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## BANGLADESH FLOOD ACTION PLAN

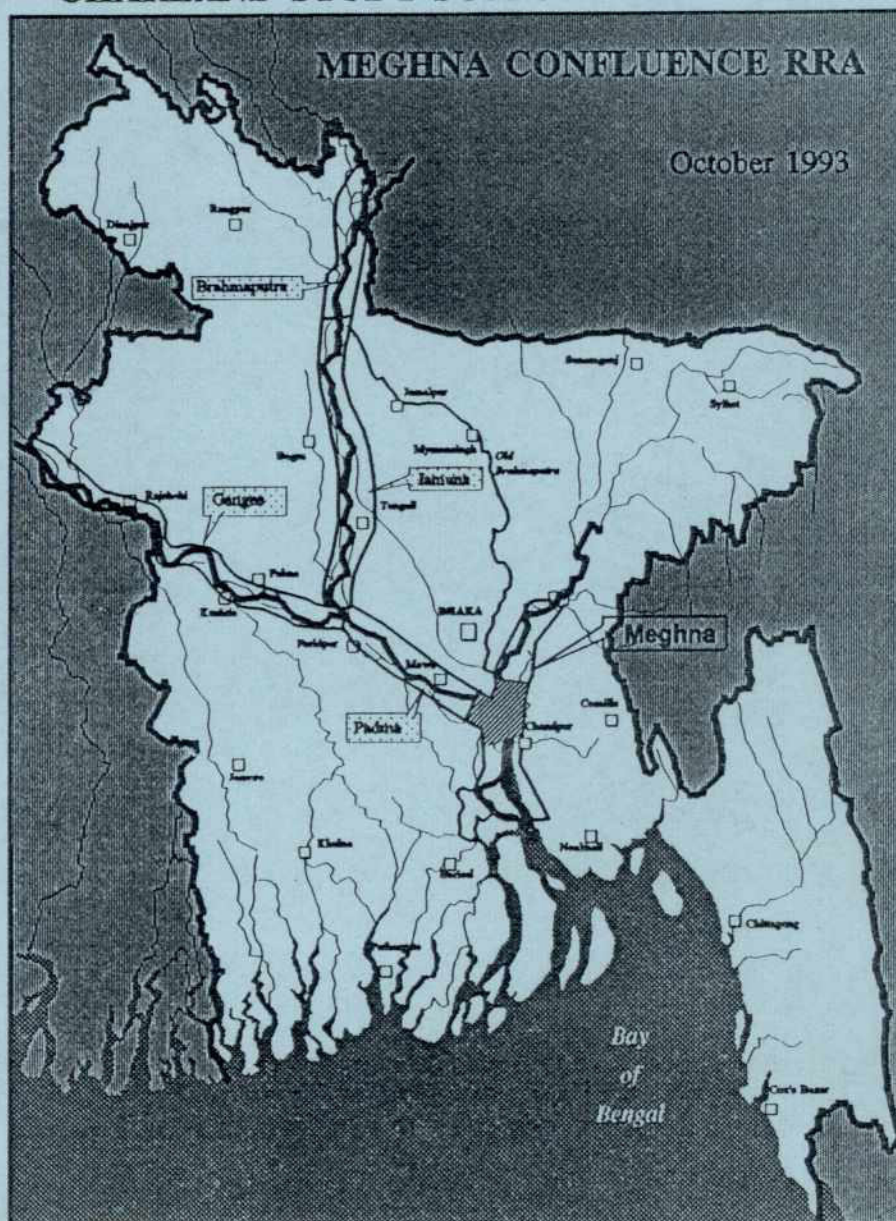
Prepared for  
The Flood Plan Coordination Organization (FPCO)  
of the  
Ministry of Irrigation Water Development and Flood Control



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### CHARLAND STUDY SUPPORTING REPORT



BN-437  
A-550

Environmental Study (FAP 16)  
Geographic Information System (FAP 19)



IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST  
Sponsored by the U.S. Agency for International Development

BANGLADESH FLOOD ACTION PLAN



**CHARLAND STUDY SUPPORTING REPORT:  
MEGHNA CONFLUENCE RRA**

**ENVIRONMENTAL STUDY (FAP 16)  
GEOGRAPHIC INFORMATION SYSTEM (FAP 19)**

Prepared for  
The Flood Plan Coordination Organization (FPCO)  
of the  
Ministry of Irrigation Water Development and Flood Control

October 1993



**IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST**  
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## PREFACE

This report is one in a series of reports covering the immediate riverine lands of the major rivers of Bangladesh—the Jamuna, Ganges, Padma, and Meghna. Riverine charlands are defined in this study as areas frequently subject to erosion and accretion within and adjacent to the main rivers of Bangladesh and unprotected by embankments. This report presents the results of a rapid rural appraisal designed to provide social and economic information to support the inventory of population and resources in the charlands of the Meghna confluence. The study was carried out by ISPAN under Flood Action Plan Supporting Studies FAP 16 (Environmental Study) and FAP 19 (Geographic Information System).

The full set of reports is shown in the table below.

Overview Reports	Inventory Reports	Supporting Reports
Summary Report		
Socioeconomic Overview		
	The Dynamic Physical and Human Environment of Riverine Charlands: Brahmaputra-Jamuna	Upper Jamuna (Brahmaputra) RRA Middle Jamuna RRA
	The Dynamic Physical and Human Environment of Riverine Charlands: Meghna	Upper Meghna RRA <i>Meghna Confluence RRA</i>
	The Dynamic Physical and Human Environment of Riverine Charlands: Padma	Padma RRA
	The Dynamic Physical and Human Environment of Riverine Charlands: Ganges	Ganges RRA
	Charland Flood Proofing	

## ACKNOWLEDGEMENTS

The production of this report, the result of a team effort involving many of the staff of FAP 16, was overseen by Dr. Keith Pitman, Chief of Party, ISPAN.

The study was jointly coordinated by Dr. Mustafa Alam and Dr. Suzanne Hanchett. It involved very intensive fieldwork under rather difficult circumstances, and those who performed this work are gratefully acknowledged. The contents of the report are based primarily on information obtained from people living in the charlands, all of whom were extremely helpful in patiently providing the necessary information. Interviews were also held with government officials and NGO field workers. The cooperation of all these participants is also gratefully acknowledged.

We are grateful to the Flood Plan Coordination Organization and to its Panel of Experts for providing overall direction to this study.



## GLOSSARY

acre	-	Acre = 0.4047 ha
aman	-	Late monsoon season paddy planted before or during the monsoon and harvested November-December
amin	-	Land surveyor
arat	-	Wholesale shop
aratdar	-	Wholesale trader with warehouse
aus	-	Early monsoon paddy planted in March-April and harvested in June-July
B. aman	-	Broadcast aman paddy, usually grown in deeper water
bangsha	-	Lineage-mates
BARC	-	Bangladesh Agricultural Research Council
bari	-	A homestead, usually consisting of more than one structure arranged around a central common area
BBS	-	Bangladesh Bureau of Statistics
BDR	-	Bangladesh Rifles
beel	-	An area of open water away from a river
bhatiya	-	People from downstream
BIDS	-	Bangladesh Institute of Development Studies
bigha	-	A local unit of area most commonly equalling 0.33 acre or 0.14 ha
bir	-	Stable
boro	-	Dry season paddy transplanted in December-January and harvested in April-May
BRAC	-	Bangladesh Rural Advancement Committee
BTM	-	Bangladesh Transverse Mercator (map projection)
BUET	-	Bangladesh University of Engineering and Technology
bustee	-	Slum
BWDB	-	Bangladesh Water Development Board
catkin grass	-	<i>Saccharum</i> spp. grasses that are prevalent in the charlands
chaura	-	Original settlers in the Ganges char areas
china	-	<i>Panicum miliaceum</i> , a variety of millet
chowki	-	Bed/platform
cumecs	-	Cubic meters per second
dacoit	-	Bandit
dal	-	Any of a variety of pulses (lentils); a high-protein food staple usually eaten with rice
decimal	-	Unit of area equal to 0.01 acre
denga	-	Land near a river
desh	-	State
deshi	-	Original settlers in Ganges char area
DEM	-	Digital elevation model
dhaincha	-	<i>Sesbania aculeata</i> , a nitrogen-fixing plant used as live fencing, fuel, and building material
diara	-	The low bank of a river
district	-	A large administration unit under the authority of a Deputy Commissioner, now known as a zila
doba	-	Submerged
EIA	-	Environmental Impact Assessment
FAP	-	Flood Action Plan

FCD/I	-	Flood Control and Drainage or Flood Control, Drainage, and Irrigation
<i>fitkiri</i>	-	Alum
FPCO	-	Flood Plan Co-ordination Organization
FWC	-	Family Welfare Centre
GIS	-	Geographic Information System
GPS	-	Global Positioning System
<i>goala</i>	-	Person trading in dairy products
<i>gur</i>	-	Locally produced molasses
<i>gushti</i>	-	Lineage-mates
<i>haor</i>	-	Deeply flooded basin of NE Bangladesh
<i>hat</i>	-	Periodic market
hectare (ha)	-	Hectare = 2.4711 acres
<i>hogla</i>	-	A bulrush ( <i>Typhus angustata</i> ) used for making mats
HSC	-	Higher Secondary Certificate
HTW	-	Hand tubewell
HYV	-	High Yielding Variety
ISPAN	-	Irrigation Support Project for Asia and the Near East
<i>jangal</i>	-	Ground cover shrubs used for fuel and as herbs
<i>jhau</i>	-	Tamarisk bush used as fuel and an herb
<i>jotedar</i>	-	Landlord
JPPS	-	Jamalpur Priority Project Study
<i>kabiraj</i>	-	Traditional healer
<i>kaisha</i>	-	A variety of catkin grass ( <i>Saccharum spontaneum</i> ) giving three cuttings a year
kani	-	Local unit of measure equal to .13 ha (.33 acres)
<i>karati</i>	-	Saw operator
<i>kash</i>	-	<i>kaisha</i>
<i>kayem, kayemi</i>	-	Permanent, old, or established
<i>kaon</i>	-	Fox-tail millet
<i>khas</i>	-	Publicly owned
<i>kheya</i>	-	Local boat landing point
<i>khal</i>	-	A drainage channel or canal either natural or man-made
<i>kharif</i>	-	Summer/wet season
kilogram (kg)	-	Kilogram = 1.11 sheer
kilometer (km)	-	Kilometer = 0.625 miles
<i>kutch</i>	-	Flimsy construction of a temporary nature, in the chars usually of grass, bamboo, straw, or similar materials
<i>lathiyal</i>	-	A stick-wielding private army employed to carry out the will of a locally powerful leader
<i>macha</i>	-	A raised platform
<i>mashkalai</i>	-	A type of pulse (lentil); see <i>dal</i>
<i>matbar</i>	-	Leader of the local community
maund	-	A unit of weight, 1 Maund = 40 sheer = 37.5 kilograms
mauza	-	A village revenue collection and cadastral mapped unit
MCSP	-	Multipurpose Cyclone Shelter Program
mile (mi)	-	Mile = 1.6 kilometers
MPO	-	Master Plan Organization (of Ministry of Irrigation Water Development and Flood Control), now called WARPO (see below)
MSS	-	Multi-Spectral Scanner (Landsat satellite sensor)





<i>musur</i>	-	A type of pulse (lentil); see <i>dal</i>
<i>nara</i>	-	Straw
NGO	-	Non-Government Organization
PACT	-	Private Agencies Collaborating Together
<i>paiker</i>	-	Wholesale trader
<i>para</i>	-	Neighborhood
PoE	-	Panel of Experts (of FPCO)
<i>pourashava</i>	-	a municipality, usually the urban center of a district
<i>pucca</i>	-	Sturdy construction of a permanent nature, usually of such materials as brick, concrete, or corrugated iron sheets
<i>rabi</i>	-	Winter/Dry Season
RDRS	-	Rangpur Dinajpur Rural Service (an NGO)
REIS	-	Riverbank Erosion Impact Study
return period	-	average interval in years between floods of a given magnitude
RRA	-	Rapid rural appraisal
<i>sadar</i>	-	The urban core (administrative headquarters town) of a thana or district
<i>salish</i>	-	local informal court
<i>samaj</i>	-	Society, community; a formal arrangement between members of a community whereby each member has certain rights and privileges
<i>sarik</i>	-	Lineage-mates
SCI	-	Service Civil International (an NGO)
<i>shabuk</i>	-	Ancient
<i>sheer</i>	-	A unit of weight = 1/40 maund = 0.94 kg
<i>shon</i>	-	A variety of grass ( <i>Imperata cylindrica</i> ) giving one cutting a year; also a generic term for thatching grass
SPARRSO	-	Space Research and Remote Sensing Organization
SPOT	-	System Pour Observation de la Terre
SRDI	-	Soil Resources Development Institute
SSC	-	Secondary School Certificate
<i>tahsil</i> office	-	Local land record and survey office
Taka (Tk.)	-	Bangladesh currency, US\$ 1 equalled approximately Tk. 40 in late 1992-early 1993
T. aman	-	Transplanted aman paddy
thana	-	A sub-division of a zila, or district
<i>til</i>	-	Sesame ( <i>Sesamum indicum</i> )
<i>tishi</i>	-	Linseed
TM	-	Thematic Mapper
ton	-	An imperial ton = 1,016 kg
union	-	Sub-division of a thana
upazila	-	Previous name for a thana (subdivision of a zila or district)
<i>ustha</i>	-	Bitter gourd ( <i>Momardica charantia</i> )
<i>uthuli</i>	-	An informal contract between a landholder and a temporary migrant, under which the migrant is allowed to shelter on the landowner's property in exchange for labor services
WARPO	-	Water Resources Planning Organization
<i>zamindar</i>	-	Landlord
zila	-	A large administration unit formerly known as a district

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## EXECUTIVE SUMMARY

The chars and mainland adjacent to the main rivers are prone to the twin hazards of floods and erosion, which destroy crops, homesteads, and land, and bring death and suffering to their inhabitants. This rapid rural appraisal (RRA) investigated social and economic conditions in an area of island and attached chars and nearby unprotected mainland at the confluence of the Meghna and Padma rivers.

The study found that frequent erosion and accretion of the char complex in the region created a high level of insecurity for the people living there. Not only were they subject to the loss of land and livelihood through erosion but they also suffered from a lack of infrastructure and public facilities.

In this extremely dynamic river reach, land erodes and reaccumulates very quickly compared to the other areas covered by the charland study. This creates the potential for frequent serious conflicts over land ownership as those who are once displaced try to hold onto their land against the forces of those who would seize the land through the use of influence or force.

As in all the other charlands studied, agriculture is the principle means of livelihood in the Meghna confluence, but the proximity of major fishing grounds make this study area a particularly important fishing center. As a result, commercial fishing is a major occupation in the area, and vast numbers of people are able to take advantage of the fisheries resource on a subsistence level. Unfortunately, the generally meager financial resources of a majority of households make optimum use of the fisheries impossible for most people.

Cattle rearing, while it does exist in the charlands of the Meghna confluence, may perhaps be somewhat more risky than in other areas because of the swiftly changing landscape of the chars in this area. Nonetheless, it provides a secondary source of income for many households.

Lack of personal transportation and unreliable public transportation, particularly for those living in the island chars, leaves many people cut off from essential services. Especially since the charlands themselves are poorly equipped with schools, medical facilities, and markets that might help people improve their ability to cope with their circumstances.

