total	566,179	642,497	158,350	736,277	2,103,303
Rice equivalent***	368,016	417,623	102,928	478,580	1,367,147
Requirement in the Area****	119,880	200,792	43,450	192,213	556,335

Note: Unit is expressed in tons.

Remarks and Source: Same as Table 3.41

(3) Input use

Chemical fertilizer is commonly used for crop cultivation in both Char and Haor. Macro nutrients of nitrogen, phosphorus and potassium are artificially supplied by use of Urea, Triple Super Phosphate and Potassium Chloride, respectively.

Table 3.43 provides the dosages of nutrients through chemical fertilizers by crops in Char and Haor Areas.

Table 3.43 Dosages of Nutrition per Unit Area in Char and Haor

Unit: kg/ha

Crop	Char			Haor		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Aus (LV)	51	33	21	54	33	25
Aus (HYV)	74	49	28	51	38	20
Aman (LV)	39	35	15	52	34	21
Aman (HYV)	63	49	21	52	35	29
Boro (LV)	56	42	20	52	36	22
Boro (HYV)	92	59	26	79	41	22
Wheat	58	36	24	49	43	22
Pulses (Lentils)	26	18	7	18	10	-
Spices	110	51	36	69	65	29

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

The dosage of nitrogen ranges from 39 to 56 kgN/ha for local variety of rice and from 63 to 92 kgN/ha for high yielding variety of rice in Char. In Haor, the dosage is rather uniform between 51 and 54 kgN/ha, except for HYV of boro with 79 kgN/ha. Generally speaking, nitrogen dosage is higher in Char than in Haor, may be due to the difference in soil textures. Char area requires more fertilizer because the soils are sandy having fewer nutrients holding capacity.

The dosage of phosphorus for rice is less than nitrogen in both Areas, ranging from 33 to 59 kg P₂O₅/ha in Char and from 33 to 41 kgP₂O₅/ha in Haor, respectively. The dosage of potassium for rice is least among three macronutrients in the Area, ranging from 15 to 28 kgK₂O/ha in Char and from 20 to 29 kgK₂O/ha in Haor, respectively.

Dosage of fertilizer to wheat is almost the same as that to rice, while less amount is applied to pulses. People apply the largest amount of fertilizer to spices.

(4) Irrigation

Irrigation is practiced for rabi crops in both Char Area and Haor Area. According to the agricultural sample survey results, irrigated area is some 58% of the total rabi cropped area in Char and 92% in Haor area, respectively. In most cases irrigation is done individually by using various types of pump such as shallow tubewells (STWs), low lift pumps (LLPs) and treadle pump. The use of deep tubewells (DTW) is very few.

In Char, shallow tubewell is dominant using groundwater as a source of irrigation, as shown in Table 3.44. Total of 2,217 STWs are used in the sample areas. Treadle pump is used more in Kurigram. The coverage of irrigation area per pump ranges from 2.2 ha/unit in Sirajganj to 7.8 ha/unit in Kurigram.

Table 3.44 Irrigation Facilities in Char and Haor

Districts	Irrigated Area		DTW			STW			LLP			Treadle pump	Remarks
	ha	%	01	02	03	01	02	03	01	02	03		
Char													
Gaibandha	3,060	66	-	-	-	60	267	169	-	-	-	38	6.0 ha/unit
Jamalpur	4,521	76	-	-	-	288	305	79	6	-	-	25	6.6 ha/unit
Kurigram	3,190	50	-	-	-	95	21	185	-	-	-	358	7.8ha/unit
Sirajganj	1,626	36	-	-	-	735	13	-	-	-	-	-	2.2 ha/unit
Char	12,397	58	-	-	-	1,178	606	433				401	-
Haor													
Habiganj	8,081	90	-	-	-	-	-	5	164	54	87	-	26.1
Kishoreganj	17,430	90	-	4	2	533	331	111	155	158	325	-	10.8
Netrokona	7,009	88	1	-	-	528	171	194	8	31	92	-	6.8 ha/unit
Sunamganj	16,982	94	-	-	-	11	1	-	698	-	23	-	23.5
Haor Total	49,502	93	1	4	2	1,072	503	310	1,025	243	527		

Note: 01: Facility Owned; 02: Facility Shared; 03: Facility Rented; Irrigable area of treadle pump is estimated at 30 % of STW; (%) of Irrigated area means the share of irrigated area in the total rabi crop area.

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

In Haor, on the other hand, both surface water and groundwater are used for irrigation by use of LLPs and STWs respectively. In Netrokona STWs are mainly used while in Kishoreganj both STWs and LLPs are used. LLPs are the major irrigation device in the two other districts. Irrigated areas per pump ranges from 6.8 ha/unit in Netrokona to 26.1 ha/unit. As compared with Char,

irrigated area by unit pump is wider.

(5) Supporting Services

Agricultural Extension

The Department of Agricultural Extension (DAE) is responsible for the agricultural extension services. Under DAE, there is a District Agricultural Office headed by a Deputy Director (DD) who supervises overall extension activities. Under the district, Thana (Upazila) agricultural offices, the lowest level of extension arms, implement extension services at farm level. A thana agriculture officer (TAO), while supervised by DD, is supported by a Subject Matter Officer, an additional Thana Agriculture Officer (ATAO), a Junior AEO, and Block Supervisors.

Diffusion and adoption of modern technologies are under the responsibility of the extension personnel. Extension activities are mainly organized through regular visits by the 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 farmer's problems are discussed.

Extension activities in the Study Area are not active as block supervisors do not visit villages regularly or have never visited them. Several reasons for their inactiveness include low travel allowances to go to villages, lack of transportation means, lack of farmers group activities, undeveloped communication infrastructure, etc.

In order to enhance agricultural productivity further, the following issues should be addressed:

- Development of Suitable Crop Varieties

Early-maturing and cold tolerant varieties with high yield potential need to be developed and introduced to avoid early flash flood. Suitable varieties of non-rice crops are also needed which can grow in the winter season before modern Boro rice varieties can be transplanted.

- Platforms for Intensive Cultivation of Non-rice Crops

The raised platforms to be built using dredged soil will, with proper management, contribute to the improvement of nutrition condition of local people through cultivation of homestead vegetables, pulses, spices and fruits.

- Crop Seeds

Usually, farmers save their seeds from the harvested crop. They sometimes exchange them among themselves, which causes mixture of varieties with different maturing stages. Seeds of HYVs or improved varieties are available at BADC seed distribution centers at Upazila level. But the total amounts of seeds distributed to farmers do not satisfy their requirement. In addition, seeds are often not available on time at the distribution centers. The net effect of shortcomings is

a reduction in the potential crop yield.

- Efficient Management of Surface Water Used for Irrigation

Surface water irrigation can be improved with the following measures:

- Excavation of khals to provide supplementary storage.
- Providing control structures at suitable locations.
- Improvement in the efficiency of surface water use.
- Ensuring equitable water distribution.
- Improved irrigation management.

Research

Bangladesh Rice Research Institute (BRRI), established in October 1970, is one of the largest agricultural research institutes of Bangladesh, and is responsible for developing new rice varieties.

Development of dwarf, photoperiod insensitive varieties were the major focus of BRRI research up to 1980. After 1980, BRRI has been putting more emphasis on developing intermediate height plant, mild photosensitive and pest tolerant varieties for specific ecologies.

BRRI has so far developed 31 modern rice varieties for cultivation in different rice growing seasons. BRRI varieties are grown both under rain-fed and irrigated condition. BRRI varieties cover 52 % of the rice area and 70 % of the total rice production in Bangladesh. Several popular BRRI varieties for Boro are shown in Table 3.45.

BR28, developed in 1994, have the shorter growth duration of 135 to 140 days. Although yield is lower than other varieties, such early maturing varieties are expected to contribute to the reduction of crop damages by early flash floods.

Table 3.45 HYVs for Boro Released from BRRI Since 1980

Variety Name	Year released	Ecology	GD (days)	Yield (ton/ha)	Others
BR17	1985	IRR	150-155	5.0-5.5	Boro
BR18	1985	IRR	170-175	5.0-6.0	Boro
BR19	1985	IRR	160-165	5.5-6.0	Boro
BR28	1994	IRR	135-140	4.0-4.5	Boro
BR29	1994	IRR	155-160	5.5-6.0	Boro
BR35	1997	IRR	150-155	4.5-5.5	Boro
BR36	1997	IRR	140-145	4.5-5.5	Boro
BR15	1983	RFL, IRR	150-160	5.0-5.5	Boro
BR16	1983	RFL, IRR	160-165	5.0-6.0	Boro

Note; IRR = Irrigated; RFL = Rainfed Lowland

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

3.5.2 Fishery

Based on the sample area survey's results, fishery production is summarized in Table 3.46.

Table 3.46 Fishery Production Record in Sample Area of Char and Haor

	Closed fisheries						Open fisheries	
	Nos. pond	Nos. fish pond	Area of pond (ha)	Area of fish pond (ha)	Annual catch (ton)	Unit yield (ton/ha)	Annual fish catch (ton)	Annual shrimp catch (ton)
Char								
Gaibandha	282	282	42.6	42.6	79.0	1.9	111.6	9.2
Jamalpur	108	108	22.8	22.8	152.0	6.7	332.7	79.6
Kurigram	189	156	32.2	27.8	45.6	1.6	45.6	89.0
Sirajganj	38	36	14.4	14.2	14.1	1.0	n.a.	n.a.
Char total	617	582	112.0	107.4	290.7	2.6	489.9	177.8
Haor								
Habiganj	230	87	29.0	12.3	42.2	3.4	271.0	-
Kishoreganj	285	272	90.3	88.1	86.8	1.0	1,669.0	37.0
Netrokona	126	29	27.7	9.4	24.3	2.6	4.3	-
Sunamganj	142	67	42.6	20.4	147.3	7.3	1,640.5	4.0
Haor total	783	455	189.6	130.2	300.6	2.3	3,584.8	41.0

Note: Open fisheries are operated in beels, rivers, etc.; n.a.: data not available.

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

Regarding closed fisheries practiced in fish ponds, productivity is similar between Char and Haor with average unit yields of around 2.5 ton/ha, although yield of fish catch varies among districts. Lowest yield is recorded in Sirajganj and Kishoreganj with 1.0 ton/ha, while the highest in Sunamganj with 7.3 ton/ha. It should be noted that during the flooding, ponds are usually overflowed, resulting in loss of cultured fish.

On the other hand, production in open fisheries shows the distinct features between the two Areas. In Char shrimp production is relatively active, especially in Kurigram and Jamalpur. While in Haor, fish catch is dominant, particularly in Kishoreganj and Sunamganj.

The long tradition of fishing in Haor is an important determinant of fishing technology. Diverse fishing practices are used in the floodplain and beels. Fishing boats that are being used to operate the gear and transport fish also vary greatly in size, and are predominantly non-mechanized country boats using sail, paddle or pole or pole propulsion.

In Haor Area, there are two distinct seasons in terms of fishing activities: monsoon season (June to October) and the dry season (November to May). In monsoon season, almost all Haor area is submerged, and any people can do fishing anywhere. On the other hand, in the dry season when water level goes down, fishing places are limited to the places where water remains such as beels, river courses, etc. As water bodies belong to the government properties, fishing there needs to get license. At present, fishing rights are issued by Ministry of Land through competitive bidding taken

place every three years. In almost all cases economically solvent people in the locality get licenses, small fishermen cannot have any opportunity to do fishing at beels in the dry season.

According to the existing study data on Fishery of Haor area, a total of 71 species of fish have been recorded from Haor area. Important groups are major carp, other carps, large catfish, knifefish, ilish, prawns, small catfish, small cyprinids, and other small species. The small species are used primarily for local consumption, and large species are commercially important at urban. Several species that were formerly abundant are now rare or locally extinct because of over exploitation and sedimentation.

3.5.3 Livestock and Poultry

The present condition of livestock and poultry summarized in Table 3.47.

Table 3.47 Number of Animals Kept in Sample Areas of Char and Haor

District	Cattle	Buffalo	Goat	Sheep	Ducks	Chicken
Char						
Gaibandha	17,043	854	12,714	5,396	13,138	34,639
Jamalpur	32,935	304	32,960	9,475	22,358	81,065
Kurigram	17,284	809	21,223	8,151	15,252	221,362
Sirajganj	23,335	27	17,327	1,788	4,479	68,466
Char Total	90,597	1,994	84,224	24,810	55,227	405,532
Haor						
Habiganj	14,066	117	3,096	1,386	42,335	21,372
Kishoreganj	32,008	1,527	9,748	2,409	125,105	144,325
Netrokona	29,400	1,340	7,720	1,652	110,900	49,800
Sunamganj	28,760	583	1,878	3,482	109,915	58,863
Haor total	104,234	3,567	22,442	8,929	388,255	274,360

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

Reflecting the different agro-ecological conditions, major animals kept differ between two Areas. While goat and sheep are found more in Char area, ducks are dominant in Haor. Cattle, important draft animal for cultivation and transportation, are found in both Areas. Chicken rising is more active in Kurigram and Kishoreganj.

During the flood season misery of the livestock are beyond description. Many of them are washed away every year by chronicle flood. But, the Char and Haor area people have the courage to defend against any natural calamities, as live animals are their valuable properties. They are adjusted to maintain livestock under adverse conditions.

The main source of cattle feed is rice straw complemented with grazing in rice fields, roadside and communal grazing fields in winter. About 87% of all animal feeds come from cultivated land. Only 13% comes form other sources such as embankments, roadsides, and low lands which are usually used on a community basis. There is no managed forage available. The small areas of communal grazing lands are now over-grazed. Animals hardly receive any nutritious feed except a small

quantity of salt and a handful of rice bran/polishing, which is produced in the households. Fattening cattle thus takes time to grow up to marketable size. Veterinary services are hardly available although there are veterinary officers in Thana (Upazila) offices.

3.5.4 Marketing

(1) Marketing of Inputs

Agricultural inputs are largely available in local markets. Seeds, seedlings, fertilizers, pesticides, farm equipments like irrigation pump, ploughing tools, weeding tools, sprayers and threshers are dealt in the markets. Tools and equipments are usually on lease. However, according to the results of market survey, there exist several constraints, as shown in Table 3.48.

Table 3.48 Constraints in Marketing Agricultural Inputs in Char and Haor

Unit: nos. of market

Items \ Constraints	Input scarcity	High price of inputs	Low quality of inputs	Low purchasing power	Disorganized market	Unawareness of inputs
Char						
Seed	7	10	7	8	0	2
Seedling	7	7	6	4	4	0
Labor	0	6	0	4	0	0
Chemical fertilizer	0	6	1	6	0	5
Organic fertilizer	10	0	1	0	0	1
Pesticides	0	9	3	6	1	10
Irrigation	1	9	1	4	2	1
Ploughing	5	7	2	7	0	0
Weeding	4	8	2	6	0	0
Sprayer	7	4	1	1	0	3
Thresher	2	0	0	0	0	0
Haor						
Seed	11	12	9	1	2	4
Seedling	8	6	10	0	1	3
Labor	7	10	1	6	0	2
Chemical fertilizer	4	13	2	2	2	10
Organic fertilizer	1	4	1	0	3	2
Pesticides	5	10	2	0	1	8
Irrigation	11	8	1	3	1	4
Ploughing	9	10	2	5	1	6
Weeding	12	6	5	4	1	2
Sprayer	11	6	4	2	0	6
Thresher	2	10	3	2	0	4

Note: Number of surveyed markets are 16 each in Char and Haor, respectively.

Source: JICA Study Team based on Marketing Survey, 2001

Common problems farmers are facing include scarcity of inputs including seeds, seedlings and sprayer. Organic fertilizers are scarce in Char while weeding tools, irrigation devices, ploughing tools are not available on time. Labors are also scarce in Haor nowadays on peak season such as

planting and harvesting. High price of inputs are also serious problems farmers complain. Sometimes, inputs especially seeds and seedlings are unacceptably low quality.

On the other hand, dealers complain that farmers do not have purchasing power to afford inputs. In general, Char farmers are less capable of purchasing inputs. Also farmers do not have deep knowledge on handling chemical fertilizer as well as pesticides.

Timely supply of inputs, supply of standard quality items are essential to satisfy farmers who purchase inputs, while credit as well as extension services should be provided to enhance market.

(2) Marketing products

Most farmers sell their farm products directly at local retail markets or so-called hat bazars which open daily, weekly or bi-weekly. In Haor area, paddy is transacted more through wholesaler who control the market, as shown in Table 3.49.

Table 3.49 Marketing Place of Farm Products and Constraints to Market in Char and Haor
Unit: nos. of market

	Market place			Constraints			
	Farmgate	Retail	Wholesale	Lack of formal market place	Lack of transport & communication	Vulnerability of producers	Others
Char							
Paddy	5	9	4	11	9	1	2
Rice	2	14	-	7	10	-	2
Jute	-	8	5	10	7	-	2
Wheat	-	13	5	6	8	-	2
Potatoes	-	11	5	5	7	-	2
Pulses	-	9	3	4	7	-	2
Oilseeds	-	11	4	7	9	-	2
Vegetables	-	9	-	1	7	1	1
Sugar cane	2	-	2	2	3	-	-
Fruits	-	9	-	1	8	-	1
Fish	-	13	-	2	8	-	1
Haor							
Paddy	-	7	15	10	15	3	-
Rice	-	3	2	1	5	-	-
Wheat	-	1	2	1	1	-	-
Potatoes	-	2	1	1	3	-	-
Pulses	-	-	1	1	1	-	-
Vegetables	-	1	-	-	1	-	-
Fish	-	8	4	5	11	3	-

Note: Number of surveyed markets are 16 each in Char and Haor, respectively.

