Government of the Peoples Republic of Bangladesh
Flood Action Plan

FAP 17

Fisheries Studies and Pilot Project

FINAL REPORT

(Draft)

JUNE 1994

Supporting Volume No. 17

VILLAGE STUDY

MANU IRRIGATION PROJECT AND HAKALUKI HAOR

ODA
Overseas Development Administration, U.K.

FINAL REPORT

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** Draft **

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and Hakaluki Haor

FAP 17
FISHERIES STUDIES
AND PILOT PROJECT

June, 1994

Prepared for the Government of Bangladesh

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SUMMARY OF FINDINGS

1. Impacts of the Manu Irrigation Project on fisheries resources

The Manu Irrigation Project (MIP) has decreased the area and depth of flooding in the areas it protects. Fish production, particularly the production of higher value carp species, has declined as a result.

The protection from seasonal flooding the MIP provides has also encouraged some use of ponds for aquaculture, but this phenomenon is restricted to the fishing village of Gayghar. Ponds in the unprotected Hakaluki *haor* continue to flood annually and as a result are stocked naturally. Increased fishing by non-traditional fishermen, the conversion of *beel* and *khal* to cultivable land, indiscriminate fish harvesting, and anomalies in the award of leases have also impacted fisheries.

2. Impacts on fisheries dependence

The pre-monsoon and early flood period, from *Baishak* (April-May) until *Bhadra* (August-September), is particularly important for fishing in Hakaluki *haor*. Since this coincides with the end of *beel* harvesting, leaseholders tend to ignore subsistence fishing, so fishing at this time is largely unrestricted. Leaseholders begin to impose moderate restrictions again at peak flooding season. In some years, as occurred in 1993, early rainstorms in *Falgoon* (February-March) or *Choytra* (March-April) can cause flash floods and set off earlier open-access fishing.

Flash flooding generally extends the period of floodplain fishing in Hakaluki *haor*, which is unprotected. This also occurs inside the MIP, where public cuts in the embankment allow rainfall runoff to enter the scheme.

3. Conflicts between agriculture and fisheries

Over the past two decades important natural and artificial changes in the *haor* have brought increasing conflict between agriculture and fisheries. Siltation, the drying-up of *khal* and *beel* and the construction of flood control embankments have all helped increase the amount of land under cultivation and altered the characteristics of *haor* fisheries. Many previously fallow low-lying areas within the MIP and in Hakaluki *haor* have been brought under

cultivation. In addition, private control of *haor* land has increased through the distribution of government *khas* land among the landless and the establishment of *de facto* control by powerful large landowners. These land ownership rights have, in some cases been extended to fish resources in the flood water covering the land.

4. Patterns of fisheries involvement

Fishing continues to be considered a low-status occupation in the North East Region, but this is beginning to change. Fishing in the *beel* and *khal* of the *haor* formerly was the preserve of traditional fishermen working either as fishing labourers or on a catch-share basis. In recent years, however, the social distance between the fishing and non-fishing communities has been eroding as increasing numbers of people take to fishing even at the cost of the loss of social status.

In Mirpur, the main agricultural village inside the MIP, 40% of the medium landowners and 45% of the small landowners reported fishing gear ownership and some fishing income. A little more than 25% of the landless households reported some fishing income and ownership of such seasonal gear as push nets.

In Nishchintapur, the main village outside the MIP, 22% of the medium landowners and 19% of the small ones reported ownership of seine nets. The landless households of Nishchintapur reported more involvement in fishing than those of Mirpur.

5. Control of access rights to fisheries

Fisheries resources in the North East are under the control of a few powerful leaseholders who have retained control for generations. These leaseholders impose extremely rigid fishing restrictions during the dry season; violation of these restrictions often leads to violent confrontation.

Traditional fishermen are totally dependent upon the leaseholders for access into the leased water bodies. The leaseholders often extend loans to fishermen in times of distress and provide protection in exchange for their ensured loyalty. As the competition for the fisheries resources increases, the dependence of the fishing community on the leaseholders also increases.

INTRODUCTION

The principal aim of the socioeconomic component of the FAP 17 Fisheries Studies is to evaluate how flood control measures have changed fisheries and, therefore, affected the livelihoods of people living on the floodplains of Bangladesh. Such a study is needed under the Flood Action Plan (FAP) because of concern that the massive expansion of areas protected from flooding by various flood control measures, as envisaged under the FAP, would cause a considerable reduction in the available fisheries resources. The possibility that poorer rural households in particular might be highly dependent on seasonal access to open-water fisheries in flooded areas has raised concerns that the negative impacts on fisheries caused by flood control might actually outweigh the benefits accruing through improved agricultural production and protection from flood damage.

The FAP 17 study is therefore analysing the role of fisheries in the livelihood strategies of different social and occupational groups in floodplain communities and how this has been affected by flood control measures. To do this, communities inside and outside existing flood control schemes, but in areas with comparable agro-ecological characteristics, have been selected for detailed study covering four regions of the country. Near each randomly selected village, one or more satellite communities specialised in fishing and sharing fisheries resources with the main community have been identified. Each of these groupings of main village (usually principally agricultural) and nearby fishing communities has been treated as a "village cluster". In each cluster, a quantitative survey of a stratified sample of households monitored labour, income and consumption over a one-year period. These quantitative surveys have been supported by village appraisals which have collected information on the historical and social processes in and around the study villages and their effects on fisheries. Given the complexity of the fisheries environment and the number of factors influencing it, this qualitative information provides a vital context for the quantitative data collected during the longer-term monitoring of the study villages.

Village clusters inside the Manu Irrigation Project (MIP) were compared with similar clusters outside the scheme in Hakaluki *haor*. The MIP is a flood control drainage and irrigation (FCDI) scheme, and Hakaluki *haor* is unprotected and reportedly sustaining a fishery of comparable importance. Both are in the North East Region of the country. The report describes and assesses the impact which different processes, structures and events have had on the interaction between local people and the fisheries resource. The report combines data

collected during the village appraisals and the various quantitative surveys carried out during the study. It is one of a series of seven Village Studies published by FAP 17 as Supporting Volumes of the project Draft Final Report. The findings of these studies are summarised in the Main Volume of the Draft Final Report.

1. DESCRIPTION OF THE STUDY AREA

1.1 Location

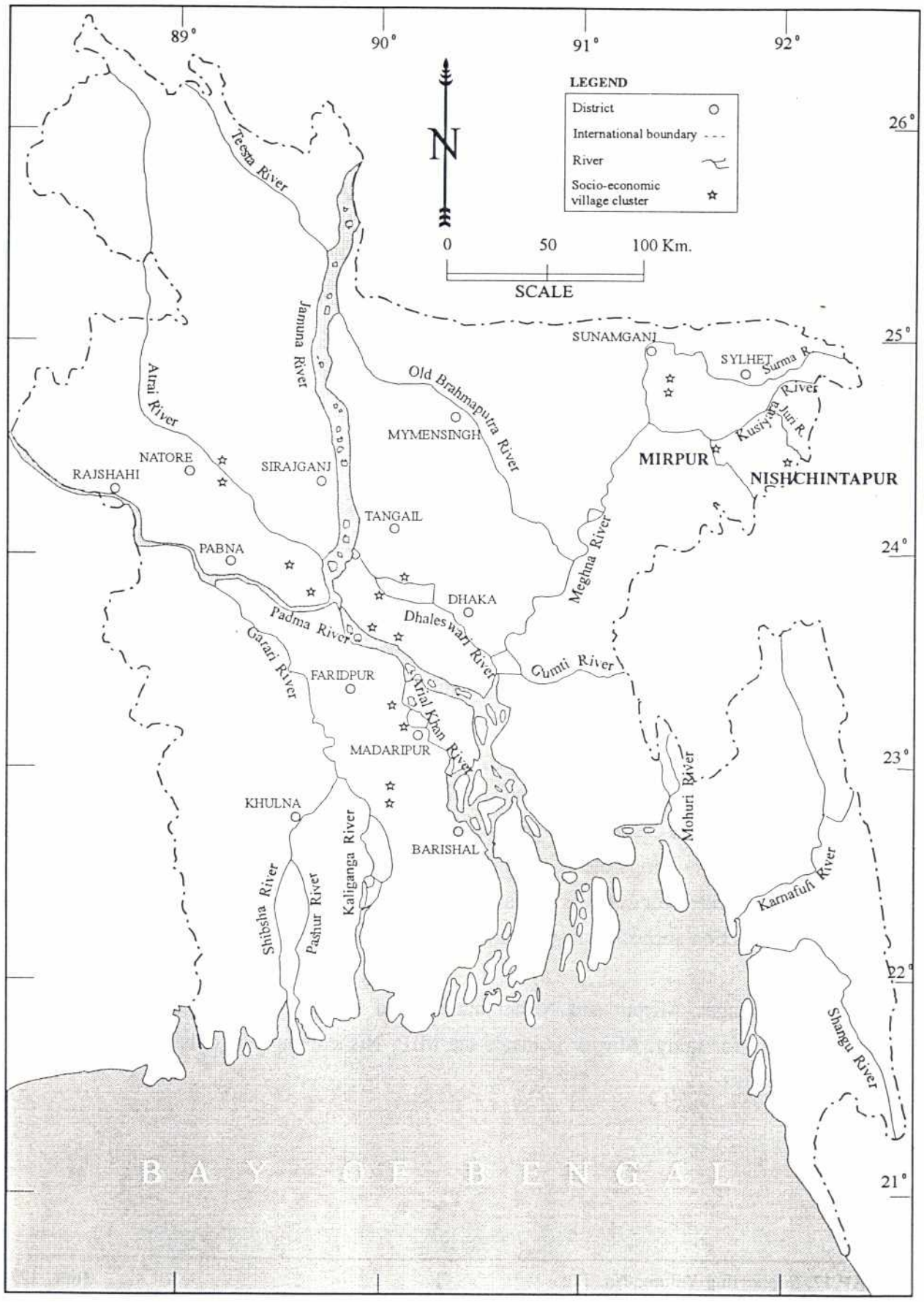
The Manu Irrigation Project (MIP), in Moulvibazar District in the North East Region of Bangladesh, is bounded by the Bhatera hills to the east, the Manu River to the west and south and the Kushiyara River to the north. Construction on the project, which covers about 56,000 acres of land, 47,618 of which are cultivable, started in 1975-76 and ended in 1982-83. It consists of a flood control embankment, a barrage on the Manu River, an irrigation canal system, drainage sluices and pumped irrigation and drainage. The embankment was intended to protect people and infrastructure against flash flooding and to increase rice production in the flood protected area.

The project encompasses a number of important *beel,* numerous former tributaries and distributaries of the Manu and Kushiyara rivers and many smaller *khal*. Kawadighi *haor* is the largest permanent water body in the area, and the most important *beel* are Patashinga, Chatal, Rakkya, Halkatoa, Majerband, Chatla and Awa. The smaller *beel* in the area are seasonal and dry up during the winter months. Before the project was implemented, 25% to 30% of the area was reported to be permanently and deeply flooded.

The North East Region is dominated by the deeply flooded *haor* basin of Sylhet District. Many of the flood control interventions in the *haor*, though not the MIP, are submersible embankment schemes designed to protect standing *boro* crops against early flood. During peak flood, water overtops these embankments and inundates the entire basin. One reason the MIP was selected for study is that submersible schemes could not be identified that were accessible, function according to plan and had not been subject to restocking programmes.

Two main villages, Mirpur and Nishchintapur, and two satellite fishing villages for each were selected for study. Mirpur is inside the MIP, Nishchintapur is outside the project.

Figure 1
Location of study areas: Mirpur and Nishchintapur



Mirpur

Mirpur is on the eastern side of the Manu River and flanked by Manu dyke on the east and the MIP on the west. The dyke was constructed by the local government. Although the village today is entirely inhabited by Muslims, 40 years ago a quarter of its population was Hindu. After Partition in 1947 the Hindus, five of whom were upper-caste *mirashdar* (petty landlords), all emigrated to India. All the members of the present Muslim population work agricultural land within the MIP. Almost annually for the past five or six years the village has been flooded, either by overflow from the Manu or through cuts in the dyke and embankment.

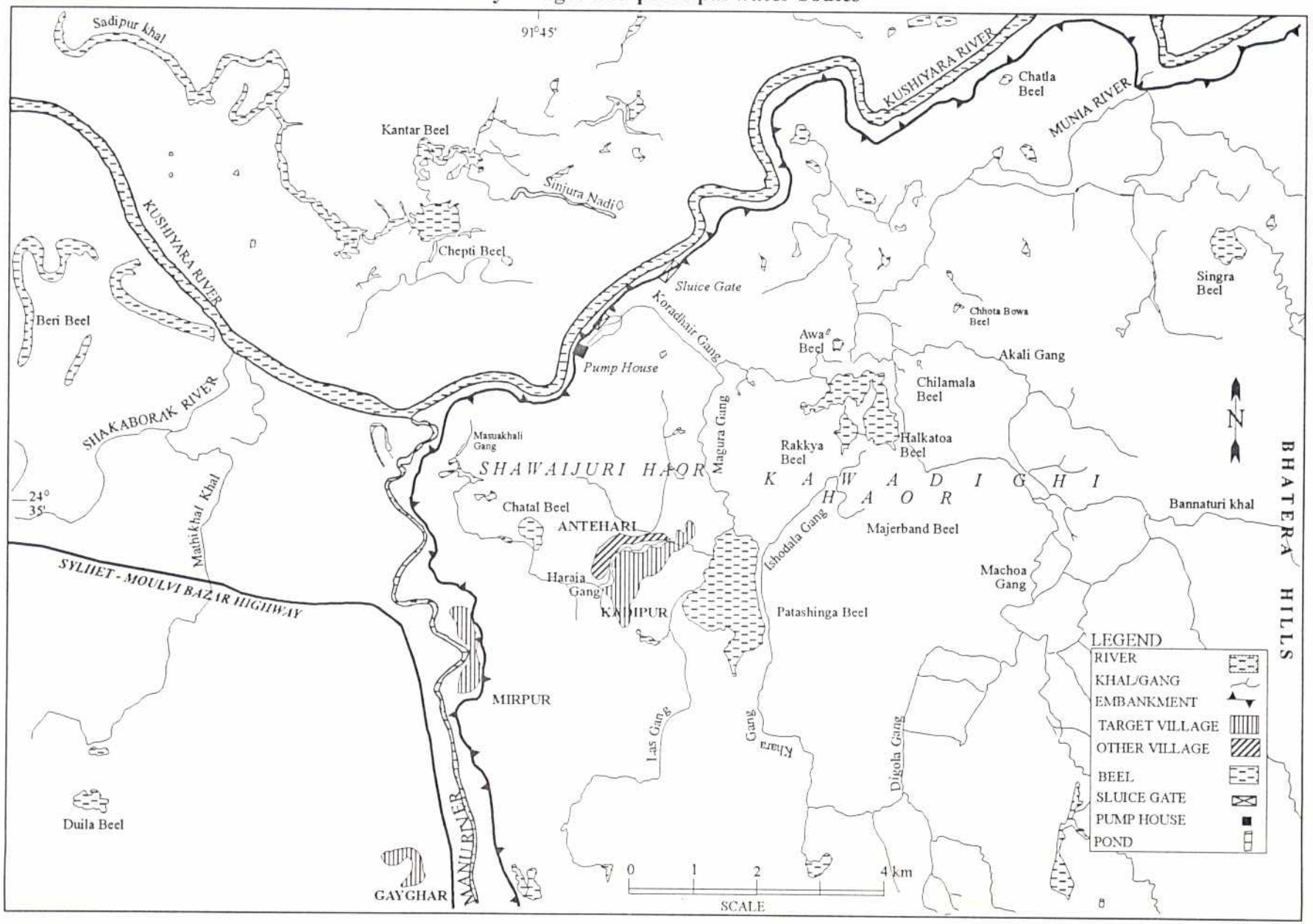
Gayghar, one of the satellite fishing villages selected for study, is outside the embankment, but was chosen because it has a sizeable fishing population, most of whom are traditional Muslim fishermen (*maimul*), many of them exploiting water bodies in Shawaijuri *haor* inside the MIP. About 3% of the village population is Hindu, but none are involved in fishing. Of the non-*maimul* Muslim households, only 10 percent are involved in fishing. There are some very rich households among the *maimul*, all of them connected through kinship ties. These households lease water bodies in the district as well as engaging in a host of diversified economic activities like brick manufacturing and rice flour and oil mills.

The poorer *maimul* earn livelihoods as fishing labourers working for *beel* and pond leaseholders. Some even travel to distant places like Chittagong, where *mahajan* hire them to fish Kaptai Lake on a seasonal basis. The non-fishing households, who prefer to be known as *bangal,* tend to maintain a caste-like segregation from the fishing communities.

The other fishing village, Kadipur, is mostly inhabited by Hindus of various castes (Muslims make up less than 5% of the population). The *namasudra* Hindus are all fishermen.

A narrow strip of water, locally called Haraia *gang*, runs through the western side of the village and connects Shawaijuri *haor* with Kawadighi *haor.* Although the *gang* is perennial, since construction of the MIP it experiences a drastic fall in water level during the winter. Antehari, also a Hindu fishing village, is on the other side of the *gang*. Figure 2 shows the location of the study villages and the principal water bodies inside the MIP exploited by the inhabitants of the three villages.