Among the recommendations made in the report are the following priorities for action:

- The construction of more educational institutions in proximity to charland settlements.
- Agricultural extension services that supply improved quality of seeds for crops appropriate to charland circumstances (local boro, peanut, and chili).
- Easier access to capital for cattle raising.
- Improved access to fisheries for the poor and capital to help fishermen purchase fishing gear.
- Installation of more tubewells, raising existing tubewells above flood level.
- Extension services to help people understand the necessity for purifying water and provide them with the means to do so.
- Institutionalized provision of transportation assistance when erosion or flooding forces people to relocate. Resettlement programs to help displaced people relocate and find jobs while they await re-emergence of their land.
- Land rights and the keeping of land ownership records need to be improved and streamlined.
- More effective flood warning.
- The construction of flood shelters where people and their animals can take refuge during floods.
- The provision of post-flood rehabilitation assistance that helps to repair or rebuild houses and supplies agricultural inputs.

## Chapter 1

### INTRODUCTION

#### 1.1 Background to the Study

##### 1.1.1 History

The original design of the Flood Action Plan (World Bank, 1989) included among its components a socioeconomic study of the active floodplains of the Brahmaputra-Jamuna, Ganges, Padma, and Meghna rivers. The active floodplain was defined at that time as areas within the main river channels and nearby areas of mainland, both of which are frequently subject to erosion and accretion and cannot be protected from floods. The aims of the active floodplain study were to:

- assess present agricultural practices, settlement patterns, and disaster responses;
- estimate the number of affected households living on chars (mid-channel islands created by accretion) and within a short distance of the river banks;
- estimate the number of households living on existing embankments; and
- prepare guidelines to be used in feasibility studies to ensure that in project planning full account is taken of the active floodplain populations.

As the detailed terms of reference (TOR) of FAP 14, the Flood Response Study, were being drawn up by the government of Bangladesh and finalized with donor agencies, it became apparent that the intended study would not immediately be possible. A more general study first needed to establish—for the full range of flood environments inside and outside the chars—the context in which flood response occurred. In addition, the active flood-

plain study required the use of remote sensing data and satellite image interpretation, but the facilities and trained staff to achieve this within the FAP would not be ready until at least late 1991.

During 1991, the first full year of FAP studies, it became clear that regional studies were unable to devote sufficient resources to the specialized work of socioeconomic study of the active floodplain. Most used the main rivers as their study area boundaries. Of the regional FAP studies only FAP 3.1, the Jamalpur Priority Project, attempted detailed socioeconomic studies in the chars, investigating those along the reach of the Jamuna adjacent to the project in 1992 (see Section 1.1.4). In addition, FAP 14, the Flood Response Study, carried out socioeconomic surveys in 10 active floodplain villages.

Finally, in 1992 on advice from the Flood Plan Coordination Organization (FPCO) ISPAN agreed to undertake an inventory of resources and people in the main river charlands. This study, then, fulfills the need—foreseen in the Government of Bangladesh/World Bank Flood Action Plan of 1989—for a socioeconomic study of the people and resources of the active floodplain. Although it does not consider in detail the populations living long-term on embankments along the main rivers, analysis of erosion and accretion patterns has been added.

The inhabitants of the charlands are among the most hazard-prone people of Bangladesh, exposed as they are to floods and erosion. Structural flood protection measures are unlikely to benefit these people, and embankments may even raise flood



levels within the charlands, increasing the risks to which they are exposed. Reliable information about these areas and the people who live in them has always been scarce. The difficulty of gaining access to chars and their constantly changing environment has made studying them a complicated undertaking. As a result, prior to this study, what little information was available did not cover in any detail all the main river charlands.

### 1.1.2 The Charland Study

The Charland Study is a special study under the Bangladesh Flood Action Plan (FAP). It was jointly carried out by FAP 16, the Environmental Study, and FAP 19, the Geographic Information System (GIS), both of which are undertaken by the Irrigation Support Project for Asia and the Near East (ISPAN) and funded by USAID.

This study has two objectives. The first is to develop databases and a geographic information system (GIS) that can be used as planning tools both for direct interventions in the charlands and for other interventions (such as embankments) that may affect the char areas. The second objective is to use the data collected, along with additional socioeconomic studies, to make general policy recommendations for the charlands and to test and develop means of rationally assessing the potential benefits of flood proofing measures in these areas.

The objectives have been addressed with five tasks.

- Making an inventory of resources, people, and infrastructures in the Brahmaputra-Jamuna, Meghna, Padma, and Ganges charlands and collecting additional information on hazards (led by FAP 16).
- Using digital satellite images to analyze physical changes and land use in these areas, and integrating this analysis with inventory data using a GIS (FAP 19).
- Conducting supplementary socioeconomic studies using rapid rural appraisal (RRA) methods in six river reaches (building on the Flood Response Study, FAP 14).

- Conducting detailed studies of flood losses and flood proofing potential in two areas along the Jamuna River (building on the Flood Proofing Study, FAP 23).
- Integrating the results of the above tasks into a comprehensive report.

This is a report of the findings for one of the six rapid rural appraisal (RRA) study areas—the confluence of the Meghna and Padma rivers. Figure 1.1 shows the charland study areas.

## 1.2 Methods

### 1.2.1 RRAs

RRA methods are essentially non-quantitative, and involve direct observation and collecting qualitative information from a range of key informants or small groups in representative villages in the study area. The method is systematic in the sense that standard checklists form the basis of the information gathering (see Charland Methodology Report), and in the way in which information is cross-checked and verified from a range of informants and sources. Locational biases are avoided by visiting both remote and more accessible areas, and socioeconomic biases are avoided by including coverage of groups such as women and the landless whose opinions might otherwise not be heard. In this way reliable information can be built up by an experienced team of specialists covering a range of disciplines based on an iterative process of questioning and expert judgement.

Additionally, RRAs in the Charland Study have the advantage of access to some quantified data from the inventory and GIS for all the mauzas (revenue villages) within the study reach, and this is integrated where appropriate into the RRA report.

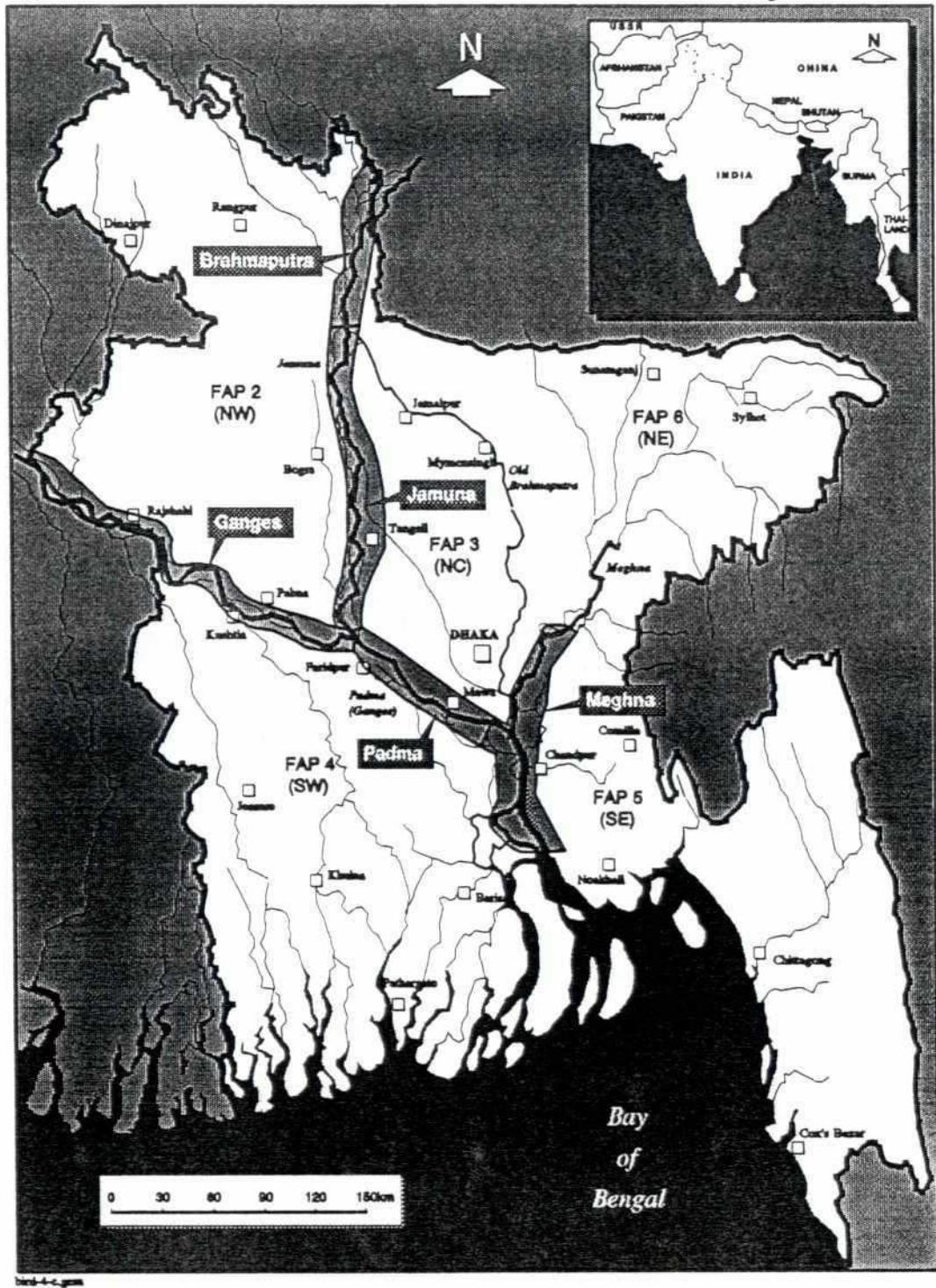
### 1.2.2 Work Schedule

The RRA team included specialists in: geography, economics, social anthropology, and fisheries. Fieldwork took place in April 1993 and was based



Figure 1.1

# Charland Study Location



in Banglabazar village. The primary sources of information were key informants; for example, knowledgeable farmers, members and ex-members of union parishads, schoolteachers, fishermen, traders, landless people, and women living in charland villages. Access was by boat, so it was not possible to walk transects through the area.

The RRA team selected a group of focus mauzas in each study area and covering a range of environments. The selection was aided by a SPOT image map of the area. Each RRA covered both old and new island chars, attached chars, and

between villages could be investigated and more general information could be cross-checked between different groups of informants within a mauza.

### 1.3 Description of the Study Region

The study region and location of the RRA study mauzas are shown in Figures 1.3 and 1.4, respectively. The charlands at the confluence of the Meghna and Padma are subjected to frequent, cyclical patterns of erosion and accretion. During

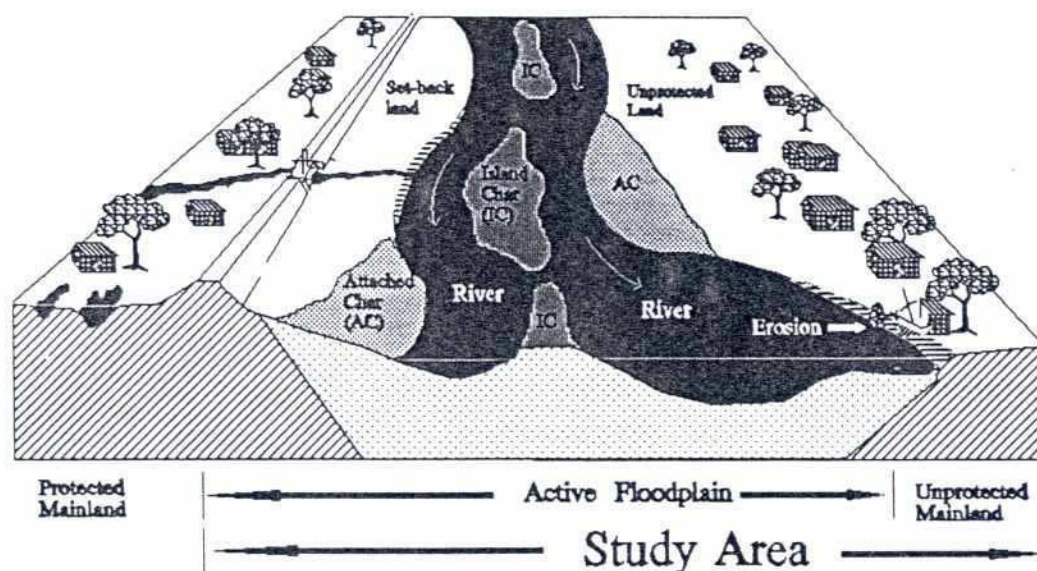


Figure 1.2 Charland Classification.

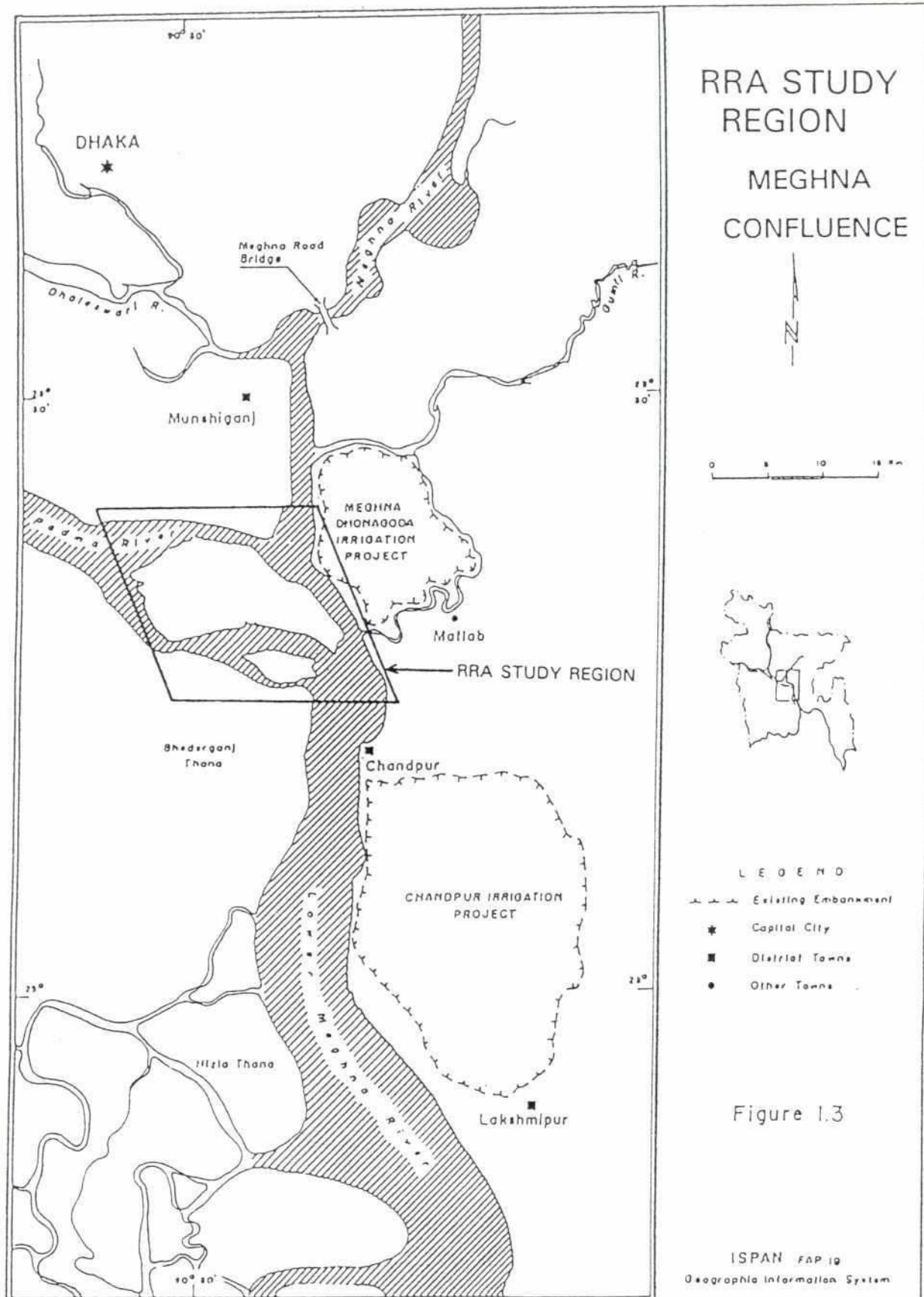
some unprotected mainland. These char types are illustrated in Figure 1.2.