Source: JICA Study Team based on Marketing Survey, 2001

Farmers have no choice but sell their products locally or through wholesalers due to lack of formal marketing places and/or to lack of transport and communication. Marketing places are not organized well, just providing open field, and people who sell products and purchase goods come to the place on market days.

Marketing places are often not available nearby villages, so farmers have to carry their products to the markets for long distance by animals, bicycle, or on foot.

3.6 Rural Infrastructure

3.6.1 Rural Communication

(1) Rural Road

(a) Categorization of rural road

Under the jurisdiction of LGED, there are four types of rural road according to their function, as shown in Table 3.50.

Table 3.50 Categorization of Communication Roads

Categories	Definition
1. Feeder Road Type-B (FRB)	<ul style="list-style-type: none"> • Road connecting Growth centers with the Upazila parishads • Road connecting Growth center with RHD road network • Roads connecting one Upazila with other Upazilas
2. Rural Road Class 1 (R1)	Road connecting Union parishad/ Hat bazars with the Upazila parishads or road system
3. Rural Road Class 2 (R2)	Roads connecting villages and farm to hat bazars /Union parishads
4. Rural Road Class 3 (R3)	Roads within villages

Source: LGED Training Unit

(b) Road inventory

An inventory of rural road of the whole country and eight districts is presented in the Table 3.51.

From the table, it can be understood that although FRB, R1 and R3 in the Area have relatively been developed well with more than 10% of the share of road length in the Country as a whole, the development of R2 have been lagged behind. Underdevelopment of the R2 in the districts of both Areas suggests that the villagers find difficulty in communicating with hat bazars or union parishads. It may restrict the participation of local people in economic activity.

Relatively higher development level of R3 in the Haor Districts may be due to dispersed pattern of villages, especially within the Haor.

Table 3.51 Summary of Length of Rural Road in Char and Haor

	FRB		R 1		R 2		R 3		Total	
	Length (km)	Share	Length (km)	Share	Length (km)	Share	Length (km)	Share	Length (km)	Share
Char										
Gaibandha	373	2.6%	996	2.6%	829	1.7%	679	2.3%	2,877	2.2%
Jamalpur	407	2.8%	1,366	3.6%	627	1.3%	1,016	3.4%	3,416	2.6%
Kurigram	308	2.1%	1,223	3.2%	655	1.3%	693	2.4%	2,879	2.2%
Sirajganj	366	2.5%	1,454	3.8%	778	1.6%	1,081	3.7%	3,679	2.8%
Sub-total	1,454	10.1%	5,039	13.3%	2,889	5.8%	3,469	11.8%	12,851	9.8%
Haor										
Habiganj	252	1.8%	863	2.3%	644	1.3%	1,051	3.6%	2,810	2.1%
Kishoreganj	407	2.8%	1,268	3.4%	963	1.9%	2,160	7.3%	4,798	3.7%
Netrokona	502	3.5%	1,285	3.4%	849	1.7%	906	3.1%	3,542	2.7%
Sunamganj	457	3.2%	844	2.2%	654	1.3%	964	3.3%	2,919	2.2%
Sub-total	1,618	11.2%	4,260	11.3%	3,110	6.3%	5,081	17.3%	14,069	10.7%
Bangladesh	14,400	100.0%	37,850	100.0%	49,540	100.0%	29,450	100.0%	131,240	100.0%

Source: RHD and LGED in 1993-95 for Bangladesh; LGED road inventory in 2000 for the Districts.

(c) Road density

The density of rural roads in the Char and Haor areas are much lower than that of the districts as a whole, as shown in Table 3.52. Both indicators of road density are lower in value in the Char and Haor than in the whole districts. Per capita road length is less than half of the District average in Char of Gaibandha and Sirajganj and in Haor of Habiganj and Sunamganj. Road length per square kilometer in Char and Haor is less than half in all the districts.

Table 3.52 Density of Rural Road in Char and Haor

	Whole district					Within Char/Haor Area				
	FRB (km)	R1, R2, R3 total (km)	Total (km)	Road Density		FRB (km)	R1, R2, R3 total (km)	Total (km)	Road Density	
				(m/capita)	(m/km ²)				(m/capita)	(m/km ²)
Char Area										
Gaibandha	373	2,504	2,877	1.19	1,320	0	106	106	0.53	210
Jamalpur	407	3,008	3,415	1.50	1,681	184	250	434	1.15	823
Kurigram	308	2,572	2,880	1.46	1,254	72	325	397	1.18	464
Sirajganj	366	3,312	3,678	1.34	1,472	0	86	86	0.18	110
Total	1,454	11,396	12,850	1.36	1,427	256	767	1,023	0.73	384
Haor Area										
Habiganj	252	2,558	2,809	1.54	1,089	111	170	281	0.38	202
Kishoreganj	407	4,391	4,798	1.72	1,784	206	1,054	1320	1.05	779
Netrokona	502	3,040	3,542	1.68	1,267	44	264	308	1.13	439
Sunamganj	457	2,462	2,919	1.45	795	280	412	692	0.58	255
Total	1,617	12,451	14,067	1.61	1,199	701	1,900	2,601	0.75	400

Source: Road Inventory, LGED and JICA Study Team based on the Rural Infrastructure Survey, 2001

It can be said that mal-distribution and lower density of road network hamper the socio-economic development of the Area.

(d) Existing FC embankment

Furthermore, existing Flood Control (FC) embankment constructed and maintained by BWDB plays an important part in the transportation in both Char and Haor areas. A number of Upazila parishad are located along the existing FC embankments, and some Upazilas link to other Upazilas and/or Union parishads through the embankment, and also many launch ghats attached with Growth center or Hat bazars are existed along FC embankments. Some sections, however, are having breaches or not accessible due to bad condition of embankment crest. Accordingly, improvement of pavement on embankment is likely to bring good results for communication, transportation as well as marketing distribution among Upazilas and Union parishads.

(2) Water Transport System

Water transport is an essential communication means in Bangladesh, and so is in Char and Haor. It is the sole means for Char people to communicate with mainland. In the Haor area, also, communication means is restricted only to water transport in the wet season. In some area in Haor, water transport is more convenient than other communication means even during the dry season. Table 3.53 as presented below shows the number of Launch ghats and Launch routes exist in Char and Haor areas. With higher number of Launch ghats and routes, the district of Kurigram in Char, and Kishoreganj and Sunamganj in Haor depend more on water transport system.

Table 3.53 Water Transport Network in Char and Haor

Within Char Area			Within Haor Area		
District	Nos. of Launch Ghat (nos.)	Launch Route Length (km)	District	Nos. of Launch Ghat (nos.)	Launch Route Length (km)
Gaibandha	7	n.a.	Habiganj	7	11
Jamalpur	4	n.a.	Kishoreganj	56	237
Kurigram	33	n.a.	Netrokona	12	18
Sirajganj	2	n.a.	Sunamganj	52	233
Total	46	n.a.	Total	127	499

Note: n.a.: data not available

Source: JICA Study Team based on the Upazila Base Maps and Rural Infrastructure Survey, 2001

(3) Tele-communication

Presently, in the study area, only among the Upazila parishads tele-communication network is connected. As for the union level, however, most of Union parishads located in island chars and Haor area have not been brought under any tele-communication system yet.

3.6.2 Marketing Facilities

(1) Growth Center/Hat Bazar

LGED has been promoting to establish Growth Centers since the last decade. A number of Growth Centers have been established as the up-graded versions of previous Hat bazars, aiming to activate marketing and distribution system as well as to promote participation of women in economic activities in the rural areas. A typical Growth Center consists of separate sheds according to the marketing goods such as vegetable, fish, meat, etc., and a women's corner where women can sell and buy products without hesitation. Paved roads with side drains and sanitary latrines are provided inside the Growth Center. Table 3.54 shows the inventory of the Marketing facilities collected from Upazila LGED offices.

Table 3.54 Marketing Facilities of Char and Haor

District	Marketing facilities						Bazar Area Total (m ²)	Bazar Density	
	Growth center		Hat bazar		Total			km ² /bazar	m ² /capita
	Nos.	share	Nos.	share	Nos.	share			
Char									
Gaibandha	0	0%	12	13%	12	13%	23,252	42.0	0.12
Jamalpur	3	3%	30	33%	33	36%	500,000	16.0	1.33
Kurigram	3	3%	21	23%	24	26%	117,323	35.6	0.35
Sirajganj	0	0%	23	25%	23	25%	29,500	33.9	0.06
Char Total	6	7%	86	93%	92	100%	670,075	29.0	0.48
4 Districts Total	73	20%	290	80%	363	100%	2,151,007	24.8	0.23
Haor									
Habiganj	11	5%	22	10%	33	15%	39,062	40.0	0.05
Kishoreganj	10	5%	45	20%	55	25%	223,172	30.8	0.18
Netrokona	8	4%	21	9%	29	13%	109,435	24.2	0.40
Sunamganj	22	10%	83	37%	105	47%	323,620	25.5	0.27
Haor Total	51	23%	171	77%	222	100%	695,289	28.8	0.20
4 Districts Total	128	23%	420	77%	548	100%	1,707,684	21.4	0.20

Source: JICA Study Team based on the information from LGED Upazila Offices

Marketing facilities, both Growth Centers and Hat Bazars, are poorly established in Char area. Merely 7% of the total market facilities are Growth Centers in Char Area, while 20% in total of four Char districts. Marketing facilities are available one per 29 km² on average in Char, which shows a little less density than the relevant Districts as a whole. However, considering the less developed village to market road as seen in the section 3.6.1 (1), it is thought that people in Char find difficulty in accessing the market facility, although the market itself provide wider space per capita.

In Haor area, on the other hand, Growth Centers have been established comparable to the Haor Districts as a whole. The number of Growth Center accounts for 23% of the total marketing facilities in Haor. As in Char, however, density of marketing facilities is less with one per 28.8 km² than the Districts total with 21.4 km², which makes Haor people feel difficult in accessing to markets.

(2) Growth Center Connecting Road

LGED has also been implementing Rural Development Project (RDP) in various parts of the country. In general, a package of RDP consists of improving of rural roads, but in some cases the package includes Growth Center Connecting Road (GCCR) aiming at developing marketing facilities. Table 3.55 shows the GCCR provided under various completed and on-going RDP projects undertaken by LGED.

Table 3.55 LGED Project related to GCCR

Name of Project	Start Year	Char Area				Haor Area			
		Gaib	Jamal	Kuri	Siraj	Habi	Kishr	Netro	Suna
RDP-3	1990					○			○
RDP-17	1989						○	○	○
RIDP (1st, 2nd, 3rd)	1993	○	○	○	○	○	○	○	○
RDP-11	1996				○				
RDP-21 including	1995	○	○	○			○	○	
RDP WFP	1997		○			○	○	○	○
Union Parishad Complex	1998								
Other projects									

Source: LGED

3.6.3 Rural Water Supply by Hand Tubewell

Hand tubewells play the major role in the rural water supply. The number of existing hand tubewells in the Study area is presented in Table 3.56, together with their density.

Table 3.56 Number of Hand Tubewell in Char and Haor

District	Nos. of Hand Tubewell (nos.)	Tubewell Density		District	Nos. of Hand Tubewell (nos.)	Tubewell Density	
		Users/Tubewell	Area /Tubewell (ha/unit)			Users/Tubewell	Area /Tubewell (ha/unit)
Within Char Area				Within Haor Area			
Gaibandha	9,300	22	5.4	Habiganj	13,100	57	17.0
Jamalpur	18,300	21	2.9	Kishoreganj	16,900	74	10.0
Kurigram	17,200	20	5.0	Netrokona	2,800	96	25.0
Sirajganj	29,900	16	2.6	Sunamganj	11,700	103	23.0
Total	74,700	19	3.6	Total	44,500	78	14.6

Source: JICA Study Team based on the Agriculture, Land and Water Use Survey by ACCESS, 2001

Tubewell density as described by users and area per one unit of tubewell is far better in Char area than in Haor area. The government policy as mentioned in NWMP is that the number of users per tubewell be reduced from 105 at present to 50 in the near future. According to the table above, density of tubewells in Char area has already achieved the target of the government policy. It is reported, however, that many of existing tubewells in Char area are inundated during flood, although the exact number has not been known.

On the other hand, the number of hand tubewells in Haor area is short from the required density in

the future. Another important issue on arsenic contamination in water of shallow tubewells in Haor area should also be taken into consideration.

3.6.4 Rural Electrification

At present, electricity line is connected only in Upazila parishads in the Study area. Most Union parishads located in island char and haor areas are very isolated and electrification has not been implemented yet. Table 3.57 shows rural electrification coverage rate of each district. Rate of coverage within Char area and Haor area are 8% and 11% respectively, compared to 31% and 37% in the respective Districts. In Char, electrification has not been put in place except Jamalpur.

Table 3.57 Electrification Coverage in Char and Haor

Char Area			Haor Area		
District	Average in the District (%)	Within Char Area (%)	District	Average in the District (%)	Within Haor Area (%)
Gaibandha	12%	1%	Habiganj	46%	13%
Jamalpur	53%	29%	Kishoreganj	42%	12%
Kurigram	23%	0%	Netrokona	12%	10%
Sirajganj	37%	1%	Sunamganj	34%	8%
Total	31%	8%	Total	37%	11%

Source: JICA Study Team based on the Rural Infrastructure Survey, 2001

3.6.5 Agricultural Infrastructures

Agricultural infrastructure such as drying yard, rice milling and store house are found very few within Chars and Haors, as shown in Table 3.58. There is no drying yard in Char, and in Haor area, average area per yard is smaller with 250 m² as compared to the district average with 550m². Those facilities belong to private ownership.

There is no storage facility in the Study area other than some food godowns located in the Upazila parishads, which are used as stockyard for government's food programs. People in the Area have to stock their products in bamboo baskets at home, which is vulnerable to inundation in wet season.

Table 3.58 Drying Yard/Milling Facilities in Char and Haor

	District in Total		Within Char/ Haor	
	Nos. of Drying Yard (nos.)	Total Area of Drying Yard (m ²)	Nos. of Drying Yard (nos.)	Total Area of Drying Yard (m ²)
Char Area				
Gaibandha	71	41,560	0	0
Jamalpur	43	240,250	0	0
Kurigram	140	95,030	0	0
Sirajganj	35	29,700	0	0
Total	289	406,540	0	0
Haor Area				
Habiganj	47	34,780	2	1,500
Kishoreganj	218	68,720	24	1,920
Netrokona	21	48,900	5	330
Sunamganj	26	19,230	14	7,500
Total	312	171,630	45	11,250

Source: JICA Study Team based on the Rural Infrastructure Survey, 2001

3.6.6 Education Facilities

Although there are some districts having quite a good number of educational institutions, some Char and Haor areas are lacking behind educational institutions. The number of schools and their capacity in the Study Area is presented in Table 3.59.

Table 3.59 Schools/Madrasha in Char and Haor

	College/High School		Primary School/ Madrasha		
	Number (nos.)	Capacity (student)	Number of Primary (nos.)	Number of Madrasha (nos.)	Capacity (student.)
Within Char area					
Gaibandha	9	3,100	158	14	45,191
Jamalpur	68	28,050	280	37	57,500
Kurigram	19	4,500	224	24	53,310
Sirajganj	29	8,900	223	17	48,240
Total	125	44,550	885	92	204,241
Within Haor Area					
Habiganj	14	7,600	271	12	60,650
Kishoreganj	42	12,850	340	74	79,850
Netrokona	25	9,070	113	17	25,420
Sunamganj	96	36,750	912	40	171,900
Total	177	66,270	1,636	143	337,820

Source: JICA Study Team based on the Rural Infrastructure Survey, 2001

3.7 Floods

3.7.1 River Systems and Morphology

(1) Char

The Chars under the Study area are situated in the active floodplain of the Brahmaputra river system, the rivers of which flow in broad braided and meandered channels. They change their courses every year, and cause damage to large area by bank erosion. Floodwater from the upstream and also that of the monsoon rainfall occurring over its catchment area is drained through these rivers. The floodwater carries large amount of sand and silt, the deposition of which creates Chars. The Chars become prominent at low water period.

In Char area, the river system is characterized by rapid and substantial changes in platform, with particular emphasis on bank line and width changes, channel braiding etc. Detail of river morphological dynamics of river system in Char area is presented in the following paragraphs, which are compiled from the direct factual information and analysis of EGIS study.

River Width

The river is becoming wider through retreat of both right and left banks. According to the study, the river has been becoming wider by about 130 m per year on an average since 1973. In some sections, the width has increased from 8 km to 11 km during the same period. Based on the historical and current trends, the study predicts that the widening will continue for at least another two decades and possibly three or more.

Bank Erosion

Both banks of the river are retreating and eroding flood plain land. The right bank has retreated to the west at an average rate of 65 m per year. This retreat is particularly severe between Fulchhari and Sirajganj. Erosion risks are high for those dwelling along the riverbanks and erosion will continue without additional riverbank protection and river training. During the 1973 and 1996, the river has destructed over 70,000 ha of mainland floodplain and created only about 11,000 ha of land through accretion along its bank.

River Braiding

The average number of low flow channels has increased by 40 percent since 1973 and their average length has increased by 30 percent. The intensity of braiding has particularly increased in the last decade and is in increasing trend. In the 1980s, downstream of Sirajganj followed a meandering path with wide point bars and multiple chute and back channels, but recently it has developed more braiding tendencies.