Figure 2
MIP and Kawadighi haor: location of study villages and principal water bodies



Hakaluki *haor*

Hakaluki *haor* is east of Kulaura and south of Baralekha *thana* in Moulvibazar District, about 40 km northeast of Moulvibazar town (Fig. 3). Parts of the *haor* lie within Sylhet and Moulvibazar districts. The *haor* has about 80 interconnecting freshwater *beel,* bounded on the east by the Patharia and Madhab hills and on the west by the Bhatera hills. The most important *beel* fisheries are Chatla, Chokia, Dulla, Tural, Pinglarkone, Haoakhal, Tekuni, Balijuri, Kukurdubi and Bahiya. Although isolated from one another in the winter season, during the flood season these *beel* form an enormous expanse of water. Some land between the *beel* has been cultivated and some fallow areas are used for grazing cattle. Floodwater, mainly from rainwater and run-off from the nearby hills, enters the *haor* through the Sonai Bardhal River to the east, the Juri to the south east, Funai *gang* to the south and Kanthinala *khal*. Since the Juri River, which discharges into the Kushiyara near Fenchuganj, is the only outlet, floodwater drains slowly from the area. The drainage rate is further reduced by sedimentation build-up at the confluence of the Juri and Kushiyara. Water levels, therefore, remain high until the end of the monsoon season.

The *beel* in the *haor* are government-owned (*khas*) land and are leased out for fishing through auction. There is also *khas* land between the *beel* and in low-lying areas.

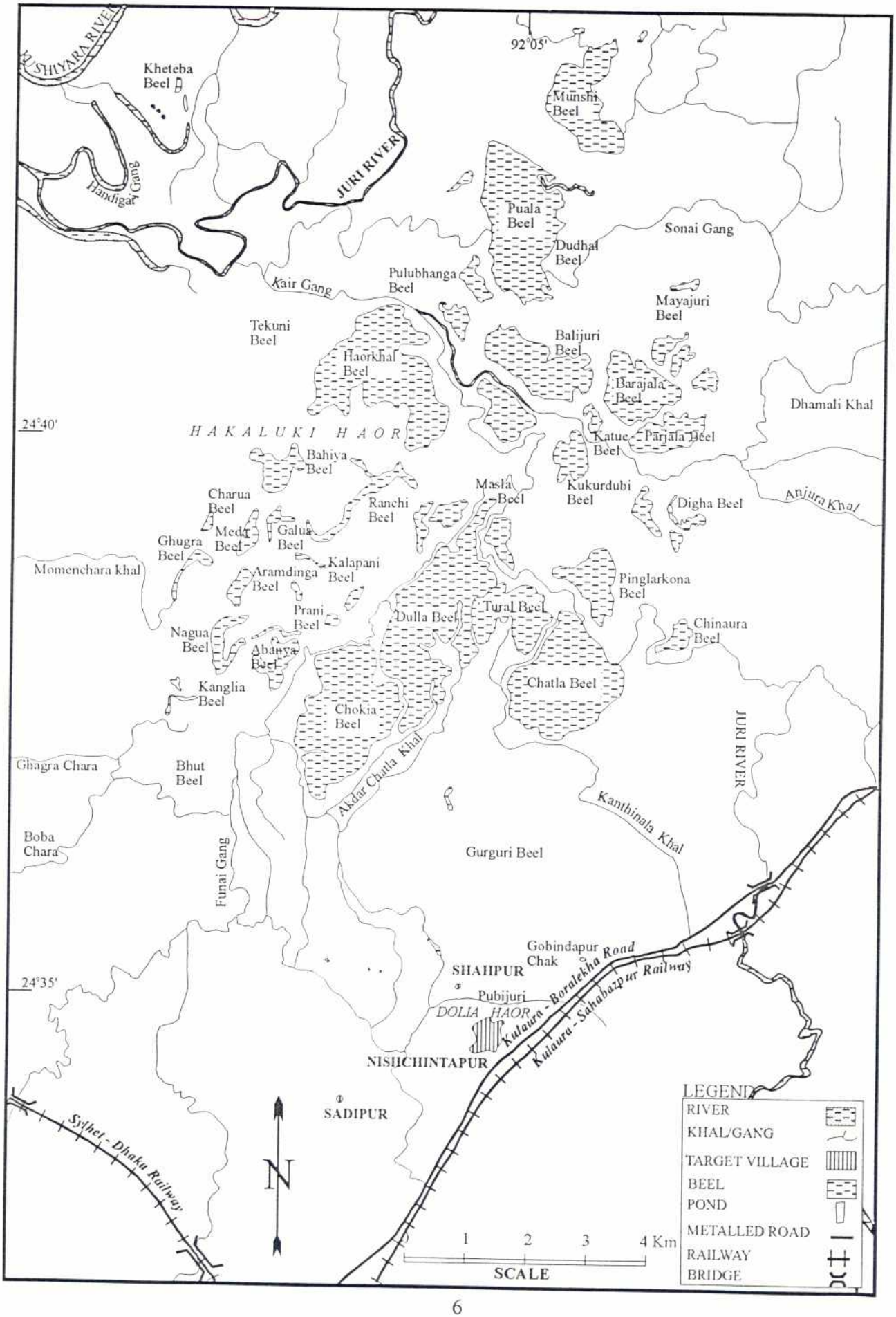
Nishchintapur

Nishchintapur is on the southern fringe of Hakaluki *haor*, in Shahpur *mauza* under Kulaura *thana* of Moulvibazar District. Nearly 67% of the households are Hindus of the mat-making *kayestha das* caste. They live on the western side of the village. Most of the Muslims are *talukdars* and live on the eastern side of the village.

The name Nishchintapur means "worry less", and local people say the name is derived from the traditional fertility and high rice yields that allow the people there to live "without worries". One year's yield of *aman* was reported to provide enough for two or three years' income. Despite its name, repeated losses of crops due to floods, especially flash floods, have reportedly brought increasing poverty, manifested in growing landlessness in the village. Many small farmers have been forced to sell their land following flood losses and have ended up share cropping. Much of the land sold this way has gone to Muslim households in neighbouring Shahpur village who are steadily moving into Nishchintapur.

Shahpur, one of the two satellite fishing villages selected for study, is north of Nishchintapur in Jayfarnagar union under Kulaura *thana*. Kanthinala *gang,* a main inlet for floodwater into

Figure 3
Hakaluki haor: location of study villages and principal water bodies



Hakaluki *haor,* is in the north east corner of the village. On the south east side of the village is a water body called Dolia *haor.* The village is divided into two parts known as Ujan Shahpur and Bhati Shahpur. The Hindu households of Shahpur are all *namasudra* caste fishermen. The Muslims are all agriculturalists.

The other fishing village, Sadipur, is in the south west corner of Nishchintapur in Mirshankar *mauza* of Bhukshimul union under Kulaura *thana.* The inhabitants of Sadipur are all Muslim *maimul* fishermen. Based on the poor construction of their houses, which are in congested clusters reminiscent of the *bosti* of urban squatters, these *maimul* are extremely poor. Figure 3 shows the location of the villages in the Hakaluki *haor* area.

1.2 Community profile

Tables 1 and 2 present basic socioeconomic data for the main villages and their satellite fishing communities. For the main villages the data are disaggregated by landholding category, for the satellite fishing communities they are disaggregated by fishing category.

The 8% of the Mirpur households that are large landowners own 66% of the land. The landless constitute 47% of the households and own less than 1% of the land between them. The medium and small landowning categories, 45% of the total population, share 32% of the land. With the exception of less than 2% of the small landowners, the community consists entirely of Muslims.

The satellite fishing villages exhibit characteristics that are specific to the North East Region, where fishing communities are composed either of Muslim *maimul* or Hindu *namasudra* fishermen. In Kadipur, for instance, the fishermen are all *namasudra;* in Gayghar they are all *maimul.* A very small proportion of the Kadipur Muslim households are involved in fishing but have other sources of income. The villages of Shahpur and Sadipur have similar religious distributions.

Although the majority of Nishchintapur households are Hindu they make up only 33% of the large landowners. Land ownership in Nishchintapur is even more concentrated than in Mirpur; 5% of the population controls 72% of the land. The landless constitute 44% of the households. The second largest concentration of households are small landowners; the 32% of village households in this category own 6% of the land. This may reflect the recurrent crop losses caused by flash floods, which have reportedly forced small and medium landowners to sell their land.

Table 1
Community profile: Mirpur, Kadipur and Gayghar (inside FCDI)

NE1-1 Mirpur — Main village

Land Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
Large	20	58.1	5.1	9.4	2.2	100.0	0.0	47	1052	10	3	1112
Medium	61	50.3	6.1	8.2	1.8	100.0	0.0	27	365	10	1	403
Small	56	46.6	3.6	6.6	1.5	98.2	1.8	22	109	7	3	141
Landless	121	42.2	1.1	5.4	1.4	100.0	0.0	10	1	2	0	13

Source: FAP 17 Village Census

* Landholding categories are defined in relation to total land owned as follows:
Large >7.5 acres; Medium 2.5-7.49 acres; Small 0.5-2.49 acres; Landless <0.49 acres.

NE1-2 Kadipur — Satellite fishing community

Fish Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
F1	3	50.0	0.7	5.0	1.3	0.0	100.0	11	5	0	0	16
F2	65	42.7	0.6	5.2	1.5	1.5	98.5	11	38	2	1	52
F3	14	51.8	1.1	5.9	1.6	0.0	100.0	20	234	5	1	260

Source: FAP 17 Village Census

NE1-3 Gayghar — Satellite fishing community

Fish Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
F1	3	46.7	0.7	7.7	1.7	100.0	0.0	7	0	4	0	11
F2	26	46.6	1.8	6.4	1.8	100.0	0.0	7	13	2	0	22
F3	4	54.8	2.3	9.0	2.0	100.0	0.0	32	300	11	0	343

Source: FAP 17 Village Census

* Fishing categories are defined as follows:
F1 = Fishing as only source of income
F2 = Fishing as primary source of income but with other subsidiary source of income as well
F3 = Fishing as secondary source of household income.

Table 2
Community profile: Nishchintapur, Shahpur and Sadipur (outside FCDI)

NE2-1 Nishchintapur — Main village

Land Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
Large	6	50.3	3.2	11.5	2.8	66.7	33.3	42	1325	8	181	1556
Medium	25	44.7	4.0	8.7	2.3	32.0	68.0	24	381	9	17	431
Small	41	40.7	3.0	6.7	1.8	34.1	65.9	11	114	5	3	133
Landless	56	38.1	2.3	4.9	1.3	46.4	53.6	5	5	1	1	12

Source: FAP 17 Village Census

* Landholding categories are defined in relation to total land owned as follows:
Large >7.5 acres; Medium 2.5-7.49 acres; Small 0.5-2.49 acres; Landless <0.49 acres.

NE2-2 Shahpur — Satellite fishing community

Fish Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
F2	27	46.6	0.5	6.0	1.7	0.0	100.0	10	43	3	2	58
F3	11	53.6	1.0	8.1	1.7	0.0	100.0	17	162	4	16	199

Source: FAP 17 Village Census

NE2-3 Sadipur — Satellite fishing village

Fish Cat.*	No.	Household Characteristics (Average)				Religious Breakdown		Average Landholding (decimals)				
		Age H/H head	Years educ. H/H head	H/H members	Earning members	% Muslim	% Hindu	Homestead	Cultivable land	Ponds	Other	Total
F1	38	40.9	0.0	5.8	1.4	100.0	0.0	3	1	0	0	4
F2	66	41.1	0.3	6.2	1.5	100.0	0.0	4	11	1	0	15
F3	36	41.8	0.3	6.3	1.4	100.0	0.0	5	88	1	0	94

Source: FAP 17 Village Census

* Fishing categories are defined as follows:
F1 = Fishing as only source of income
F2 = Fishing as primary source of income but with other subsidiary source of income as well
F3 = Fishing as secondary source of household income.

Settlement patterns in the *haor* are of two types: densely populated clusters on lands above flood level and elongated linear clusters along natural levees. Agricultural land owned and operated by the villagers is in the low-lying areas.

1.3 Agro-ecology

The two main villages occupy similar agro-ecological units within the same agro-ecological regions. These agro-ecological units have been defined by the Bangladesh Land Resource Survey (FAO, 1988) which are themselves based on soil reconnaissance surveys conducted in the 1960s. The AEUs are therefore indicative of conditions prior to the construction of the principal embankments in the area. The Land Resource Survey uses the distribution of different soil types and flooding depth and duration (based on land elevation) to establish the agricultural potential of different agro-ecological units.

AEUs initially were used as a basis for selecting study communities as they appeared to offer the possibility of identifying areas with similar access to water bodies as defined by land height. In practice, using AEUs for this purpose did not always prove satisfactory given the immense range of variables influencing fisheries activity.

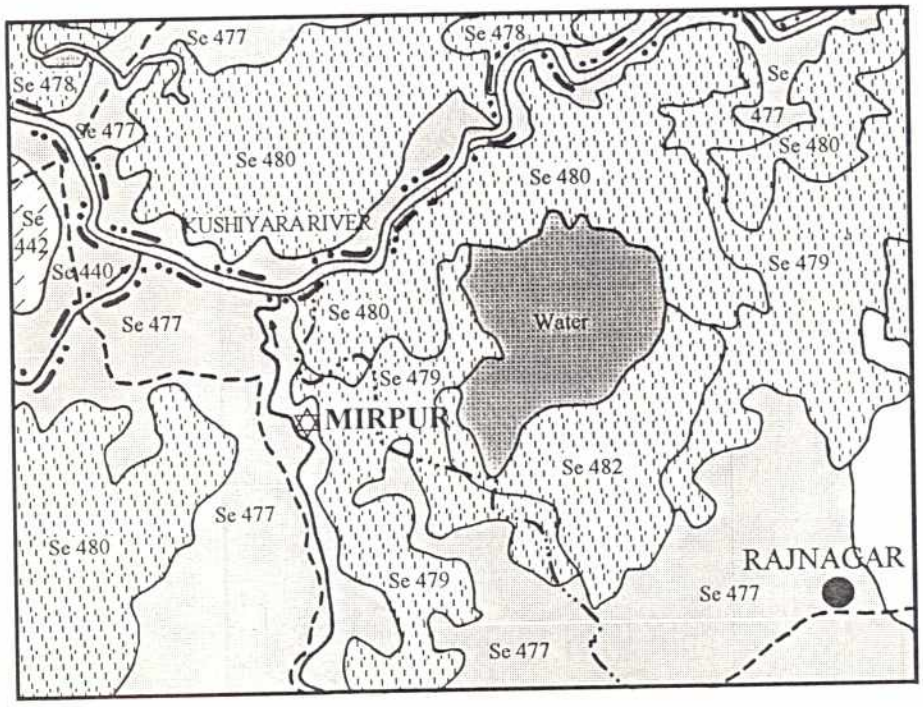
Nonetheless, the agro-ecology of areas around study villages provides a general indication of conditions. Figures 4 and 5 show the agro-ecological units containing the villages of Mirpur and Nishchintapur. Finding agro-ecological matches inside and outside schemes was not generally difficult since soil associations tend to be broadly similar. The complex distribution of agro-ecological units, however, means that many villages straddle several different units.

1.4 Floods

Flooding in North East Region has two distinct phases: pre-monsoon flash flood and full-monsoon deep flood. The former normally occurs in late *Choytra* (March-April) but sometimes comes as early as *Falgoon* (Feb-March). The deep flood phase begins when water from the Meghna system inundates the *haor* areas of the Surma-Kushiyara floodplain. The *haor* areas then remain flooded until the water in the Meghna starts receding.