Most of the mauzas visited contain a number of villages (*grams*) or neighborhoods (*paras*). Once in the mauza, the RRA team split up. Each individual team member then collected information on his or her subject area. The information gathered, while for the entire mauza when possible, concentrated on the experiences of the inhabitants of a particular village. Hence the discussions and tables refer to villages/neighborhoods or mauzas as appropriate. In this way important differences

heavy monsoon, huge volumes of water pass through the region, and water-borne sand and silt quickly form chars. The predominantly sandy or sandy loam soil of these lands also is frequently eroded, particularly just following the monsoon.

Because of the seasonal fluctuations in these chars, their social and economic conditions are generally unstable. Charland dwellers in this area often have to move their homes and take up new occupations. It is quite common here to find landless farmers, day laborers, and fishermen who were once well-to-do peasants.







# LOCATION OF RRA STUDY MAUZAS MEGHNA CONFLUENCE

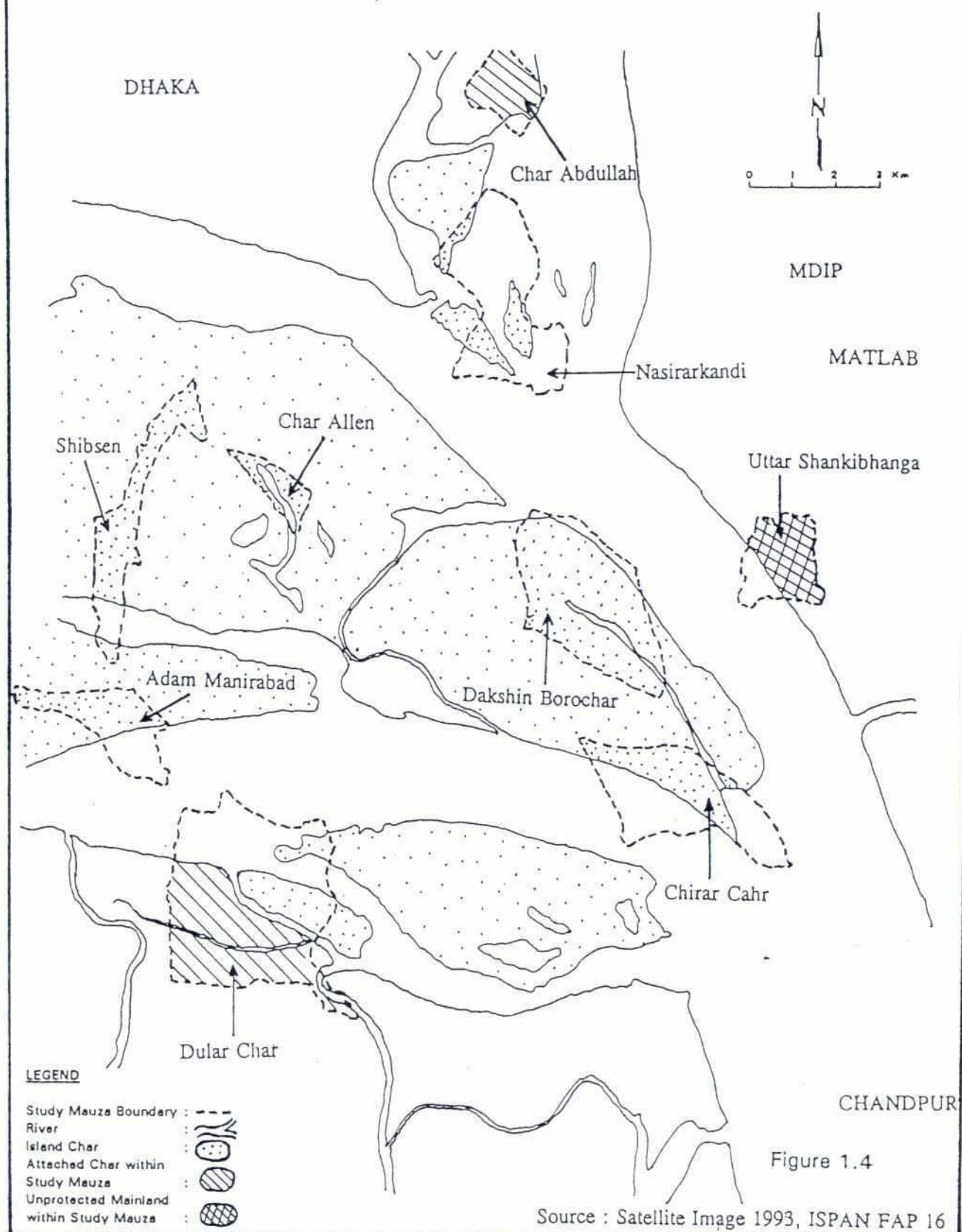


Figure 1.4

Source : Satellite Image 1993, ISPAN FAP 16

Table 1.1 General Description of RRA Mauzas

Mauza	Location	Char Type	Total Households
Adam Manirabad	Union: Gharishar Thana: Naria Zila: Shariatpur	Island	25
Char Allen	Union: Kachikata Thana: Bhedarganj Zila: Shariatpur	Island	283
Chirar Char	Union: Raj Rajeshwar Thana: Chandpur Sadar Zila: Chandpur	Island	290
Dakhsin Borochar	Union: Ekhlaspur Thana: Matlab Zila: Chandpur	Island	450
Nasirarkandi	Union: Mohonpur Thana: Matlab Zila: Chandpur	Island	370
Shibsen	Union: Kachikata Thana: Bhedarganj Zila: Shariatpur	Island	100
Char Abdullah	Union: Adhara Thana: Munshiganj Sadar Zila: Munshiganj	Attached	220
Dular Char	Union: Kachikata Thana: Bhedarganj Zila: Shariatpur	Attached	600
Uttar Shankibhanga	Union: Jahirabad Thana: Matlab Zila: Chandpur	Unprotected Mainland	350

Source: Charland RRA

Table 1.2 Physical Description of the Study Region

Land Category	Island Char	Attached Char	Unprotected Mainland	Total
Water (%)	42	28	24	34
Sand (%)	7	3	1	4
Vegetated/cultivated (%)	51	69	75	62
Area (ha)	22,810	17,887	5,865	46,561
Percentage of Total Area	49	38	13	100

Source: Charland Inventory

Table 1.3 Area and Population of the Study Region

	Island Char	Attached Char	Unprotected Mainland	Total
Area (km <sup>2</sup> )	228	179	59	466
1981 Population	55,081	103,242	78,445	236,768
1993 Est. Population	126,792	126,700	124,184	377,676
1993 Est. Households	10,220	22,606	16,025	48,851
1981 Population Density (per km <sup>2</sup> )	281	577	1,337	509
1993 Est. Population Density (per km <sup>2</sup> )	556	708	2,117	811
Estimated Percentage Population Change, 1981-93	+130	+23	+58	+60

Sources: 1981 Census, Bangladesh Bureau of Statistics; Charland Inventory

Table 1.4 Char Age and History of Char Development in the Study Region

Attribute	Island Char							Attached Char						
	Percentage of Mauzas							Percentage of Mauzas						
	Mauzas Reporting (Total=55)	1-3 yrs	4-10 yrs	11-20 yrs	21-30 yrs	>30 yrs		Mauzas Reporting (Total=46)	1-3 yrs	4-10 yrs	11-20 yrs	21-30 yrs	>30 yrs	
Char Formation	47	34	36	9	11	11		39	0	8	28	3	62	
Natural Vegetation	44	36	23	9	11	20		20	10	5	60	5	20	
Crop Cultivation	37	49	16	5	8	22		20	10	10	55	5	20	
Settlement	41	54	5	12	5	24		19	11	32	26	11	21	

Source: Charland Inventory



#### 1.4 Description of Mauzas Visited

The RRA in this location covered nine mauzas. Tables 1.1 through 1.4 contain general data describing the study region. The RRA mauzas were dispersed over an area of approximately 465 km<sup>2</sup>, about 90 percent of which was charland. Population in the area has increased over time (Table 1.3), the increase being most prominent for island chars (130 percent from 1981 to 1993). Of the six island chars covered by the RRA, three, Adam Manirabad, Char Allen, and Shibsen, were resettled during the past four to 10 months after having previously eroded. One island char, Nasirarkandi, is more than 30 years old, but has been undergoing severe erosion for a number of years. The other two island chars, Chirar Char and Dakhsin Borochar, are about 20 years old. Chirar Char has also been eroding over the last few years. The nature and extent of the erosion (and accretion) in the study mauzas will be discussed in more detail in Chapter 3.



## Chapter 2

### SOCIOECONOMIC ORGANIZATION

#### 2.1 Settlement Patterns and House Types

In the disaster-prone island chars, joint families are quite common and there is strong interdependence between and among families. Although such joint families are not uncommon in the attached chars, there are proportionately fewer of them than on island chars, and their interdependence is less pronounced. Similarly, the island chars tended to have larger *samajes* than the attached chars, which may also be indicative of their greater need for interdependence. In attached char mauzas there

were typically four or five *samajes* serving 250 or so households, while in island char mauzas only one or two *samajes* would serve a similar number. In general, therefore, there is a greater sense of comity among the people living in island chars. Table 2.1 presents data on the number of *samajes* in the study mauzas as well as on the availability of certain public facilities.

Table 2.2, which contains data on housing construction in the chars, shows that in island char areas houses constructed entirely of straw and

Table 2.1 Social Organization and Facilities

Mauza	No. of <i>Samajes</i>	No. of Mosques	No. of Clubs/ Community Centers	Post Office Facility (distance in km)
Adam Manirabad	1	A prayer room donated by <i>matabar</i>	-	Gharishar (11)
Char Allen	1	1	-	Postal facilities through a market shop (8 km away) owned by the <i>samaj</i> leader
Chirar Char	3	1	-	Raj Rajeshwar (8)
Dakhsin Borochar	4	3	-	Ekhlaspur (7)
Nasirarkandi	1	1	-	Mohonpur (3)
Shibsen	1	A prayer room in <i>matabar's</i> house	-	Kachikata (8)
Char Abdullah	5	3	3	Chitulia (3)
Dular Char	7	4	2	In the mauza
Uttar Shankibhanga	1	1	3	In the mauza

Source: Charland RRA

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Table 2.2 House Construction in RRA Mauzas

Mauza (Char Type)	Settlement Pattern	Percentage by Type			Cost by Type (Tk.)		
		All Straw/ catkin	CI* Roof, Bamboo Walls	All CI	All Straw/ catkin	CI Roof, Bamboo Walls	All CI
Adam Manirabad (Island)	Linear	80	20	-	1,100	5,500	-
Char Allen (Island)	Linear	67	24	9	1,150	5,500	35,000
Chirar Char (Island)	Cluster	53	33	14	1,150	6,000	27,000
Dakhsin Borochar (Island)	Discontinuous linear	75	22	3	1,300	6,500	27,000
Nasirarkandi (Island)	Linear	90	8	2	1,200	5,500	25,000
Shibsen (Island)	Discontinuous linear	30	65	5	1,550	7,000	30,000
Char Abdullah (Attached)	Linear	20	42	38	1,600	9,000	45,000
Dular Char (Attached)	Cluster	24	40	36	1,750	7,500	40,000
Uttar Shankibhanga (Unprotected mainland)	Cluster	5	25	70	2,000	16,000	50,000

Source: Charland RRA

\*Corrugated iron

catkin predominated, and the highest percentage of such houses was found in Nasirarkandi. The exception is Shibsen, where the settlers are relatively well off and live under economic conditions similar to those of attached char dwellers. In attached chars, houses with CI roofs and bamboo walls were most common, and in the lone mainland area, Uttar Shankibhanga, all-CI houses were the norm.

The height and life spans of char houses depend upon their construction. Houses built entirely of straw and catkin average about four feet in height and they are generally rebuilt annually. Houses with CI sheet roofs and bamboo walls average five to five and a half feet in height. The bamboo pillars and walls of these houses are generally

replaced every one or two years. Houses with CI sheet walls and roofs average six and a half to seven feet high, and when bamboo pillars are used, they are replaced every two or three years.

Timber trees are in short supply in most of the chars visited by the RRA. Only in Uttar Shankibhanga was there a plentiful supply of both timber and fruit trees. In the island chars, residents said that flood waters, which frequently inundate their homesteads, prohibited the planting timber trees. Some residents of attached chars, however, said that if they were supplied with such trees they would plant them.

During floods villagers reported that they take measures to protect their house plinths, usually by



erecting bamboo fences—draped with catkin, wild shrubs, or other vegetation—around the homestead. Such protection, the villagers reported, generally costs an average of about Tk.300, although the price of protection varies depending upon the size of the homestead.

## 2.2 Occupations and Income Sources

Table 2.3 presents seasonal occupational data for the people living in the study mauzas. As the table indicates, agriculture is the primary occupation of most people in the study mauzas, followed by fishing and day labor.

The dividing lines between occupations are not always clear. Some people, the survey found, work their own land for part of the day and work as agricultural day laborers for the rest of the

time. In addition, the Meghna being a major fishing grounds, many people who are farmers or laborers for part of the day may fill the rest of their day by fishing. In many cases, those who do agricultural work by day engage in fishing at night.

Fishing was found to be a particularly important occupation in the island chars. In Nasirarkandi, as many as 80 percent of the households were primarily fishing during the wet season. While fishing was still practiced among those living in attached chars and on unprotected mainland, farming was the most important occupation in those areas.

Most people (including landowning households) in the surveyed mauzas work as day laborers at least part of the time. Only those in a few rich families were exempted from having to do such work. Table 2.4 shows the main day laboring jobs by season.

Table 2.3 Primary Seasonal Occupations of Households (percent)

Mauza	Dry Season				Wet Season			
	Agriculture	Fishing	Day Labor	Other	Agriculture	Fishing	Day Labor	Other
Adam Manirabad	50	35	10	5	45	45	5	5
Char Allen	20	40	30	10	20	50	20	10
Chirar Char	50	25	20	5	45	35	15	5
Dakhsin Borochar	45	25	25	5	40	40	15	5
Nasirarkandi	10	40	45	5	10	80	5	5
Shibsen	35	40	25	-	35	45	20	-
Char Abdullah	60	15	15	10	55	25	10	10
Dular Char	50	25	15	10	45	35	10	10
Uttar Shanki-bhanga	50	-	25	25	50	5	20	25
Island Char	32	33	30	5	30	51	14	5
Attached Char	53	22	15	10	48	32	10	10
Unprotected Mainland	50	-	25	25	50	5	20	25

Source: Charland RRA

Table 2.4 Main Work of Day Laborer by Season

Dry Season	Wet Season
a) Agricultural Work	
Weeding	Jute Harvesting
Aus/aman/jute cultivation	Aus Harvesting
Aman/rabi crop harvesting	
Boro cultivation/harvesting	
HYV boro cultivation/harvesting	
b) Non-agricultural Work	
Working in brick field	Porter
Earth cutting	Rickshaw/van pulling
Construction/road repair	Maid servant
Porter	Boat operation
Rickshaw pulling	Selling catkin/straw ( <i>kash</i> )

Source: Charland RRA

The usual work hours and wages for agricultural day laborers were found to vary considerably from mauza to mauza, as Table 2.5 indicates.