(2) Haor

Saucer-shaped seasonally flooded inter-fluvial areas are the main characteristic of Haors. The main rivers traversing the Haor area include Surma, Kalni, Kushiya, Baulai and Dhanu. These rivers have sinuous, meandering sand-bed channels with cohesive banks. The inflows from the tributaries of Surma and Kushiya rivers cause considerable spilling during the monsoon. Spilled flows follow over a wide flood plain and other channels before reaching the upper Meghna and then to Bay of Bengal.

Construction of flood control embankments, loop cuts, channel closers as well as on going channel changes over the last 25 years are responsible for the morphological changes in the river system. Negative impacts are envisaged aggrading of river bed due to deposition of silt on the lower Kushiya-Kalni river which is occurring as a result of the several factors including upstream channel shifts, impacts of past loop cutting and alteration of the river's flow regime. Increased sediment yields could accelerate ongoing sediment aggradation within flood control embankments on rivers such as Khowai and Chillikali. This may cause channel shifting and sedimentation on alluvial fans. Again naturally occurring patterns of instability on alluvial fans may result in abandonment of some existing channels and development of new channels over a time span of 10 to 20 years. Changes along the Surma/Baulai are also observed, where water levels during the monsoon season were found to be virtually unchanged from existing conditions.

3.7.2 Flood Environment

(1) Char

The Chars are highly dynamic due to erosion and deposition of sediments. Many of the Brahmaputra Chars experience yearly submergence of different magnitudes during the wet season. The Chars are almost completely inundated by the floods that have been estimated to have a return period of 25 years at Chilmari in Kurigram district and 12 years in Sirajganj district. These flood-and-erosion prone Chars are the homes of substantial number of people who are the victims of these natural happenings.

On the basis of their situation, they are termed as (a) Island char area, (b) Attached char area and (c) Unprotected mainland, adjacent to active floodplain. Again from the consideration of stability against erosion, the Chars may be classified as (i) Stable and (ii) Unstable. A Stable Char is a well-vegetated comparatively higher floodplain and accommodates semi-permanent population. As described in the main report of NWMP, the minimum useful life of a Stable Char is assumed to be 10 years. Although centers of these islands have a long life, the peripheries undergo a constant and sometime a dramatic change in shape. There are some places in the middle of the Brahmaputra-Jamuna river where there has never been a major channel; these chars are also under the category of Stable Chars and sometimes known by the name *mega-char*. On the other hand, Unstable Chars are the lower Chars and do not have any fixed locations. Usually, they vanish almost in every flood event creating new ones depending on the flow mechanism of the river. The

Unstable Chars have their top elevations nearly at the dominant discharge level. It is very difficult to predict the stability of these Chars.

The flood environments of the Char areas are mainly influenced by their location in the active river flood plain. Both inundation of the households in stable Chars and the erosion of the unstable Chars itself make the dwellers more vulnerable to floods, which often result in the shifting of the households. The Brahmaputra Charland Inventory found that 90% of the inhabitants within the bank area had moved between Char and water at least once during the period 1973-93. People live in stable Chars may move to a nearby flood free place temporarily till the flood recedes. In case for unstable Chars, the inhabitants may settle in a nearby location waiting indefinitely for the eroded char to re-emerge. In fact, unstable Chars are more vulnerable to flooding than the stable Chars. The Char dwellers' needs are various: ranging from the flood warning to assistance during evacuation, provision of shelters, and other support services.

Although it depends on the magnitude of the event, people in Chars suffer from flood damage every year. The survey results reveal that none of the villages is protected from flooding of any degree or from river erosion of the Char itself. Table 3.60 as presented below gives an account of the depth and duration of flooding in Char area during 1998, 1999 and 2000. The Table shows most of the villages experienced a depth of flooding less than 1.5 m, and about 60% of villages were submerged for a period of two to three months. The both, depth and duration of flood occurred in 1998 were deeper and longer than that of the floods in 1999 and 2000.

Table 3.60 Depth and Duration of Flooding in Char Last Three Years

Year	Nos. of sample villages with depth of flooding (m)				Nos. of sample villages with duration of flooding (month)					
	Depth range	<1.5	1.5-3.0	3.0-4.5	4.5<	Duration range	<2	2-3	4-5	5<
1998	No. of villages	15	96	4	0	Nos. of villages	1	107	7	0
1999		93	22	0	0		40	74	1	0
2000		100	15	0	0		47	66	1	1

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

(2) Haor

In every flood season, the Haor area receives floodwater from catchments of the above-mentioned systems originated from the slope of Shillong Plateau in the north and Tripura hills in the southeast. Runoffs of these rivers cause *early-floods* during April-May and accumulate in Haors and other floodplain depressions. These floods are termed as *flash-floods* in the border belts (piedmont plains) because of quick rise and fall of the water levels. Records show that the water level may rise as high as 3-6 m in 24 hours and may recedes completely within the next 24-48 hours. Almost all of the *flash-flood-basin's* outfalls are near the Indo-Bangladesh border. From the outfall, the water travels usually a distance of 10-20 km through a single channel known as *nodal reach*. The villages, embankments and other structures along the *nodal reach* are always subject to damages

because of large amount of flood flow and high flow velocity. In the downstream of the *nodal reach*, the river network becomes *deltaic* and loses its fury in the Haor area. As a result, depth of *flash-flood* in the Haor area is lower than that of the *nodal reach*. In April-May when the *flash-flood* water reaches the Haor area, it is known as *early-flood*, which usually causes damages to standing Boro crop by submergence.

The Haors may be classified into two types: (a) Deep Haor areas and (b) Shallow Haor areas. The former is where the elevation is below 4m MSL, while the latter is those that fall under the elevation of between 4 and 6m MSL. The Deep Haor areas fall under the F₄ type of land according to the Agricultural Land Classification, where the flood depth is more than 3m and are more susceptible to erosion caused by wave action. The Shallow Haor areas belong to F₁, F₂, or F₃ type of land, which have the flood depth up to 0.9m, 1.80m and 3.00m respectively.

During the period of June through September, when local rainwater along with the river flow from border coincides with flash flood water, the water levels of the deltaic rivers in the Haor area raise to an alarming level. It has been observed that in some cases, the accumulated water in the large Haors can keep most of the surrounding area flooded for more than six months in a year.

Table 3.61 below gives an account of the depth and duration of flooding in Haor area for the years 1998, 1999 and 2000.

Table 3.61 Depth and Duration of Flooding in Haor in Last Three Years

Year	No. of sample villages with depth of flooding (m)				No. of sample villages with duration of flooding (month)					
	Depth range	<1.5	1.5 -3.0	3.0-4.5	4.5<	Duration range	<2	2-3	4-5	5<
1998	Nos. of villages	9	26	63	43	Nos. of villages	33	63	41	4
1999		45	43	48	5		69	49	23	0
2000		35	59	40	7		68	45	22	6

Source: JICA Study Team based on the Rural Living Conditions Survey (RLCS) by DICS, 2001

The Table shows that both in terms of depth and duration, the flood event of 1998 was very serious and caused much damages than the other two events of 1999 and 2000. In 1998, out of 141 villages surveyed, 63 experienced a flood depth of 3-4.5m and over 5m in depth was experienced by 43 villages. In case of duration, 41 villages were inundated for period of 4-5 months and four villages were inundated for over five months.

In earlier days, the homesteads were comparatively larger and located on higher land than today. The area had significant coverage of swamp forest, which served to lessen the effect of wave action. Now the swamp forest has disappeared due to people's intervention. The villages have become smaller due to erosion by wave action. The people living in these homesteads are unable to carry out earthwork for necessary maintenance due to increasing economic hardship. It was learnt that in the worst case, wave action could reduce the homestead by 15 to 20% in a particular year. In some

village, it is reported that 25% of the homestead area have been lost in the last few years.

In the Haor areas, major actions taken by the people before the occurrence of floods are: protection of mounds by indigenous method, raising of homestead floor, strengthening house structure and storing foods. During the flood season, they have to concentrate only for fighting wave erosion to protect their homesteads.

3.7.3 Flood Damages and Flooding Situation in the Study Area

(1) Flood Damages

The flood damages varies in terms of the magnitude, timing and protective measures. In the recent years, there were about five flood events e.g. in 1987, 1988, 1998, 1999 and 2000. The records show that floods of 1988 and 1998 were of higher magnitudes in comparison with the others. The former two floods caused unprecedented damages to crops, human lives and properties all over the country as shown in Table 3.62.

Table 3.62 Flood Damages of the Study Districts in 1988 and 1998

District	Year	Affected area (sq km)	Affected population	Affected crop area total (ha)	Affected crop area partial (ha)	No. of affected houses total	No. of affected houses partial	No. of dead people	Affected road total	Affected road partial	Livestock dead
Gaibandha	1988	1,670	866,150	44,581	0	11,717	26,175	56	1,242	0	450
	1998	n.a.	538,487	22,523	26,599	n.a.	41,598	14	694	0	0
Jamalpur	1988	1,598	1,187,425	75,236	38,540	25,282	60,531	22	311	1,310	315
	1998	n.a.	1,132,820	15,123	22,548	n.a.	44,426	18	325	1,764	150
Kurigram	1988	1,337	644,953	47,894	28,760	11,273	12,085	11	0	816	2,354
	1998	n.a.	359,784	7,209	33,999	n.a.	58,387	9	0	567	360
Sirajganj	1988	2,526	1,865,908	104,100	0	91,480	275,175	126	1,934	0	2,910
	1998	n.a.	2,000,869	64,375	55,379	n.a.	284,645	35	584	1,690	507
Char Total	1988	7,131	4,564,436	271,811	67,300	139,752	373,966	215	3,487	2,126	6,029
	1998	n.a.	4,031,960	109,230	138,525	198,076	429,056	76	1,603	4,021	1,017
Habiganj	1988	1,750	893,350	14,105	0	8,851	14,409	8	0	0	8
	1998	n.a.	797,110	140,313	0	n.a.	25,136	12	297	1,664	1,934
Kishoreganj	1988	2,247	1,234,321	47,307	0	20,262	45,520	309	1,603	0	450
	1998	n.a.	721,167	24,232	17,717	n.a.	79,381	33	428	1,094	513
Netrokona	1988	1,998	587,678	30,429	15,786	16,400	21,015	175	1,245	0	175
	1998	n.a.	254,060	19,201	54,179	n.a.	11,663	9	0	94	154
Sunamganj	1988	2,705	1,090,000	2,600	2,456	8,350	9,100	25	0	187	25
	1998	n.a.	279,678	24,257	0	n.a.	7,320	5	0	268	0
Haor Total	1988	8,700	3,805,349	94,441	18,242	53,863	90,044	517	2,848	187	658
	1998	n.a.	2,052,015	208,003	71,896	37,529	123,500	59	725	3,120	2,601

Source: NWMP Draft Development Strategy 2000

The table shows that the numbers of affected population, human casualty and road damage are remarkably higher in the case 1988 flood than the flood in 1998. In case of damage to the crop area, the Char area has a higher figure in 1988, on the other hand, Haor area experienced more damage

in 1998. In case of affected houses, in Char area, more houses were damaged in 1998, where as in Haor area damages were more in 1988. Although, it is difficult to draw a complete conclusion from these figures, however, as observed, the flood of 1988 was severe in terms of flood level, on the other hand, the flood of 1998 was catastrophic in terms of inundation duration.

(2) Flooding in the Study Area in 1998, 1999 and 2000

In order to get a clear picture of very recent floods, the Study team carried out surveys and collected information of 1998, 1999 and 2000 floods. The survey was carried out on 256 mauzas covering 40 UZs of eight study related districts. Main parameters of data were depth and duration of floods and damages caused by them. The results of the analysis are summarized as for inundated area and duration in Table 3.63 and flood damages in Table 3.64.

As shown in Table 3.63, the percentage of inundation area is higher in both areas (Char and Haor) in the event of 1998, and in Char area, the duration is higher in 1998 and lower in other two events, however, comparing between the two areas (i.e. Char and Haor), the duration of flood in Haor area is longer in all three events. The data also made it clear that the Sirajganj district was inundated in lesser extent in all events.

Table 3.63 Inundation in Char and Haor in the Last Three Years

Char/Haor of District	Total area of Char/Haor (km ²)	Sample survey area gross (ha)	Inundation 98			Inundation 99			Inundation 00		
			Area (ha)	% inundated	Av. Duration Weeks	Area (ha)	% inundated	Av. Duration Weeks	Area (ha)	% inundated	Av. Duration Weeks
CHAR AREA											
Gaibandha	504	9,310	7,014	75%	9	4,600	49%	4	3,868	42%	3
Jamalpur	528	14,251	12,018	84%	7	10,526	74%	6	10,725	75%	5
Kurigram	854	16,566	13,665	82%	8	10,339	62%	5	11,150	67%	5
Sirajganj	779	7,793	2,912	37%	12	2,003	26%	4	2,286	30%	3
Total Char	2,665	47,920	35,609	Av 74 %		27,468	Av 57%		28,029	Av 58%	
HAOR AREA											
Habiganj	1,394	9,469	4,563	48%	21	2,671	28%	18	3,098	33%	19
Kishoreganj	1,694	54,575	47,298	87%	21	33,300	61%	18	39,547	72%	19
Netrokona	701	11,833	10,895	92%	23	9,525	80%	19	10,804	91%	21
Sunamganj	2,713	22,690	16,043	71%	18	11,594	51%	15	8,185	36%	14
Total Haor	6,502	98,567	78,799	Av 80%		57,090	Av 58%		61,634	Av 63%	

Source: JICA Study Team based on the Flood Damage Survey, 2001

Table 3.64 shows that the damages in terms of crop, cattle, house and human lives were more in 1998. The districts of Shirajganj in Char area and the district of Sunamganj had less crop damage in all the flood events in comparison with other study related districts, in case of Sirajganj, the percentage of damage varies only between 8 ~13% and same for Sunamganj is between 5-6%.

Table 3.64 Flood Damages of Char and Haor in the Last Three Years

Char/Haor of District	Total area of Char/Haor (km ²)	Sample survey area gross (ha)	Damaged Crop						Damaged Cattle			Damaged House			Human life lost		
			1998		1999		2000		1998	1999	2000	1998	1999	2000	1998	1999	2000
			area (ha)	Area damaged (%)	Area (ha)	Area damaged (%)	Area (ha)	Area damaged (%)	No.	No.	No.	No.	No.	No.	No.	No.	No.
CHAR AREA																	
Gaibandha	504	9,310	4,313	46%	3,687	40%	3,287	35%	506	0	0	1,028	19	14	0	0	0
Jamalpur	528	14,251	8,354	59%	6,619	46%	6,008	42%	1,310	20	0	1,855	90	25	4	0	0
Kurigram	854	16,566	7,478	45%	5,002	30%	4,809	29%	2,903	1,359	1,310	3,435	1,743	1,494	12	0	1
Sirajganj	779	7,793	993	13%	671	9%	647	8%	539	290	208	629	396	330	16	1	1
Total Char	2,665	47,920	21,138	Av 44%	15,979	Av 33%	14,751	Av 31%	5,258	1,669	1,518	6,947	2,248	1,863	32	1	2
HAOR AREA																	
Habiganj	1,394	9,469	2,325	25%	1,426	15%	1,519	16%	3,140	1,680	1,425	677	371	455	16	3	7
Kishoreganj	1,694	54,575	20,431	37%	4,946	9%	4,756	9%	3,962	316	679	11,332	1,401	2,569	35	0	0
Netrokona	701	11,833	3,155	27%	2,383	20%	7,295	62%	1,816	1,216	2,613	1,347	598	1,173	7	0	0
Sunamganj	2,713	22,690	1,423	6%	1,028	5%	1,419	6%	1,644	161	289	3,100	475	385	0	0	0
Total Haor	6,502	98,567	27,334	Av 28%	9,783	Av 10%	14,989	Av 15%	10,562	3,373	5,006	16,456	2,845	4,582	58	3	7

Source: JICA Study Team based on the Flood Damage Survey, 2001

The present response to inundation of homesteads are manifested mainly by (i) raising sleeping place during flood by constructing *macha* - raised platform mostly by bamboo, sometime wood, (ii) pre-flood (or post-flood) raising of homesteads (or room) by earthworks, (iii) flood time evacuation to a raised ground, road, embankment, flood shelter, or relatives' houses in flood free areas.

As a matter of fact, the homesteads in Haor area are built on higher ground and are not subject to inundation in the normal floods but subject to severe damage by wave action. It has been seen that during the flood of 1998, the village mounds in both Chars and Haors were overtopped, however, the depth of flood and frequency of overtopping were lower in Haors than in the Chars.

3.7.4 Situation of Flood Sheltering

The purpose of flood shelter is to provide people of flood prone areas with a safe place to refuge when their own houses are inundated during the peak flooding period. The concept of flood sheltering has been initiated in Bangladesh long ago concentrating in the coastal areas. Due to insufficiency of shelters, schools or any raised grounds are used as shelters for human and livestock. In the recent years, in order to mitigate sufferings of Char and Haor area people some governmental agencies such as LGED and NGOs namely, CARE are engaged in construction of flood shelter as a flood-proofing component.

It is true that the number of existing shelters are well below the necessary numbers, however, real problems may be found in other areas such as dissemination of flood related information to the people of flood prone areas, proper distribution of responsibilities and coordination among the local government agencies, location of shelters, evacuation means and so on. In the national level of

flood management, there are many organizations and maintain coordination, for example, Flood Forecasting and Warning Center of BWDB, Control Room/Emergency Operation Center of Ministry of Disaster Management and Relief, National Disaster Council and sometimes a Inter-Ministerial Disaster management Coordination Committee are the main organizations who work together in case of management of worse flood situation.