Flash floods are caused by heavy rainfall in the hills across the border in India and sometimes destroy standing crops in the *haor*. In 1993, when there was heavy rainfall in

Figure 4
Mirpur
Flood phases and agro-ecological units



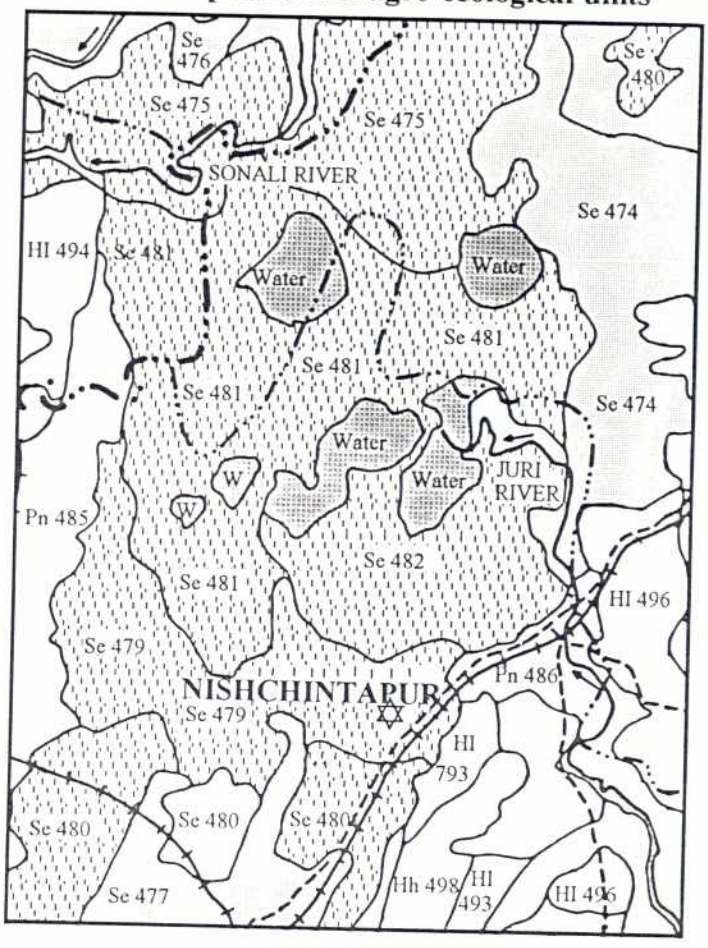
LEGEND

>50% F0	District boundary
>50% F0 and F1	Upazila boundary
>50% F2, F3, F4	Main road
>50% F3 and F4	Railway
>50% F4	River
Target villages	Tidal river
Town	0 1 2 Km. SCALE

AEU	LAND TYPE DISTRIBUTION (% of land of different flooding depth)					LAND CAPABILITY (%)			
	H	MH	ML	L	VL	Land Capability I		Land Capability II	
SE 479	8	0	35	57	0	IIW (50%)	Moderate to good yields of two rice crops per year where irrigation water is available.	IIIWd (50%)	One good rice crop under traditional management.

Source: FAO 17 Land Resource Survey

Figure 5
Nishchintapur
Flood phases and agro-ecological units



LEGEND

>50% F0	District boundary
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>50% F2, F3, F4	Main road
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Target villages	Tidal river
Town	0 1 2 Km. SCALE

AEU	LAND TYPE DISTRIBUTION (% of land of different flooding depth)					LAND CAPABILITY (%)			
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SE 479	8	0	35	57	0	IIW (50%)	Moderate to good yields of two rice crops per year where irrigation water is available.	IIIWd (50%)	One good rice crop under traditional management.

Source: FAO Land Resource Survey

Falgoon, Hakaluki *haor* experienced early flash flooding that completely destroyed the standing *boro* crop.

The MIP embankment was originally designed to afford full protection against floods, but annual flooding continues to be a major problem. These floods are mainly the result of public cuts in the embankment and rainfall runoff from the Bhatera hills to the east.

1.5 Fisheries access issues and the fishermen of Bangladesh

The most important source of variability between communities in terms of their dependence on fisheries is the existence and enforcement of access restrictions. The formal and informal controls over who fishes where and when are key to understanding patterns of dependence on fisheries resources and in gauging the effects changes in those resources may have on a community.

Fisheries access issues in Bangladesh are extremely complex, governed not only by law but also by tradition and local fiat. As the fish resources themselves change access also can change. To further complicate matters, access controls affect different fishing populations in different ways. To understand the basis for this it is necessary to understand the nature of these different fishing populations.

Most attempts to categorise those who fish in Bangladesh end up identifying three groups: professional fishermen, seasonal fishermen and subsistence fishermen. Given the degree of variation between regions, areas and villages, and the degree of variation in the fisheries resource from year to year, there are obviously many groups and areas that will fall outside any attempt at categorisation at any given moment. In general terms, however, the three groups, professional, seasonal and subsistence, constitute sectors of the population with identifiably different levels of dependence on fishing. Each is affected differently by access arrangements on area water bodies. Section 1.6 outlines the existing access control arrangements. These are discussed in greater detail for seasonal and subsistence fishermen in Section 2 and for professional fishermen in Section 3.

Professional fishermen

Professional fishermen are defined by the high degree of their dependence on fishing for a livelihood. Within the category of professional fishermen there are two groups: traditional fishermen and non-traditional fishermen.

Historically, professional fishermen in Bangladesh have been a clearly circumscribed group, defined by religion, caste and their low social status. They were fishermen by tradition. Such traditional fishermen (*jele*) are frequently thought of as being almost all Hindu, but in many areas of the country there have long been extensive communities of Muslim fishermen who are either Hindu fishing communities that have converted to Islam or poor Muslim communities that have been involved in fishing for many generations.

In traditional rural Bengal society, fishing is a hunting activity, which is associated with low-caste or even non-caste (i.e. tribal) people. Those who fish, are therefore held in low social esteem and generally segregated from the majority of society. At the root of this situation is the concept of pollution. Fishermen, because they generally must get into the water to perform their occupation, are considered polluted. This concept, although generally associated with Hindu culture, is also strong among the Muslim communities of rural Bangladesh, and it is reflected in the opposition among higher status Muslim farmers to the involvement of any of their co-religionists in fishing. Distinctions are made, however, between fishing with gear in the water and fishing from the bank. Anyone can apparently drop a line or throw a *jhaki jal* (cast net) from a riverbank (keeping dry in the process) without risk of compromising their social standing. Actually getting into the water with a push net or a seine net is an entirely different matter and implies risks of pollution. The negative social connotations of fishing also appear to be strictly limited to fishing as a source of livelihood. Fishing as "recreation" or simply for household consumption is largely exempt from the general disapproval of fishing activity by anyone except a fisherman.

Since the 1970s, pressed by their own economic need for a livelihood and attracted by the avid demand for fish in Bangladesh, people outside the traditional fishing communities have crossed barriers of social status to take up full-time fishing. Regardless of their religion, those who fish for a living are looked down upon.

Seasonal fishermen

The acute seasonality in almost all fisheries in Bangladesh tends to limit new entrants to the fisheries to seasonal fishing. Few of these seasonal fishermen, who are either landless labourers or landowners (typically owning small to medium farms) actually become full-time, year-round fishermen, even though they may make substantial income from the occupation. The landowners among the seasonal fishermen have usually realized the value of the fisheries resource occupying floodwaters over their land and have therefore decided to appropriate that part of the resource for themselves. Therefore, for the purpose of this study, seasonal

fishermen are defined as those non-professional fishermen who hold no formal leases and take advantage of the seasonal availability of fisheries resources to provide some or all of their income for that part of the year.

Subsistence fishermen

Making meaningful distinctions between subsistence fishing and fishing for income can be a futile exercise. To some extent calling oneself a subsistence fisherman has become a matter of convenience. When people outside professional fishing communities want to minimise the amount of fishing they do (because they are using illegal gear or think there may be some kind of access restriction) they describe it as fishing just for consumption, although they may well be using sizeable units of fishing gear. Children's fishing is almost always said to be "just for consumption" even though many may sell some of their catch to supplement family income. The degree to which what is caught is sold for income also depends a great deal on seasonal fluctuations in the fish biomass of area water bodies. During the drawdown, for example, when fish are plentiful and concentrated in small areas where they are easily caught, a self-described subsistence fisherman can easily find himself with more fish than his family can consume. Subsistence fishermen are defined as those who fish for consumption and for whom any income from fishing is more a matter of chance than intent.

1.6 Fisheries access in the study area

The *haor* area of the North East Region is renowned for its abundant fisheries resources. Deep flooding, extensive areas of permanent wetland and the patterns of runoff from surrounding hills all contribute to the productivity of the basin fisheries. Access to these fisheries is characterized by extremely tight control by very powerful and wealthy leaseholders. Nowhere in Bangladesh are fishing limitations as strictly enforced as in the North East Region.

The largest permanent water body inside the MIP is Patashinga *beel* in Kawadighi *haor*. Shawaijuri *haor,* inside the MIP north west of Kadipur and north of Mirpur, contains Chatal *beel* and several other smaller water bodies. These *beel*, which are connected by a network of *khal*, are leased out as individual *jalmahal* by the local Land Revenue Office.

There are more than 80 interconnected *beel* in Hakaluki *haor.* Most are leased out either as group fisheries or individual *jalmahal.* Leaseholders generally hire fishermen from Sadipur, Rajnagar and Fenchuganj to harvest the *beel.* The outer fringe of the *beel* and shallowly

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flooded area of the *haor* are open for fishing from *Baishak* (April-May) to *Bhadra* (August-September). The fishermen of Shahpur take advantage of this opportunity to fish the shallow part of *haor* during that period. From *Ashwin* (September-October) onward the Shahpur fishermen harvest ponds. The fishermen of Sadipur are mostly hired by leaseholders to harvest *beel*. These fishermen get preference over the villagers of Shahpur because of their ownership of large gears suitable for harvesting *beel*.

2. FISHERIES IN MIRPUR AND NISHCHINTAPUR

2.1 Sources of Information

The socioeconomic research undertaken by FAP 17 used four different means to assess levels of fishing activity and dependence on fisheries in the communities under study:

- During the census survey, each village household reported the principal occupation of the household head and ranked a selection of other income sources for the household, including fishing.

- During the baseline survey, the sample households listed income-generating and expenditure-saving activities undertaken at various times of the year by family members. This included any fishing activities either for income or consumption.

- The one-year monitoring of incomes and activities of sample households recorded the earnings, expenditures and time spent by household members on all income-generating and expenditure-saving activities, including fishing. Special care was taken to check on fishing activities not mentioned during the census or baseline surveys.

- Semi-structured rapid rural appraisals (RRAs) were done in all the study communities at several points during the study. These open-ended appraisals focused on qualitative issues and historical processes affecting fisheries. The information gathered facilitated cross-checking of available data sets, identification of distorting factors and, most important, understanding of the social, cultural and historical context of the fisheries.

The analysis in this chapter addresses four basic questions:

- **who** is involved in fishing?
- **when** and **where** do these groups fish?
- **why** do they fish **there**?
- **how important** is fishing for these groups?

2.2 Patterns of fishing involvement

Table 3 shows the first- and second-ranked sources of income for all households in Mirpur and Nishchintapur. The data, from the census survey, are arranged according to landholding category.

Table 3
Mirpur and Nishchintapur
Ranking of sources of household income
by landholding category

NE1-1 Mirpur **Main village** **Inside**

Land Cat.	No.	First Rank Occupation *					Second Rank Occupation **				
		Farm	Fish	Lab	Trade	Other	Farm	Fish	Lab	Trade	Other
Large	20	65.0	0.0	0.0	5.0	30.0	35.0	0.0	0.0	10.0	15.0
Medium	61	82.0	0.0	3.3	1.6	9.8	13.1	0.0	1.6	3.3	13.1
Small	56	58.9	0.0	7.1	3.6	28.6	30.4	0.0	14.3	1.8	16.1
Landless	121	28.1	0.0	40.5	2.5	27.3	5.0	0.0	23.1	1.7	9.1

Source: FAP 17 Village Census

NE2-1 Nishchintapur **Main village** **Outside**

Land Cat.	No.	First Rank Occupation *					Second Rank Occupation **				
		Farm	Fish	Lab	Trade	Other	Farm	Fish	Lab	Trade	Other
Large	6	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	16.7
Medium	25	68.0	0.0	0.0	12.0	20.0	24.0	0.0	4.0	36.0	28.0
Small	41	51.2	0.0	14.6	24.4	9.8	48.8	0.0	4.9	14.6	29.3
Landless	56	8.9	0.0	50.0	10.7	19.6	21.4	0.0	3.6	3.6	19.6

Source: FAP 17 Village Census

* % of households ranking source of household income as primary.
** % of households ranking source of household income as secondary.

The social stigma attached to fishing in the North East Region is clearly reflected in the table. In neither village did anyone, even among the landless households, report fishing as either a first- or second-ranked occupation. In fact, however, during subsequent visits to the villages many people were seen fishing but would not admit doing so to FAP 17 enumerators. The use of multiple sources of information for cross-checking and the monitoring of neighbouring water bodies was, therefore, important in obtaining a complete picture of local fisheries activity.

Subsequent surveys and appraisals in the study communities provided an opportunity to correct the census figures. During the baseline survey of sample households, a sizeable number of households who reported no gear ownership in fact turned out to own fishing gear and even to earn a considerable fishing income at certain times of the year. Using the corrected data, new tabulations were made to show gear ownership by each landholding category (Table 4). Large landowning households are excluded from the analysis as they all reported 100% dependence on farming or other non-fishing activities.

Table 4 shows that all three household categories have some fishing income. Interestingly, in Mirpur, where a caste-like segregation is maintained between the *bangal* (farmers) and *maimul* (traditional muslim fishermen), there are households in the medium landowning category who have some fishing income.

In Mirpur, the *bangal* and the *maimul* are segregated and the *bangal* consider fishing to be socially degrading. If any *bangal* is seen fishing he would say, *"era jat mere bhat khachhe"* ("I earn my food at the cost of my social status").

Box 1: Fishing among *Bangal*

Landless households, on the other hand, only own inexpensive push nets, which are used seasonally. Because of the economic hardship in which they live, these households are unable invest in more costly gear. Thus, the fishing makes only a small contribution to their total income.

In Nishchintapur, which is mostly inhabited by *kayestha das* Hindus, investment in fishing gear is very low. Only about 22% of the medium landowners and 19% of small landowners have seine nets. The village landless households, although there are few, own almost all types of gear. Thus, unlike Mirpur, landless households in Nishchintapur have some fishing income.

2.3 Women in fisheries

In Bangladesh, irrespective of their religious affiliation, women above a certain age generally do not fish. Although there is no absolute taboo against women fishing, they generally avoid working in water. Among Muslim women, the strictures of *purdah* discourage women from getting involved in activities like fishing that may take them outside the homestead compound. The women of Hindu fishing communities, although regarding fishing as a man's job, will assist them by making, mending and dyeing nets, and performing other fishing-related tasks within the homestead. Growing poverty is beginning to affect the seclusion of women in rural areas, however, and some now pursue a variety of income-generating

activities, including fishing. Even so, age limits remain in effect and women's involvement in fishing is still very limited both in terms of their number and the volume of fish they catch. Women fish primarily for consumption, indirectly contributing to family income by saving food expenditures.

Table 4
Mirpur and Nishchintapur
Gear ownership, average annual income from gear types and landholding category

NE1-1 Mirpur **Main village** **Inside**

Gear Type	Bengali Name	Medium Farmers			Small Farmers			Landless		
		No.	%	Tk.	No.	%	Tk.	No.	%	Tk.
Seine net	Deal	15	24.6	758	0	0.0	0	0	0.0	0
Trap	Polo	0	0.0	0	4	6.8	450	0	0.0	0
Hook	Sip	0	0.0	0	4	6.8	150	0	0.0	0
Push net	Thella jal	10	15.8	328	18	31.4	474	31	25.5	617
Other	Dewatering	0	0.0	0	0	0.0	0	5	4.0	400

Source: FAP 17 Socioeconomic Monitoring

NE2-1 Nishchintapur **Main village** **Outside**

Gear Type	Bengali Name	Medium Farmers			Small Farmers			Landless		
		No.	%	Tk.	No.	%	Tk.	No.	%	Tk.
Gill net	Current jal	0	0.0	0	0	0.0	0	6	10.0	250
Seine net	Deal	5	21.8	1666	8	19.1	441	11	19.0	743
Cast net	Jhaki jal	0	0.0	0	0	0.0	0	3	4.5	100
Push net	Thella jal	8	30.6	317	13	30.5	1208	8	14.5	519

Source: FAP 17 Socioeconomic Monitoring

Purdah restrictions on Muslim women are more rigidly enforced in the North East Region than in other areas of Bangladesh. In Mirpur, essentially a Muslim village, the majority of women do no fishing at all. Female members of indigenous groups, known as *sthanio*, mindful of local customs also do not fish. But women from migrant families, locally called *abadi,* are sometimes seen fishing. These women mostly fish the floodplain and *khal* during the full monsoon between *Joisthya* (May-June) and *Ashwin* (September-October) using hook

and line or *feloon* (push net). Although they primarily fish for consumption, they occasionally exchange fish for rice.

In the fishing village of Kadipur women generally consider fishing to be a man's job, but some widows and members of other vulnerable groups occasionally fish away from public view in the water bodies around their homesteads. Some women also make *feloon* (push net) and *jhaki jal*. About 10-15 women are reportedly engaged in net- and trap-making. A very small number of women are also active in fish drying.

The *maimul* women of Gayghar do not fish. In fact, even the male *maimul* have abandoned fishing for other occupations, particularly fish trading. Some of the village women who are Grameen Bank members pass on loans taken from the bank to their husbands, relatives or neighbours to invest in the fish trade on the basis of equal sharing of the profit. A few women also dry fish, purchasing and re-selling fish through fish traders. In this activity, too, the profit is shared equally.