Day laboring women, often employed to harvest rabi crops, were reported in the mauzas of Shib-

sen, Adam Manirabad, Char Allen, Uttar Shankibhanga, and Dular Char. Women also reportedly do earth work related to construction and repair of roads and embankments.

## 2.3 Education

The educational facilities and the literacy rates in the study mauzas are detailed in Table 2.6. As the table shows, there are primary schools in five of the nine mauzas, and high schools in two of them (Uttar Shankibhanga and Dular Char). In order to attend school, many students would have to travel long distances or live away from their chars. For most households, this makes educating their children impossible. Those who can do so may send their children to live in relatives' houses that are closer to a school. The newly inhabited chars in the survey area have no schools, and children in these places go to *maktabs*, where they study Arabic and some Bengali. Although char parents are often eager to give their children an

Table 2.5 Work Hours and Wages of Agricultural Day Laborers

Mauza	Usual Work Hours	Total Hours	Wages (Tk./day)	Meals/day
Adam Manirabad	0800-1300	5	25-30	0
Char Allen	0700-1300	6	25	1
Chirar Char	0800-1300	5	25	0
Dakhsin Borochar	0800-1300	5	30	0
	1400-1800	4	15	
Nasirarkandi	0800-1300	5	25	0
Shibsen	0800-1400	6	20-25	1
Char Abdullah	0800-1400	6	25	1
Dular Char	0700-1400	7	25	1
Uttar Shankibhanga	0800-1300	5	25	0

Source: Charland RRA

Table 2.6 Educational Facilities and Literacy Rate

Mauza	Literacy Rate (%)	No. of Schools in Mauza		No. of Students Travelling Out of Their Mauzas		
		Primary	High	Primary	High	College
Adam Manirabad	2	-	-	-	1	-
Char Allen	3	-	-	-	2	-
Chirar Char	5	-	-	5	3	-
Dakhsin Borochar	25	1	-	-	175	-
Nasirarkandi	12	1	-	-	17	-
Shibsen	10	-	-	4	2	-
Char Abdullah	13	1	-	-	7	2
Dular Char	12	3	1	-	-	10
Uttar Shankibhanga	25	2	1	-	40	18

Source: Charland RRA

education, frequently they are unable to do so because of the difficulty of access. Therefore, most char children are illiterate.





## Chapter 3

### CHANGES IN LAND AND SETTLEMENT

#### 3.1 The Effects of Erosion

The nine mauzas studied by the RRA experienced their most recent major erosion at widely varying times in the past (Table 3.1). Thus, while the last major erosion in one mauza occurred in the early 1960s, in another it occurred in the mid-1970s,

and in two others it occurred in the mid-1980s. In Char Allen, erosion has taken place intermittently over a fairly long period, usually with a couple of years between each occurrence.

Three of the study mauzas were experiencing erosion at the time of fieldwork for this study.

**Table 3.1 Erosion Impacts on Land, Houses, and Infrastructure**

Mauza	Major Erosion Years	% Mauza Land Eroded	Households Prior to Erosion	Households Moving due to Erosion	Infrastructure Affected (Roads & Schools)
Adam Manirabad	1988	100	300	300	No roads; one school moved
Char Allen	1970, then every couple of years	85	400	400	No roads; no schools
Chirar Char	1988 onwards	60	500	200	Some earthen roads damaged; no schools
Dakhsin Borochar	Mid-1970s	100	600	600	Some earthen roads damaged; one school moved
Nasirarkandi	1988 onwards	80	650	500	Some earthen roads damaged; one school moved
Shibsen	1984 to 1987	100	400	400	No roads; no schools
Char Abdullah	Early 1960s	90	100	100	No roads; no schools
Dular Char	1989 onwards	35	600	200 households moved to safer land in the same mauza	No roads; one school moved
Uttar Shankibhanga	1983 to 1988	25	--	Very few households affected	No effect on roads or schools

Source: Charland RRA

Among the other mauzas, which reported that the last major erosion event had come to an end, all except the unprotected mainland mauza of Uttar Shankibhanga were severely affected by the erosion. As the data in Table 3.1 show, 85 to 100 percent of the land in these mauzas was lost during those erosion events. The magnitude of the erosion resulted in extensive emigration from the charlands. Since the study mauzas had very little physical infrastructure even before the erosion, the damage to physical infrastructure is largely insignificant. In a number of cases, however, some earthen roads were washed away, and in some mauzas school buildings threatened by erosion were dismantled and moved to safer ground.

Those households who migrated out of the eroding chars generally went to mainland areas or more stable island and attached chars, as shown in Table 3.2. Some of the migrants were fortunate to have owned land in the place where they resettled. Others moved to areas where they could find jobs as agricultural day laborers or sharecroppers or took up petty trading. In many cases, the migrants sought help from relatives living in more secure places. The migrants reportedly sometimes found it difficult to arrange the boats needed to transport themselves and their household assets to safety, and RRA respondents expressed a need for transportation assistance from the Union Parishad or some other government agency.

Table 3.2 Years of Migration, Destinations, and Reasons for Choosing Destinations

Mauza	Year(s) of Migration	Destinations	Reason for Destination Choice
Adam Manirabad	1988	Mainland unions to the south; Kachikata & Char Bagha	Near relatives, sharecropping and day labor opportunities
Char Allen	1970	Mainland to the north (Dighirpar) and south (Char Bagha) and stable chars (Char Atra & Noapara) in Naria Thana	Sharecropping, day labor, and fishing
Chirar Char	1988 onwards	Balashia mauza in Raj Rajeshwar union, Chandpur Thana	Own land, near relatives
Dakhsin Borochar	Mid-1970s	Mainland to the east in Ekhlaspur union, Matlab Thana	Sharecropping, agricultural day labor, and petty trade
Nasirarkandi	1988 onwards	Mainland Matlab (Ekhlaspur), mainland Munshiganj (Kalir Char), and attached chars in Munshiganj	Petty trade, sharecropping, and day labor
Shibsen	1984 to 1987	Mainland to the south (Sureshwar, Haimchar) and relatively stable island char of Mathabhanga	Sharecropping, day labor, and fishing
Char Abdullah	Early 1960s	Attached chars and mainland to the west in Munshiganj	Near relatives, own land, sharecropping and day labor opportunities
Dular Char	1989 onwards	--	Own land, sharecropping and day labor opportunities
Uttar Shankibhanga	No migration	--	--

Source: Charland RRA



### 3.2 Accretion of Land, Initiation of Cultivation, and Settlement

All the mauzas surveyed, with the exception of the unprotected mainland mauza of Uttar Shankibhanga, reported that the last major erosion event had come to an end and that they have subsequently experienced accretion. A comparison of the data in Tables 3.1 and 3.3 indicates that time gap between the end of erosion and onset of accretion has been relatively small. In one part of Dular Char, erosion and accretion were occurring seasonally every year; erosion commenced immediately after monsoon season and accretion followed in the relatively dry months. In three of the study mauzas, accretion started a couple of years after erosion. The largest time gap, reported in Dakhsin Borochar, was six years.

The RRA found that the chars in the study area become vegetated quite quickly after accretion and cultivation follows anywhere from one to three years after the accretion of land. The fact that land accretes relatively quickly after erosion and that, once accreted, it becomes cultivable reasonably fast, has encouraged erosion-affected people to stay close to their eroded land to be able to monitor its status.

### 3.3 Land Rights Issues

Land ownership in the chars, by virtue of the changing nature of the land, is fraught with difficulties. Under existing law, land that resurfaces after erosion becomes government (*khas*) land, but systematic enforcement of the law is reportedly almost completely non-existent. Without proper planning, organization, and manpower, the government is largely unable to implement its *khas* law and oversee equitable distribution of the land. In this vacuum, it is relatively easy for powerful local interests to seize control of newly accreted land. According to the RRA respondents, the government has conducted multiple land ownership surveys in the charlands, but has done little to clarify the rights to *khas* land control or ownership.

Three major trends regarding *khas* land emerged from the interviews conducted by the RRA team:

- people traditionally having possession of *khas* land have retained the ownership on the newly accreting land;
- community leaders have distributed newly accreting *khas* land among people of a mauza/village, but the distribution usually

Table 3.3 Accretion and the Beginning of Agricultural Activity

Mauza	Accretion Years	Percentage of Mauza Above Water in 1993	Current Agricultural Activity Started
Adam Manirabad	1990 onwards	60	1991
Char Allen	1989	95	1990
Chirar Char	Currently eroding	40	Early 1980s
Dakhsin Borochar	Early 1980s	95	Mid-1980s
Nasirarkandi	Currently eroding	20	1940s
Shibsen	1990	90	1991
Char Abdullah	Mid-1960s	70	Late 1960s
Dular Char	1986 onwards	65	Agriculture very old
Uttar Shankibhanga	Eroded from 1983 to 1988; no accretion since	75	Agriculture very old

Source: Charland RRA



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- is biased in favor of the local elite; when *khas* land ownership becomes too controversial, influential people try to formalize their rights to portions of it by leasing it from the local land revenue (*tahsil*) office through an arrangement known as DCR (Duplicate Carbon Receipt).

Although the government has a program to lease *khas* land to the landless, little evidence of it was reported in the study area. Where implementation has occurred, it was alleged that influential people (like *matbars* and large landowners) arrange applications from eligible candidates, but they themselves retain control of the lease.

Under the circumstances it is hardly surprising that conflicts over newly surfaced land have occurred, sometimes with violent consequences requiring the intervention of government law enforcement agencies. Such conflicts occur both on a small scale between individual landowners, on a medium scale between competing local leaders, and on a large scale where district boundaries are disputed. The people of Dakhsin Borochar, for example, reported that in 1983 a major conflict broke out in their area over the boundaries of Chandpur and Shariatpur districts, a dispute that resulted in a number of deaths.

Disputes are generally local in nature, however, and absentee land ownership, the fieldwork found, was relatively uncommon in the study area. One reason for this was the propensity for relatively well-off households to increase their properties in the mainland rather than in the chars. The few places where there has been significant absentee ownership, the land in question has mainly been cultivated through sharecropping arrangements.

In general, charland dwellers in possession of eroded land do not pay taxes on that property. The exceptions were people who had applied for government loans requiring that all taxes be paid up. A small number of people also were found to be paying taxes on eroded land in order to avoid drawing government attention to the erosion,

thereby retaining control of the land when (and if) it resurfaced. Many respondents expressed the opinion that the land tax rates for mainland property and char property should not be the same because their land is much less productive than that of the mainland.

## Chapter 4

### FLOOD EXPERIENCE

The flood of 1987 had a severe impact on the charlands of the Meghna confluence, and of the nine mauzas surveyed by the RRA, three—Char Allen, Adam Manirabad, and Shihsen—were completely eroded in that year. Only half of the people in these mauzas were able to move their houses and assets to safety, the rest either did not have time to move or lacked a boat to do so. The erosion also destroyed crops, stored food, and cattle. The displaced people sought temporary shelter on nearby mainland, on more stable older chars, and on embankments. They began returning to their land in 1992, and at the time of the RRA in April 1993, people were continuing to resettle the area.

During the 1988 flood, 100 percent of the land in the six remaining mauzas was underwater. As Table 4.1 indicates, homestead damage and destruction as a result of this flood was widespread.

A vast majority of those affected by the 1988 flooding took shelter on nearby high land, older chars, embankments, or in mainland areas. A few of those who left even managed to take their houses with them. Those who remained behind either built platforms (*machas*) inside their houses or lived on boats moored to their houses. In Chirar Char, some people reported cutting off the lower portion of the bamboo walls of their houses to let the strong currents of the flood pass through without completely destroying the structure.

To save their cattle, people pursued a variety of strategies. Some simply sold their cattle, others took their animals with them to the mainland, embankment, or other area where they sought

shelter. In a normal flood or even medium-high flood, the char people can generally save their cattle by raising them above the flood water with *machas* or piles of fodder for the animal to stand on. This was not possible in the 1988 flood. Large numbers of animals also died of diseases brought on by the flood.

Five of the study mauzas lost 20 percent or more of their cattle due to flooding. Because the people of Uttar Shankibhanga kept their cattle on the barrages, they were saved from the flood and disease.

Table 4.2 shows occurrences of crop damage in the study mauzas for the ten years prior to the RRA. The 1988 flood destroyed 100 percent of the crops in all six surveyed mauzas. The newly sown aman crop was destroyed by waves that washed the paddy away, and although aus and jute crops were harvested before the flood, those crops were destroyed as a result of poor drainage.

To recover from the disaster many of the people in all six mauzas sought work as day laborers, traveling out of the mauza to do so. In planting season they cultivated a variety of crops, including *bhadui paddy*, mustard, sweet potatoes, green chili, and wheat.

The three other surveyed mauzas did the same, working as day laborers after the 1987 flood.

Relief and rehabilitation during and after the flood were difficult for the nine surveyed mauzas. On the island chars, even under normal circumstances, services were unavailable because the area is very

Table 4.1 Flood Damage During 1987/1988 Floods

Mauza and Flood Year	Houses Flooded (%)			House Damage (%)			People Evacuated (%)	Duration of Evacuation	Livestock Lost (%)
	Above Floor	Roof Level	Above Roof	Destroyed	Damaged				
Adam Manirabad (1987)	100 (100% at floor level)	25	10	35	40		100 (mauza eroded)	3-5 years	25
Char Allen (1987)	100 (100% at floor level)	25	15	40	40		100 (mauza eroded)	3-4 years	30
Chirar Char (1988)	95 (100% at floor level)	15	5	30	65		60	2-6 months	25
Dakhsin Borochar (1988)	90 (95% at floor level)	5	-	15	80		5	40 days	20
Nasirarkandi (1988)	95 (98% at floor level)	30	15	30	45		70	50 days	10
Shibsen (1987)	100 (100% at floor level)	30	15	60	40		100 (mauza eroded)	3-5 years	35
Char Abdullah (1988)	90 (95% at floor level)	50	20	30	50		85	1 month	10
Dular Char (1988)	40 (70% at floor level)	10	5	10	25		25	35 days	5
Uttar Shankibhanga (1988)	20 (60% at floor level)	-	-	5	20		20	25 days	-

Source: Charland RRA



Table 4.2 Floods Affecting Crops in the Past 10 Years

Mauza	Year(s) Flood Occurred	Most Severe Damage		
		Year	Damaged Crops	Percent Damaged
Adam Manirabad	1991	1991	Mixed aus-aman	75
Char Allen	1991	1991	Mixed aus-aman	75
Chirar Char	1987, 1988, 1991	1988	Mixed aus-aman Jute	100 100
Dakhsin Borochar	1987, 1988, 1991	1988	Mixed aus-aman Jute	100 100
Nasirarkandi	1987, 1988, 1991	1988	Aus Jute	50 100
Shibsen	1991	1991	Mixed aus-aman	75
Char Abdullah	1987, 1988, 1991	1988	Mixed aus-aman Jute	100 100
Dular Char	1987, 1988, 1991	1988	Mixed aus-aman Jute	100 100
Uttar Shankibhanga	1987, 1988, 1991	1988	Mixed aus-aman Jute	100 100

Source: Charland RRA

inaccessible and communication with the mainland is very poor.