However, when it comes to the lower level of management, the coordination does not function in an efficient way. For example, what should be the water level for a particular village in the Char or Haor to start evacuation? How many boats will be required to evacuate all people? Is the sanitary system working? Is there any plan to tackle any epidemic that may break out in the shelter?

There is no positive answer of these questions. As observed and outcome of the Team's survey results, people in Char and Haor areas act using their past experience and traditional means. Two examples for are presented below for Char and Haor areas respectively.

Char Area:

During 1998 flood, a family living in Char area first heard the severity of flood from neighbouring Chars, who heard about the ensuing flood from radio. Realizing the danger, they started observing the rate of rising of water level. However, they did not take any action until the courtyard was under knee-deep water. When the situation became worse, they decided to evacuate their homestead and managed to rent an engine boat to reach the shelter. They did not take all of their belongings with them but the cow with a calf. One person remained in the house in order to look after the things they left behind. He lived on a *macha* (raised platform), which is generally used by flood affected people in such situation. The family lived in the shelter for three weeks before they could return to their own house. During their stay in the shelter they received limited food staff as relief from an NGO.

Haor Area:

In the flood event of 1998, one family explained that they arrived at a school cum shelter when their mound went under water at a depth of six inches. They did not hear any warnings through loudspeakers or any other means. They decided to evacuate by themselves when their mound was under severe attack by the waves. The family experienced extreme inconvenience due to limited space and inconsistency of relief supply. They said that the dry food staff they carried with them was very helpful. The family spent four weeks in the shelter.

Therefore, establishment of more shelters in appropriate locations with necessary rules and means for evacuation, and strengthening of operational capability of the responsible GOB agencies and more involvement of NGOs are needed.

3.7.5 Existing Flood Sheltering Facilities

The quantity of existing flood shelters under the Relief and Rehabilitation Department are being supplemented by a number of LGED flood shelter cum schools. In comparison to the actual needs, the number is, however, extremely meager.

Community flood-proofing activities are yet to develop adequately in the country. Flood shelters have not been the traditional floods proofing as yet. There have not been enough of flood shelters built to accommodate the flood-affected mass, not to speak of their livestock, household properties, etc. On average, the people of the flood prone areas have to look for a refuge place once in a five (5) years period. The present numbers of shelters in Char and Haor areas are furnished in Table 3.65.

Table 3.65 Number of Existing Flood Shelters and Their Capacities in Char and Haor

District	Char Popu.	No.of Flood shelters	Shelter Capacity (pers.)	Coverage (%)	District	Haor Popu.	No.of Flood Shelters	Shelter Capacity (pers.)	Coverage (%)
Gaibandha	201,051	4	700	(0.3%)	Habiganj	718,090	40	10,200	(1.4%)
Jamalpur	377,128	36	8,350	(2.2%)	Kishoreganj	1,254,947	41	11,500	(0.9%)
Kurigram	335,291	8	825	(0.2%)	Netrokona	271,563	21	10,640	(3.9%)
Sirajganj	485,710	184	49,290	(10.1%)	Sunamganj	1,183,826	66	11,906	(1.0%)
Total	1,399,180	232	59,165	(4.2%)	Total	3,428,426	168	44,246	(1.3%)

Source: JICA Study Team based on the Flood Related Facilities Survey, 2001

The table shows that both areas, in many districts, the number of shelters is too little in comparison with the needs. Although, the total number of population has little to do with the required number of shelters, however, from the survey and interviewing people it was learnt that the construction of more shelters in appropriate locations should be taken up as early as possible. It should be noted that construction of only shelter will not solve the problems, because people require not only shelter for themselves but they need some raised and flood free ground for their livestock and drying yard for drying crops as well.

3.7.6 Flood Forecasting and Warning System

Flood Forecasting and Warning Center (FFWC) within BWDB is the sole agency to carryout the responsibility of flood forecasting and warnings to the people of the flood prone areas of the country since 1972. In order to improve the activity of FFWC, a study (FAP 6) covering NE region i.e. Haor area, has been conducted in 1994. The study identified flash flood affected prone channels and areas, and recommended to establish telemetering stations in Tripura and Meghalaya (in India) including the actions that people should take in case receiving a notice of flash flood. The study also proposed to establish a full directorate named “Flash Flood Warning Agency” within BWDB. It seems that the recommendations have not been realized as of the date. In 1995, another DANIDA financed study under FAP 10 was conducted with an overall objective to provide improved information on floods to aid national preparedness in flood disaster and to minimize flood impacts

by modelling studies and developing range of forecast outputs and dissemination. The study included improvements of hydro-meteorological information monitoring, institutional structures of the FFWC and dissemination system in close cooperation with Disaster Management Bureau.

At present, the FFWC is functioning with its own limitations. The activities of the Center using support services from SWMC covers limited stations of the main river system dealing with water levels and rainfall. There is no warning system to communicate from national level to community level in the Char and Haor areas due to lack of communication facilities and coordination guidelines. However, officials of the Relief and Rehabilitation Department claimed that after Disaster management Bureau receive information of the impending floods through wireless, they arrange for announcement by loudspeaker through the Upazila Nirbahi Officers.

The FFWC should materialize the *area-inundation* warning system and program for efficient dissemination. This will benefit people of the present Study area and help them in taking timely decision about flood preparedness.

3.7.7 Present Flood proofing Activities

The present flood-proofing in the Study area mainly comprises of raising of homesteads and infrastructure, such as roads, flood shelters, shared areas, water supply and sanitation facilities above normal flood level. At present, the following are the major items of flood-proofing activities in the Char and Haor areas.

(1) Structural Flood proofing:

(a) Raising of homesteads

The main item of Flood proofing in Char and Haor areas is raising of homestead by earthwork by the people themselves. Also elevating the community places, social institutions, small-scale village roads, tubewells, dug wells, latrines etc. are in practice. Nowadays, some NGOs are assisting the poor in raising their homesteads, although in a very limited scale. While planning to raise homesteads, stability of the Char in the face of erosion is a prime factor to consider. When erosion devours the dwellings, people shift the housing structure to another Char or in the same Char but safer locality. In the Haor area, waves erode side(s) of village mounds every monsoon and as a common practice, the people restore the lost earth in the next dry season.

(b) Protection and extension of village mounds

Protection of village mounds from wave action (erosion) in the Haor areas is carried out by one of the followings;

- (i) Bamboo and *chaila* grass and vegetative barrier on the windward direction;
- (ii) Brick or concrete blocks on earth slopes (generally financed by NGOs); and

(iii) Masonry or concrete wall (by a very limited rich people and by NGOs).

(c) Non-structural flood-proofing:

Protection of Char villages from the river erosion being unfeasible, the Char dwellers respond by migration to another place in a nearby locality or in an adjacent Char. They vegetate around the homesteads to protect them from the action of flow but with limited success. Other non-structural modes are community education, awareness, training etc.

(2) NGO's Activities for Flood proofing Projects

Limited NGOs are performing flood-proofing activities in Chars and Haors within Study area because it is surmised that they do not have enough capacity to invest in unstable areas with difficult topographic and natural conditions. Only a few NGOs, namely, CARE and CONCERN Bangladesh, however, are paying their efforts in Char and Haor areas.

(a) CARE Bangladesh's flood-proofing project

Under the Integrated Food Securing Program (IFSP) of USAID, the CARE Bangladesh is currently implementing a 5-year Flood proofing Project. The goal of IFSP is to promote and protect food and livelihood of vulnerable groups in underdeveloped high-risk rural and urban areas of Bangladesh. Flood proofing Project is designed to implement in three (3) flood environments such as (i) active floodplain in the main rivers (char), (ii) deeply flooded tectonic depression areas (haor) and (iii) Sea surge area in the southern part of Bangladesh (coastal).

The objectives of CARE's flood-proofing are; (i) to avoid loss of human life, (ii) to reduce the disruption of normal activities during and after a flood, and (iii) to provide people with the security and motivation necessary to make and sustain improvements in their economic and social welfare to achieve prosperity in an environment that frequently floods.

CARE's interventions under IFSP on flood-proofing projects of Char and Haor areas, both structural and non-structural measures are the followings (source: CARE Bangladesh, Dhaka);

1) Structural measures:

- Raising of house plinths above flood level,
- Provision of multi-purpose flood shelters above peak flood level,
- Raising plinth level of community places such bazar, school, madrasha and so on,
- Provision of community evacuation boat and school boat, and
- Safe storage areas above flood level,

- Provision of flood-proofed latrines at community places and household levels,
- Provision of submersible roads,
- Securing the livestock shelters above flood level,
- Raised road cum refuge area and provision of structures to allow floodwater to drain,
- Protecting the village mounds (settlement) from being eroded, with CC block, wave protection walls, and brick retaining wall, and
- Extension of village mound (settlement) through earth works.

2) Non-structural measures

- Plant base erosion protection plantation, and home gardening and nursery, and fodder promotion,
- Hygiene, nutrition and flood preparedness education for the Local Project Society (LPS),
- afforestation with indigenous trees,
- Introduce alternative income earning activities, and
- Community mobilization and village plan.

Under the Study area of both Char and Haor, the pilot projects have been completed during the fiscal years 1996-1999 covering 115 villages, 79 in char areas in Kurigram district and 36 in haor area in Netrokuna district. Now it has a five-year (2000-2004) Flood proofing Project under implementation. Over the next five (5) year period, the project intends to reach the direct project participants in 1,025 villages of 19 Upazilas, composed 11 UZs of Char and eight UZs of Haor respectively, shown in the following Table 3.66.

Table 3.66 CARE Bangladesh Activities of Flood proofing Project

District	Upazilas		
	Completed	On-going	Will be taken up next year for implementation
Char Area			
1.Gaibandha	1)Sundarganj	2)Shaghatta, 3)Fulchhari	
2.Kurigram	4)Ulipur	5)Kurigram Sadar, 6)Nageshwari, 7)Raumari	8)Char Rajibpur
3.Sirajganj			9)Chauhali, 10)Kazipur, 11)Sirajganj Sadar
Haor Area			
1.Kishoreganj	1)Nikli, 2)Karimganj	3)Bajitpur	
2.Netrokona	4)Madan	5)Mohanganj	
3.Sunamganj			6)Derai, 7)Jagannathpur, 8)Jamalganj

Source: Paper of Flood proofing- An option to live with flood, CARE Bangladesh

(b) CONCERN Bangladesh's project

CONCERN Bangladesh has been working with and on behalf of the poorest and most vulnerable groups in Bangladeshi society since 1972. Its main role is to develop practical solutions to enable the poorest to achieve sustainable advancement as well as to protect themselves from crises.

CONCERN Bangladesh currently operates programs in seven (7) areas which Kishoreganj and Netrokona districts. Their intervention in Haor area started with relief activity after the devastating flood in 1988. Rural development program then started in 1992. Participatory needs assessment was conducted first to identify their programs and issues. Now the program covers four (4) Upazilas in Kishoreganj and Netrokona with the following activities:

- (i) Flood disaster preparedness;
- (ii) Institutional building;
- (iii) Self-generating fund through savings and credit, and income generating activities;
- (iv) Education through adult literacy program and non-forma primary education;
- (v) Awareness building; and
- (vi) Environmental health and nutrition.

Of the above activities, direct relation to flood-proofing, namely (i) flood disaster preparedness includes following components;

- Village protection (reconstruction), of which objectives are resettlement of families who have lost homestead land, generating income by space for home gardening and providing development opportunities,
- Flood shelter construction, of which objectives are providing safe living space for people

and their livestock, reducing the vulnerability and mitigating the loss and properties,

- Afforestation to protect villages from erosion, to restore degraded local environments and to create income generating, and
- Disaster preparedness training, of which objectives are increasing knowledge on emergency preparedness.

(Data source: Report of Haor rural development project Khaliajuri Thana, CONCERN, Bangladesh)

3.7.8 Constraints

Tables 3.67 and 3.68, as presented below indicate two different flood environments in the two areas under the Study. Inundation of homesteads and lack of shelter for people and livestock appear to be the main issues in the Char area. The item ‘other’ in the columns of constraints includes ‘absence of roads’, ‘absence of embankments’, etc. While in Haor area, wave erosion of village mounds is the prime constraint, with lack of shelter, inundation of the households etc. in the next order.

Table 3.67 Constraints on Floods Claimed by Char Dwellers

Constraints	Gaibandha (%)	Jalalpur (%)	Kurigram (%)	Sirajganj (%)
1) Homestead inundation	18	24	36	46
2) Erosion of the Char	6	8	21	4
3) Absence of shelter for people and cattle	65	59	35	40
4) Lack of flood warning and preparedness	3	3	6	7
5) Others	8	6	2	3
Total	100	100	100	100

Source: JICA Study Team based on the Flood Related Facilities Survey, 2001
(number of sample Mouzas=99)

Table 3.68 Constraints on Floods Claimed by Haor Dwellers

Constraints	Habiganj (%)	Kishoreganj (%)	Netrokona (%)	Sunamganj (%)
1) Homestead inundation	14	12	18	18
2) Wave erosion of the Village Mound and diminishing of homestead	41	47	41	46
3) Absence of shelter for people and cattle	19	34	26	27
4) Lack of flood warning and preparedness	14	2	9	6
5) Lack of transport in dry season and boats during monsoon, sub-embankment etc.	12	5	6	3
Total	100	100	100	100

Source: JICA Study Team based on the Flood Related Facilities Survey, 2001
(number of sample Mouzas =157)

3.8 Existing Institutions

3.8.1 Local Administration

Under the decentralisation policy of the government, the power of the administration is vested with what is known as Upazila Parishad (the former Thanas) and Union Parishad (the former Unions).

The administration of the Upazila and Union Parishad is headed by an elected Chairman. In the Upazila Parishad, the Chairman is assisted by Upazila Nirbahi Officer (UNO) and other officers of different ranks appointed by the government. It is the administration of the Upazila Parishad responsible for the overall development of the area through line agencies including LGED, BRDB, Agricultural Extension, Education and Health. Table 3.69 is an example of local service conducted by branch office of central government.

Table 3.69 Local Administration Service relevant to Rural Development

Bureau	Officer	Worker
Agriculture	Officer (1) & Asst Officer (2)	Block Supervisor (14)
Livestock	Officer (1) & Veterinary Surgeon (1)	Field Assistant - Fodder (1) - Artificial Insemination (1) - Veterinary (4)
Fishery	Officer (1) & Asst. Officer (2)	-----
Health/Family Planning	Officer (1)	Health Inspector (2) Asst. Health Inspector (6) Health Asst (25) Medical Officer(4)* Medical Asst. (4)
Social Welfare	Officer (1) & Supervisor (1)	Social Worker (5)** Training Instructor (2)
Family Planning	Officer (1)	Family Welfare Worker (7)*** Family Welfare Assistant (35) Family Planning Inspector (7)
Public Health	Engineer (1) & Mechanic (2)	-----
Construction	Engineer (1) & Work Asst. (6)	-----
Rural Development Corporation	Officer (1) & Asst Officer (1) TCCA Inspector (4)	Organizer (3)

Remarks: * Medical Officer & Assistant reside at Health Center;

** Social Worker reside at Sub-center in each Union;

*** Worker reside at Family Welfare Center in each Union.

Source: JICA Study Team based on the Information of Concerned Bureau

The Union Parishad (UP) is composed of a chairman, nine members (one each from Ward; a union has nine Wards) and three female members (one each from three Wards). The chairman and members of UP are all elected by popular votes while the 3 female members are elected directly by the people. At present there exists no elected Upazila Chairman. However, UP is obliged to maintain liaison with the Upazila administration.

As an institution, UP is to look into the development activities as well as the administration of the Union. Having liaison with the Upazila Parishad, UP administers the area under its jurisdiction and remains in-charge of the development activities of the concerned area. Being responsible for the planning of the area, the Upazila Parishad from time to time with its allocated funds undertake development programs to improve the socio-economic condition of the people at large.

UP has practically no fiscal autonomy or capability, and their resource base depends on receiving development grants from the Government's annual development program. UP is also responsible for collecting taxes from a number of sources, but in practice not much is collected.

Attempts to establish Gram Parishad or village government have been made in the past, but the shift of the leading political party abolished the idea every time. Gram Parishad Act passed with provision for elected body in 1997. But the election has yet been taken place. UP, therefore, with all its limitations, remain the most directly participatory local government.

3.8.2 Government Services Coverage in the Study Area

According to the result of the village survey, the Char and Haor villages receive support services in various forms from various public bodies, as shown in Table 3.70.

Table 3.70 Coverage Ratio of Government Services in Char and Haor

Services	Char No. of Villages with % of Coverage							Haor No. of Villages with % of Coverage						
	0	1-10	10-20	21-30	31-40	41-50	50>	0	1-10	10-20	21-30	31-40	41-50	50>
Agriculture Extension	79	27	6	2	0	1	0	107	11	6	12	3	1	1
Forestry & Horticulture	108	7	0	0	0	0	0	136	5	0	0	0	0	0
Fishery	112	3	0	0	0	0	0	139	2	0	0	0	0	0
Livestock & Poultry	111	3	1	0	0	0	0	136	1	4	0	0	0	0
Health & Family Planning	6	52	16	17	4	6	14	5	24	23	46	26	9	8
Social Welfare	113	2	0	0	0	0	0	133	4	2	0	2	0	0
Cooperatives	115	0	0	0	0	0	0	129	8	3	2	0	1	0
Education	23	40	2	6	5	11	31	10	16	23	29	28	15	20
Relief & Rehabilitation	15	68	20	5	3	1	3	18	63	20	25	8	5	2
Credit Programme	46	56	8	3	1	0	1	29	14	13	39	18	16	12
Others	0	0	0	0	0	0	0	31	1	0	2	0	1	1

Source: RLCS by DICS, 2001

It is interesting to note that in Char the government services such as forestry and horticulture, fishery, social welfare and cooperatives and to some extent livestock and poultry, are not covered in any of the villages by more than 10%, although their importance cannot be undermined. Villages with more than 50% coverage of services like education (31), health and family planning (14), relief and rehabilitation (3) and credit programmes (1) are notable.