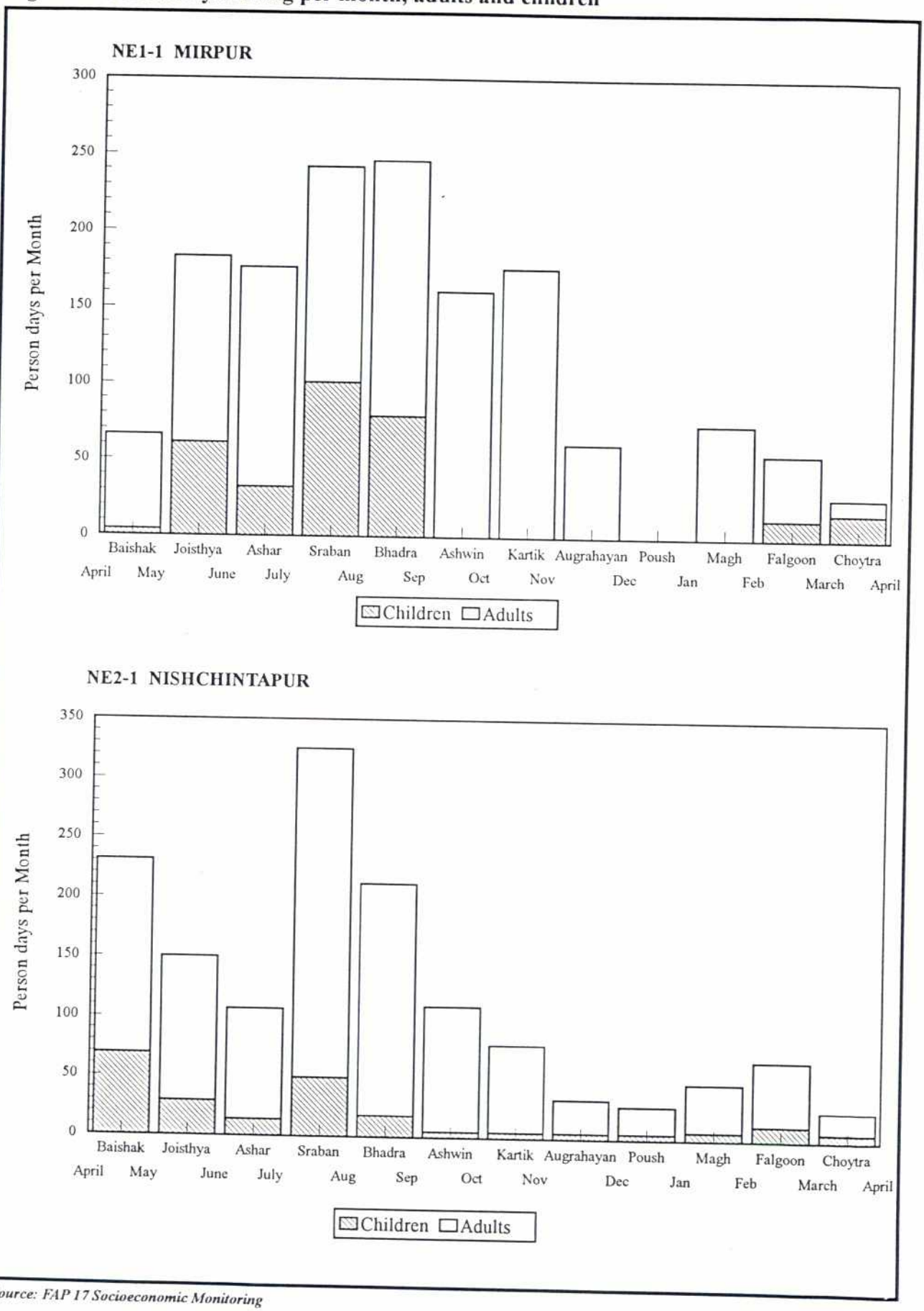
In Nishchintapur, women do not fish for fear that social sanctions will be imposed upon them by the village elders. As in Kadipur, however, women from vulnerable groups sometimes fish out of public view in *gopat* or ponds near their homesteads. In the fishing villages of Shahpur and Sadipur women's involvement in fishing is negligible.

2.4 Children's involvement in fisheries

Before the 1970s, children primarily fished for consumption and "play", and even now children's fishing activities are often limited to assisting a father or elder brother by holding the container for the catch while the older person fishes. But children between the ages of 11 and 15 often supplement families' fishing labour requirement. Sometimes these children take turns operating a *veshal* (lift net) or keeping watch on it.

Figure 6 shows person days adults and children spent fishing each month in Mirpur and Nishchintapur. Mirpur children are primarily involved in fishing during the peak flood period from *Joisthya* (May-June) to *Bhadra* (August-September). During this season children fish around the periphery of the floodplain. Children's fishing activity drops off starting in *Ashwin* (September-October), when leaseholders begin imposing restrictions on open fishing. During the flash flood period from *Falgoon* (February-March) to *Choytra* (March-April) limited fishing activity occurs.

Figure 6 Person days fishing per month, adults and children



Source: FAP 17 Socioeconomic Monitoring

In Nishchintapur, children are involved in fishing to varying degrees throughout the year. Except during *Baishak* (April-May) and *Sraban* (July-August), however, adult fishing is lower than in Mirpur.

2.5 Access to fisheries

As in all other regions of Bangladesh, access to fisheries in the North East depends on the interplay of a number of factors, among them, strict enforcement of the leasing system, growing numbers of people involved in fishing and reduction of water bodies. The factor that distinguishes the North East from other regions is its tightly controlled leasing system. During the colonial period these fish resources were controlled by *zamindars, mirashdars* (petty landlords) or their intermediaries. When the *zamindari* system was abolition in 1950, the intermediaries emerged as the effective controllers of the fish resources, becoming leaseholders of the *beel* and *khal* fisheries.

Until the early 1970s, leaseholders and the traditional fishermen working for them did not need to exert especially strict controls over fishing activity, except during the year-end harvest in *Magh* (January-February) and *Falgoon* (February-March). The abundant availability of fish made rigid enforcement of restrictions unnecessary, and in any case the social stigma attached to fishing ensured that, for the most part, none but traditional fishermen would fish. Under these circumstances leaseholders tended to turn a blind eye to subsistence fishing in the floodplain.

Under the relatively contained fishing pressure of the past, the arrangement consisting of leaseholder-controlled *jalmahal* in the *beel* surrounded by uncontrolled floodplain where anyone could fish for consumption, ensured a degree of balance in the distribution of resources. The leaseholders' policy of restricting their activities to leased water bodies benefitted people living around the floodplain, who only engaged in fishing for subsistence. The quantity of fish caught did not seriously jeopardise the profitability of the leaseholders' or the traditional fishermen's operations when *beel* were finally harvested.

This relatively balanced distribution of resources has changed rapidly over the last two decades. Traditional fishermen now face stiff competition from an ever-increasing number of non-traditional fishermen, who are sarcastically called *sheikh* (Muslim) by both *maimul* and Hindu *namasudra*. The fact that even the *maimul* apply this term to their co-religionists

is testimony to the acrimonious competition and conflict that characterize the present-day relationship between the fishing and non-fishing communities.

Several factors have contributed to the increase in the number of non-traditional fishermen. The *haor*, like the rest of Bangladesh, have experienced a high rate of population growth. This has been compounded in the North East by in-migration from neighbouring districts. The large landowners of *haor* areas have historically encouraged in-migration, giving employment preference to migrant agricultural labourers. These migrants, called *abadi*, ultimately settled in the area. The *abadi* are generally poor and have settled marginal land farther down the slope of the *haor*. As outsiders they are less concerned about social norms regarding fishing and have been more willing to move into an occupation previously reserved for the fishing castes. The deteriorating economic situation has also helped push increasing numbers of people into fishing.

From the leaseholders' perspective these changes threaten one of the basic factors which made the *beel* fishery so productive. When the *beel* were fished during the dry season, leaseholders were effectively harvesting the concentrated fish production of the entire *haor* area, which followed the receding flood into the *beel*. If more of the fish are now being caught on the floodplain, the production of the traditional *beel* fishery is obviously threatened. The leaseholders' reaction has been to attempt to extend their sphere of control, restricting fishing even beyond the area of their official lease to ensure that as large a proportion as possible of the floodplain production "returns" to the *beel* at the end of the season. This is evident in leaseholders' increasing expenditures to employ guards, called *parials*. In Patasinga *beel*, for example, the leaseholder in 1993 spent about Tk. 10,000 on wages for guards and another Tk. 11,500 to provide boats for them.

Such measures bring the leaseholders into conflict with floodplain farmers over the fish caught on privately owned land outside the *jalmahal*. The claims and counter claims of the leaseholders and farmers, and the increasingly strict enforcement of fishing restrictions, are progressively pushing landless subsistence fishermen and traditional fishermen without leases out of their own fishery.

2.6 Seasonality and fisheries

Fishing activity is closely related to the annual flood cycle and the movements of fish which the rise and fall of water levels produce. Inevitably, therefore, flood control measures will affect fishing activities by changing the extent and timing of floods.

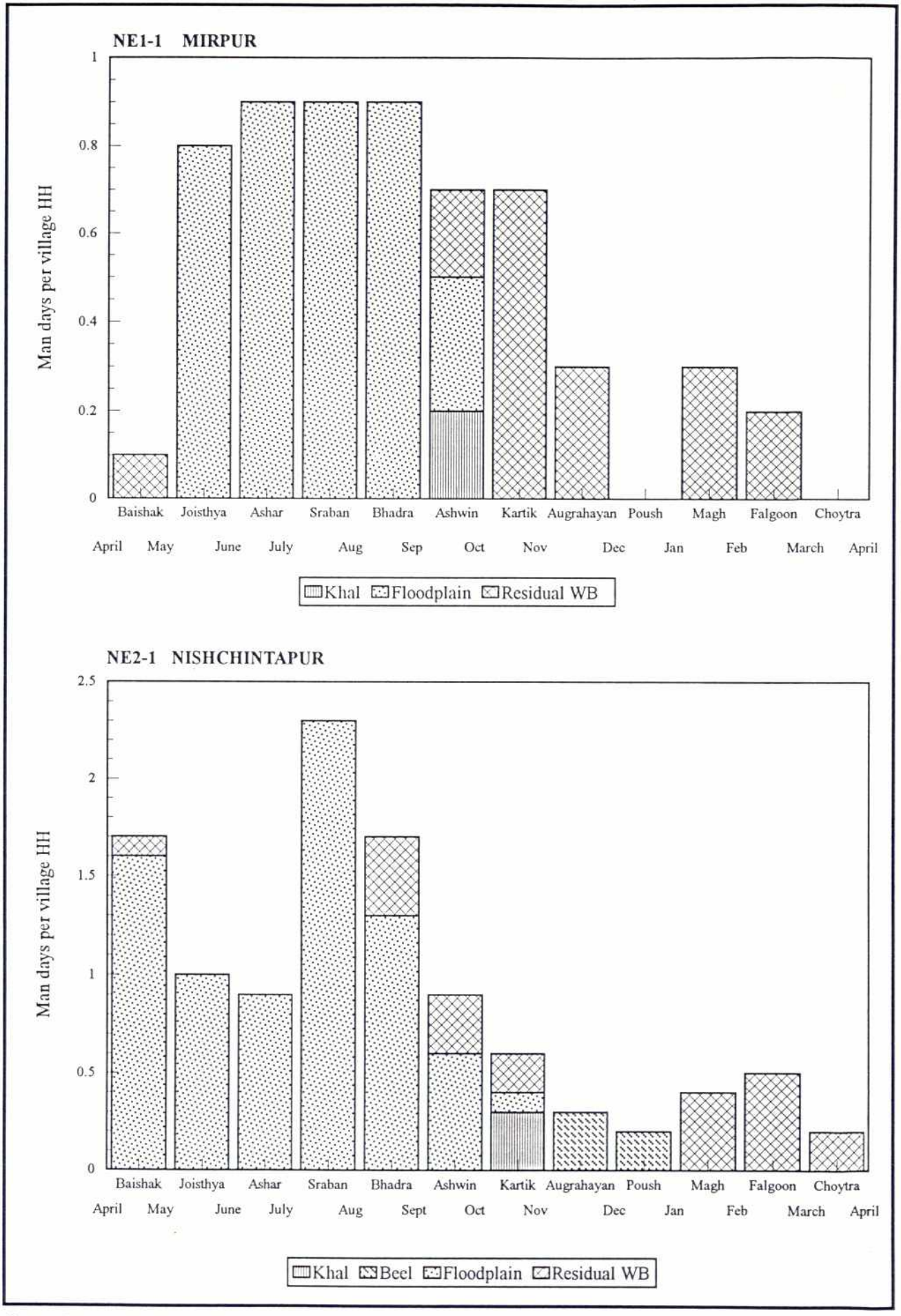
Figure 7 shows how fishing effort varies on water bodies through the year in Mirpur and Nishchintapur; Table 5 shows the intensity and distribution of fishing through the year for the main gear/water body combinations. The maximum fishing activity of Mirpur residents occurs on the floodplain from *Joisthya* (May-June) to *Bhadra* (August-September), which is the peak flood season. During the transition from peak flood to recession in the month of *Ashwin* (September-October) fishing is done in *khal*, floodplains and residual water bodies. For the remaining months of the year, beginning in *Kartik* (October-November) and ending in *Baishak* (April-May), fishing is restricted to the harvesting of ponds, embankment borrow pits and ditches.

In Nishchintapur, the highest levels of fishing occur on the floodplain from *Baishak* (April-May) to *Bhadra* (August-September), covering both the pre-monsoon and peak flood periods. From *Ashwin* (September-October) on, fishing activity is largely restricted to residual water bodies. The exception is the period from *Augrahayan* (November-December) to *Poush* (December-January), when a limited amount of fishing is done in the *beel*. The higher level of fishing activity in the month of *Baishak* (April-May) reflects fishing during flash floods.

Pre-monsoon

As previously mentioned, the pre-monsoon period in the *haor*, from *Choytra* (March-April) to *Joisthya* (May-June), is marked by violent storms, heavy local rainfall and flash floods. During 1993-94, the year of the FAP 17 study, the North East Region experienced severe storms and heavy downpours during *Falgoon* (February-March). These early rains caused serious flooding and the villagers of Nishchintapur and Shahpur claimed to have lost all their crops. Such erratic weather patterns also have serious implications for the *beel* fisheries, which are being harvested around this time. Flash flooding can suddenly inundate the *beel* and surrounding areas and equally as suddenly shed water. These temporary increases in current and water flow trigger the migratory behaviour of fish throughout the system. Migratory species in the rivers start their upstream spawning runs and their eggs and fry subsequently begin to drift downstream to be carried laterally onto the floodplains.

Figure 7 Distribution of fishing effort by water body through the year



Source: FAP 17 Socioeconomic Monitoring

Table 5

Principal gears, use by month and water body

NE1–1 Mirpur — **Units: Man Days per Village Household**

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Deol	Khal						0.2							0.2	3.4
	Floodplain		0.2	0.3		0.4								0.9	15.3
	Residual WB	0.1						0.2						0.4	6.8
By hand/Dewatering	Residual WB						0.2	0.2	0.1					0.6	10.2
Thella jal	Floodplain		0.6	0.6	0.8	0.5	0.3							2.8	47.5
	Residual WB							0.3			0.2			0.7	11.9

NE2–1 Nishchintapur — **Units: Man Days per Village Household**

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Deol	Floodplain	0.5	0.6	0.3	1.5	0.7								3.8	36.5
	Residual WB	0.1				0.2	0.1	0.1			0.2	0.2	0.1	1.0	9.6
Thella jal	Khal							0.3						0.3	2.9
	Beel								0.3	0.2				0.5	4.8
	Floodplain	0.8	0.4	0.5	0.5	0.6	0.5	0.1						3.5	33.7
	Residual WB					0.2	0.2				0.2	0.3		1.1	10.6

Note : Depth of shading indicates relative intensity of gear use within the year

In the *haor*, the fluctuations in *beel* levels and the onset of floodplain inundation give rise to the *ozaya mach* fishery. As water from intense rainfall drains into the *beel,* resident fish begin their migration, moving against the current out of the *beel* onto the floodplain to breed and spawn.

Breeding begins during the pre-monsoon flood. Depending on the rain and the volume of water in the river and on the floodplain, most of the catfish and a number of other species start breeding around the end of March or early April. For species like *boal, pabda, koi,* and *puti*, flash floods stimulate fish breeding. For the non-professional fishermen living around the *haor* this is the most productive fishing period. Fish are easily caught and reportedly move in shoals, which can produce sizeable catches.

Since the pre-monsoon coincides with the end of the *beel* fishing season, it is not subject to control or interference from leaseholders. Restrictions on fishing are normally removed once the *beel* harvest is completed. In any case fishing at this time of year would be very difficult to control, as it involves enormous numbers of people spread all over the floodplain. Children often play a major role in this fishing, partly because their parents are occupied with the *boro* harvest.

When pre-monsoon floods occur very early in *Falgoon* (February-March) before the *beel* harvest is complete (as happened in 1993-94), leaseholders do not attempt to limit the ensuing rush of fishing by local people.

Peak flood

Characteristically, *haor* fill with water during pre-monsoon and early-monsoon rainfall. In Hakaluki and Kawadighi *haor* the early flood is caused by water flowing in from hills across the border in India. In some years the period between pre-monsoon flood and peak flood is marked by a temporary recession of flooding, but in others incessant rainfall may abolish the recession.

The peak flood generally begins with the onset of the monsoon in *Ashar* (June-July) and lasts until the end of *Bhadra* (August-September), sometimes extending to mid-*Ashwin* (the end of September). During this period all the rivers overflow onto the floodplain. River tributaries flowing into Bangladesh from the Indian hills attract spawning migrations of carp and other species.