During the 1987 and 1988 floods, almost all the surveyed mauzas received some sort of relief from the Union Parishad and NGOs.

According to the island char people, their biggest problems during the flood were moving their cattle, crops, and valuables to safety, and finding proper shelter and daily necessities. This, they felt, should be supervised by the district/thana administration.



## Chapter 5

### AGRICULTURE



#### 5.1 Soil Type and Dry Season Submersion

Data on the type of soil in the charlands of the study mauzas are presented in Table 5.1. As the table indicates, the soil on the island chars studied is mainly sandy or sandy loam, and that of the attached chars and unprotected mainland is sandy loam or clay.

Table 5.2 shows the percentage of land is underwater and above water during the dry season. Eighty percent of Nasirarkandi, an erosion-prone mauza, was submerged during the time of the fieldwork, and in Chirar

**Table 5.1 Soil Type**

Mauza	Char Type	Percentage		
		Sandy	Sandy Loam	Clay
Adam Manirabad	Island	50	50	0
Char Allen	Island	50	50	0
Chirar Char	Island	40	50	10
Dakhsin Borochar	Island	40	50	10
Nasirarkandi	Island	60	40	0
Shibsen	Island	50	50	0
Char Abdullah	Attached	10	60	30
Dular Char	Attached	30	40	30
Uttar Shankibhanga	Unprotected Mainland	5	25	70

Source: Charland RRA

**Table 5.2 Mauza Areas and Percentage Under and Above Water in Dry Season**

Mauza	Total Area (ha)	Underwater (%)	Above Water (%)
Adam Manirabad	278	40	60
Char Allen	115	5	95
Chirar Char	324	60	40
Dakhsin Borochar	354	5	95
Nasirarkandi	421	80	20
Shibsen	252	10	90
Char Abdullah	261	30	70
Dular Char	1,066	35	65
Uttar Shankibhanga	229	25	75

Source: Charland RRA & BBS

Table 5.3 Land Use Pattern

Mauza	Char Type	Land Area (ha)	Distribution of Land (%)		
			Homestead	Agricultural	Non-Cultivated
Adam Manirabad	Island	167	1	70	29
Char Allen	Island	109	5	75	20
Chirar Char	Island	130	10	90	0
Dakhsin Borochar	Island	336	5	80	15
Nasirarkandi	Island	84	5	80	15
Shibsen	Island	227	5	75	20
Char Abdullah	Attached	183	15	85	0
Dular Char	Attached	693	20	70	10
Uttar Shankibhanga	Unprotected Mainland	172	15	85	0

Source: Charland RRA

Char more than 50 percent of the mauza was underwater.

## 5.2 Land Use

Table 5.3 shows the land use pattern for the study area. The vast majority of the land in all mauzas is used for agriculture. Most of the agricultural land in the study area is on low land (Table 5.4). Medium and high elevation lands are used for growing three crops a year, low land is used for two crops, and very low land for one (Table 5.5). Mixed aus-aman is the predominant cropping practice (Table 5.6). In the attached chars, the RRA found some HYV boro cultivation using irrigation facilities. During rabi season low lands in both island and attached chars produce significant amounts of local boro. Deep water aman is commonly grown in all of the mauzas except Nasirarkandi, where flood water sweeps through the agricultural land each year, so that for the past 20 years it had no aman crops (see Appendix A).

The mauzas in the island chars have almost no irrigation systems. In the two attached char mauzas in the sample, Dular Char and Char Abdullah, 25 percent and 50 percent of the agricultural land is under irrigation, respectively. These two mauzas

Table 5.4 Elevation of Agricultural Land\*

Mauza	High (%)	Medium (%)	Low (%)	Very Low (%)
Adam Manirabad	5	20	65	10
Char Allen	5	15	60	20
Chirar Char	10	20	60	10
Dakhsin Borochar	10	20	60	10
Nasirarkandi	5	50	45	0
Shibsen	5	30	55	10
Char Abdullah	10	25	60	5
Dular Char	15	40	40	5
Uttar Shankibhanga	15	30	55	0

Source: Charland RRA

\*The way char dwellers generally defined land levels can be translated into the following: High = Less than 1.2 m of water on land during high monsoon; Medium = 1.2-1.8 m of water on land during high monsoon; Low = 1.8-2.7 m of water on land during high monsoon; Very low = More than 2.7 m of water on land during high monsoon.



Table 5.5 Cropping Intensity

Mauza	Single Cropped	Double Cropped	Triple Cropped
Adam Manirabad	20	70	10
Char Allen	50	40	10
Chirar Char	10	60	30
Dakhsin Borochar	10	60	30
Nasirarkandi	0	90	10
Shibsen	10	80	10
Char Abdullah	5	30	65
Dular Char	10	35	55
Uttar Shankibhanga	0	35	65

Source: Charland RRA

are therefore able to grow irri boro paddy. Uttar Shankibhanga, the unprotected mainland mauza, had no irrigation facilities, and agriculture there depends mainly on rain water.

Some of the mauzas surveyed have had waterlogging problems, and percentages of waterlogged agricultural land in these mauzas are shown in Table 5.7. Waterlogging in these areas helps rather than hinders agriculture by enabling the cultivation of boro paddy. The water also is used for other household needs by the char dwellers.

### 5.3 Yield, Price, and Production Cost

Data on crop yields and prices for the char types are reported in Table 5.8. The cost of producing crops generally ranges between Tk.4,000 and Tk.6,000 per acre. The cost can be much higher for some crops, however. Raising groundnuts, for instance, can cost Tk.8,000 per acre, and raising potatoes can cost as much as Tk.16,000 per acre.

### 5.4 Land Prices and Leasing/ Sharecropping Conditions

The price of land in chars depends upon their stability. Because Nasirarkandi has been prone to

prolonged erosion, the price of land there is very low (Table 5.9). In contrast, the price of land in Adam Manirabad and Shibsen, two newly surfaced habitable chars, has been higher. As expected, the price of land in Uttar Shankibhanga, a mainland mauza without any impending threat of erosion, is very high. The price of land in new chars may be quite low if the land is poor in quality, as found in the case of Dular Char.

The price of a lease depends upon the quality of the land involved. The lease price per acre of land for the study mauzas are shown in Table 5.10. The lease price of land in Char Abdullah, an attached char, is very high because of the relatively high fertility of its soil. The fertility of the soil is reflected in the fact that potato yield in this area can be as high as 700 to 800 maunds per acre.

Sharecropping is the main mode of farming in this area. When the landowner bears half the cost of inputs such as seed, irrigation water, and fertilizer, he gets half of the harvest. In the absence of any cost-sharing by the landowner, the owner gets one third of the harvest, the remainder going to the sharecropper.

Table 5.7 Waterlogging in Agricultural Land

Mauza	Agricultural Land Waterlogged (%)
Adam Manirabad	10
Char Allen	20
Chirar Char	10
Dakhsin Borochar	10
Shibsen	10

Source: Charland RRA

Table 5.6 Cropping Pattern by Land Type

Crop	Cultivated Land (%)										
	Island Char				Attached Char				Unprotected Mainland		
	High	Medium	Low	Very Low	High	Medium	Low	Very Low	High	Medium	Low
RABI											
Chilies	40	18	-	-	15	18	-	-	30	15	-
Mustard	13	8	8	-	25	18	-	-	30	20	-
Sweet Potato	5	-	-	-	20	18	-	-	-	-	-
Groundnut	10	4	-	-	3	10	-	-	-	-	-
Kaon	6	2	-	-	10	-	-	-	-	-	-
Pulses	18	10	-	-	-	5	-	-	40	20	-
Potato	3	4	-	-	25	20	-	-	-	-	-
Wheat	-	33	-	-	-	13	-	-	-	25	-
Onion	-	13	-	-	-	-	-	-	-	20	-
Garlic	-	8	-	-	-	-	-	-	-	-	-
Sugarcane	-	-	-	-	3	-	-	-	-	-	-
L. Boro	-	-	53	100	-	-	15	100	-	-	-
HYV Boro	-	-	-	-	-	-	50	-	-	-	-
KHARIF I & II											
B. Aus + Aman	61	62	60	-	70	75	35	-	70	75	100
Jute	18	23	-	-	30	25	-	-	30	25	-
Til + (Aman)	20	15	-	-	-	-	-	-	-	-	-
B. Aman	68	65	42	-	70	75	35	-	70	75	100
Cropping Inten-	262	265	163	100	271	277	135	100	270	275	200
sity											
Area in Study	49	213	477	82	77	211	320	32	22	44	80
Mauzas (ha)											
% of Land in	6	26	58	10	12	33	50	5	15	30	55
Char Type											

Source: Charland RRA

Table 5.8 Summary of Yield and Harvest Prices of Main Crops

Crop	Island Char		Attached Char		Unprotected Mainland	
	Tn/ha	Tk/tn	Tn/ha	Tk/tn	Tn/ha	Tk/tn
Chili	2.3	9,377	2.48	9,511	2.39	9,377
Mustard	2.21	9,056	2.21	9,430	2.39	9,645
Sweet Potato	9.22	1,339	10.23	1,607	-	-
Groundnut	2.12	11,172	2.48	12,056	-	-
Kaon	1.93	5,492	2.21	5,358	-	-
Pulses	2.12	8,493	2.39	9,377	2.3	8,305
Potato	20.74	5,358	46.10	5,358	-	-
Wheat	2.21	6,430	2.39	6,698	2.39	6,027
Onion	3.31	8,493	-	-	3.68	8,572
Garlic	1.84	16,075	-	-	-	-
Til	2.12	9,377	-	-	-	-
L. Boro	2.21	4,340	2.12	4,286	-	-
L. Aus	2.12	4,688	2.12	4,635	2.3	4,688
Jute	2.21	4,420	2.12	4,313	2.21	4,473
B. Aman	2.21	5,358	2.12	5,358	2.3	5,358
HYV Boro	-	-	6.91	4,152	-	-
Sugarcane	-	-	60,000*	-	-	-

Source: Charland RRA

\*gross return in Tk/acre



80  
Table 5.9 Land Prices (taka/hectare)

Mauza	Homestead	High Land	Medium Land	Low Land	Non-Cult. Land
Adam Manirabad	50,000	50,000	50,000	37,000	25,000
Char Allen	37,000	25,000	25,000	25,000	17,000
Chirar Char	25,000	19,500	18,000	17,000	17,000
Dakhsin Borochar	50,000	37,000	30,000	29,000	18,000
Nasirarkandi	12,000	9,500	8,500	8,500	7,000
Shibsen	29,000	25,000	23,000	23,000	19,500
Char Abdullah	150,000	135,000	135,000	120,000	-
Dular Char	100,000	75,000	75,000	75,000	50,000
Uttar Shankibhanga	200,000	120,000	120,000	120,000	-
AVERAGE					
Island Char	33,833	27,666	25,750	23,250	17,250
Attached Char	125,000	105,000	105,000	100,000	25,000
Unprotected Mainland	200,000	120,000	120,000	120,000	-

Source: Charland RRA

### 5.5. Constraints

Both excessive water and scarcity of water are important problems for the char people. Excessive water and advance floods spoil crops like aus, jute, and aman paddy, and excessive dry weather damages boro paddy. In areas where there is no irrigation, rabi crops too are liable to be damaged by prolonged dry weather.

The newly created parts of Nasirarkandi, Char Allen, Adam Manirabad, and Dular Char are very sandy and remain non-cultivated. Almost every island char is infested with rats. Rabi crops are often damaged due to hail storms. Water hyacinths are a problem in Uttar Shankibhanga because the plants drift onto the aman fields and damage the crop. In Char Abdullah, heavy rainfall can cause widespread damage to potatoes, the mauza's main cash crop.

Table 5.10 Lease Price of Agricultural Land

Mauza	Lease Price/Hectare (Tk.)
Adam Manirabad	5,000
Char Allen	3,700
Chirar Char	3,700
Dakhsin Borochar	6,000
Nasirarkandi	2,200
Shibsen	5,000
Char Abdullah	17,000
Dular Char	7,000
Uttar Shankibhanga	11,000

Source: Charland RRA

Most of the people in the surveyed charlands grow beans, melons, pumpkins, and other food crops around the house. No help is available from any government or non-government institution to make such efforts more effective, however.

## Chapter 6

### LIVESTOCK

#### 6.1 Introduction

A considerable amount of livestock farming is done by people living on chars, who raise cows and female goats for their money-making potential as breeders and milk producers. For some, in fact, livestock rearing the only means of support during periods of scarcity. While cows are commonly found in the area, buffaloes and sheep are virtually absent. Ducks and chickens are commonly kept both for egg production and food.

Since sale prices of animals are higher in chars than elsewhere, people trade in them to help repay loans from moneylenders, and to cover "social costs," too. The cattle fattening business, in particular, serves a pragmatic purpose for the char people. Since almost all the crop and grazing lands are submerged for five to seven months (May through October) there is a seasonal shortage of fodder for animals. Additionally, sheltering livestock during monsoon can be difficult, and abnormal flooding makes the situation even worse. Many char people, therefore, purchase cattle after flood waters recede (November-December) and sell them when monsoon flooding starts (May-June). This allows them to use the animals for cultivation, fatten them on abundant dry-season fodder, and sell them, hopefully at a profit, just as they are heading into the season of greatest hardship.

Problems of caring for livestock are: 1) Insufficient high land shelter for them during monsoon; 2) Shortages of fodder;

3) Lack of veterinary care or facilities; and 4) Inadequate grasslands in some places.

#### 6.2 Extent of Livestock Resources

Among the livestock animals, cattle were most abundant in the Meghna RRA study area. Table 6.1 shows that an average of 68 percent of the charland households possessed cattle. Cows were most common among the households of Chirar Char and Char Allen, where 80 percent had cattle, and they were least common in Adam Manirabad, where only 20 percent had them.

Goat populations were generally lower in all the char study areas, with only 25 percent of households raising goats. In Adam Manirabad there

**Table 6.1 Household Livestock Ownership (percent)**

Mauza	Cattle	Goat	Chicken	Duck
Adam Manirabad	20	0	80	4
Char Allen	80	50	100	50
Chirar Char	80	10	100	20
Dakhsin Borochar	75	20	95	0
Nasirarkandi	70	30	100	0
Shibsen	70	15	95	0
Char Abdullah	60	25	98	15
Dular Char	60	15	95	10
Uttar Shankibhanga	60	40	100	80
All Mauzas	68	25	99	21

Source: Charland RRA



were no goats at all. People interviewed in this mauza explained that goats, because they are less hardy than cattle, are less suitable in an area where heavy rains and flooding are common. Cattle are also preferred over goats, they said, because they can serve multiple purposes.

Chickens also are very common in the charlands surveyed. On an average, 99 percent of the households in the RRA mauzas raise chickens as an additional income source. Ducks are far less common; only 21 percent of the study are households raise ducks.

The number of cattle per household in the study mauzas averaged 2.66, ranging from a minimum of 1 in Adam Manirabad to a maximum of 4 in Shibsen and Chirar Char. The small number of cattle in Adam Manirabad was due to its recent settlement; only 25 households were living there at the time of the RRA and they had only been there for about eight months. With the exception of Adam Manirabad, the per capita availability of cattle was higher in the island chars than in attached chars or unprotected mainland (Table 6.2).

Availability of goats per household averaged 0.66 and was highest in Uttar Shankibhanga (2) and lowest in Dakhsin Borochar and Dular Char (0.3).