In Haor area, health and family planning, education, relief and rehabilitation and credit programmes including agricultural extension are noteworthy. The village with more than 50% coverage are seen to be in such services as education (20), credit programmes (12), health and family planning (8), relief and rehabilitation (2) and agricultural extension (1). The other aspect to be noted is that although the support services with less than 10% are covered in all the villages in Haor areas in different dimensions, the notable services not being covered in all villages by more than 10% are forestry and horticulture and fishery, much needed services in the development of economy.

The common services available to villages in both Char and Haor areas with more than 50% coverage are health and family planning, education, relief and rehabilitation and credit programmes. The number of villages covered by government services is presented in the Table 3.71.

Table 3.71 Number of Villages Covered by Government Services in Char and Haor

Services	Char (115 villages surveyed)		Haor (141 villages surveyed)	
	No. of Villages	Coverage(%)	No. of Villages	Coverage(%)
Agricultural extension	36	31	34	24
Forestry and horticulture	7	6	5	4
Fishery	3	3	2	1
Livestock and poultry	4	3	5	4
Health and family planning	109	98	136	96
Social welfare	2	2	8	6
Cooperatives	0	0	12	9
Education	92	80	131	93
Relief and rehabilitation	100	87	123	87
Credit programme	69	60	112	79
Others	0	0	110	78

Source: RLCS by DICS, 2001

It is obvious that the pattern of government services in the study villages is seen to be almost the same, focusing mostly on health and family planning, education, relief and rehabilitation and credit programmes, and to a certain extent the agricultural extension.

However, various kinds of service conducted by branch office of each ministry are slanted to specific group or individual. Besides, service information of local government is seldom delivered to village people. It is very hard situation for village people to receive services from a government, as shown in Table 3.72.

Table 3.72 Situation of Administrative Service in Char and Haor

	Char	Haor
Some Administrative Service Unit exist	15 Unions	3 Unions
VDP (Vulnerable Development Program)	2 Unions	1 Union
Grampolice	4 Unions	1 Union
Chowkider	5 Unions	1 Union
UP (Union Parishad)	8 Unions	1 Union
Some projects are/were conducted within 2 years	16 Unions	9 Unions

Notes: The number of surveyed union is 16 Unions each for Char and Haor, respectively.

Source: JICA Study Team based on the Village Organizations Survey, 2001

In particular, administrative service in Haor area is very poor compared with Char area. Administrative service unit does not exist in most Union of Haor. Development projects are hardly ever conducted within 2 years in about half Unions of Haor. This survey results are based on Union level, thus the administrative service in village level is easily presumed to be worse than this.

UP, composed of representatives from village people, is established under the Upazila (Thana). UP should adjust the activities in village of assistant officer. But, each assistant officers is active according to the order from their ministry, thus request of improvement from UP has no effect actually. On the other hand, financial budget and food are allocated for UP for small-scale development in Union. They are doing a small-scale development project, e.g. rural road

construction, irrigation, by using these budgets. These small-scale development projects conducted by UP are considered to be transparent and accountability, but most of the case are actually planned by officer and influential person in village. Thus, construction of infrastructure is slanted to some specific area or people in general. This tendency is found from the survey result for “Administrative Service”. There is much difference in development project in number and budget in case of UP exists or not.

3.8.3 NGOs and Their Support Services

NGO support services for village are limited compared with government services. NGOs’ services provision is requisite to satisfy the need of the villages of Chars and Haors. It is alleged that NGOs are not very much interested in such areas as Chars and Haors, presumably because of their perception that the instability as well as floating character of Char livelihood is not helpful for long term development activities. There are not much NGO activities in the Study Areas concerning flood-proofing excepting a few, namely, CARE and CONCERN in Haor areas and CARE and RDRS in the Char area. Others e.g. BRAC, Oxfam, ASA, Porshika and Gono Unnayan Sangstha, have multiple objectives and functions related to the socio-economic development of the flood prone areas. Table 3.73 shows the services provided by NGOs with respect to villages in terms of percentage coverage.

Table 3.73 Coverage Ratio of NGO Services in Char and Haor

Services	Char No. of Villages with % of Coverage							Haor No. of Villages with % of Coverage						
	0	1-10	11-20	21-30	31-40	41-50	50>	0	1-10	11-20	21-30	31-40	41-50	50>
Agri. Extension	97	17	1	0	0	0	0	136	4	0	1	0	0	0
Forestry & Horticulture	107	7	1	0	0	0	0	103	7	3	16	6	2	4
Fishery	115	0	0	0	0	0	0	141	0	0	0	0	0	0
Livestock & Poultry	110	4	1	0	0	0	0	129	10	1	0	1	0	0
Health & Family Planning	93	12	7	1	1	1	0	81	9	16	16	9	7	3
Social Welfare	114	1	0	0	0	0	0	110	16	6	9	0	0	0
Cooperatives	114	0	0	0	0	0	1	110	2	2	18	5	1	3
Education	87	14	6	3	3	2	0	114	11	11	3	2	0	0
Relief & Rehabilitation	77	23	7	7	0	0	1	131	5	2	2	0	1	0
Credit Program	46	56	8	3	1	1	0	99	19	1	4	10	3	5
Others	0	0	0	0	0	0	0	69	0	0	0	0	0	0

Source: RLCS by DICS, 2001

In the char area, only two villages with more than 50% of coverage are seen: cooperatives and relief and rehabilitation (one village each). The number of villages covered by NGO services is highlighted in the Table 3.74.

Table 3.74 Number of Village Covered by NGO Services in Char and Haor

Services	Char (115 villgaes)		Haor (141 villages)	
	No. of Villages	Coverage(%)	No. of Villages	Coverage(%)
Agricultural extension	18	16	5	4
Forestry and horticulture	8	7	38	27
Fishery	0	0	0	0
Livestock and poultry	5	4	12	9
Health and family planning	22	19	60	43
Social welfare	1	1	31	22
Cooperatives	1	1	31	22
Education	28	24	27	19
Relief and rehabilitation	38	33	10	7
Credit programme	69	60	42	30

Source: RLCS by DICS, 2001

As can be seen, among the services credit programme and relief and rehabilitation cover more than one-third of the total villages each. This is evident enough to say that NGO services in Char areas are too inadequate to bring about development. There are limited services in terms of villages with regard to education, health and family planning and agricultural extension.

In Haor area, over 50% of coverage regarding four services, viz., forestry and horticulture (4 villages), health and family planning (3 villages), cooperatives (3 villages) and credit programmes (5 villages) have been noted. It is also seen that although some form of NGO activities are in operation in haor villages, the extent of support in villages is seen to be very limited.

It is obvious from the above that services provided to villages by more than 30% are only health and family planning and credit programmes. Among other services mentioned may be made of forestry and horticulture, social welfare, cooperatives and to a lesser extent, education.

The common services rendered in both the char and haor areas by NGOs revolve around health and family planning, credit programmes, relief and rehabilitation, education and forestry and horticulture to some extent.

3.9 Foreign Aid Project

Foreign aid projects in which LGED is involved in the Study Area are summarized in Table 3.75.

Table 3.75 Foreign Aided Projects in the Char and Haor

No	Project Name	AID Source	Area									
			Char				Haor					
			J	K	G	SI	N	SU	KI	H		
1	Urban basic service delivery project	UNICEF										
2	Agricultural Diversification and Intensification Project	IFAD/ WFP										
3	Bridge Culvert project in financial of selling profit by the help of food under PL-480, Tangail-3 project	USAID										
4	Cyclone damages government primary school rehabilitation project (1 st phase)	ADB										
5	Char Development and Settlement Project (2 nd phase)	ADB										
6	Construction of Large Bridge/Culverts on important Feeder & Rural Roads	DRGA										
7	Construction/Reconstruction of Roads, Bridges & Culverts in Rural areas on priority basis (Part-II)	IDB										
8	Construction of Steel Baily Bridge under DFID Assistance Bridge/Culverts on Rural Roads	DFID										
9	Construction of Steel Baily Bridge under DFID Assistance (2 nd phase)	DFID										
10	Development of Primary Education With German Assistance	KFW										
11	Damaged rural infrastructure reconstruction in 1998 flood by the help of ADB	ADB										
12	Government primary school cum flood shelter project by the help of IDB	IDB										
13	IDA 3 rd rehabilitation project	IDA										
14	Integrated Food Assisted Dev. Program	EU										
15	Municipal Services Project (MSP)	IDA										
16	Medium town infrastructure development project-2	ADB										
17	3 rd Nogor development project	ADB										
18	Netrokona Integrated Agriculture and Irrigation Management Project	IFAD & WFP										
19	Primary education development project by the help of German	KFW										
20	Japan Assisted Portable Steel Bridge Construction Project (JPSB)	JICA										
21	Netherlands assisted Construction of Portable Steel Bridge under ORET program	Holland										
22	Third Rural Development Project	ADB										

23	RDP-11, Infrastructure, Greater Rajshahi, Bogra, Pabna & Dhaka districts	IDA/SDC									
24	RDP-17: Infrastructure and SSWRDSP Natore Rajshahi Kishoreganji Netrokona and Sunamganj district	CIDA									
25	RDP-21, Infrastructure, Greater Rangpur, Dinajpur, Mvmensingh & Jamalpur districts	ADB/CIDA									
26	RDP-3: Infrastructure, greater Sylhet districts (2 nd phase)	USAID & IDB									
27	RDP-World Food Programme, Extension-10, Growth Center Connecting Road Development Programme	WFP									
28	Rural Infrastructure & Community Development Project (RICDP)	GTZ									
29	ADB assisted 1998 Flood Damaged RIRP	ADB									
30	3 rd rehabilitation project by the help of IDA	IDA									
31	Rural supervision programme: 3 rd phase	CIDA									
32	Shrimp Developing Project (2 nd phase)	UNICEF									
33	Mymensingh, Sherpur and Jamalpur Small Holder Development Project	IFAD/WFP									
34	North-East SSWRDSP: Greater Sylhet Netrokona and Kishoreganj district	ADB									
35	Secondary towns integrated flood protection project (Municipal component)	ADB									
36	Secondary Towns Infrastructure Development Project-2 (STIDP-2)	ADB									
37	Urban Basic Service Delivery Project (UBSDP)	UNICEF									
38	Urban Poverty Reduction Project (UPRP) through Local Partnership	UNDP									

Source: LGED

Total number of projects including completed and/or on-going project totals 38. These projects are funded by various sources including bilateral basis and international aid institutions. These projects are implemented in 74 sites in Char and 76 sites in Haor, respectively.

3.10 NGOs' Activities

(1) Profile of Major NGOs in the Study Area

CARE: CARE is the world's largest private, nonsectarian, not-profit relief and development agency. CARE started functioning in the then East Pakistan with a relief operation in 1949. Prior to independence in 1971, CARE's efforts were focused on relief, school and pre-school feeding, and

construction of warehouse and low cost housing. Since 1971 and with the signing of the basic operational agreement with the government of Bangladesh in 1974, CARE has focused on development projects. At present CARE's programs in Bangladesh are organized into four sectors - Agriculture & Natural Resources, Rural Infrastructure, Health & Population, and Small Economic Activity Developments.

BRAC: BRAC started its operation in a small way in 1972 at Sulla in Sunamganj. In the beginning, its working were mainly aimed at rehabilitating the refugees returning from India after the liberation war. Over the years, BRAC has evolved as the largest non-government development organization in the world with over 25,000 regular staff and 34,000 part-time teachers at grassroots level. The major interventions of BRAC include organizational development of the poor and micro-credit, education, health, and capacity building at the grassroots level. BRAC's target group is the poorest women.

CONCERN: CONCERN Bangladesh is a part of CONCERN Worldwide, an international organization devoted to the relief, assistance and advancement of people in need in less developed areas of the world. CONCERN Bangladesh has been working with on behalf of the poorest and most vulnerable groups in Bangladesh since 1972. Its main role is to develop practical solutions to enable the poorest to achieve sustainable advancement, as well as to protect themselves from crises. In designing and managing its programs, CONCERN Bangladesh attempts to ensure that it accomplishes the followings: (i) placing stakeholders at the center of the development process, as lead players in decision-making (ii) establishing gender equity as a central, guiding principal throughout the planning, policy and practice of CONCERN Bangladesh (iii) building capacities of local development organizations and state agencies, which work in the interests of our target groups; and (iv) promoting the conservation of natural resources and the suitable management of the environment.

Oxfam: Oxfam started with relief activity of flood victims many years ago. At first activity was limited to the relief activity of people, but they realized the insufficiency of helping people by relief activity only. At present, Oxfam's activities include many fields: (i) disaster preparedness and management; (ii) livelihood development; (iii) health and environment; (iv) capacity building and local resources mobilization; and (v) women in development (WID), etc.

(2) Characteristics and Constraints in NGO Activities

Characteristics: A clear feature of NGOs' activity in the Study Area is that most of them started with relief activities for refugees of civil war and victims of natural disasters. Then they changed their strategy from relief into development. Holistic approach has been adopted as they have learned that hurdles to overcome are complex and that single sector approach cannot solve the problem. Empowerment of local people is another theme to achieve their objectives. Unless the local people realize themselves as main players of development, any efforts will not bear fruit.

Constraints in expanding NGO activities in Study Area: Judging from the interview to NGOs and

results of RRA study, the following matters are considered to be constraints in expanding NGO activities.

- Geographical impediment

Geographical impediment is pointed out to be a main problem to expand the activities in the Study Area. Study Areas are isolated from the main lands and lacking of better communication system.

- Heterogeneous society

The settlers, in particular in Char, come from many different areas. This makes that the char peoples are not socially homogeneous. Their cultural and social values are different from each other. That is why one NGO has to communicate with different clusters of people at a time.

- Lack of Education

This is also another major problem to work in the Study Area. The education level of the people in Char is much lower compared with the country average, due to frequent migration and poverty. If they have appropriate education level, they maintain various social norms and regulation, which is an impediment for carrying NGO's regular activities.

- Socio-economic backwardness

At the same time the social disciplinary structure of char areas is different compared with other areas in Bangladesh. The system of labor without wages or with small wages is still practiced especially in Char area in the downstream. Conservative class society and way of thinking based on the past Zamindar system, is still prevalent in Char areas. Because of their social and economic backwardness the Char people have to struggle against the social exploitation as well as fight against the nature. NGO have to deal with social pressure and conservative class society before starting their activities. Thus, Char is often said to be difficult to develop the activities of NGO in terms of not only severe natural conditions but also social aspects.

3.11 Case Study

Total of 10 existing and on-going development projects were studied to learn the lessons and reflect them into the planning in the Study. Those projects are listed in Table 3.76 and explained separately in the subsections. Summary of the case studies is also presented in Table 3.77.

Table 3.76 List of Projects Studied

Title of project	Implementing Agency	Project Status (project duration)	Project area
Flood Proofing Project (FPP)	CARE Bangladesh	On-going (2000-2004)	Char, Haor and Coastal
South Asia Poverty Alleviation Program (SAPAP)	UNDP	Completed (1994-2001)	Kishoreganj Sadar Thana
Rural Development Program	BRAC	On-going (since 1970s)	Nationwide
Rural Development Program	Concern Bangladesh	On-going (since 1998)	Khaliajuri and Itna Thana
Rural Development Project	Shapla Neer	On-going (since 1980s)	Manikganj, Narsindi and Mymensingh
Participatory Rural Development Project (PRDP)	BRDB/JICA	On-going (2000-2003)	Garihati Upazila of Tangail District
River Basin Program	Oxfam	On-going (since 1990s)	46 Unions in 5 Districts in Char
Poverty Alleviation Project	BRDB	On-going (since 1980s)	Nationwide
Small Scale Water Resources Development Project (SSWRDP)	LGED	Completed (1995-2002)	37 districts in the west of the Jamuna river
Environmental Management Project	CNRS	On-going (1998-2004)	Sunamganj District

3.11.1 Flood Proofing Project (FPP) by CARE Bangladesh

(1) Project outline

Under the Integrated Food Security Program (IFSP), the CARE Bangladesh has been implementing a 5-year Flood Proofing Project since 2000. The goal of IFSP is to promote and protect food and livelihood of vulnerable groups in underdeveloped high risk rural and urban areas of Bangladesh. Flood Proofing Project is designed to implement in three (3) flood environments including Char, Haor, and coastal areas.

The objectives of FPP are; (i) to avoid loss of human life, (ii) to reduce the disruption of normal activities during and after a flood, and (iii) to provide people with the security and motivation necessary to make and sustain improvements in their economic and social welfare to achieve prosperity in an environment that frequently floods.

CARE's interventions on FPP in Char and Haor areas include both structural and non-structural measures in the following:

Structural measures:

- Raising of plinths of homestead area above flood level,

- Provision of multi-purpose flood shelters above peak flood level,
- Raising plinth level of community places such bazar, school, madrasha and so on,
- Provision of community evacuation boat and school boat,
- Safe storage areas above flood level,
- Provision of flood-proofed latrines at community places and household levels,
- Provision of submersible roads,
- Securing the livestock shelters above flood level,
- Raised road cum refuge area and provision of structures to allow floodwater to drain,
- Protecting the village mounds (settlement) from being eroded, with CC block, wave protection walls, and brick retaining wall, and
- Extension of village mound (settlement) through earth works.