Hakaluki *haor* is flooded with water from the Kushiyara, Sonai Bardhal and Juri rivers. This area also experiences heavy rainfall during the monsoon, and since drainage is slow, the *haor* retains water for an extended period. In full flood the area available for fishing becomes enormous. All categories of people, including traditional and non-traditional fishermen, landless households, women and children take this opportunity to fish around the periphery of the *haor* with such gears as *deal* and *thella jal* (push net). Although it is impossible to effectively restrict fishing activity in the *haor*, leaseholders have their *paharadar* (guards), in place as early as *Sraban* (July-August).

Drawdown

The entire *haor* region is affected by drainage congestion as the enormous volume of water gathered in the Sylhet basin drains out through the Meghna River at Bhairab. The ability of the Meghna to cope with this flow also depends on flows out of the Padma-Jamuna system. If these are high, water backs up through the entire Meghna system and slows drainage of the basin even further. During recession, the flood water from the *haor* gradually runs down from the floodplain into the perennial *beel, gang* and *khara* crisscrossing the *haor*.

Both Kawadighi *haor* inside the MIP and Hakaluki *haor* outside have only one outlet through which floodwater can drain. For Kawadighi *haor* the principal outlet is through Machukhali *khal* at the confluence of the Manu and the Kushiyara. In this area people cut the embankment almost every year to relieve drainage congestion. The only outlet for Hakaluki *haor* is through the Juri River discharging into the Kushiyara near Fenchuganj. In recent years the drainage here has slowed because of siltation at the Juri's confluence with the Kushiyara. The ability of the Juri to cope with the flow also depends upon the flood height at Kushiyara.

During drawdown, all over the floodplain, *beel* leaseholders discourage fishing with a mixture of intimidation and influence. Fishing in both Kawadighi and Hakaluki *haor* is strictly controlled during the drawdown. Local people harvest the waters draining off the agricultural land on the periphery of the *haor*, but leaseholders try to restrict fishing as much as possible. From *Ashwin* (September-October) onwards the fishing activity of non-professional fishing households falls drastically. At the same time, some landowners trap water in bunded sections of the floodplain and harvest the fish remaining there.

The leaseholders of the *beel* within the MIP live around the village of Mirpur, some in the fishing village of Gayghar. They hire fishermen to harvest the *beel* during the dry season, beginning from *Augrahayan* (November-December).

As the water recedes, *boro* is planted following the receding line of inundation. In recent years Nishchintapur farmers have shifted to HYV *boro* cultivation, planting it on higher land near the village. Similarly, in Kawadighi *haor* transplanted *boro* is cultivated on higher lands, though on a very limited scale.

Dry season

In terms of fish production, the dry season from *Augrahayan* (November-December) to *Choytra* (March-April) is the peak fishing period in the North-East. Dry season fishing is largely restricted to leaseholders and their hired fishermen. Others in the communities living around the *haor* benefit only indirectly from the abundant availability of fish in the market.

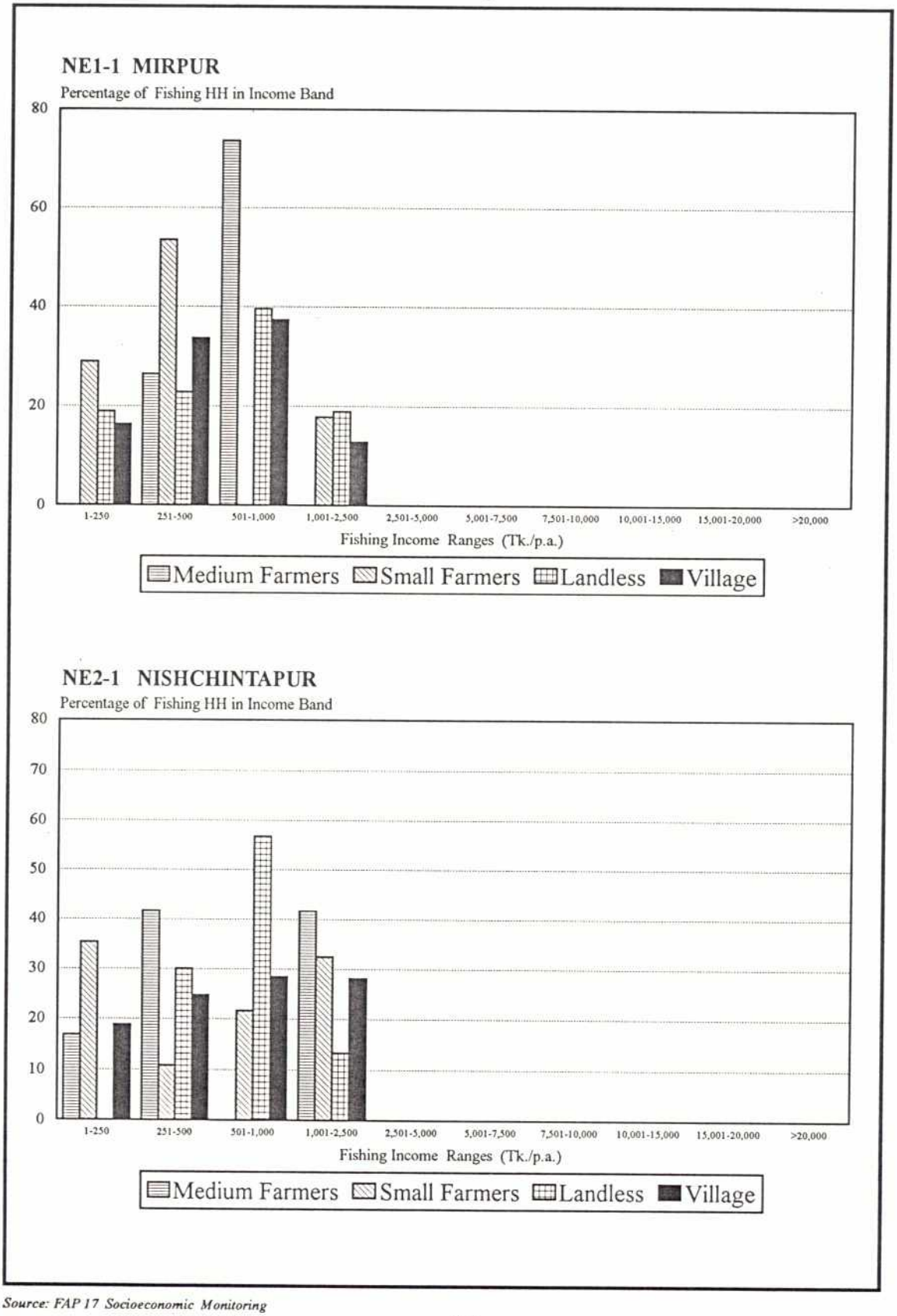
As land between the *beel* begins to re-emerge, leaseholders tighten their restrictions on fishing. By the end of *Augrahayan* there are practically no areas left on the floodplain which can be freely fished. Some fishing continues, however. Nishchintapur villagers harvest nearby ponds by hiring fishermen from neighbouring villages. They also erect small embankments about 30 cm high that are primarily intended to facilitate irrigation during dry season. Fish trapped by these embankments are harvested. Mirpur has about a hundred ditches that remain available for fishing.

Unlike some other areas studied by FAP 17, this area has no system whereby the *beel* and *khal* are opened after the harvest for community fishing, but there is a century-old fish *mela* (festival) at Monumukh every year. The date of the *mela* coincides with the Hindu festival *Poush Sangkranti* (the last day of the month of *Poush*). It is said to be the most important fishing festival in Bangladesh. Large quantities of fish are brought from neighbouring Chandpur, Jamalganj, Netrokona, Dhirai, and Sunamganj to be sold at this festival. Large fish are put on display to attract high prices.

2.7 Fisheries incomes

The fishing incomes of Mirpur and Nishchintapur have some similarities (Fig. 8). The two communities have almost the same proportion of small landowners and landless households in the income range of Tk. 1001-2500. In Mirpur, a larger proportion of small farmers earn

Figure 8 Distribution of fishing incomes for fishing households



Source: FAP 17 Socioeconomic Monitoring

Tk. 251-500, and there is a sizeable proportion of landless households in the Tk. 500-1000 range. In Nishchintapur, on the other hand, there is a higher proportion of landless households in the Tk. 501-1000 range, and a larger proportion of small farmers in the Tk. 1001-2500 range.

Tables 6 and 7 and Figures 9 and 10 show the different sources of household income for sample households in the two villages through the year. The two villages have similar trends in fisheries income. In Mirpur, no landless households earn fishing income during *Poush* (December-January), *Magh* (January-February) or *Falgoon* (February-March). During these months the *beel* are harvested by hired fishermen. Landless Nishchintapur households have no income from fishing from *Augrahayan* (December-January) to *Choytra* (March-April) for the same reason. Self-employment provides the most income in both villages.

2.8 Conclusion

For the people of Mirpur the intended benefits of the MIP have been defeated; public cuts in the embankment have ensured that flooding remains a regular phenomenon. Consequently, the scheme has been unable to bring about a sustained change in the cropping pattern. The initial years of the project were marked by a shift to cultivating HYV *boro* on land at lower elevations. But when this could not be saved from early inundation, the farmers largely abandoned the practice, choosing more limited *boro* cultivation on higher lands. The farmers of Mirpur now favour HYV *aus* as it is less costly and problematic.

Although it is an "outside" area, Hakaluki *haor* has seen the construction of some small embankments to facilitate the irrigation of paddy fields during the dry season. These embankments, while they restrict water flow and promote sedimentation, facilitate fish concentration during the drawdown.

In Nishchintapur two *beel,* Chowmazi and Dolia, have been transformed into crop land as they gradually silted up. During the past 10 years village farmers have been shifting to the cultivation of local *boro*, although a few areas are planted with HYV varieties.

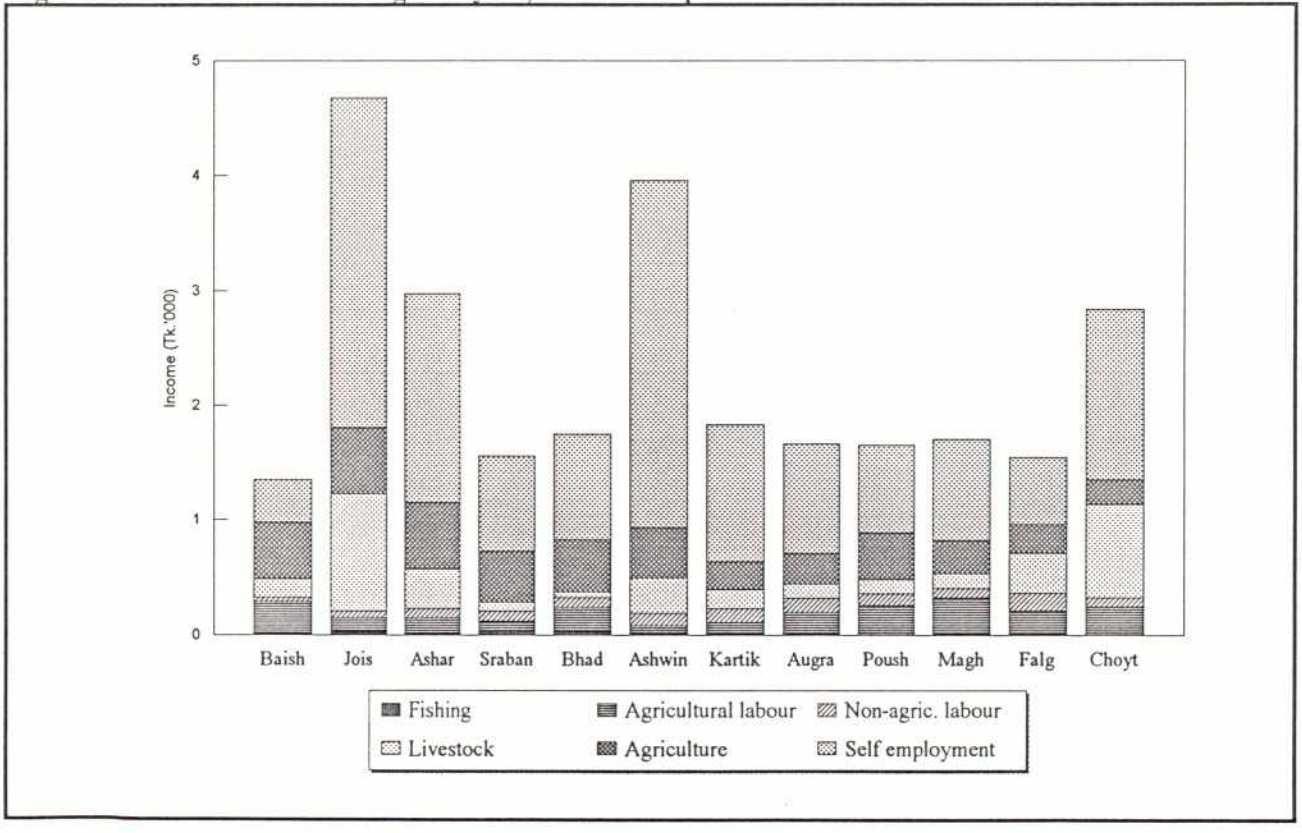
The villagers of Mirpur reported a drastic fall in fish production from Kawadighi *haor* following construction of the MIP. According to the villagers, the embankment affected fish movements during the early monsoon and peak flooding season, resulting in reduced carp production in the *beel*. Local fishermen say fish production has decreased by about 30

Table 6 Income sources through the year, by landholding category, NE1-1 Mirpur

UNIT: TK.

LAND CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
Medium	Fishing	12	35	24	53	60	5	18	4	-	11	6	9	238	0.6
	Non-agric. labour	106	106	106	106	106	106	106	106	106	106	106	106	1,269	3.3
	Small stock	19	217	7	28	11	28	32	22	20	4	12	33	432	1.1
	Large stock	248	1,201	141	118	42	152	505	365	84	297	1,104	518	4,774	12.3
	Agriculture	956	911	1,066	987	743	626	494	683	1,044	843	639	440	9,432	24.2
	Self employment	1,194	3,439	2,892	1,611	430	5,797	2,157	474	870	1,879	550	1,525	22,817	58.6
	Total	2,535	5,909	4,236	2,903	1,392	6,714	3,312	1,654	2,124	3,140	2,417	2,631	38,962	100
Small	Fishing	-	24	18	22	29	17	20	7	-	29	24	-	189	0.5
	Agricultural labour	34	-	-	-	-	-	-	41	90	-	-	35	199	0.6
	Non-agric. labour	-	44	171	171	203	126	117	191	83	-	-	-	1,106	3.2
	Small stock	55	5	10	8	12	5	37	11	-	15	26	50	233	0.7
	Large stock	65	50	102	102	102	1,090	66	78	76	98	98	869	2,795	8.0
	Agriculture	288	603	616	444	698	800	308	244	451	138	142	142	4,875	13.9
	Self employment	57	7,402	3,967	150	2,098	3,790	846	1,009	1,041	490	449	4,299	25,598	73.1
	Total	499	8,128	4,884	897	3,142	5,828	1,394	1,581	1,741	770	739	5,395	34,995	100
Landless	Fishing	8	28	27	48	27	12	16	4	-	-	-	4	173	0.9
	Agricultural labour	532	240	252	161	399	145	186	356	465	624	407	469	4,236	23.2
	Non-agric. labour	29	42	21	38	21	92	125	104	104	101	239	94	1,010	5.5
	Small stock	1	5	2	2	-	1	2	4	-	5	3	12	36	0.2
	Large stock	119	1,254	539	25	18	-	-	-	144	48	48	877	3,072	16.8
	Agriculture	357	395	316	150	189	168	84	70	71	77	110	137	2,121	11.6
	Self employment	106	487	310	767	624	1,284	877	1,171	594	560	682	184	7,646	41.8
	Total	1,152	2,451	1,467	1,191	1,278	1,702	1,290	1,709	1,378	1,415	1,489	1,777	18,294	100
Village	Fishing	7	29	24	43	36	11	18	5	-	9	7	4	194	0.7
	Agricultural labour	278	122	128	82	203	74	95	190	258	317	207	246	2,200	8.0
	Non-agric. labour	42	59	78	86	86	104	118	125	100	78	149	75	1,099	4.0
	Small stock	18	59	5	10	6	9	18	10	5	7	11	26	184	0.7
	Large stock	139	957	334	67	44	296	145	112	112	123	330	783	3,443	12.5
	Agriculture	494	576	579	434	451	434	242	268	410	288	253	216	4,643	16.9
	Self employment	373	2,871	1,832	838	921	3,030	1,198	954	770	882	593	1,496	15,759	57.3
	Total	1,351	4,673	2,980	1,560	1,747	3,958	1,834	1,664	1,655	1,704	1,550	2,846	27,522	100