Higher goat populations were found in mauzas that are relatively stable and safe from flooding such as Uttar Shankibhanga, Char Allen, and Char Abdullah. Most of the goats in the charlands are normally purchased following the monsoon season and sold before the next monsoon.

### 6.3 Fodder Resources

The charlands have considerable grazing lands and fodder resources. Seven types of feed normally are given to cattle: grass, catkin, straw, water hyacinth, *kalai*, and rice bran and oil cake (Table 6.3). The most common fodder sources are grass, catkin, and straw, but the type of fodder used depends on its seasonal availability. Catkin and straw are most commonly used in monsoon months in all but one of the study mauzas. In Char Abdullah, where catkin is not available, straw and bran with oil cake (*bhushi*) are the main fodder source during the monsoon season. People in this mauza usually store dried straw after the rice harvest that can be used during the monsoon months. Grass is also a common feed during the dry months, except in Adam Manirabad, where settlement has taken place very recently. Rice bran with oil cake is used as cattle feed both in the dry season and during monsoon months, but only the

Table 6.2 Average Number of Livestock per Household

Mauza	Char Type	Cattle	Goats	Chickens	Ducks
Adam Manirabad	Island	1	0	6	0.08
Char Allen	Island	3	1	10	3
Chirar Char	Island	4	0.45	5	0.4
Dakhsin Borochar	Island	3	0.3	9	0
Nasirarkandi	Island	3	0.45	11	0
Shibsen	Island	4	0.45	9	0
Char Abdullah	Attached	2	1	8	0.45
Dular Char	Attached	2	0.3	5	1
Uttar Shankibhanga	Unprotected Mainland	2	2	8	2
All Mauzas		2.66	0.66	7.7	0.7

Source: Charland RRA

Table 6.3 Major Sources of Fodder by Season

Mauza	Grass		Catkin		Straw		Water Hyacinth		Kalai		Bran & Oil Cake	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Adam Manirabad	-	-	✓	✓	✓	✓	-	-	-	-	-	-
Char Allen	✓	-	✓	✓	✓	✓	-	-	-	-	✓	-
Chirar Char	✓	-	✓	✓	-	✓	-	-	-	-	-	✓
Dakhsin Borochar	✓	-	✓	✓	-	✓	-	-	-	-	-	-
Nasirarkandi	✓	✓	✓	✓	-	✓	✓	✓	-	-	-	✓
Shibsen	✓	-	✓	✓	✓	✓	-	-	✓	-	✓	-
Char Abdullah	✓	-	-	-	-	✓	-	-	-	-	-	✓
Dular Char	✓	-	-	✓	-	✓	-	-	✓	-	✓	✓
Uttar Shankibhanga	✓	-	-	✓	✓	✓	-	✓	-	-	✓	-

Source: Charland RRA

rich people can afford such feed. Water hyacinth and *kalai* are the least available fodder sources in the charlands, but in Nasirarkandi water hyacinth is fed to cattle in both dry and monsoon months, and in Uttar Shankibhanga it is used only during the monsoon. *Kalai* is used as fodder during dry months only in Shibsen and Dular Char.

While cattle can serve multiple purposes, the RRA found that the emphasis of one use over another varied from mauza to mauza. Milk production was the main purpose of cow rearing in Dakhsin Borochar, Char Allen, Shibsen, and Dular Char. People of Nasirarkandi and Char Abdullah, on the other hand, simply fattened their cows for resale.

The marketing of milk in the charlands primarily is done through *goalas*, or middlemen, who collect milk door to door and resell it to markets in Dhaka. Some households also sell their milk in local markets.

Cattle poaching, which is apparently worst during monsoon season, is a considerable worry to char dwellers who raise cows. Some of them even keep the animals in their houses at night to prevent them from being stolen. To avoid the difficulties of raising cattle during the monsoon, those who raise cattle sell them in April or May (*Baishakh* or

*Jaisthya*) and buy new cattle at the end of the season in October or November (*Kartik* or *Agrahayan*). The other main sale time for cattle and goats is during Ramadhan just before Eid-ul-Azha (usually in March) when they bring good prices.

#### 6.4 Market Price of Livestock

Sale value of livestock varies little over time or between mauzas in the RRA study area. The people of these mauzas market their cattle and goats in periodic markets (*hats*) in the adjacent mainland, virtually all of them preferring to trade cattle at Dighirpar market in Munshiganj Thana.

Bullock prices range from Tk.5,000 to Tk.12,000, depending on their size. Milk cows, depending on their yield, cost between Tk.6,000 and Tk.10,000. Goats cost from Tk.500 to Tk.2,000.

#### 6.5 Livestock Tenancy

Livestock tenancy system (*barga*) was common in the study mauzas. Under this system, poorer people are given cattle or goats to fatten by relatively wealthier people living in the same or an adjacent mauza on the mainland.



In this tenancy system, the owner and the tenant fix a market value for the cattle or goat at the time of the agreement. After the tenant rears the cattle for a reasonable period, and when the sale value has reached its peak, the animal is sold and the owner takes the original agreed value of the animal as well as half of the profit. The tenant gets the other half of the profit. If a cow should calve during its tenancy, the agreement usually gives the tenant the first calf and the owner gets the second calf. If a goat gives birth, there are usually two kids, in which case the tenant and owner each get one. If three kids should be born, the third one is valued and the tenant or owner can buy it for half that value.

**Table 6.4 Livestock Diseases**

Mauza	Foot and Mouth	Diarrhoea	Fever
Adam Manirabad	✓	✓	-
Char Allen	✓	✓	-
Chirar Char	✓	-	-
Dakhsin Borochar	✓	✓	-
Nasirarkandi	✓	-	-
Shibsen	✓	✓	✓
Char Abdullah	✓	✓	-
Dular Char	✓	✓	-
Uttar Shankibhanga	✓	-	✓

Source: Charland RRA

## 6.6 Disease and Treatment

The study area households reported three common diseases of cattle: foot and mouth, diarrhoea, and fever/rheumatism (Table 6.4). Of the three, foot and mouth (*khura rog*) was reportedly the most common followed by diarrhoea and fever/rheumatism. Foot and mouth disease mainly occurs during two periods: following monsoon between mid-September and December (*Ashwin* to *Agrahayan*) and mid-February to mid-May (*Falgun* through *Baishakh*) before the monsoon. Diarrhoea mainly occurs late in the monsoon season.

In the charlands visited by the RRA there were no livestock treatment facilities, and villagers were

normally reluctant to seek veterinary help except in the most serious cases. The distances they must travel to get such help and the difficulty and cost of transporting a sick animal were the chief impediments to seeking such help. Instead, they rely on traditional methods of treatment provided by local healers (*kabiraj*). The usual treatment for foot and mouth disease is to wash the infected legs with hot water and then apply raw turmeric to the hooves and mashed sesame to the tongue and mouth. The infected animal also is normally kept on sandy soil until it is cured.



## Chapter 7

### FISHING

#### 7.1 Fishing as a Profession

Fishing is one of the main economic activities of the people living in the Meghna confluence (see Table 2.3). Unlike mainland areas, the chars have no traditional fishing families who live clustered in particular *paras* or villages. Rather, in the charlands, most of the households rely on fishing for at least some part of their livelihood. Fishing is done both commercially by professional fishing families as well as on a subsistence level. The professional fishermen mainly fish for *hilsha* and *icha* (Table 7.1). Most of the *hilsha* fishing households, however, do not have their own boats or nets and generally use those of other people (see Section 7.7).

- an excess seasonal agricultural laborers and lack of diverse non-farm employment opportunities;
- fishing is easier because of the proximity of the rivers.

In Uttar Shankibhanga, an unprotected mainland area, the majority of people are involved in agricultural activities and the rest are in service and other non-farm occupations. The people interviewed in Uttar Shankibhanga reported that the village was quite distant from the river as recently as four or five years ago, and therefore their life styles are not yet well linked to the river. Nonetheless, they said, about 90 percent of Uttar Shankibhanga households fish for consumption

Discussion with the key informants revealed that about 25 years ago the majority of the fishing families in this area were Hindu. The main Muslim occupations were agriculture, wage labor, and petty business; fishing was a secondary activity done mainly for family consumption. At the time of the RRA, this situation had changed and virtually all the professional fishing families were Muslims. The Muslim families have gradually switched to fishing from their traditional occupations for several reasons:

- loss of agricultural land by riverbank erosion;
- migration of Hindu fishermen;

Table 7.1 Professional Fisheries

Mauza	Fishing Households with Boats/Nets (%)	Type of Fishing (%)	
		<i>Hilsha</i>	<i>Icha</i>
Adam Manirabad	0	50	100
Char Allen	25	25	75
Chirar Char	25	95	5
Dakhsin Borochar	7	70	30
Nasirarkandi	20	90	10
Shibsen	10	60	35
Char Abdullah	40	70	30*
Dular Char	30	80	20
All Mauzas	22	73	27

Source: Charland RRA

\*No *icha* fishing from mid-November to mid-April (*Agrahayan* through *Chaitra*).

during the monsoon season in floodplain, canals (*khals*), ponds, and the river.

## 7.2 Fishing Grounds and Access Arrangements

Charland people, the survey found, fish not only in the channels of the Padma and Meghna rivers but also in canals, waterlogged depressions, and inundated chars. Fishing rights in the channels are obtained either by paying rent or a toll to the lessee or paying license fees to the Department of Fisheries (DOF).

The government licensing system, although preferred by the fishermen, is not enforced in the study area except in a small section of the Padma near Chirar Char and Shibsen mauzas. License fees vary according to the size of boats. The annual fee for small boats is Tk.130 and for large boats Tk.400 to Tk.500. The fishing license is issued by the local fishery officers at Naria and Bhedarganj.

The respondents reported that wealthy non-fishermen on the mainland control leasing of the river. The lessee collects tolls from people fishing in his leased area using a surveillance team. The amount of toll or rent varies according to the size of fishing units. A small fishing boat (3-6 fishermen) normally pays Tk.200 to Tk.500 per year and a large fishing boat (10-14 fishermen) pays Tk.1,000 to Tk.1,500 per year. The fishermen of Chirar Char said that, because their area was particularly rich in fish, they paid double the usual amount in two annual installments.

Bamboo trap fishing is toll-free according to the fishermen in all study mauzas.

## 7.3 Fishing Gear and Ownership

Charland fishermen use three main types of fishing gear:

- *chandi jal* or current *jal/dora jal* for catching *hilsha*;
- *chai* (bamboo traps) for shrimp (*icha*) and small fish; and
- *moi jal/chewa jal* for *icha* and *chewa*.

They also use fishing boats of three sizes: small (3-4 fishermen), medium (3-6 fishermen), and large (8-14 fishermen). The cost of fishing gear and craft is listed in Table 7.2.

Some fishermen purchase fishing gear and craft out of their own resources, and some borrow part of the capital from relatives. Many, however, get the necessary capital from local non-formal sources such as money lenders or fish traders in an arrangement called *dadon*. Under this system, the fishermen are bound to sell their catch to the money lender for 5 to 10 percent less than the market value. The amount of credit is thereby reimbursed in installments over the fishing season, which lasts five to six months. Poor people, unable to get credit, work as fishing laborers in the boats of owner-fishermen.

Some fishermen only own nets and hire small boats, usually from fish traders, at a cost of about Tk.300 per month.

Table 7.2 Fishing Gear and Craft

Gear/Craft	Unit Price (Tk.)
<i>Chandi Jal</i>	70,000-80,000
<i>Current/Dora Jal</i>	5,000-10,000
<i>Moi Jal/Chewa Jal</i>	500-1,500
<i>Chai</i> (single unit: 80-100 nos.)	8,000-10,000
Large Boat	50,000-80,000
Medium Boat	8,000-10,000
Small Boat	2,500-3,500

Source: Charland RRA



## 7.4 Major Fishing Types

Two types of fishing are done by char people in the survey area: *hilsha* fishing and shrimp (*icha*) fishing.

*Hilsha* fishing primarily is done in the main channels of Padma and Meghna, although some fishermen travel to Bhola and Noakhali districts for the fish. Boats and special nets (*chandi jal*, current *jal*, and *dora jal*) are required for *hilsha* fishing. The season for this type of fishing generally is from mid-March (*Chaitra*) to November (*Kartik*), and the peak occurs from mid-August to mid-September (*Bhadra*). In the chars and on the banks of the Lower Meghna (Chirar Char) and in the right channel of the Padma (Dular Char), which are among the richest fisheries in Bangladesh, *hilsha* fishing continues almost year-round.

*Icha* fishing is mainly done with bamboo traps (*chai*) along the shoreline of chars. Traps are also used in the inundated croplands and canals of the chars during monsoon months. Some people also use drag nets (*moi jal*) along the shoreline of rivers. *Icha* fishing starts in March (late *Baishakh*), peaks between mid-September and mid-October (*Ashwin*), and continues until November (mid-*Kartik*). A single fisherman operates 50 to 120 traps in a season of five to six months. The traps are not durable, and usually two to three sets of traps, purchased from local markets, are required per season. The reported average catch of 100 traps ranges from 4-6 kg/day.

## 7.5 Lean Period Activities

Some fishing households in the study area own agricultural land, and during lean fishing periods (November to April; *Kartik* to *Chaitra*) switch to farming. Those without land seek employment as agricultural laborers or support themselves with non-farm activities.

Some fishing households continue fishing even if the catch is poor, this was found to be the case in Chirar Char and Dular Char.

Some *hilsha* fishermen in Dular Char, Char Abdullah, and Dakhsin Borochar switch to fishing for *chewa* or *icha* during the lean period.

## 7.6 Fish Marketing

In most cases, middlemen (*paikers*) buy fish directly from the fishermen at the fishing site, paying slightly less than the market price. Some fishermen sell their catch to wholesalers (*aratdars*) or retail them in markets near their fishing grounds.

## 7.7 Fisheries Income and Share System

Table 7.3 summarizes the fishing income data gathered in the survey mauzas by the RRA. It was very difficult to obtain reliable income figures for fishing activities; fishing families almost never keep income and expenditure records. An attempt was made, however, to get a rough idea of people's fishing income, which varies depending upon the agreement under which the fisherman works as well as type of fishing.

The share system is similar in all the study mauzas. The boat and net owner (owner-fisherman) retains 50 percent of each day's catch as rental payment for the fishing gear and craft and the rest is equally distributed among the fishing

Table 7.3 Fishing Income

Type of Fishing	Type of Fisherman	Income (Tk./Month)
<i>Hilsha</i>	Owner-Fisherman (large boat)	10,000-45,000
	Owner-Fisherman (small boat)	4,400-20,000
	Fishing Laborers	900-4,000
<i>Icha</i>	Owner-Fisherman	2,500-5,500
<i>Chewa</i>	Owner-Fisherman	3,000-10,000
	Fishing Laborers	800-2,500

Source: Charland RRA



laborers working on the boat. If the owner also works as a laborer in his boat he gets his rental share plus a proportionate laborer's share of the catch.

## 7.8 Constraints

Natural disasters such as severe flood and land erosion do not directly affect fishing, and in fact, higher catches are obtained during monsoon flooding, which increases the surface area for fishing, particularly in the inundated charlands. Natural calamities indirectly affect fishing households when they are forced to move because of erosion or flooding.

Fishermen are subject to mid-river robbery by bandits (*dacoits*), who steal their nets, money, and catch. Incidents of robbery mainly occur during the peak fishing period of the monsoon months. Fishermen in Dular Char and Chirar Char reported that they encounter five to 10 such incidents a month in their area, while fishermen in Char Allen reported about five such incidents in a year. This indicates that robbery is more common in the lower Padma and Meghna rivers, where fishermen use large fishing boats and costly gear, and where fish catches are highest.