Non-structural measures:

- Plant base erosion protection plantation, and home gardening and nursery, and fodder promotion,
- Hygiene, nutrition and flood preparedness education for the Local Project Society (LPS),
- afforestation with indigenous trees,
- Introduce alternative income earning activities, and
- Community mobilization and village plan.

(2) Implementing arrangements (Organization)

CARE organizes the Local Project Society (LPS) at village level or even smaller para level when the project is decided to implement through discussion with the people of the target village or para. This entity, LPS, is the main body to coordinate the project implementation, and to operate and maintain after implementation. LPS consists of one to two Union Parishad members, a local elite, a teacher or a religious leader, a VDP (Vulnerable Development Project) member or a community organizer, a landless or marginal farmer, two females and two community members including a youth. Project lasts for 3 years in one village. Structure is completed in the first year, and the training and other components, i.e. health education, home gardening, etc., are conducted for LPS members in the second year, and the project is transferred to partner NGO and/or LPS in the third

year.

(3) Village people participatory system

Village people take part in the project as labor of earthworks. LPS members are to get trained and then they will extend what they learned to villagers.

(4) Mechanism to ensure project sustainability

In case of structural measures, project is expected to be sustained through regular maintenance by villagers. For major repair, LGED takes responsibility.

In case of non-structural measures, trickle down effects are expected from LPS members to ordinary villagers by periodical lectures after LPS members get trained in various aspects including health, nutrition and sanitation.

(5) Operation and maintenance after implementation

For structural measures, operation and maintenance is under the responsibility of villagers. However, wave protection walls constructed in Haor areas are generally too big for village people to maintain when it needs repair. LGED is expected to take responsibility when the major repair is necessary.

(6) Financial source

Project is financed by USAID, and CARE Bangladesh implements the project in cooperation with LGED and NGOs. Cost sharing of beneficiary is decided through the meeting between LPS and CARE. (Approximately 10%-30% of the earthworks in case of constructing wave protection wall in Haor)

3.11.2 South Asia Poverty Alleviation Program (UNDP)

(1) Project outline

The South Asia Poverty Alleviation Programme (SAPAP) is the United Nations Development Programme's response to the 1993 Dhaka declaration that "the center-piece of a policy framework for poverty alleviation has to be the mobilisation of the poor in order to enable them to participate directly and effectively in the decisions that affect their lives and prospects". The programme's overall aim is to provide support and guidance to the rural population to harness their potential, enabling them to help themselves and, based on their own strengths, improve their living condition. The programme, which in principle has a seven-year life span up to the year 2002, was launched first in the Kishoregand Sadar Thana in Bangladesh and in Syangja District in Nepal in October 1994, and subsequently expanded to other countries. The programme and its development approach and activities were an innovative experiment, aimed at alleviating poverty in the rural

areas of the respective regions. The programme was set up as a demonstration pilot project, in the hope that the positive experiences gained and lessons learnt from the programme would provoke Government initiatives to test and implement the social mobilisation approach on a much larger scale, and to make it an integral part of the national policy for local development and poverty eradication.

The programme's social mobilisation approach focuses on:

- The formation of village organisations at the grassroots, working towards participatory rural development and enabling the villagers to identify their problems themselves, to take their own decisions and to prepare, implement and manage their own activities; and
- The organisation of the poor to enhance their bargaining leverage and create an enabling environment for accessing the government delivery system.

The main components of the program are:

- The formation of self-managed organizations of villagers at the grassroots;
- The mobilization of savings from the members of such village organizations (VOs) to create a local capital base;
- The operation of self-managed credit program by VOs for self-employment and income generating activities;
- The creation of a cadre of village activists in each VO, and the improvement of their skills in various sectors, so that they in turn can instruct their fellow VO-members in order to increase overall productivity;
- The establishment of linkage between the VOs on the one hand and government departments, local government institutions, NGOs, financial institutions, and private organizations on the other, enabling the poor to access resources and obtain necessary support; and
- The development of a process of producing and implementing village plans by the VOs through establishing tripartite linkages involving the village population, elected Union Parishad leaders and Government employees.

The programme covers the entire area of the Kishoreganj Sadar Thana. As of December 1999, since its commencement in October, 1994, 48,751 villagers have organized in 1,031 village organizations in all the 202 villages of Kishoreganj Sadar Thana.

(2) Implementing arrangements (Organization)

The process of Social Mobilization and Institution Building is as follows:

- ① The villagers are motivated to organize themselves through dialogue and discussion with the social mobilizers;

- ② The villagers form their own village organizations and identify their priorities;
- ③ The villagers develop the capacity to fulfill the obligations of forming the organization, of developing the skills of their peers, and of generating a village capital base through savings;
- ④ Through support to community investments, the program responds to the self-identified priority needs of the community;
- ⑤ The program develops the capacity of the organization to conceive development ideas, and to plan, implement and manage activities;
- ⑥ Through establishing various types of linkages, the program improves the capacity of the poor to interact more confidently with other agencies such as local government bodies, government departments, banks, and others;
- ⑦ The villagers gradually take up various schemes and activities for socio-economic development aiming at improving their living standard; and
- ⑧ Village plans for the VOs take shape, after which a number of VOs get together and with increased capacity and confidence develop a plan for the whole union, thus expanding their horizon.

The above process leads to a drive among the villagers to plan and implement new ideas and schemes and to collaborate at different levels. With increased capacity and confidence the VO leaders get together, interact with each other at the ward level, and hold meetings in due course at the union level in order to consolidate their respective plans and programs. Ultimately, the process facilitates the development of an institutional framework for the Upazila as a whole.

To facilitate the implementation of the program and to institutionalize the project at the union level, *Village Support Centers* (VSCs) will be established in all unions. These will be run by a committee of representatives of the VOs and supported by project staff, i.e. the social organizers. At the ward level, supervisory committees have been formed. These committees consist of some 10 to 12 of the best performing managers, presidents and activists of the VOs, and are elected from amongst all the VO-managers, presidents and activists in the ward. At the village level, village committees have been formed, consisting of all the managers of the VO's in that village. In general, one village counts 4 to 8 VOs.

(3) Village people participatory system

Village people take part in the project from the beginning and are motivated to form VO through dialogue and discussion with the social mobilisers. VOs are the main player of the development as a whole.

Village people are involved in the broad program, i.e. management training for VO-presidents and managers, and technical training for a number of VO-activists and members.

(4) Mechanism to ensure project sustainability

- **Linkages and partnerships**

Many of the training courses organized for VO-managers, presidents and activists are provided by the government line agencies. The linkages and partnerships that have been established over the years between the village organizations and the local government bodies, line agencies and NGOs are crucial, not only in terms of training and service delivery, but even more so to make the program sustainable in the long run.

- **Effective linkage**

Effective linkage with the various organizations, i.e. Government departments, financial institutions, NGO, is the important factor for ensuring the project sustainability. In particular, the Union Parishads are able to deliver a wide range of useful services to the village organizations. The project has therefore established strong linkages with the Union Parishads, involving the field staff of several departments (agriculture, family planning, health care), the chairpersons and members of the UPs, and the presidents and managers of the VOs of the respective unions.

- **Saving small amounts of money on a regular basis**

By saving small amounts of money on a regular basis, the village organizations gradually build up a local source of credit which can be used by the VO-members themselves, and according to their own choices, for small-scale income generating activities or for urgent consumption purposes.

- **Strong institutional base**

Sufficiently strong institutional base will enable the VOs to continue their activities once the program comes to an end.

(5) Operation and maintenance after implementation

Basically O&M for the program are conducted by VOs. Management techniques of VO and leadership, etc. are trained during the project implementation. And also, linkages and partnerships with government agencies as well as NGOs support VOs after implementation of the program. Saving of small amounts of money on a regular basis build financial base for VOs.

(6) Financial source

Micro credit is basically operated by VO-savings and UNDP seed capital. UNDP seed capital is distributed to the VOs based on their performance, number of prospective borrowers, and demand for credit. However, in most of the VOs approximately 70% of the members are poor and landless, and the demand for loans has been so large that it could not be met from the VO-savings and the UNDP seed capital alone. Given these restraints, Bangladesh Krishi Bank (BKB) provides a credit to the poor and marginal farmers of the VOs.

3.11.3 Rural Development Program by BRAC

(1) Project outline

The Rural Development Program (RDP) works with and for the disadvantaged rural population of Bangladesh, especially women. The ultimate goal of RDP is to contribute towards a just and equitable society, in which the poor and disadvantaged can, by joining together in their own organizations, attain a high degree of self-reliance managing their own affairs to achieve sustainable improvements in their livelihoods. RDP has wide range of interventions including (i) institutional Building; (ii) legal awareness and assistance; (iii) micro-finance; (iv) skill-training; (v) enterprise development; and (v) health.

The greatest strength of RDP is in its ability to learn, experiment and innovate to develop programs that give more hope and meaning in the lives of the poor.

(2) Implementing arrangements (Organization):

RDP focuses on institutional building in order to bring the rural poor into the mainstream of development. BRAC, first and foremost in this process, seeks to build strong local women leaders among the poor with their strong local organizations. The Village Organization (VO) is the primary unit of institutional building and the base for delivering services and inputs. The VO members meet once a week to discuss and facilitate credit operations and meet once a month to discuss various socio-political and legal issues that impact their lives, including social inequality and injustice, discrimination and violence against women.

BRAC has also organized ward level organization called Polli Shomaj (PS) composed of elected representatives from all the VOs (3 to 7) in each ward. BRAC extends its support by building leadership capacity of the members. The PS meets every two months to discuss social ills, such as illegal divorce, dowry, child marriage, polygamy, as well as the rights of the poor to government services and resources.

(3) Village people participatory system

The village people take part in RDP through VO. VO is the primary unit of institution and the base of receiving services and inputs. The VO members have to attend the meeting once a week to discuss and facilitate credit operations and meet once a month to discuss various socio-political and legal issues. The Village Organizations are key institutions for the delivery of financial services to the village people.

(4) Mechanism to ensure project sustainability

- BRAC believes that micro-credit is an important tool in breaking the cycle of poverty. It also places an emphasis on training its members in income generating activities and in facilitating their linkages with Bangladesh's consumer markets.

- Reliable opportunities to save in small amounts are valued greatly. According to the observation of BRAC, the importance of savings during the 1998 floods when the savings build up by members helped them in a big way.
- BRAC also believes that a number of social development initiatives designed to increase member's awareness of their rights and responsibilities and to facilitate addressing issues of discrimination in their villages and their region is important for sustainability.
- Through the program i.e. Agriculture Extension Program, 20 VO members in each area receive training and become Agriculture Extension Workers (AEW) and each of the AEWs is responsible for assisting another 30 participants in agriculture related activities. This system secure the sustainability of program in terms of technology and expansion.

(5) Operation and maintenance after implementation

Through the program implementation, VO members receive training, technology transfer and organizational management, and those members who receive training are responsible for assisting other members.

(6) Financial source

The project budget for BRAC for the year 2001 is US\$ 153 million. Donor contributions will account for approximately 20% of that amount. Some RDP program i.e. Fisheries Program, is a partnership program which includes International Fund for Agricultural Development (IFAD), Danish International Development Agency (DANIDA), World Food Program (WFP), Government of Bangladesh and BRAC.

3.11.4 Haor Rural Development Project by CONCERN Bangladesh

CONCERN Bangladesh forms a part of CONCERN Worldwide, an international NGO devoted to the relief, assistance and advancement of people in need in less developed areas of the world.

CONCERN Bangladesh has been working with and on behalf of the poorest and most vulnerable groups in Bangladesh society since 1972. It sees that its main role is to develop practical solutions to enable the poorest to achieve sustainable advancement, as well as to protect themselves from crises.

In designing and managing its programs, CONCERN Bangladesh attempts to ensure that it accomplishes the following: (i) placing stakeholders at the center of the development process, as the lead players in decision-making; (ii) establishing gender equity as a central, guiding principal throughout the planning, policy and practice of CONCERN Bangladesh; (iii) building capacities of local development organizations and state agencies, which work in the interests of our target groups; and (iv) promoting the conservation of natural resources and the suitable management of the environment.

CONCERN Bangladesh currently operates programs in seven areas of the country of which Haor areas of Kishoreganj and Netrakona districts are included, and responds to disasters and emergencies where they occur.

(1) Project outline

CONCERN Bangladesh's intervention to Haor area started with relief activity in 1988 after a devastating flood attacked the area. Rural development program then started in 1992. Participatory needs assessment was conducted first to identify their problems and issues. Now the program covers four upazilas in Kishoreganj and Netrakona (two upazilas per district).

Based on the needs assessment, CONCERN Bangladesh set development objectives (i) improvement of economic status; (ii) to improve the participation of the target group especially women in education; (iii) to improve health conditions; and (iv) to mitigate the effect of flood disaster.

To achieve the above objectives, CONCERN Bangladesh is undertaking the following activities:

- (i) Flood disaster preparedness through village protection (reconstruction), flood shelter (earthen killa) construction and afforestation with indigenous trees;
- (ii) Institutional building through group formation and village organizations;
- (iii) Self-generating fund through savings and credit, and income generating activities;
- (iv) Education through adult literacy program and non-formal primary education;
- (v) Awareness building and
- (vi) Environmental health and nutrition through basic health, water and sanitation and home gardening.

(2) Implementing arrangements (Organization)

For project/program implementation, CONCERN Bangladesh promotes local people organizing based on community (or para). Community approach has been adopted to ensure complete coverage of certain project components such as water and sanitation, adult literacy program, health promotion, personal development, over the community.

At first groups are formed in a village to enhance the people's collective works within their area. Community Based Organizations (CBOs) or Village Organizations (VOs) are generally established 18 to 24 months after groups have been formed. CBOs/VOs are to provide support to groups within their respective areas. CBOs/VOs play a role in resolving dispute within and between groups as well as in the wider community.

To strengthen and support the activities of CBOs/VOs, a federation has been formed. The federation provides support to groups in managing their savings and loan accounts, promote formation of new groups in an effort to ensure growth in its system, and promote income generating activities.

(3) Village people participatory system

CONCERN Bangladesh conducts the Participatory Needs Assessment in the planning stage, and then formulates the project/program based on local people's needs. CONCERN Bangladesh facilitates the village people to form groups and consider the problems and their solutions by themselves. Project implementation, monitoring are conducted under the participation of village people. Village people will actively be involved in the evaluation of the project.

(4) Mechanism to ensure project sustainability

- To form groups to create solidarity and cooperation among participants and build capacity of group members;
- To support and strengthen group activities through establishment of CBOs/VOs and federation;
- To promote group activities to be self-reliant by enhancing saving and credit and promoting income generating activities.

(5) Operation and maintenance after implementation

O&M is basically done by groups which are supported by CBOs/VOs and a federation. Financial support by CONCERN Bangladesh will be continued only for 5 years.

(6) Financial source

Project cost is mainly financed by foreign aid, and CONCERN Bangladesh implement the project based on the finance. Cost sharing of beneficiary is done through the donation of land and labor supply.

3.11.5 Rural Development Project by Shapla Neer (Japanese NGO)

Shapla Neer was established in 1972 in order to help rural poor of Bangladesh. It has been pursuing community based rural development.

Shapla Neer's intervention to rural poor starts with organizing *samitees*, voluntary mutual help groups in a village. *Samitee* consists of poor households that do not have regular occupation and land. Organized *samitee* holds regular meeting where problems and issues on ordinary life are to be discussed. Also each member of *samitee* will save group funds for either group loan or group project.

(1) Project outline

Shapla Neer's rural development project has the following activities:

- Development and training of *Samitee*,
- Literacy education for adult,
- Supplementary lesson for children (target is poor family),
- Health and sanitation program, and
- Income generation program (financing, technical training).

Health and sanitation program include education for enlightenment, tube-well construction and distribution of simple toilet by cost-sharing to prevent a parasite and epidemic.

(2) Implementing arrangements (Organization)

Shapla Neer's intervention is done through *Samitee* consisting of approximately 15-20 members. This size is proper by their experience to save group fund. *Samitee* is usually formed based on the *bari* or homestead, and there is usually some *Samitees* in Para. *Samitees* are organized for men and women separately. The target *Samitee* members are poor households that don't have regular occupation and land. *Samitee* collects money (average 20-50 Tk/month) from members to raise fund for their activities. *Samitee* member can get loan at low interest rate from the fund when the member become unemployed or sick. In addition, they can be financed according to their deposit amount.

A community development center (CDC) is also established at Upazila as supporting organization for *Samitee*. CDC is composed of one representative, one accountant, four program supervisor, seven field organizer, and three service staffs. CDC usually covers 4 unions and 30 grams.

(3) Village people participatory system

All activities are done through *Samitee*. *Samitee* holds a meeting 4 times a month (every week). The member of the *Samitee* has to attend at the meeting at least twice a month.

(4) Mechanism to ensure project sustainability

- The spirit of co-operation is expected through organizing a *Samitee*,
- Ownership of each member in *Samitee* is encouraged through saving a deposit,
- *Samitee* members are empowered through training conducted by CDC,
- The operation cost of *Samitee* is covered by fund raised by the members, and
- Continuous support from CDC is also important factor for sustainability.

(5) Operation and maintenance after implementation

All the programs are maintained by *Samitee* under the support of CDC.

(6) Financial source

Approximately 50 % is covered by revenue from the activities, and the rest is covered by donation and subsidy from the government. The cost regarding the ordinary routine activity is mainly covered by revenue generated from micro credit by *Samitee*.