Figure 9 Income sources through the year, NE1-1 Mirpur



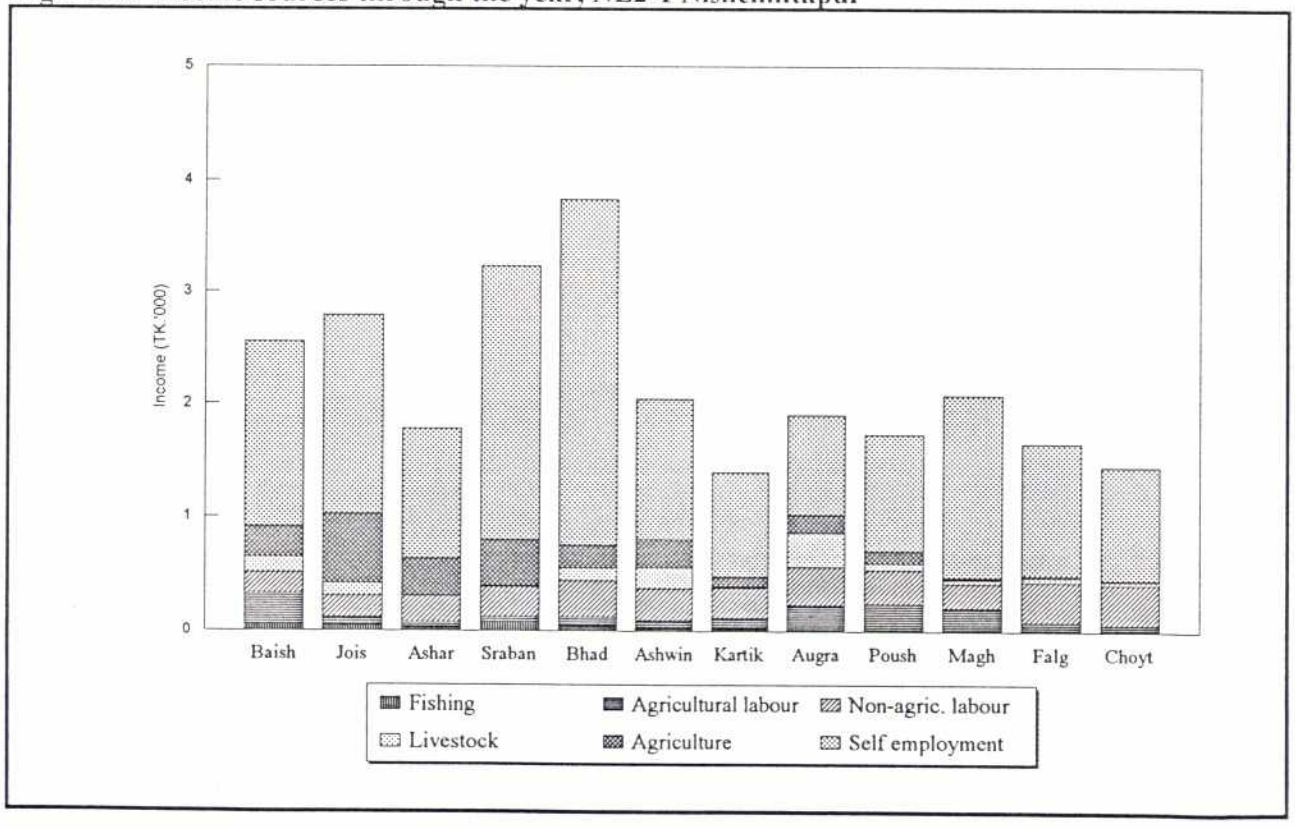
Source: FAP 17 Socioeconomic Monitoring

Table 7 Income sources through the year, by landholding category, NE2-1 Nishchintapur

UNIT: TK.

LAND CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
Medium	Fishing	128	139	30	85	-	-	-	-	-	34	34	30	479	0.8
	Agricultural labour	-	-	-	-	-	-	-	-	-	58	-	-	58	0.1
	Non-agric. labour	-	68	-	-	-	-	-	515	203	68	81	102	1,036	1.7
	Small stock	36	201	5	21	67	68	24	173	54	11	15	53	726	1.2
	Large stock	542	298	-	-	-	17	17	898	-	22	22	-	1,817	2.9
	Agriculture	617	1,919	700	1,309	492	996	183	556	448	20	65	-	7,305	11.7
	Self employment	4,933	5,971	2,593	8,891	11,433	2,126	1,907	1,677	2,512	4,438	2,597	2,184	51,262	81.8
	Total	6,256	8,596	3,328	10,306	11,992	3,207	2,131	3,819	3,217	4,651	2,814	2,369	62,683	100
Small	Fishing	66	43	39	67	86	66	39	19	14	14	24	10	487	2.2
	Agricultural labour	225	101	136	113	260	226	247	385	341	206	68	81	2,388	10.9
	Non-agric. labour	61	132	143	149	125	125	169	80	113	93	252	230	1,673	7.6
	Small stock	13	9	-	5	16	20	-	15	10	12	14	32	145	0.7
	Large stock	24	16	16	16	211	154	8	-	149	40	40	24	698	3.2
	Agriculture	288	476	463	328	221	54	81	41	29	37	15	15	2,049	9.3
	Self employment	971	1,092	941	1,139	1,660	1,968	1,072	1,102	1,013	1,374	1,126	1,040	14,497	66.1
	Total	1,648	1,869	1,738	1,817	2,579	2,613	1,616	1,642	1,669	1,776	1,539	1,432	21,937	100
Landless	Fishing	32	21	32	99	35	13	13	-	-	-	-	-	246	1.8
	Agricultural labour	405	74	-	-	-	-	48	218	272	258	104	56	1,436	10.3
	Non-agric. labour	347	280	383	456	579	495	438	425	460	352	536	547	5,298	38.2
	Small stock	18	1	6	2	57	21	-	18	-	1	3	12	139	1.0
	Large stock	-	-	-	-	-	223	-	134	-	31	31	-	420	3.0
	Agriculture	98	127	75	65	64	54	54	80	18	-	-	-	635	4.6
	Self employment	656	407	640	525	431	374	378	376	387	534	554	447	5,709	41.1
	Total	1,556	910	1,136	1,147	1,166	1,180	931	1,251	1,137	1,176	1,228	1,062	13,883	100
Village	Fishing	63	52	34	86	44	27	19	6	4	11	14	9	370	1.4
	Agricultural labour	265	68	43	36	82	71	101	226	238	201	71	53	1,454	5.5
	Non-agric. labour	185	190	228	265	317	277	263	334	298	212	353	355	3,278	12.4
	Small stock	20	45	4	7	46	30	5	49	14	7	9	27	261	1.0
	Large stock	119	66	5	5	67	159	6	248	47	32	32	8	794	3.0
	Agriculture	265	605	326	403	201	247	89	165	110	16	18	5	2,451	9.3
	Self employment	1,633	1,765	1,136	2,435	3,077	1,237	911	873	1,021	1,600	1,154	991	17,832	67.4
	Total	2,550	2,791	1,776	3,237	3,834	2,048	1,394	1,901	1,732	2,079	1,651	1,448	26,440	100

Figure 10 Income sources through the year, NE2-1 Nishchintapur



Source: FAP 17 Socioeconomic Monitoring

percent, and some support for this view was provided by the results of FAP 17's fisheries surveys (Draft Final Report, Supporting Volume No. 8).

The farming households of Nishchintapur reported that they used to fish much more extensively in the past and that their fishing activity has declined as fish have become less available. The decline in fish production is primarily blamed on increased fishing effort and destructive fishing practices such as the use of *current jal* (gill net) and dewatering. Changes in the leasing system, leading to indiscriminate exploitation of resources, are also held partly responsible for declining fish productivity.

Fisheries resources are valuable to the area and they extremely well guarded by anyone who is able to establish a claim over them. Local leaseholders who have been in the business for several generations, trace the source of their wealth to the enormous fish resources.

3. FISHING COMMUNITIES AND FLOOD CONTROL

3.1 Means of comparison

Identifying fishing communities between which valid socioeconomic comparisons can be made is difficult. The strategies employed by different fishing communities for maintaining their livelihood is highly dependent on historical, social and cultural factors that are rarely replicated from one community to the next.

The complexity of the social interactions affecting fishing communities means that, in most cases, quantitative comparisons are less informative than more qualitative means of assessment. This is particularly true when dealing with traditional Hindu fishing communities, which have been more strongly influenced by political and social changes than by changes in the fisheries resource due to flood control.

There are a six basic indicators that can be studied and assessed in order to achieve a better understanding of how flood control measures have affected the livelihood of professional fishing communities. These indicators are reviewed below.

Social and religious structures of fishing communities

Until the Partition of India and Pakistan in 1947, fishing as a full-time professional livelihood was almost entirely limited to specific social and religious groups. Since then, many of the lines traditionally dividing fishing and non-fishing communities have steadily broken down. Hindu caste fishermen have either emigrated or changed occupation and Muslim farmers have become fishermen. Changes in resources and hydrology due to flood control constitute one of the pressures affecting who is fishing.

Migration

Patterns of migration can be indicative of changes in the fisheries resource or in access to that resource. These changes, in turn, can be affected by flood control measures. In some cases, migration due to changes in the fisheries resource is clear, but several general points need to be made regarding migration as an indicator of flood control impacts.

- By far the most important cause of migration by traditional Hindu fishing communities in Bangladesh is communal pressure. Most migration has taken place in clear waves, usually following significant political changes (the Partition of India and

Pakistan in 1947, the Independence of Bangladesh in 1971) or episodes of communal tension (anti-Hindu riots in 1965, the backlash after the Babri Mosque incident in 1992). These events have led to fluxes of migration by Hindu households in general to India. These events should not be confused with impacts of flood control.

- There has been a general tendency for Hindu fishing communities to remain in Bangladesh for as long as possible. Since the capture fisheries resources in Bangladesh are far more abundant than in West Bengal, even with increased competition and resource decline, there are greater opportunities in Bangladesh for them to continue their traditional occupation.

- Changes in patterns of seasonal migration for fishing are probably better indicators of changes in the resource than wholesale out-migration by entire fishing communities. These changes are seldom the result of the introduction of flood control *per se*, but flood control is often one of several factors influencing changes in the areas exploited by fishermen.

Access issues

Traditional fishing communities have tended to be affected more than others by the changes in fisheries access arrangements that have occurred over the past 40 years. Flood control impacts on water bodies have often contributed to important changes in the social structure of access, but many other factors are also at work and need to be identified.

Seasonality and fishing

Studying the seasonal patterns of gear use and changes in gears and fishing techniques can also serve as a useful comparative indicator for fishing communities. Different types and sizes of fishing gear are designed for use on water bodies with specific characteristics of depth, flood duration and species composition. As the water bodies change, the gears used on them must also change. In the floodplain, any change in water bodies and hydrology also implies changes in seasonal patterns of gear use and water body exploitation. Comparison of gear use and water body exploitation through the year thus becomes a very important indicator of the condition of the fishery.

While fishing communities adapt, like any other community, to changing circumstances and change their technology accordingly, gear use among specific groups of fishermen also reflects long-standing traditions of exploitation, and management, of fisheries resources.

These indicators are not as readily observed among seasonal fishermen or agriculturalists engaged in fishing part-time.

Patterns of water body exploitation

Changes in the types and locations of water bodies exploited by traditional fishing communities have to be carefully placed in their historical context, requiring an understanding of conditions 40 years ago or more. This obviously presents problems in terms of finding reliable sources but such research is essential for understanding the real impact of flood control measures on fisheries resources and the communities dependent on them. Often patterns of water body exploitation now and in the past are due to long-term changes in water bodies, the communities around them and the social and political context of Bangladesh as a whole.

Occupations and incomes

In spite of social and cultural barriers, traditional fishing communities do seem to diversify out of fishing into other activities in response to changes in the fisheries on which they depend. The extent to which individual communities are able to do this varies greatly from area to area and community to community, but this can also provide an important indicator of the ways in which local resources and fishing communities' access to them has altered over time.

3.2 Social and religious composition of satellite fishing communities

Kadipur and Gayghar

Kadipur and Gayghar, satellite villages of Mirpur, represent the two major types of fishing community in the North East Region: Kadipur is a Hindu *namasudra* village and Gayghar is a Muslim *maimul* community.

Gayghar, in some respects, is quite different from other *maimul* villages. Most of the Gayghar *maimul* have abandoned their traditional occupation and shifted to fish trading. A few wealthy *maimul* in the village hold the leases to important local *jalmahal* in addition to having other capital assets including small rice, oil and flour mills. Some of them also have overseas relatives who regularly remit a part of their income. In spite of the economic well-being of these *maimul*, local non-fishing households will not intermarry with them, thus maintaining the traditional social division between the fishing and non-fishing communities.

Shahpur and Sadipur

The fishermen of Shahpur are *namasudra,* while those of Sadipur are *maimul.* The Sadipur *maimul*, as previously noted, live in intensely overcrowded conditions. Most are landless and totally dependent on fisheries.

3.3 Migration

Kadipur and Gayghar

Gayghar once had a significant Hindu population, but since 1940 about 67 households have emigrated to India, mainly because of insecurity stemming from their minority status (Table 8). About 15 Kadipur households have emigrated to India as well. Their reasons for emigrating are more varied and include increased competition from non-traditional fishermen and loss of employment, as well as a sense of communal insecurity. Between 1970 and 1989 about five families have moved into Kadipur to join relatives living there. In this type of movement, young men generally move into their fathers-in-laws' village hoping to gain some land as dowry.

Table 8
Kadipur and Gayghar
Out-migration of households - 1950s to present

Village	Kadipur		Gayghar	
Timing	H/H nos.	Reasons for migration	H/H nos.	Reasons for migration
Before 1950			10	• Community conflict • Feeling of insecurity
1950-1970			4	• Feeling of insecurity
1970-1980	15	• Competition from non-traditional fishermen • Feeling of insecurity • Loss of employment • To join relatives	50	• Feeling of insecurity
1980-1990				
1990-present			3	• To join relatives

Shahpur and Sadipur

Only three households have migrated to India from Bhati Shahpur area since 1972 because of deteriorating economic conditions. No migration was reported from Sadipur.

3.4 Fisheries access - leaseholders in the *haor*

In the North East Region, control of access is the single most important fisheries issue. The situation in the *haor* basin is, and always has been, different from other areas of Bangladesh in this respect. Due to certain historical factors, including the original pattern of settlement, and cultural factors, like the social divide between the fishing and non-fishing communities, a stronger system of access control has evolved in the *haor* than in other parts of the country.

Leaseholders

The *haor* have large numbers of interconnecting freshwater *beel.* These *beel,* and the levees between them, are government-owned *khas* land and are leased out for fishing through auction. The leased water bodies, known as *jalmahal,* are controlled by the Land Revenue Department of the Ministry of Land. A district-level official called the Additional Deputy Commissioner (Revenue) conducts the auction and awards the lease to the highest bidder (see Section 3.5). Lease lengths vary from one to three years, with occasional longer leases in special cases.

Today the *haor* remains a somewhat wild environment with relatively limited human settlement and poor communications, and the operation of a commercial fishery in *beel* many miles from the nearest village creates special logistical problems. Because leaseholders are many miles from their *jalmahal* they incur extra costs that their counterparts in other regions of the country do not have. For example, temporary camps, known as *khola*, are required to house fishermen near the *beel* fishing sites for the three- to four-month fishing season. Most fishing teams involved in harvesting operations require advances on their earnings in order to prepare gear and hire new members, and it is usually the leaseholder who provides these initial loans. Investment is also required for structures such as *katha* (brush piles) and *bana* (bamboo barriers) which, in most cases, is beyond the means of ordinary fishermen. In addition, some leaseholders invest in the re-excavation of *khal* connecting the *beel* to ensure the smooth flow of water in and out.

Recognizing all of these factors, during the colonial period *mirashdars* appointed influential members of the fishing community as intermediaries to collect revenue from the water bodies under their control. These intermediaries acquired considerable power in the process as fishing operations required particular organisational skills and more capital outlay than most agricultural activities. In some cases, influential *maimul* and *namasudra* became intermediaries.

With the enactment of the State Acquisition Act of 1950, the *mirashdars* disappeared, but their intermediaries stepped in and became leaseholders. In independent Bangladesh, these leaseholders consolidated their position by establishing links with the power elite at the national level and by capturing politically powerful local positions such as union council memberships.

The water bodies in Kawadighi *haor* are controlled by a few *maimul* families that live in Gayghar and the nearby villages of Chandpur and Palpur. Many of them never fish, choosing instead to manipulate the awarding of leases in their favour through contacts with powerful people in Mirpur and Palpur and by using their traditional occupational title *maimul.*

In recent years the traditional leaseholders have been facing competition from a new class of investors who are attracted to fishing by its profitability. Many of these people have come from the growing, urban-based middle class, or even from Bangladeshis abroad looking for businesses to invest in "back home". Some of them have good political connections. The introduction of competitive bidding for *jalmahal* has made it easy for these new investors to enter the fishing business.