Charland fishermen are not well organized; none of the study mauzas surveyed had fishermen's cooperatives. There are informal understandings between fishermen working in a single section of the river, however, and minor disputes are usually settled among themselves. In some cases, elder fishermen of the mauza intervene to resolve problems.

## Chapter 8

### INSTITUTIONS, TRANSPORTATION, AND MARKETS

#### 8.1 Institutions

The RRA found little in the way of infrastructure or public facilities in the Meghna charlands, especially in the more remote island chars.

As Table 8.1 shows, health care was in particularly short supply in the study region—only 11 percent of the mauzas surveyed reported having any medical facilities. The lack of nearby facilities combined with the difficulty of gaining access to more distant mainland medical centers means that the char dwellers must often depend on local healers (*fakirs* and *kabiraj*) for their medical care. The quality of care such healers offer may be poor, but it is much more affordable than the cost of transportation to a mainland medical center, a physician's fee, and the costly treatments that the doctor is likely to prescribe.

Fifty percent of the island char mauzas were reported to have primary schools, and 69 percent of attached char mauzas had primary schools, but in both cases many of the schools were not operational due to lack of teachers or physical damage caused by flooding or erosion. High schools, too, were rare; only 12 percent of island chars and 18 percent of attached chars had such schools.

Many of the char mauzas reported having weekly markets (*hats*). In most cases, these mauzas were relatively far from mainland markets, and the markets grew out of a need to a place to trade in daily essentials.

There is very little NGO activity in the study area, primarily because the ever-changing physical circumstances of the chars (caused by erosion and accretion) have forced the population to be some-

**Table 8.1 Infrastructure and Facilities in the Study Region (percent of inhabited mauzas)**

Facility	Island Char	Attached Char	Unprotected Mainland	Total
Health Care	6	8	21	11
Primary School	50	69	59	60
High School	12	18	24	18
Weekly Market ( <i>hat</i> )	29	44	41	38
Launch Ghat	12	10	21	14
Electricity	0	13	38	16
NGO Activity	29	8	17	18

Source: Charland Inventory

Table 8.2 Accessibility of Government Offices from Surveyed Mauzas by Char Type

Char Type & Number	Average Distance from Village (with range) in km	Dry Season (one way)			Wet Season (one way)		
		Average Time (hr)	Average Cost (Tk)	Mode of Transport	Average Time (hr)	Average Cost (Tk)	Mode of Transport
a) Union Parishad Office							
Island Char (6)	7 (2.5-11)	1.5	6	On foot+ Boat+ Rickshaw	1.2	7	Engine Boat+ Rickshaw
Attached Char & Unprotected Mainland (3)	5 (0.5-9)	1.3	1.8	On foot+ Boat	1.1	2.0	On foot+ Launch
b) Thana Headquarters							
Island Char (6)	18 (13-32)	3.2	10.3	On foot+ Rickshaw	2.8	10.8	Engine Boat+ Rickshaw
Attached Char & Unprotected Mainland (3)	13 (10.5-17)	2	8.7	On foot+ Rickshaw	1.7	10	On foot+ Engine Boat+ Rickshaw

Source: Charland RRA

what transient, which is viewed by some to be an obstacle to traditional NGO operations.

The RRA gave particular attention to charland access to primary government institutions (union parishad office and thana headquarters), which contain key facilities and are a source of support during flooding. Distances of union parishad and thana headquarters from island chars were general-

ly greater than the distances from the attached and unprotected mainland areas (Table 8.2). This reflects the relative remoteness of the island chars and corresponds with their lack of infrastructure. The average distance from the island chars to the union parishad was 7 km and to thana headquarters, 18 km; the attached chars and unprotected mainland were 5 km from the union parishad, and 13 km from thana headquarters. The table also

Table 8.3 Boat Ownership by Char Type

Char Type	No. of house-holds	Small Boat				Engine Boat			
		No. of HH with Boat	% of HH with Boat	Total Boats	Boats/ HH	No. of HH with Boat	% of HH with Boat	Total Boats	Boats/ HH
Island Char	1,518	348	23	372	0.25	28	2	28	0.02
Attached Char & Unprotected Mainland	1,170	330	28	348	0.3	32	3	29	0.02

Source: Charland RRA



shows that there are travel time and cost differences between the dry and wet seasons. The main reason for this is that more navigable waterways and more mechanized boats become available during monsoon. It should be pointed out that the char people go to thana headquarters only if they have an urgent need to do so, not only because transportation for the journey is expensive but also because it means the loss of a day's work.

## 8.2 Transportation

Although engine boats are available throughout the charlands, their schedules are irregular and people often have to wait a long time before being able to get aboard the right boat. In some char areas no regular transportation is available at all. Thus, personal boats can be a tremendous asset to a charland family. Few households can afford such personal transportation, however.

Table 8.3 summarizes boat ownership by char type. The table indicates that on the basis of the

percentage of households with boats and number of boats per household, the people in attached chars and unprotected mainland are somewhat better equipped with boats than those in the island chars. Although the people of the island chars reported that they needed boats more urgently than others, they were often too poor to be able to afford them.

## 8.3 Markets and Prices

Char villagers generally travel to the nearest bazaar to purchase daily necessities. For special marketing needs, such as Eid purchases and wedding preparations, or for selling their produce or cattle, char dwellers travel somewhat greater distances to larger marketplaces and *hats*. Dighirpar is the key marketplace in the study region, drawing not only local char dwellers but also people from more remote chars. The average distance of the marketplaces from the RRA mauzas was found to be 8.2 km, and the average cost of a one-way trip was Tk.4.63 (see Appendix B).

Table 8.4 Average Market Price of Selected Commodities

Commodity	Normal Price (Tk)	Monsoon Season Price (Tk)	Percentage change from Dry Season to Monsoon
Rice (kg)	9	11	+ 22
Flour (kg)	8	10	+ 25
Chili (kg)	30	38	+ 27
Pulses ( <i>masur</i> , kg)	28	31	+ 11
Edible oil (soybean, kg)	37	43	+ 16
Potato (kg)	6	9	+ 50
Salt (kg)	6	8	+ 33
Lungi (each, average quality)	98	112	+ 14
Saree (each, average quality)	136	143	+ 5
Bamboo (1 large piece)	85	110	+ 29
CI sheet (22m, average quality)	2,400	2,500	+ 4
Straw (1 maund)	14	20	+ 42
Cow (average quality)	5,950	5,250	- 12
Goat (average quality)	850	745	- 12

Source: Charland RRA



Char villagers reported that they generally prefer to sell their produce directly in the market rather than to middlemen. Some even risk trips to markets in monsoon season in the hope of getting better prices for their goods. Commodities like poultry, eggs, and milk are, however, usually sold to the middlemen (much of it by women).

Data on average market price of selected commodities during dry and monsoon seasons are presented in Table 8.4. The data indicate a general trend toward higher prices during monsoon. At that time of year only the price of cattle drops, mainly because it is relatively difficult to maintain the animals during monsoon due to the scarcity of fodder and dry shelter.

## Chapter 9

### HEALTH, WATER SUPPLY, AND SANITATION

#### 9.1 Disease among Char People

The most common diseases among the charland people of this RRA area are fever/cold, scabies, diarrhoea, and measles (Table 9.1). In addition, many get chicken pox and dysentery.

Diseases occur year-round, but certain diseases have strong associations with particular times of the year:

- Scabies mainly occurs between December (*Poush*) and continues until just before the monsoon in April (*Baishakh*). This disease is associated with poor water quality in the dry season. Unhygienic practices in homesteads, combined with cramped living quarters and the proximity of other home-

steads aggravate the spread of this contagious disease.

- Fever and colds peak during summer months (March through September; *Chaitra* through *Bhadra*). People generally attribute these illnesses to prolonged exposure to monsoon rains. A second peak, during October and November (*Kartik* and *Agrahayan*), is associated with the change of season from monsoon to winter.
- Measles and chicken pox are confined to the pre-monsoon season, starting in February (*Falgun*) and continuing until May (*Baishakh*). Children are the most common victims of these illnesses, and general ignorance about contagious diseases can cause epidemic outbreaks of measles.
- Diarrhoea has two peaks, one in late

Table 9.1 Common Diseases among Char People

Mauza	Cold	Fever	Scabies	Diarrhoea	Measles	Pox	Dysentery
Adam Manirabad	✓	✓	✓	-	-	-	✓
Char Allen	-	✓	✓	✓	✓	✓	✓
Chirar Char	✓	✓	-	✓	✓	✓	-
Dakhsin Borochar	✓	✓	✓	✓	✓	-	-
Nasirarkandi	✓	✓	✓	✓	✓	✓	✓
Shibsen	✓	✓	✓	-	-	-	✓
Char Abdullah	✓	✓	✓	✓	✓	✓	✓
Dular Char	✓	✓	✓	✓	✓	-	-
Uttar Shanki-bhanga	-	✓	✓	✓	✓	-	-

Source: Charland RRA



monsoon, when flood waters are receding, and the other just before monsoon, when the rivers are at their lowest levels and nearly stagnant. Diarrhoea is associated with polluted water, poor hygiene, and inadequate sanitation (defecation in open land close to the homestead).

Few cases of hepatitis, kala-azar, malaria, or goiter were reported by the villagers interviewed. Hepatitis cases were reported in Uttar Shankibhanga, and malaria was said to have occurred in Char Allen. The homesteads of Char Allen stand along a small creek, which during dry season is very shallow (2 to 3 feet), almost stagnant, and polluted—conditions that favor malarial mosquito breeding as well as various water-borne diseases such as scabies, diarrhoea, and dysentery.

## 9.2 Medical Treatment

There are few medical facilities in the charlands (see Chapter 8) and those that exist are of poor quality. Most of the people living in the surveyed mauzas depend on mainland medical facilities for the treatment of serious illnesses. In Chirar Char and Dular Char, common treatments, such as ORS and medicines for fever and dysentery, were reportedly available. In Dakhsin Borochar, which has no doctor, people seek treatment and medicine in the adjacent mauza, Kashimpur. Kashimpur is an older, more stable mauza with an important *hat* that has three *palli* doctors who provide primary treatment and medicines to the people of Dakhsin Borochar and others.

Traditional healers (*kabiraj*, *fakir*, or *imam*) are primary sources of treatment in most charlands. The herbal treatments of a *kabiraj* are usually sought for ailments like jaundice, rheumatism, and stomach ache. Most char people believe in the effectiveness of these treatments but also think that medical treatment is better. Choosing the traditional healer over a doctor is a matter of economics and convenience: the traditional treatment is less costly and more accessible.

When serious illness strikes, people first go to MBBS doctors in adjacent mainland bazaars such as Dighirpar, Sataki Bazar, Sureshwar, Ghurishar, and Mulfatganj. These bazaars are anywhere from two to eight miles from the charlands of the study area. If the illness continues, they may then seek care at the nearest government hospitals, which are in Matlab, Chandpur, Naria, and Bhedarganj. Some may even go to Dhaka. Serious diarrhoeal patients are taken to the ICDDR,B hospital in Matlab.

## 9.3 Drinking Water and Sanitation

Safe drinking water was scarce in many of the study mauzas. The highest number of tubewells was found in Uttar Shankibhanga (unprotected mainland) and Dular Char (attached char). This is probably attributable to the stability of these areas. In general, however, the number of tubewells in all areas is inadequate for the populations they serve. For all of the study mauzas, there is one tubewell for every 41 households. The RRA found that, overall, only 51 percent of the char people have access to tubewells, and in Adam Manirabad there were no tubewells at all. Those without tubewell access rely entirely upon river water for drinking and other households purposes.

During monsoon flooding tubewells can be submerged and people on island chars must travel long distances by boat to fetch well water. As a result, many households (particularly those without boats) resort to drinking from the river. Households that drink river water are generally unaware of the necessity for boiling the water before drinking it. Even for those who do know this, a lack of fuel may make it impossible to take this precaution. It was also reported that some people prefer to drink river water as they believe tubewell water may cause rheumatism or other diseases.

Sanitation practices in all the surveyed mauzas were poor and unhygienic. Interviews found that only 50 percent of char households had latrines, almost all of them *kutchha* structures of bamboo

Table 9.2 Availability of Tubewells and Latrines

Mauza	No. of Tubewells	Households/ Tubewell	Households Drinking Tubewell Water (%)	Households with Latrines (%)
Adam Manirabad	0	0	0	15
Char Allen	1	283	15	25
Chirar Char	6	48	75	10
Dakhsin Borochar	4	113	20	60
Nasirarkandi	1	370	30	30
Shibsen	1	100	25	20
Char Abdullah	8	28	95	10
Dular Char	25	24	60	80
Uttar Shankibhanga	20	18	90	95
All Mauzas	66	41	51	50

Source: Charland RRA

and catkin and mainly for women's privacy. These latrines, in most cases, were built close to the homestead and were therefore health hazards for both family and community. Even where there were such latrines, men and children used open fields and river banks for defecation. In monsoon season men go out by boat for this purpose and women use temporary latrines. Sanitation practices were best in Uttar Shankibhanga and Dular Char where most of the households had latrines. Uttar Shankibhanga reportedly had about 20 water-sealed latrines (10-12 sanitary latrines and 5-6 ring latrines).

#### 9.4 Health Services

Health educators or workers seldom visit char areas. In Uttar Shankibhanga, the setback area and most accessible of the mauzas studied, health workers reportedly came once a month. In the attached Dular Char, health workers only visited once a quarter. The island chars reported health worker visits only once or twice a year. The sole exception, Nasirarkandi, is close to the mainland and near a large growth center, and easy communications facilitate more frequent visits. During visits, which sometimes include both male and

female health workers, children are vaccinated and advice on family planning, health care, and sanitation is provided.

#### 9.5 Conclusion

The lack of medical facilities in the charlands and their general unhygienic living conditions could be alleviated, RRA informants said, by:

- Community based massive health education program.
- Mobile immunization and health care programs.
- Strengthening *palli* doctors, TBAs, and rural dispensaries.
- Installation of tubewells and low-cost sanitary latrines centrally located in small community groups.



## Chapter 10

### CONCLUSIONS

#### 10.1 Summary of Findings

The charlands of the Meghna confluence have been subjected to frequent erosion and accretion, and the damage and suffering due to erosion have been most severe among the people of the area's island chars. When necessary, the people of the chars have tried to cope with the instability of their lands in a variety of ways, including:

- moving to safer land within their village or mauza;
- migrating to other nearby rural areas that are more stable;
- migrating to nearby urban areas; and
- migrating to distant urban areas that have more job opportunities.

The infrastructure and public facilities in the study area charlands is extremely limited. Given the dynamics of the charlands, most people interviewed by the RRA agreed that it would not be advisable for the government to invest too much in roads. There were distinct demands, however, for building more primary level educational institutions, which, in the opinion of the respondents, could be moved in the event of erosion. Among the adaptations char people have made to their environment are construction techniques that enable them to quickly dismantle their homes and haul them away to safer places.

The average time between erosion and accretion, as well as between accretion and cultivation of the soil in the study area, is relatively short. Therefore, people have traditionally tried to stay close to their land when it eroded in order to monitor its

status. This has not always been possible, however, since earning a livelihood in the interim period, which could be a number of years, often required them to migrate large distances.

The short time lag between erosion and accretion found in the study area has limited the amount of confusion over private land ownership. The ownership and control of government-owned *khas* land, however, has been a source of controversy. For a variety of reasons, the government was found to have very little control over *khas* land. As a result, much of it was under the private occupation of influential individuals without any proper leasing arrangements.