3.11.6 Participatory Rural Development Project (PRDP) by BRDB

(1) Project outline

BRDB in cooperation with Japanese experts under JICA program has been piloting a project “Participatory Rural Development Project (PRDP)” since April 2000, in order to develop “an alternative rural development strategy” or “Link-Model”. Based on the previous study entitled “Joint Study Rural Development Experiment (JSRDE)”, it was found that linkage between village people and local government services as well as NGOs was insufficient in every approach, which hampered the development in rural areas. Reconsidering the lessons learned above, PRDP stresses on coordination and establishing linkages among the stakeholders. Various approaches have been tried to strengthen the linkage, such as establishment of Union Development Complex, establishment of contact points for local government services and villagers, establishment of notice board for villagers to recognize administrative information. Also infrastructure development at village level, have been tried by using participatory approach.

(2) Implementing arrangements (Organization)

In case of participatory infrastructure development, a facilitator from PRDP goes to the village and proposes a project to all the villagers. When they agree to implement the project, a Village Committee (VC) is organized by all the villagers, as a prerequisite of the project implementation. VC selects 15 to 20 executive members among villagers. VC is the main entity to implement, operate and maintain the project.

The project proposal is then sent to the Union Coordination Committee (UCC) at Union, and the proposal is discussed at UCC to finally decide whether it is implemented or not. UCC is a newly established organization specific to the project and consists of UP chairman, UP members, Government officers at Union level such as block supervisors (agricultural extensionists) and health officers, and NGOs.

BRDB also assigns a Union Development Officer to facilitate communication between VC and UCC.

(3) Village people participatory system

Village people of target area of project through VC take part in the project in planning, implementation, and O&M, respectively.

(4) Mechanism to ensure project sustainability

All the village households through VC are involved in the project from the planning phase to O&M phase, which encourage the ownership of the project by them.

Beneficiaries share some 20 % of the project cost in the form of labor supply and/or donation of land, thus ownership is also encouraged.

Adopting the long-established technology, village people could operate and maintain the project properly by themselves.

(5) Operation and maintenance after implementation

O & M are conducted mainly by VC and Union. Adopting the long-established method, villagers can operate and maintain the project by themselves. Regarding the cost needed matters of the project, local government development budget so-called “Test Relief” is allocated at Union level.

(6) Financial resource

80% of the project cost is shared by PRDP, and the rests, 20 %, is shared by village people. (share portion of village people is covered by land supply and/or labor supply)

PRDP disburses its cost for implementation only after the recognition of disbursement of local fund portion.

3.11.7 River Basin Program by Oxfam

(1) Project outline

Oxfam is working in char area under river basin program which have been adopted world widely by Oxfam International's.

Geographic Targeting: Oxfam extends assistance to char area, covering 46 Unions over five districts of *Kurigram, Gaibandha, Jamalpur, Sirajganj* and Shariatpur, through 10 local NGOs. (italics is our Study Area in Char)

Activities: Activities are classified into the following five issues identified based on the baseline survey for local people's problems and needs.

- Activity for disaster preparedness and management based on family and community level

- Activity for livelihood development
- Activity for health and environment
- Activity for capacity building and local resources mobilization
- Activity for women in development (WID)

(2) Implementing arrangements (Organization)

Oxfam basically implements projects through local NGOs. In addition, they organize a local people's organization (Village Development Communities; VDC) at village level and they also use VDC in the framework of implementation. VDC is formed for O & M of project, and the other organization composed of women for micro-credit. Micro credit is only for women and they adopt the "group approach".

(3) Village people participatory system

Local people are involved in the planning stage through baseline survey. However, they do not actively participate in the project.

(4) Mechanism to ensure project sustainability

- Projects are formulated based on local people's problems and needs grasped through the baseline survey.
- Local NGOs, assisted financially by Oxfam, support the activities of local people to sustain the project.

(5) Operation and maintenance after implementation

O&M is mainly conducted by VDC. In addition, local NGO support the VDC after implementation. Routine O&M is usually conducted by VDC in cooperation with local NGO, and non-routine O&M is supported by Oxfam International.

(6) Financial resource

Cost sharing of beneficiary is in the range between 10% and 30% of the total cost in the form of labor and/or land supply. The rate of cost sharing varies from one project to another.

3.11.8 Poverty Alleviation Project (BRDB)

(1) Project outline

Bangladesh Rural Development Board is the leading public sector agency under MLGRD&C involved in executing rural development as well as poverty alleviation projects / programme in Bangladesh. The Board along with the small and marginal farmers to increase food production;

addresses the asset less poor to ameliorate their socio-economic conditions by different antipoverty projects and the rural women for their social and economic empowerment across the country.

Therefore, gradually the activities of BRDB expanded beyond its mandated functions to the task of alleviation of poverty by reaching the poorest of the poor through group based self-employment and income enhancing initiatives. In order to fulfil its lately assumed mission for reducing rural poverty, BRDB since mid 80s adopted a new strategy and undertook a number of poverty alleviation projects in addition to its normal program with the assistance from different donors (SIDA, NORAD, CIDA, EEC and others) and GOB

Major components of BRDB Poverty Alleviation Project are:

- Group formation of the defined poor people,
- Human development and skill development training for social empowerment of the members and staff.
- Provision of credit for income generating activities,
- Compulsory savings for resource mobilization,
- Close monitoring through weekly meeting, and
- Focus on increased women participation.

(2) Implementing arrangements (Organization)

BRDB organizes a group consisting of poor people. This group is a main body to receive a training, education of human development. Qualification of receiving a micro-credit should be a member of this group. The number of Group member is approximately 15 – 30. Each member of group has to save about five Taka a month as a group fund to be used for the maintenance of group activities.

(3) Village people participatory system

Human development training and awareness improvement seminar are held once a week.

(4) Mechanism to ensure project sustainability

- Compulsory saving is essential factor for sustainability of group,
- Social mobilization and group formation of village poor people are also necessary factor to sustain the program, and
- Loose supervision for loan is important to sustain the system of micro-credit in poor group.

(5) Operation and maintenance after implementation

O&M of group is done by compulsory savings. And also income from credit operation is used for

O & M of group.

(6) Financial source

This project is financed by SIDA, NORAD, CIDA, EEC and Bangladesh Government.

3.11.9 Small Scale Water Resources Development Sector Project (SSWRDSP) by LGED

(1) Project outline

Objectives: To create a sustainable increase in agricultural production and incomes for marginal farm families. To establish sustainable operation and maintenance (O & M) systems for small scale water resources projects through beneficially participation. To alleviate poverty in project area by raising production and generating employment.

Scope of Works: People's participation in the selection, design, implementation and operation & maintenance (O & M) of sub-projects. Rehabilitation and construction of embankments and/or water control structures to protect homesteads and farmland from flooding. Re-excavation of drainage canals to increase their capacity for better water flow management. Development of water retention capacity of oxbows, beels, ponds, canals and borrow pits by re-excavation to expand irrigation and fisheries. Improvement of existing irrigation systems by providing better distribution system and expanding irrigation areas.

<u>Project Cost:</u>	Foreign exchange	\$15.9m (24%)
	Local currency	\$49.8m (76%)
	Total	\$65.7m (100%)

Project area: 37 districts of Rajshahi, Khulna, Barisal divisions and greater Faridpur districts of Dhaka division i.e. Western part of Jamuna-Padma-Meghna rivers. Beneficial area totals 165,109 ha with beneficiaries of 715,280 in 282 sub-projects during phase 1 (1995-2002).

(2) Implementing arrangements (Organization)

Project Management Office (PMO) in Dhaka of LGED mainly supervise the project.

Water Management Cooperation Association (WMCA) is formed at each of sub-projects to take responsibility of O&M of the infrastructure. It also extends micro-credit for local people by collecting fund from the members.

Labor Contracting Society (LCS) composed of landless and destitute women in the project area is organized in each sub-project to undertake unskilled works like earthworks, excavation, etc.

(3) Village people participatory system

Project itself is conducted by the request of beneficiary and that it is checked by PRRA conducted by NGO before starting the project design. Through the PRRA, project is checked whether it reflects the intention of village people or not. In addition to these procedures, beneficiary will check the design after preliminary design and also O & M.

(4) Mechanism to ensure project sustainability

- It is expected that the beneficiaries would have the sense of ownership of the project because the project is decided to be implemented based on the request of to be beneficiaries.
- Beneficiary share the cost, approximately 5.3%, thus ownership is expected to be encouraged.
- PMO conducts training on O&M for WMCA members, thus it is possible to sustain the project by WMCA.
- In the planning phase before implementation, beneficiaries agree to take responsibility of O&M of the project.
- As the project brings about economic benefits, cost for minor repair could be shouldered by WMCA.

(5) Operation and maintenance after implementation

WMCAs are formed in each of the sub-projects who will ultimately take the responsibility for the operation and maintenance of the sub-project. All people living, farming, fishing or performing any other subsistence activity are entitled to become members of WMCA. Each WMCA elects a WMC Committee which should represent all groups and reflect the aspirations and needs of the beneficiaries of the sub-project. In order to satisfy this, representatives from all sections of the society (including landless, small, marginal, large farmers, fishermen, women, boatmen) are represented in the WMCC.

(6) Financial source

5.3 % of total project cost is shared by beneficiaries through WMCA, and the rest is shared by GOB (20.1 %), ADB (48.5 %), IFAD (15.8 %), and Netherlands (10.3 %).

3.11.10 Environmental Management Projects by Center for Natural Resources Studies (CNRS)

CNRS is a NGO working in the area of conservation of biodiversity through community-based management of habitats. The goal of CNRS is to reclaim sustainable natural environmental management through habitat restoration, bio-diversity conservation and regeneration of natural resources in harmony with the ecosystem. To achieve and to uphold the mission of the organization,

CNRS determined following specific objectives:

- Demonstrate sustainable management of habitats and biodiversity;
- Influence national development strategy in directions supportive to conserve national environmental resources;
- Develop comprehensive database on the state of environment and different components of natural resources;
- Generate environmental awareness among mass people and promote community based natural resource management;
- Exchange information and views with other national and international organizations and agencies working in environment sector; and
- Provide technical support services to other agencies and NGOs working in the field of environment and natural resources management.

(1) Project outline

CNRS is currently implementing the following projects in Haor area.

- Sustainable Environment Management Project (SEMP): Budget :1.3 million US\$, Financial resource: UNDP, Target Area: Sunamganj, Implementation period: 1998-2004
- Community Based Wetland Management (CBWM): Budget: 250 thousand US\$, Financial resource: IUCN, Target Area: Sunamganj, Implementation period: 1998-2002
- Community Based Fishery Management (CBFM): Budget: 90 thousand US\$, Financial resource: DFID, Implementation period: 2001-2006

In all of the above projects, CNRS make use of indigenous tree species of Hijal and Koroch for reforestation. Both species have long been grown in Haor area, and are expected to contribute to the conservation of ecosystem, by providing a habitat for indigenous fish and shrimp and protecting mound erosion by waves.

Seedlings of Hijal and Koroch are grown by local people who participate in the projects, at nurseries established in the projects, and they are sold for plantation purpose. This activity brings about some income to local people as well as the project itself.

(2) Implementing arrangements (Organization)

CNRS adopts participatory planning program for project planning. At first local people are invited to 10-days planning program. By classifying them into four groups (medium and large farmers, landless farmers, fishermen, and women) by social status, problems are identified separately in each group. The problems identified by each group are then gathered and discussed in plenary for getting consensus on prioritising problems. Prioritised problems are again discussed by each social group for determining solution and inputs, and a draft action plan is finally prepared through plenary session.

For project implementation, a Project Implementation Committee (PIC) is established by local people as an executing body at local level, supported by the government as well as CNRS. In implementation phase, CNRS supports the village people in terms of technique, finance, and operation, and the project is transferred to the PIC two years after the project starts. CNRS conducts the training regarding the improvement of operation capacity, leadership and financial management when they transfer the project to PIC.

(3) Village people participatory system

CNRS adopts the participatory planning program of village people from the planning phase, and the project is formulated based on the problems they identified. Also the project is implemented by full involvement of local people.

(4) Mechanism to ensure project sustainability

- Village people take part in the workshop from the planning phase, thus ownership is expected to be encouraged,
- Self-development is possible by money produced from the project,
- CNRS conducts the training for PIC to operate and maintain the project at the time of project implementation, and
- CNRS adopts the construction method and technology that the village people can operate and maintain by themselves, thus the village people can support themselves after implementation.

(5) Operation and maintenance after implementation

PIC conducts the O & M after implementation. However, initial revolving fund is provided from CNRS to PIC. After that, O & M cost is maintained by the profit gained by the project, i.e. sales of seedlings of Koroch and Hijal. It is also possible for CNRS to provide the “Environmental Fund”.

(6) Financial source

International agencies including UNDP, IUCN and donor agencies like DFID provide project fund to CNRS. After the implementation of the project, village people sustain the project by raising fund through the sale of seedlings of indigenous trees.

Table 3.77 Summary of the Case Study (1/2)

	Project outline	Organization	Village people participatory system	Mechanism to ensure project sustainability	Operation and maintenance after implementation	Financial sources
Flood Proofing Project (FPP) by CARE Bangladesh	A 5-year Project under the Integrated Food Security Program (IFSP) which aims at promoting and protecting food and livelihood of vulnerable groups in underdeveloped high risk areas of Bangladesh. The objectives of FPP are: (i) to avoid loss of human life, (ii) to reduce the disruption of normal activities during and after a flood, and (iii) to provide people with the security and motivation necessary to make and sustain improvements in an environment that frequently floods. To attain the above objectives, FPP adopts both structural and non-structural measures.	Local Project Society (LPS) at village level as a unit of implementing the project (often organized more than one in a village based on para, called FPP village). CARE field office at Upazila level to plan, coordinate and supervise the project. Partner NGO and LGED Upazila offices to implement the project. Project implementation in one village lasts 3 years.	Village people are involved in the project through PLA to establish LPS at initial stage. LPS is a nuclear of the project at village level responsible for decision making, organizing people, implementing projects, etc.	The project mainly focuses on hard measures like construction of wave protection wall, raising plinth of homestead areas, etc. The sustainability of the project has yet been clear because such a big flood as in 1988 has not occurred since the construction. Project is expected to be sustained by LPS through training.	LPS is responsible for minor maintenance works, while the major works are to be done by LGED (government).	All the project cost is financed by USAID, and CARE implement the project. Cost sharing of beneficiary is decided by the meeting between LPS and CARE. (Approximately 10%-30% of the earth works)
South Asia Poverty Alleviation Program (SAPAP) by UNDP	The program's overall aim is to provide support and guidance to the rural population to harness their potential, enabling them to help themselves and, based on their own strengths, improve their living condition. The main components of the program are: (i) formation of self-managed organizations of villagers at the grassroots; (ii) mobilization of savings to create a local capital base; (iii) operation of self-managed credit program for self-employment and income generating activities; (iv) creation of a cadre of village activists and the improvement of their skills, to increase overall productivity; (v) establishment of linkage between the VOs and government and private sectors, enabling the poor to access resources and obtain necessary support; and (vi) development of a process of producing and implementing village plans by the VOs.	Village organizations (VOs) at para/hamlet level. Village committees have been formed at village level, consisting of all the managers of the VOs. In general, one village counts 4 to 8 VOs. Supervisory committees at the ward level. Village Support Centers (VSCs) at union level to facilitate the implementation of the program and to institutionalize the project	Village people take part in the formation of VO through dialogue and discussion with the social mobilisers. Village people are involved through the broad program, i.e. management training for VO-presidents and managers, and technical training for a number of VO-activists and members.	The linkages and partnerships that have been established over the years between the village organizations and the local government bodies, line agencies and NGOs are crucial to sustain the program. By saving small amounts of money on a regular basis, the VOs gradually build up a local source of credit which can be used by the VO-members. Sufficiently strong institutional base will enable the VOs to continue their activities once the program comes to an end.	Basically O&M for the program is conducted by VO. Management techniques of VO and leadership training, etc are trained during the project implementation. And also, linkages and partnerships support the VO after implementation of the program. Saving small amounts of money on a regular basis can be used for small-scale income generating activities and for urgent consumption purposes.	Micro-credit is basically operated by VO-savings and UNDP seed capital. However, in most of the VOs approximately 70% of the members are poor and landless, and the demand for loans has been so large that it could not be met from the VO-savings and the UNDP seed capital alone. Given these restraints, Bangladesh Krishi Bank (BKB) provide a credit to the poor and marginal farmers of the VOs.
Rural Development Program by BRAC	The Rural Development Program (RDP) works with and for the disadvantaged rural population, especially women. The ultimate goal of RDP is to contribute towards a just and equitable society, in which the poor and disadvantage can, by joining together in their own organizations, attain a high degree of self-reliance managing their own affairs to achieve sustainable improvements in their livelihoods. RDP has wide range of interventions including: (i) Institutional building; (ii) Legal awareness and assistance; (iii) Micro-finance; (iv) Skill-training; (v) Enterprise development; and (vi) Health The greatest strength of RDP is in its ability to learn, experiment and innovate to develop programs that give more hope and meaning in the lives of the poor.	Village Organization (VO) is the primary unit of institutional building and the base for delivering services and inputs. Polli Shomaj (PS) at ward level comprises elected representatives from all the VOs (3 to 7) in each ward. BRAC extends its support by building leadership capacity of the members.	The village people take part in RDP through VO. The VO members have to attend the meeting once a week to discuss and facilitate credit operations and meet once a month to discuss various socio-political and legal issues. The PS meets every two months to discuss social ills, such as illegal divorce, dowry, child marriage, polygamy, as well as the rights of the poor to government services and resources.	<ul style="list-style-type: none"> Micro-credit is an important tool in breaking the cycle of poverty. Training of members in income generating activities and in facilitating their linkages with Bangladesh's consumer markets. A number of social development initiatives designed to increase member's awareness of their rights and responsibilities and to facilitate addressing issues of discrimination is important for sustainability. 	Through the program, VO members receive training, technology transfer and organizational management, and those who received training are responsible for assisting other members.	The project budget for BRAC for the year 2001 is US\$ 153 million. Donor contributions will account for approximately 20% of that amount. Some RDP program i.e. Fisheries Program, is a partnership program which includes IFAD, DANIDA, WFP, Government of Bangladesh and BRAC.
Rural Development Program by CONCERN Bangladesh	<u>Geographic Targeting:</u> Four upazilas in Kishoreganj and Netrakona in Haor area and Gainbandha in Char. <u>Objectives</u> are: (i) to improve economic status; (ii) to improve the participation of the target group especially women in education; (iii) to improve health conditions; and (iv) to mitigate the effect of flood disaster <u>Activities</u> taken to fulfill the objectives include: (i) flood disaster preparedness; (ii) institutional building; (iii) self-generating fund; (iv) education; and (v) environmental health and nutrition	<u>Community based organization (CBO)</u> at village (para) level as beneficiary. <u>Federation</u> is organized by CBOs to strengthen their status. In terms of cost sharing, CONCERN requests village people to provide the land and labor supply. CONCERN continues financial support for 5 years after implementation.	Through PRA, CONCERN facilitates the village people to consider the problem and solution by themselves. Project monitoring is conducted under the participation of local people.	Project sustainability has yet been assured due to conflict among local people in O&M of physical structure and interference of project implementation by influential people.	O & M is conducted by CBO. Financial support by CONCERN will be continued for 5 years.	Project is financed mainly by foreign aid. Cost sharing of beneficiary is done through the provision of land and labor.
Rural Development Project by Shapla Neer	<u>Objective:</u> To pursue community based rural development. <u>Activities:</u> Development and training of <i>Samitee</i> (a voluntary mutual help group in a village), literacy education for adult, supplementary lesson for children (target is poor family), health and sanitation program, income generation program (financing, technical training)	<u>Samitee</u> , consisting normally of 15-20 members, is usually formed based on the <i>bali</i> . Members of <i>Samitee</i> are poor households that don't have regular occupation and land. <u>Community development center (CDC)</u> is established at Upazila for supporting <i>Samitee</i> . CDC is usually in charge of 4 unions and 30 grams.	All activities are done through <i>Samitee</i> , and the <i>Samitee</i> holds a meeting 4 times a month (one per week). Every member of the <i>Samitee</i> has to attend the meeting at least twice a month.	Ownership of members in a <i>Samitee</i> is encouraged through saving a deposit. The operation cost is disbursed from the savings deposited by the <i>Samitee</i> members (average 20-50 Tk/month). Continuous support from CDC is also important factor for keeping sustainability. The training for operation is conducted by CDC.	Operation of program is done by <i>Samitee</i> in corporation with CDC.	Approximately 50 % is covered by revenue from the activities and the rest is covered by donation and subsidy from the government. The cost regarding the ordinary routine activity is mainly covered by revenue generated from Micro Credit for <i>Samitee</i> .