3.5 Fisheries access - changes in the leasing system

The changes in the leasing system introduced after the abolition of the *zamindari* system were primarily aimed at improving the coverage and efficiency of the mechanisms for revenue collection from government *jalmahal.* The policy succeeded in benefitting revenue collection, but it failed to benefit the fishermen whose livelihoods depended upon fishing, nor did it contribute to the development of fisheries in the country. While in the agricultural sector, the government tried to redress social inequality by distributing *khas* land to farmers, in the fisheries sector no similar policy was adopted. After the Independence of Bangladesh, fishing communities organised into *samity* were given the opportunity to make the first bid at *jalmahal* auctions. Under this arrangement, the *samity* were to compete among themselves and the one that bid over the reserve price fixed by the government would be awarded the lease. If the *samity* failed to offer enough, the auction would be opened to all.

In practice it is very difficult for the *samity* to participate in the bidding for successive years, because the reserve price increases by 25% annually. In the absence of institutional sources of credit, the fishermen are therefore compelled to seek financial backers or *mahajan* to raise the money, sometimes at the cost of surrendering effective control of the *jalmahal* to the

mahajan. More often than not, the leaseholders are the active movers in this relationship, approaching fishing communities and acquiring the right to use their names in order to obtain leases in return for rights to fish either as labourers, licence holders or sub-lessees.

The auction system is also widely abused. In many cases local leaseholders form a cartel and refrain from participating in the bidding with the intention of forcing the authorities to lower the reserve price. If the price is dropped, one member of the cartel then participates in subsequent bidding through mutual agreement and gets the lease. Alternatively, the authorities may decide not to award the lease to anyone. When this happens, the *beel* is theoretically open to all for fishing. In reality, the local leaseholder will establish control over the *beel* and, through force and intimidation, close it to fishing except by his own people. Local government officials are also reported to deliberately delay the award of leases aiming to increase the bribes they can demand.

Irregularities in the award of leases have led leaseholders to file legal cases either against the awarding authorities or against each other. Conflicts between leaseholders can often become violent, resulting in injuries or even deaths. Matters are further complicated by the involvement of different levels of government. This has resulted in claims that leases to the same water body have been issued by more than one authority. Expenses incurred in bribes and litigation discourage leaseholders from making any investment in the development of the fisheries.

New Fisheries Management Policy

In 1986 the government introduced its New Fisheries Management Policy (NFMP), which local fishermen call *nitimala*. Under NFMP, licences are issued to fishermen for use of a particular gear on a particular water body for one year. The licence must be renewed at the end of each year and the fee increases annually by 10%. Initially, about 150 water bodies nationwide were covered by the NFMP; none of these is in the study area.

3.6 Fisheries access - changes in the *haor*

As siltation increases, more and more *haor* areas are being cultivated. The construction of embankments that can protect crops from floods is an extra incentive for extending crop cultivation in the *haor*. As this happens, the potential for conflict between landowners and fisheries leaseholders increases.

Conflicts occur when leaseholders attempt to maintain and extend control over the fisheries resource while, at the same time, landowners try to establish their claim to a portion of the resource as an extension of their claim to the land. In addition, leaseholders often compete among themselves for control of the *jalmahal*. This type of conflict has recently intensified as a result of the entry of new investors.

Traditional leaseholders maintain that because *beel* harvesting has been their principal source of income for generations they try to take care of *beel* to ensure the sustainability of the fishery. This view receives some support from local fishermen. The leaseholders, especially the traditional ones, are aware of the breeding and migratory patterns of the high-value carps like *rui, catla, mrigel* and *kalbaus* and are therefore willing to allow time for the fish to breed and grow in expectation of better returns in the future.

Ostensibly to assist such development, in 1991, the government adopted a policy of awarding leases for periods of 4 to 10 years when the lease application was accompanied by a production-oriented development plan. With longer leasing periods, it was thought, leaseholders would have had some incentive to manage their *beel* carefully. In practice, such long-term leases were rarely granted, and under the present circumstances, where leases are normally given for only one to three years, leaseholders tend to extract the maximum benefit in the shortest possible period. This has contributed to a marked decline in *beel* management practices over the last few years.

3.7 Fisheries access - fishing communities

Kadipur and Gayghar

In the North East, where most of the water bodies are under lease, fishermen generally have access to the fisheries only on a catch-share basis or through employment as fishing labourers during the flood drawdown and dry season. The only open-access period on the floodplain is during the pre-monsoon and full flood seasons. Even during these periods leaseholders now

sometimes instruct their guards to close access to ensure maximum return of the floodplain fish production to the *beel* when the flood recedes.

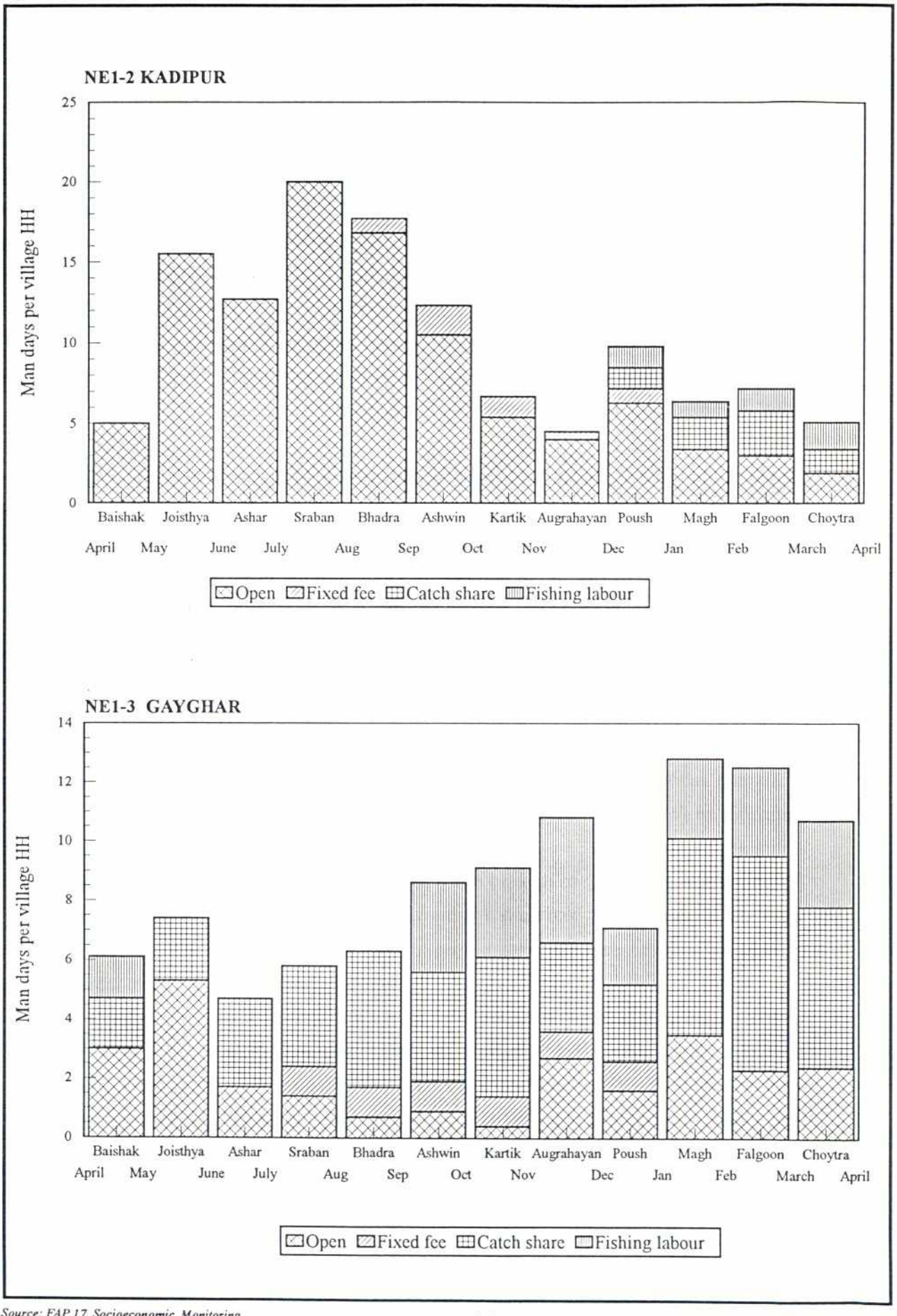
Figure 11 shows the distribution of fishing activity in Kadipur and Gayghar for various water bodies under different types of access arrangement through the year. The religious composition and location of Kadipur and Gayghar influence their access arrangement with the leaseholders. The relatively higher proportion of fishing labour and fishing on a catch-share basis in Gayghar suggests that *maimul* leaseholders prefer to hire *maimul* fishermen. This puts the Hindu *namasudra* of Kadipur at a comparative disadvantage. Kadipur is surrounded by a number of important water bodies including Patashinga *beel,* Chatla *beel* and the Haraia *gang*. The major water body nearest Gayghar is the Manu River. Nonetheless, most of the Gayghar *maimul* are hired to fish in Boro *haor* and some are hired to fish Chatal *beel*; the leaseholders in both cases live in Gayghar.

Many of the *beel* in Boro *haor* have dried up and been converted into crop land since construction of the MIP embankment. Gayghar villagers also believe that the embankment has greatly reduced the area of floodplain. These alleged negative impacts have been offset somewhat by a sharp rise in the number of ponds in the village. Many old ditches have also been re-excavated and re-shaped into ponds. Prior to construction of the embankment no fish farming was done in the village, now all the surrounding ponds have been converted to the purpose. This has improved employment opportunities for local fishermen. As a result, as Figure 11 shows, Gayghar fishermen fish year-round on a catch-share basis, their activity reaching a peak in *Magh* (January-February) and *Falgoon* (February-March). They also work as fishing labourers starting in *Ashwin* (September-October) with employment peaking in *Augrahayan* (November-December).

Kadipur fishermen seem to depend more on open access. Figure 11 indicates that they have year-round open access, and their fishing activity reaches its peak in *Sraban* (July-August), coinciding with the peak flooding season.

Unlike Gayghar fishermen, Kadipur fishermen work little on a catch-share basis or as fishing labourers. According to the villagers, the *beel* in Shawaijuri *haor* are mostly fished by the *barman* fishermen of the neighbouring village of Chandpur, who are better equipped with the gear needed for *beel* fishing. The villagers reported that only 10% of those hired for the *beel* harvest are from Kadipur, the rest are recruited from other villages. Every year the leaseholders or their agents visit the village during *Kartik* (October-November) to recruit for

Figure 11 Distribution of fishing effort by access type through the year



Source: FAP 17 Socioeconomic Monitoring

the harvest. The Kadipur fishermen reportedly pay the agent of the leaseholder to give them jobs, but not always successfully.

The local fishermen's cooperative leased Haraia *gang*, a secondary river, for 1993. It is here where most of the *veshal* were seen in operation. The Kadipur fishermen have access to the river after payment of a fixed fee.

Shahpur and Sadipur

Figure 12 shows the distribution of fishing effort for Shahpur and Sadipur through the year by access type.

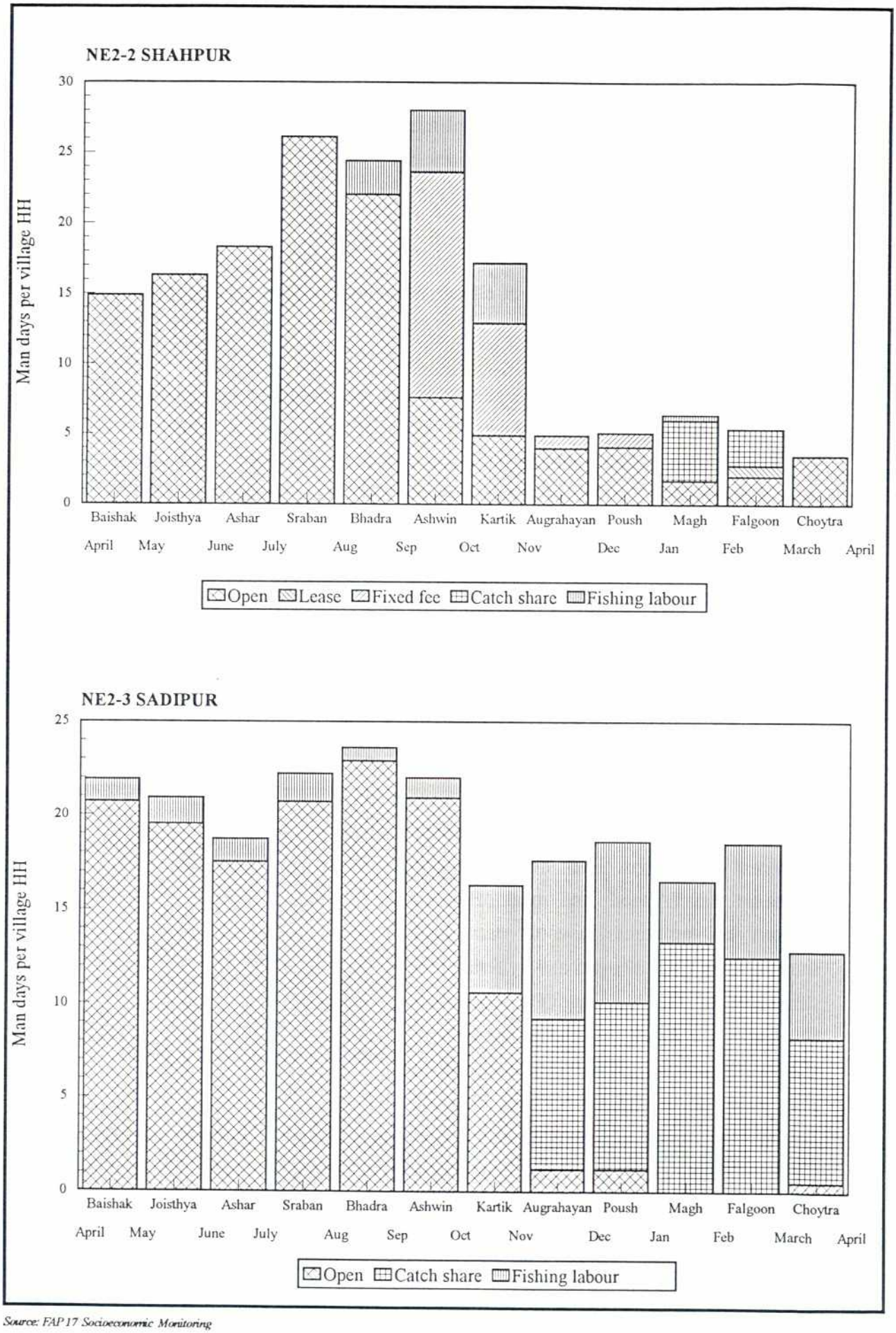
The fishermen of Shahpur have open access on the periphery of the *haor* from *Choytra* (March-April) to *Sraban* (July-August), which encompasses the pre-monsoon and peak flooding seasons. During *Sraban* (July-August), a maximum of 25 man days of fishing is done per household. In *Bhadra* (August-September), leaseholders become active and begin to impose restrictions; consequently, fishermen only have access either on payment of a fee or as fishing labourers. Since they lack deep-water fishing gear, leaseholders generally do not hire them for *beel* harvesting work, however. During *Magh* (January-February) and *Falgoon* (February-March), village fishermen harvest ponds by dewatering on a catch-share basis. In certain *beel* of Hakaluki *haor*, including Nagua and Chatla, restrictions imposed by the leaseholders are moderate during pre-monsoon and peak flooding periods but more severe during drawdown and *beel* harvesting periods.

Sadipur is a classic example of a fishing community subject to the strict enforcement of access regulations. Even during the pre-monsoon flash flood and peak flooding seasons its residents have to earn their livelihood as fish labourers and by fishing the periphery of the *haor* and the floodplain. Starting in *Kartik* (October-November), fishing restrictions gradually increase and the man days of fishing labour also increase. During *Augrahayan* (November-December) and *Poush* (December-January), Sadipur fishermen work either on a catch-share basis or as fishing labourers. The total lack of open fishing in *Magh* (January-February) and *Falgoon* (February-March) are typical of the *haor*

One fishermen from Sadipur reported that from *Ashwin* to *Augrahayan* he fished in the Parikhali River by purchasing tickets from the leaseholder. From *Augrahayan* to *Poush* (November-January) he fished in ponds owned by other people as an employee on a catch-share basis, where his share was one-third of the catch.

Box 2: Fishing with a ticket

Figure 12 Distribution of fishing effort by access type through the year



Source: FAP 17 Socioeconomic Monitoring

areas, where the *beel* are closed and become the preserve of the leaseholders and their own fishermen. During these months the Sadipur fishermen operate more on a catch-share basis than as fishing labourers. Some leaseholders reportedly sell "tickets" or "tokens" for fishing in the leased water bodies during the period between the start of the drawdown and the beginning of the *beel* harvest. Once the harvest begins the division of shares is always in the leaseholder's favour, but the fishermen's share increases as the harvest draws to an end. In Nagua-Dolia *beel,* popularly known as Dulla *beel,* the fishermen's share started at 10% and increased progressively to 15%, 25% and 50% as the total fish stock decreased. When the fishermen work as labourers, their daily wage ranges from Tk. 20 to 40.