While agriculture is the mainstay of the people in all the Meghna confluence charlands, fishing plays an extremely important role in the area's economy. This is particularly the case during the monsoon, when fish are more easily available and inundation prevents many farmers from cultivating their land. Commercial fishing, while it continues to some extent year-round, becomes a major industry during the monsoon. The chief beneficiaries of the rich fisheries resources of the Meghna confluence are relatively wealthier households that can afford big boats and nets, but the poor also benefit. Most poor households regularly fish for domestic consumption, and in peak fishing season, many poor people work as laborers (at times with small shares from the catch) on fishing boats. Although government licensing of fishermen had recently been instituted in the study area, control of the fisheries was still largely controlled by previous lessees who continued to collect tolls from individual fishermen.



Some of the chars surveyed were found to have ample grazing, and the raising of cattle is an important supplementary occupation for many area households. Cattle rearing commonly was done under a tenancy agreement between well-off households of the charlands and mainland and poor charland tenants with enough extra labor (women and children) to look after the cattle.

Transportation, which is difficult in all the charlands, is a year-round problem for the island chars. People living in these areas rarely can afford boats of their own and are rather poorly served by public transportation. During monsoon, when it is easiest to get around by boat, the river and bigger tributaries are often too rough for small craft, and in the dry months, when many canals dry up, travelling by boat becomes much more difficult and people must walk long distances to take advantage of mainland services.

Erosion is not the only hazard of people in the chars, flooding also was reported to be a major problem. More effective advance warning of floods, survey respondents suggested, would help them better prepare for such events. Much of the damage caused by flooding was due to the swift currents of flood waters, which can damage or destroy houses, trees, and other household assets. In some places people reported cutting off the lower part of their house walls so that the flood water could pass through unobstructed, thereby limiting the damage done to the house.

Health and sanitation conditions in the island char mauzas were usually very poor. In most cases, people drank water from the river with minimal or no effort to purify the water. Extension services are needed to help charland people understand the necessity for taking such precautions. At present, there are no significant government or NGO programs in these fields.

## 10.2 Suggested Priorities

The suggested priorities for action in the charlands can be divided into three categories: general

development issues, erosion/accretion issues, and flooding issues. Since general development issues tend to have an impact on erosion and flooding issues, there is some overlap between these three areas.

### 10.2.1 General Development

- The study area charlands, particularly the island chars, need more educational institutions in proximity to settlements. These institutions should be planned in such a way that they are not permanently lost following erosion events.
- Agricultural extension services are needed to supply improved quality of seeds for crops appropriate to charland circumstances (local boro, peanut, and chili). Extension services for pest control (severe damage by rats was reported in many locations) is also needed.
- Cattle raising in the study area could be further encouraged by providing capital loans to farmers. Cattle raising might also expand if char people did not have to sell their cattle every time they were threatened by a flood. Therefore, flood shelters are needed for cattle.
- Although fishing is an important activity in the study area, fishermen receive little institutional help. Many poor households cannot adequately take advantage of the fishing grounds around them either because they do not have access to them (due, for example, to their inability to pay tolls to the lease holders) or because they do not possess the requisite fishing gear.
- There are opportunities for NGO-sponsored income-generating activities in the chars. One such activity, for example, might be the production of bamboo fishing traps.
- More tubewells are needed in most locations to provide adequate supplies of drinking water. Tubewells also need to be raised so that they can continue to be used during floods. Basic extension in health and sanitation is also needed.

### 10.2.2 Erosion and Accretion

- People affected by erosion need assistance in obtaining transportation services to move to safer areas. Respondents said that local government institutions, particularly the union parishad, could help arrange boats during such calamities. Resettlement programs are urgently needed to help displaced people relocate and find jobs while they await re-emergence of their land.
- Land rights and the keeping of land ownership records need to be improved and streamlined. The confusion that results from the existing system too often results in conflicts between groups of people and between people and the government. In fact, the government has poor control of *khas* land in the chars, resulting in the concentration of land resources control in the hands of those who have the power to seize land by extralegal means.
- Survey respondents regard the law that makes eroded land *khas* land after its re-emergence as unfair. They argued that since erosion and accretion were rather frequent and extensive phenomena in the area, application of the rule would result in virtually no private ownership of land in many areas, a consequence that would be unacceptable to most people.

### 10.2.3 Flood and Rehabilitation

- A more effective flood warning system is needed. Key informants said that the union parishad could play an important role in flood warning.
- Although people affected by flooding can sometimes take refuge on nearby embankments, embankments are inadequate shelter and, in any case, there are not enough of them to accommodate everyone. Flood shelters are therefore necessary. Shelters should also accommodate people's livestock and offer some storage space.
- Post-flood rehabilitation assistance that

helps repair or rebuilding houses and supplies agricultural inputs is also needed. Many households suggested that a post-flood credit program be taken up either by the government or some NGOs to facilitate these activities.

## APPENDICES



# APPENDIX A: DETAILED AGRICULTURAL DATA

Table A.1 Cropping Pattern, Yield, and Prices of High-Elevation Agricultural Land

Table A.1 Cropping Pattern, Yield, and Prices of High-Elevation Agricultural Land												
Mauza	Crop	Rabi			Kharif I			Kharif II			Price Tk/md	
		Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)		Yield md/ac
Adam Manirabad	Chili	50	25	350	M. Aus Aman	60	22	180	B. Aman	80	22	200
	Khesari	40	22	300	Jute	20	24	175				
	Kaon	10	22	200	Til + Aman	20	22	350				
Char Allen	Chili	50	25	350	M. Aus Aman	80	24	175	B. Aman	100	24	200
	Khesari	50	24	300	Til + Aman	20	24	350				
Chirar Char	Chili	30	25	350	M. Aus Aman	60	24	180	B. Aman	80	25	200
	Kaon	30	22	225	Jute	20	25	180				
	Mug	10	24	400	Til + Aman	20	25	350				
	Mustard	30	25	350								
Dakhsin Borochar	Chili	30	18	350	M. Aus Aman	50	25	175	B. Aman	80	25	200
	Mustard	20	22	300	Jute	20	25	150				
	Sweet Potato	20	100	50	Til + Aman	30	22	350				
	Groundnut	20	20	400								
	Kaon	05	20	200								
	Khesari	05	18	300								
Nasirarkandi	Mustard	20	20	350	Aus	80	22	175				
	Groundnut	40	24	400	Jute	20	24	150				
	Chili	30	25	350								
	Sweet Potato	10	100	50								

(continued)

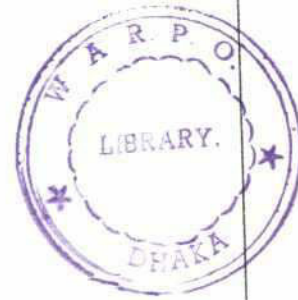


Table A.1 Cropping Pattern, Yield, and Prices of High-Elevation Agricultural Land

Mauza	Rabi				Kharif I				Kharif II			
	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md
Shibsien	Chili	50	25	350	M. Aus Aman	40	22	180	B. Aman	70	24	200
	Potato	20	200	200	Jute	30	24	180				
	Kaon	20	20	200	Til + Aman	30	22	350				
	Mustard	10	25	350								
Char Abdullah	Potato	50	500	200	M. Aus Aman	60	24	175	B. Aman	60	24	200
	Chili	10	28	350	Jute	40	24	175				
	Mustard	10	25	350								
	Sweet Potato	20	120	60								
	Groundnut	05	25	450								
	Sugarcane	05	-	60000								
Dular Char	Mustard	40	20	350	M. Aus Aman	80	24	175	B. Aman	80	22	200
	Chili	20	28	350	Jute	20	22	150				
	Sweet Potato	20	100	60								
	Kaon	20	24	200								
Uttar Shankibhanga	Khesari	40	22	300	M. Aus Aman	70	25	175	B. Aman	70	25	200
	Mustard	30	24	350	Jute	30	24	175				
	Chili	30	25	350								

Source: Charland RRA

Table A.2 Cropping Pattern, Yield, and Price of Medium-Elevation Agricultural Land

Mauza	Rabi				Kharif I				Kharif II			
	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	*Yield md/ac	Price Tk/md
Adam Manirabad	Wheat	40	24	250	M. Aus Aman	60	22	180	Aman	80	24	200
	Onion	25	35	300	Til + Aman	20	24	350				
	Garlic	25	20	600	Jute	20	24	160				
	Pulses	10	24	300								
Char Allen	Chili	50	26	350	M. Aus Aman	100	20	175	Aman	100	25	200
	Pulses	50	24	300								
Chirar Char	Wheat	60	24	225	M. Aus Aman	40	22	175	Aman	70	24	200
	Mustard	20	22	350	Til + Aman	30	24	375				
	Chili	10	25	350	Jute	30	23	175				
	Kaon	10	20	200								
Dakhsin Borochar	Wheat	40	22	250	M. Aus Aman	50	25	180	Aman	60	25	200
	Onion	30	37	300	Jute	40	25	150				
	Garlic	20	20	600	Til + Aman	10	22	350				
	Mustard	10	25	350								
Nasirarkandi	Wheat	25	25	250	Aus	70	24	175				
	Onion	25	35	350	Jute	30	23	160				
	Chili	25	28	350								
	Groundnut	25	25	450								
Shibsen	Wheat	30	24	225	M. Aus Aman	50	24	175	Aman	80	24	200
	Chili	25	24	350	Jute	20	22	175				
	Potato	25	250	200	Til + Aman	30	22	325				
	Mustard	20	24	350								

(continued)



Table A.2 Cropping Pattern, Yield, and Price of Medium-Elevation Agricultural Land

Mauza	Rabi					Kharif I					Kharif II						
	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	
Char Abdullah	Potato	40	500	200	M. Aus Aman	80	25	175	Aman	80	24	200					
	Groundnut	20	28	450	Jute	20	22	160									
	Mustard	10	28	360													
	Pulses	10	26	350													
	Sweet Potato	10	125	60													
	Chili	10	28	370													
Dular Char	Mustard	25	24	350	M. Aus Aman	70	23	180	Aman	70	23	200					
	Wheat	25	26	250	Jute	30	24	160									
	Chili	25	25	350													
	Sweet Potato	25	100	60													
Uttar Shankibhanga	Wheat	25	26	225	M. Aus Aman	75	26	180	Aman	75	25	200					
	Mustard	20	28	370	Jute	25	24	160									
	Chili	15	27	350													
	Onion	20	40	320													
	Pulses	20	28	320													

Source: Charland RRA

Table A.3 Cropping Pattern, Yield, and Price of Low-Elevation Agricultural Land

Mauza	Rabi				Kharif I				Kharif II			
	Crop	Acre (%)	Yield md/ac	Price Tk/md	Crop	Acre (%)	Yield md/ac	Price Tk/md	Crop	Acre (%)	Yield md/ac	Price Tk/md
Adam Manirabad	L.Boro	25	24	170	M. Aus Aman	75	24	175	Aman <i>Vadduri</i>	75 10	23 22	200 150
Char Allen	L.Boro	90	25	160	M. Aus Aman	10	22	175	Aman <i>Vadduri</i>	10 20	22 22	200 150
Chirar Char	L.Boro	40	24	175	M. Aus Aman	60	22	170	Aman	60	24	200
Dakhsin Borochar	L.Boro	50	25	160	M. Aus Aman	50	24	175	Aman <i>Vadduri</i>	50 20	25 20	200 150
Nasirarkandi	Mustard	50	26	300	Aus	100	20	160	-	-	-	-
Shibsen	L.Boro	40	25	160	M. Aus Aman	60	22	175	Aman <i>Vadduri</i>	60 20	22 22	200 160
Char Abdullah	L.Boro HYV Boro	10 70	22 75	160 160	M. Aus Aman	20	20	160	Aman	20	22	200
Dular Char	L.Boro HYV Boro	20 30	24 75	150 150	M. Aus Aman	50	24	175	Aman	50	24	200
Uttar Shankibhanga	-	-	-	-	M. Aus Aman	100	25	170	Aman	100	26	200

Source: Charland RRA

Table A.4 Cropping Pattern, Yield, and Price of Very Low-Elevation Agricultural Land

Mauza	Rabi				Kharif I				Kharif II			
	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md	Crop	Area (%)	Yield md/ac	Price Tk/md
Adam Manirabad	L. Boro	100	24	150	-	-	-	-	-	-	-	-
Char Allen	L. Boro	100	24	160	-	-	-	-	-	-	-	-
Chirar Char	L. Boro	100	25	170	-	-	-	-	-	-	-	-
Dakhsin Borochar	L. Boro	100	22	160	-	-	-	-	-	-	-	-
Nasirarkandi	-	-	-	-	-	-	-	-	-	-	-	-
Shibsen	L. Boro	100	23	160	-	-	-	-	-	-	-	-
Char Abdullah	L. Boro	100	23	160	-	-	-	-	-	-	-	-
Dular Char	L. Boro	100	24	170	-	-	-	-	-	-	-	-
Uttar Shankibhanga	-	-	-	-	-	-	-	-	-	-	-	-

Source: Charland RRA



# APPENDIX B: ACCESS TO MAIN MARKETPLACES FROM SURVEYED MAUZAS

Mauza	Marketplace(s)	Goods Bought and Sold	Distance (km)	Main Mode of Transportation		Cost (Tk)
				Dry Season	Wet Season	
Adam Manirabad	Noapara Bazar	Daily needs	3	On foot	Engine boat	4
	Dighirpar Bazar	Bulk trading	11	Engine boat	Engine boat	10
	Sureswar Bazar	Daily needs	5	Engine boat	Boat + launch	4
Char Allen	Dighirpar Bazar	Agri. produce, cattle, bamboo, bulk trading	7	Engine boat	Engine boat	4
	Noapara Bazar	Daily needs	5	On foot	Engine boat	3
	Kachikata Bazar	Daily needs, agri. produce	6.5	On foot	Engine boat	3
Chirar Char	Amirabad	Daily needs	5.5	Engine boat	Engine boat	5
	Chandpur	Bulk trading, agri. produce	13.5	Engine boat	Engine boat	10
	Kandir Bazar	Mainly bamboo	6.5	Engine boat	Engine boat	5
	Shokhipur Bazar	Mainly cattle	10.5	Engine boat + on foot	Engine boat + on foot	3
Dakhsin Borochar	Borochar Bazar	Daily needs	0	-	-	-
	Shokhipur Bazar	Cattle	24	Engine boat	Engine boat	10
	Dighirpar Bazar	Cattle, agri. produce	11	Engine boat	Boat + launch	4
	Chandpur	Bulk trading	19	On foot + launch	Launch	8

(continued)

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Mauza	Marketplace(s)	Goods Bought and Sold	Distance (km)	Main Mode of Transportation		Cost (Tk)
				Dry Season	Wet Season	
Dular Char	Sureshwar Bazar	Agri. produce	8	Engine boat	Engine boat	4
	Wapdar Hat	Bamboo	9.5	On foot	Engine boat	5
	Shordar Bazar	Cattle	13	On foot	Engine boat	10
	Gharishar Bazar	Cattle, clothes	3	On foot	Engine boat	3
Uttar Shankibhanga	Natun Bazar	Daily needs	1.5	On foot	Personal boat	-
	Dasher Bazar	Daily needs	1.5	On foot	On foot	-
	Amirabad Bazar	Cattle, catkin grass	4	Rickshaw	Rickshaw	5
	Chengar Char Bazar	Cattle	9	On foot	On foot	-

Source: Charland RRA