Table 3.77 Summary of the Case Study (2/2)

	Project Outline	Organization	Village people participatory system	Sustainability	Operation and Maintenance after implementation	Financial Sources
Participatory Rural Development Project (PRDP) by BRDB	The project aims to develop an "alternative rural development strategy", by strengthening ties between village people and local government services. The strengthening of the function of Union Parishad is emphasized through establishing Union Coordination Committee, construction of Union Development Complex, establishing notice board that transmit administrative information to villagers, establishing contact points between villagers and administrative officers like block supervisors.	<u>Village Committee (VC)</u> at village level consisting of all the households. VC selects 15 or 20 executive members. Only created when a project is agreed to be implemented. <u>Union Coordination Committee (UCC)</u> at Union. <u>Union Development Officer</u> facilitates communication between VC and UCC.	Local people participate in the project through VC from planning phase, implementation phase through O&M phase.	Sustainability of the project is expected to be assured by: 1. The project is agreed at VC under the full participation of local people. 2. A part of the project cost is shouldered by local people in the form of labor and land. 3. The projects to be selected will be ones to which local people can participate.	VC and Union Parishad are responsible for O&M. Adopting the long-established method, VC can operate and maintain the project by themselves. Regarding the cost needed matters, Test Relief of Union is allocated to them.	The cost per project is some US\$2,000, 80% of which is shared by PRDP and the rest, 20 %, by village people. (Share portion of village people is covered through land supply or labor supply)
River basin program by Oxfam	Oxfam is working in char area under river basin program which have been adopted world widely by Oxfam International's. <u>Geographic Targeting</u> : Oxfam extends assistance to char area, covering 46 Unions over five districts of Kurigram, Gaibandha, Jamalpur, Sirajganj and Shariatpur, through 10 local NGOs. <u>Activities</u> are classified based on (i) Disaster preparedness and management based on family and community level; (ii) Livelihood development; (iii) Health and environment; (iv) Activity for capacity building and local resources mobilization; and (v) Activity for women in development (WID)	<u>Village organization (VDC)</u> , as beneficiary of the project and also responsible for O & M of project <u>Women' group</u> for micro-credit. <u>Local NGO</u> to implement the project	VDC is organized by the initiative of the project. Local people's intention is grasped through base line survey at initial stage.	Village people share the cost in the form of labor supply, thus ownership of village people is expected. Local NGO supports VDC.	O & M is mainly conducted by VDC. In addition, local NGO support the VDC after implementation. Routine O & M is usually conducted by VDC in corporation with local NGO, and non-routine O & M is supported by Oxfam International.	Cost sharing of beneficiary is covered 10%-30% in the form of labor and/or land supply.
Poverty Alleviation Project by BRDB	BRDB has, since mid 80s, adopted a new strategy and undertaken a number of poverty alleviation projects. Major components of BRDB Poverty Alleviation Project are: (i) group formation of the defined poor people; (ii) human development and skill development training for social empowerment of the members and staff; (iii) provision of credit for income generating activities; and (iv) compulsory savings for resource mobilization.	<u>Group</u> consisting of 15 to 30 poor people, as a main body to receive a training, education of human development. Only the member of the group is entitled to receive credit.	Village people take part in a project / program through group. The member of group has to save about 5 Tk a month.	Compulsory saving is essential factor for sustainability of group. Social mobilization and group formation of village poor people are also necessary to sustain the program. Loose supervision for loan is important to sustain the system of micro-credit in poor group.	O & M of group is covered by compulsory savings and also income from credit operation is used for O & M of group.	Financial source is covered by SIDA, NORAD, CIDA, EEC and Bangladesh Government.
Small Scale Water Resources Development Project (SSWRDP) by LGED	<u>Objectives</u> : Poverty reduction is the principal objective, which will be achieved by: (i) mobilizing beneficiaries to participate in the project from the beginning; (ii) implementing small scale water resource schemes to improve water control and enhance irrigation; (iii) expanding agricultural and fisheries production; and (iv) creating employment opportunities particularly for landless and destitute women, in income generating activities. <u>Project Description</u> : The project consists of many small-scale water resources sub-projects incorporating various elements. Other project components include: (i) beneficiary participation and training, (ii) fisheries development, (iii) tree plantation, and (iv) technical and managerial support for the Executing Agency. <u>Project scale</u> : 282 sub-projects covered 165,109ha and 715,280 beneficiaries	<u>Project Management Office (PMO)</u> of LGED HQ is the executing agency. <u>Water Management Cooperation Association (WMCA)</u> to be formed at each of sub-projects to take responsibility of O & M of the infrastructure. It also extends micro-credit. <u>Labor Contracting Societies (LCS)</u> , composed of landless and destitute women, to undertake unskilled works like earthworks, excavation, etc.	Project is formulated by the request of local people. The request is examined by PRRA conducted by NGO before starting the project design. Through the PRRA, project is checked whether it reflects the intention of village people or not. In addition to these procedures, beneficiary will check the design after preliminary design and also O & M.	<ul style="list-style-type: none"> Beneficiaries share the cost, approximately 5.3%, thus ownership is expected to be encouraged. PMO conducts O & M training for WMCA. Self-sustain is expected because the procedure of beneficiary consensus is adopted from the planning phase. 	WMCA mainly conducts an O&M, and is registered to Cooperative Department. WMCA is in charge of small repair while LGED is responsible for major repair. WMCA establish an O & M fund and the cost for O & M is covered by it.	<u>Project Cost</u> : Foreign portion: \$15.9m (24%) Local portion : \$49.8m (76%) Total : \$65.7m (100%) 5.3 % of total project cost is shared by beneficiary, and the rest is shared by GOB (20.1%), ADB (48.5%), IFAD (15.8%), and Holland (10.3%)
Environmental Management Project by CNRS	The goal of CNRS is to reclaim sustainable natural environment through habitat restoration, bio-diversity conservation and regeneration of natural resources in harmony with the ecosystem. Following projects are implemented in Haor area. <u>Sustainable Environment Management Project (SEMP)</u> : Budget :1.3 million US\$, Financial resource: UNDP, Target Area: Sunamganj, Implementation period: 1998-2004 <u>Community Based Wetland Management (CBWM)</u> : Budget: 250 thousand US\$, Financial resource: Ford Foundation, Target Area: Sunamganj, Implementation period: 1998-2002 <u>Community Based Fishery Management (CBFM)</u> : Budget: 90 thousand US\$, Financial resource: DFID, Implementation period: 2001-2006	<u>Project Implementation Committee (PIC)</u> for the village people of target area which will be supported by the government when the project is implemented. In the implementation, CNRS supports the village people in terms of technique, finance, and operation, and the project is transferred to the PIC after 2 years of implementation.	Local people are involved in the projects from the planning phase by participating in 10 days planning program. A series of workshop are conducted to do: (i) confirmation of problem in the area; (ii) screening of problem in terms of natural resources; (iii) examination of the problems of cause and effect relationship; and (iv) making an action plan. For (i) and (ii) people are classified into four groups by social status, and discussed separately.	<ul style="list-style-type: none"> Village people take part in the project from the planning phase. Project will make profit by selling seedlings of trees. CNRS conducts training for PIC to maintain the project before transferring. CNRS adopts the construction method and technology that the village people can operate and maintain. 	PIC is responsible for O&M after implementation. However, initial revolving fund is provided by CNRS. And it is also possible for CNRS to provide the "Environmental Fund".	International donor agent, i.e. UNDP, DFID, etc. provide the fund for CNRS, and CNRS conduct the project based on the fund. The village people contribute the project through supplying the labor.

3.12 Lessons Learned

Based on the case studies in the previous section, various lessons which should be reflected in formulating projects on Rural Development Focusing on Flood Proofing, were learned. All the projects tried to establish certain mechanism for the projects to be sustainable. Common practices adopted by many projects for ensuring project sustainability include: (i) participatory approach to enhance ownership of the project by beneficiaries, (ii) organizing people to enhance solidarity and mutual cooperation among them, (iii) group savings and credit to strengthen economic base, and (iv) strengthening of linkage among rural people at village level and government services and NGOs to improve services delivery.

The above four issues are explained in the following.

(1) Participatory approach

Participatory approach has been adopted in all the projects. Local people in the project area are involved in the project from the planning stage through PRA or PLA. All the projects have target people, who are usually poor ones, and motivate them to form groups/organizations. The unit of group/organization varies by projects, but in many projects such as FPP, SAPAP, RDP by BRAC, and RDP by CONCERN, people are organized based on *para*. In case of Shapla Neer's project, groups are generally formed based on *bari*.

In SSWRDP, on the other hand, beneficial people are organized based on the geographical area of the sub-project. In the project by CNRS, all people in the project area are involved. In general small group such as unit as gram, para, bari, etc. is easy to be united and less conflict within the group is expected.

In such projects as FPP, RDP by CONCERN, SSWRDP, PRDP, which have components of civil works, beneficiaries share a part of the project costs in the civil works through the supply of labor and/or donation of land.

Through enhancement of participation and cost sharing of project, sense of ownership is expected to be encouraged.

It should also be noted that BRAC emphasized that social development initiatives designated to increase beneficiaries' awareness of their rights and responsibility are valued.

(2) Organizing people

Organizing people is another important issue for self-sustained project/program. Poor people hardly have a chance to uplift their economic status individually. Collective efforts as group will enhance solidarity and mutual cooperation, which will be the engine of development. SAPAP by UNDP demonstrates that community based local people through village organizations were able to reduce their poverty through individual and community based investment and that how such

grassroots organizations can be effective vehicles for local development and equitable growth, provided there is sufficient access to financial, social and technical services.

As shown in the cases of BRAC's RDP and SAPAP, strong institutional base will enable the Village Organizations to continue their activities once the program comes to an end. Training and human resource developments are, therefore, a major pillar of the program, aimed at making the program sustainable in the long run. This should be emphasized as Shapla Neer and CONCERN experienced in their projects that organized group have been dissolved due to conflicts among group members because of mismanagement of group savings (in case of Shapla Neer), and to weak group activities (in case of CONCERN).

To support the activities of village level organization or groups, upper level organizations have been established in several projects including Shapla Neer's RDP (CDC), BRAC's RDP (Polli Shomaj), and CONCERN's RDP (a Federation).

Also as BRAC emphasizes, in order to bring the rural poor into the mainstream of development, RDP focuses on institutional building as a strategy of inclusion. The village level organization is the primary unit of institutional building and the base for delivering services and inputs.

(3) Saving and credit

Lack of access to reliable and fair financial instruments is a major constraint that works against the efforts of the poor to lift themselves out of poverty. In order to strengthen local people's economic base, group savings have been adopted in many projects such as SAPAP, RDP by BRAC, CONCERN and Shapla Neer, BRDB's poverty alleviation project, and SSWRDP. By saving small amounts of money on a regular basis, the village organization gradually build up a local source of credit which can be used for small-scale income generating activities or for urgent needs, according to their own choices. From the self-sustained point of view, reliable opportunities to save in small amounts are valued highly. As BRAC case demonstrates that the importance of savings during the 1998 floods when the savings build up by members helped them very much. Moreover, these self-managed savings and credit programs are one of the most important elements in the mobilization and organization of the rural poor, and a crucial factor in institution building and sustainability of project/program.

(4) Linkage with outside

Strong linkage between village and supporting services is also a crucial factor for ensuring project sustainability. To build capacity and empower local people, all the projects studied provided various training programs regarding institutional building, saving and credit, various skills for income generation, etc. These training have been provided by the projects, government institutions or NGOs. However, once projects phase out, these linkage and partnerships, in other words, supporting system, hardly continue in most of the rural areas, especially disadvantaged geographic areas like Char and Haor. PRDP by BRDB in cooperation with JICA emphasizes the

necessity to establish strong linkage between villages and local government services through Union Parishads. The same are mentioned by SAPAP and CONCERN's RDP. The success of SAPAP may be due to, aside from its own efforts to organize local people and empower them, the strong supports provided by the local government at Upazila level in technical extension and BKB in providing credit.

The above issues are mutually related. Schematics below shows the flow of project in general to attain sustainability.

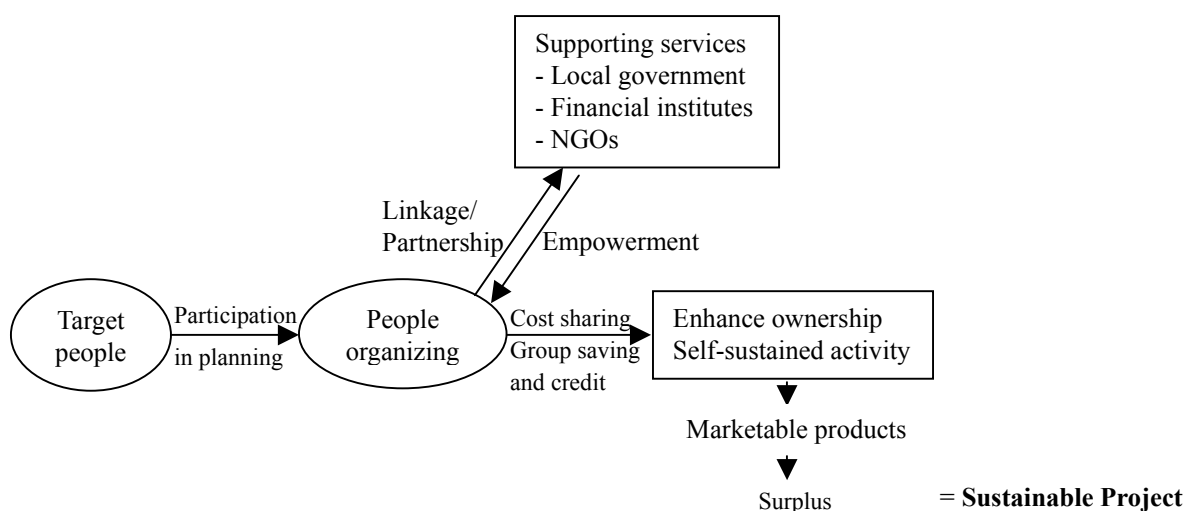


Figure 3.1 Flow of the Project for Attaining Sustainability

Lastly, it should be noted from the lessons from PRDP that adoption of rural technologies (long-established technologies) be considered when planning projects. Many useful technologies in farming, health care, nutrition and infrastructure building have been inherited through generations and maintained in rural Bangladesh. Most of these indigenous technologies were appropriate, environment-adaptive, environment-friendly and much less costly than foreign technologies. However, those technologies seemed to have been neglected by external aid agencies through the introduction of modern costly technologies. Voluntary participation of villagers can be ensured when these appropriate technologies will be employed in rural development programmes both in planning and implementing stages.