Although Shahpur and Sadipur are both in Hakaluki *haor* and exploit the same water bodies, as Figure 12 shows, they have distinctly different access arrangements. The reason for this is that most of the leaseholders are from traditional Muslim fishing communities and they prefer to employ Muslim *maimul.* Some leaseholders, like the leaseholder of Nagua *beel*, are residents of Sadipur. In addition, Sadipur fishermen are reportedly better equipped with appropriate gear for *beel* fishing.

3.8 Seasonality and fisheries

Table 9 Gear distribution, Kadipur

Gear Type	Bengali Name	No.	%	Tk.
Gill net	Current jal	5	6.6	350
Seine net	Ber jal	16	19.8	1493
	Deal	10	6.6	1880
Lift net	Veshal jal	12	15.1	1867
Scoop net	Afa	34	41.6	2633
Trap	Doiar	48	58.4	4104
Hook	Daun	60	36.7	3332
Push net	Thella jal	18	21.7	1747

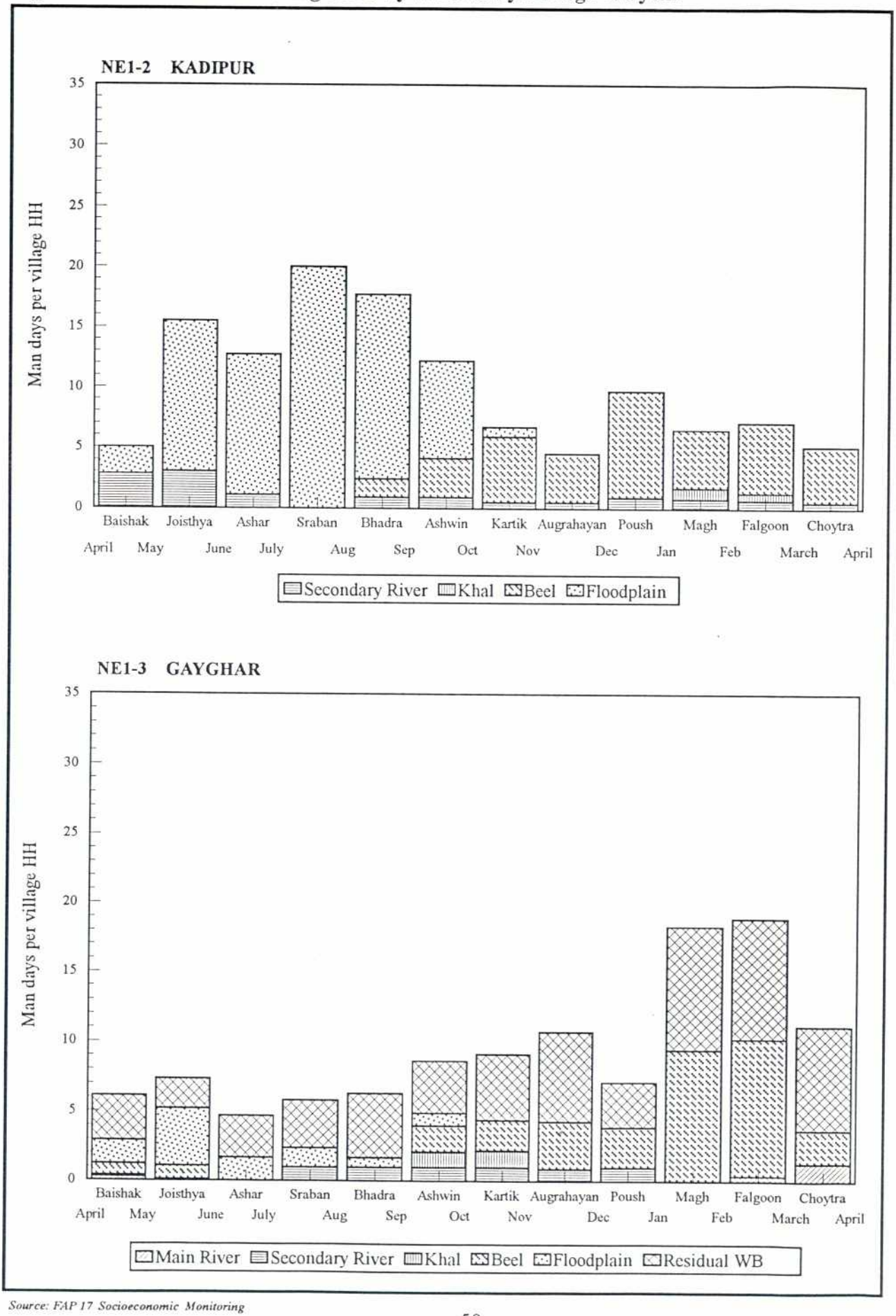
Source: FAP 17 Socioeconomic Monitoring

Kadipur and Gayghar

Gear ownership is closely linked with the type of water body exploited by the fishermen. Table 9 shows the number and type of fishing gear owned by Kadipur fishermen, the percentage of households owning them and the average total income earned from each gear type. Figure 13 shows the distribution of fishing effort by water body type, and Table 10 shows the seasonal patterns and intensity of use for the principal gear/water body combinations.

Kadipur fishermen primarily fish on the floodplain from *Baishak* (April-May) to *Sraban* (July-August). This is reflected in their high ownership of *doiar* (58%), which also provides

Figure 13 Distribution of fishing effort by water body through the year



Source: FAP 17 Socioeconomic Monitoring

Table 10
Principal gears, use by month and water body

NE1–2 Kadipur — Units: Man Days per Village Household

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Ber jal	Beel									1.3	1.3	2.8	1.5	6.7	5.5
Doiar	Floodplain	0.3	7.5	8.4	15.5	9.2	2.3	0.8						44.0	35.9
Veshal jal	Secondary River	1.8	2.1	1.1		0.9	0.3			0.9				7.1	5.8
Daun	Floodplain	1.1	4.3	2.2	3.0	3.5	3.3							17.4	14.2
Afa	Beel						0.7	2.9	2.3	5.5	2.7	1.1	1.5	16.7	13.6
	Floodplain	0.9	0.3	0.8	1.6	1.2	2.5							7.3	5.9

NE1–3 Goyghar — Units: Man Days per Village Household

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Leaseholder labour	Beel						1.9	1.8	2.9					6.5	5.7
Ber jal	Secondary River				1.0	1.0	1.0	1.0	0.9	1.0				5.9	5.2
	Beel									1.3	4.7	6.0	0.6	12.5	10.9
Ber jal labour	Beel										2.7	3.0	0.8	6.4	5.6
Ber jal	Residual WB	1.7	2.1								4.1	5.0	3.5	16.4	14.4
Ber jal labour	Residual WB	1.4		3.0	3.4	4.6	3.7	4.7	4.3	3.2	2.6	2.7	3.9	37.5	32.8
Thella jal	Beel	0.8						0.4	0.6	1.6	1.2	0.8	1.1	6.4	5.6
	Floodplain	1.7	2.5	0.5	0.4	0.7	0.4							6.2	5.4

Note : Depth of shading indicates relative intensity of gear use of within the year

them with most of their income. The 12 *veshal* shown in the table are mostly used in Haraia *gang*.

A small number of fishermen who are recruited by leaseholders use *ber jal* (seine net) to harvest *beel* during *Falgoon* (February-March). *Afa* (scoop nets), owned by nearly 42% of the households, are used to fish the *beel* during *Poush* (December-January), which corresponds to the beginning of the *beel* harvest. It is also used during drawdown on the floodplain in *Ashwin* (September-October).

The intensive use of *daun* (hook), owned by nearly 37% of the households, on the floodplain during *Joisthya* (May-June), *Bhadra* (August-September) and *Ashwin* (September-October) reflects fishermen's efforts to evade the leaseholders guards (*parahadar*). This low-visibility gear can be used secretly.

Figure 13 clearly indicates Gayghar fishermen's close link with the leaseholders. They are involved year-round in fishing residual water bodies. The peak effort during *Magh* (January-February) and *Falgoon* (February-March) corresponds with the harvesting of the village ponds, almost all of which are privately owned and cultured. The Gayghar fishermen also provide labour for the *beel* harvest, but they do hardly any floodplain fishing. The pattern of gear ownership shown in Table 12 reflects the water body types where the gears are used, and Table 10 shows the intensity with which those gears are used on various water bodies during the year.

Table 11 indicates that the most popular gear in Gayghar is the *thella jal* (push net), which is owned by about 51% of households. This is a seasonal and an extremely inexpensive net that is used in the *beel* in *Poush* (December-January), just before the beginning of *beel* harvesting.

Table 11 Gear distribution, Gayghar

Gear Type	Bengali Name	No.	%	Tk.
Gill net	Current jal	2	7.2	2300
Seine net	Ber jal	8	25.5	30930
Scoop net	Afa	2	7.2	550
Cast net	Jhaki jal	2	7.2	800
Push net	Thella jal	17	51.1	1194
Other	Dewatering	2	7.2	1500

Source: FAP 17 Socioeconomic Monitoring

The major earner for Gayghar fishermen is the *ber jal,* which they use in the Mathakhair River and Kherauna *khal* (the major sources of flood for Bara

haor) as well as in *beel* and residual water bodies. It is most intensely used in the river and *khal* from *Sraban* (July-August) to *Poush* (December-January), and in leaseholders' *beel* during *Magh* (January-February) and *Falgoon* (February-March). Table 11 clearly shows the seasonal movement of *ber jal* (seine net) from the secondary river during peak flooding season onto the *beel* and into the harvesting of ponds during the dry season.

Shahpur and Sadipur

Table 12 shows gear ownership in Shahpur. About 76% of the fishermen of this village own *afa* (scoop nets), which are mostly used in the floodplain and *beel*. Floodplain fishing, which begins in *Baishak* (April-May) and continues until *Bhadra* (August-September), in fact, comprises the bulk of the fishing effort of the Shahpur villagers (Figure 14).

Table 12 Gear distribution, Shahpur

Gear Type	Bengali Name	No.	%	Tk.
Seine nets	Ber jal	13	33.3	4383
	Ferra jal	6	7.9	724
	Kathi jal	8	9.6	1390
Lift net	Veshal jal	3	7.9	1680
Scoop net	Afa	29	76.3	5721
Push net	Thella jal	12	31.6	2125
Other	Dewatering	7	17.5	245

Source: FAP 17 Socioeconomic Monitoring

During *Ashwin* (September-October) and *Kartik* (October-November), with the beginning of the flood recession, fishing activity moves from floodplain to the *beel* and *khal* around the village and to Pubijuri River. This is when seine nets, particularly *ber jal* are most intensively used. Nearly 51% of the households own various types of seine net, including *ber jal, ferra jal* and *kathi jal (kathi* is a type of seine net often used for harvesting *katha,* or brush piles).

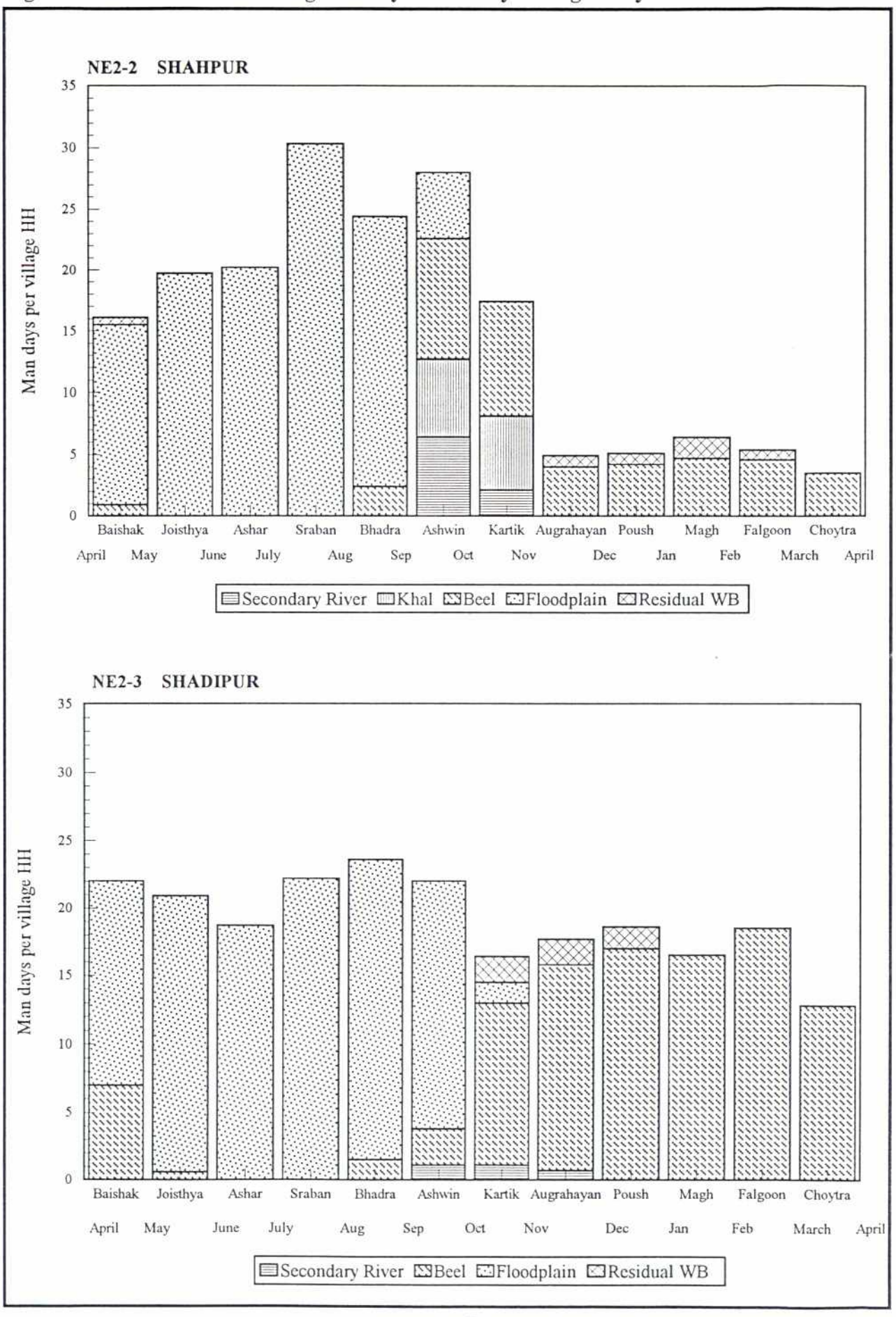
Table 13 Gear distribution, Sadipur

Gear Type	Bengali Name	No.	%	Tk.
Gill nets	Current jal	37	26.3	7670
	Koi/Fashi jal	29	20.4	5881
Seine nets	Ber jal	64	45.7	9856
	Dora jal	16	5.9	1400
Scoop net	Afa	62	43.9	8662
Hook	Daun	12	8.5	1490
Cast net	Jhaki jal	16	5.9	5380
Push net	Thella jal	30	21.3	1723

Source: FAP 17 Socioeconomic Monitoring

Table 13 shows gear ownership in Sadipur. Nearly 52% of the households operate various types of seine net, and another 46% use some sort of gill net. *Afa* (scoop net), also an important gear, is used by about 44% of households.

Figure 14 Distribution of fishing effort by water body through the year



Source: FAP 17 Socioeconomic Monitoring

Sadipur fishermen depend on leaseholders for fisheries access. All the *beel* in Hakaluki *haor* are under lease and restrictions on fishing in them are strictly enforced. From *Baishak* (April-May) to *Ashwin* (September-October) Sadipur villagers fish around the edge of the *beel,* making intensive use of *ber jal*. The sizeable ownership of *current jal* reflects fishermen's attempts to evade floodplain fisheries restrictions, which are moderately enforced by the leaseholders during pre-monsoon and peak flooding seasons. From *Kartik* (October-November) to *Choytra* (March-April) the fishermen have access to the water bodies as leaseholder labour (Table 14).

Cast net or *jhaki jal* is used for fishing in residual water bodies such as homestead borrow pits. *Daun* (hook) is used during the peak flooding season when flood water reaches the homesteads, as well as to evade floodplain fishing restrictions.

3.9 Patterns of water body exploitation

Kadipur and Gayghar

The construction of the MIP, tightening of the leasing system and increasing competition from newcomers to fishing have affected patterns of water body exploitation by the fishermen of Kadipur and Gayghar. Other than their floodplain access, these fishermen work only as fishing labour, on a catch-share basis, or on payment of a fixed fee.

According to these fishermen, the depth and size of the floodplain has been drastically reduced by the MIP. Consequently, although the fishing period on the floodplain has remained unchanged, catches have declined.

The leasing of water bodies has a long tradition in the North East, but as the number of people wanting to fish has grown, and the value of fish has increased, fishing restrictions have tended to become even more strict. Moreover, increasing competition from *abadi* (new settlers) and *bangal* (farming households) has had an influence on which water bodies fishermen chose to exploit.

For the fishermen of Kadipur and Gayghar there has been no radical change in the water bodies they most commonly exploit or the distance they have to travel to reach them (Figure 15).

Table 14

Principal gears, use by month and water body

NE2–2 Shahpur

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Ber jal	Khal						6.3	6.0						12.3	6.8
Thella jal	Beel	0.9							3.2	3.2	2.0	3.9	1.7	14.9	8.2
Afa	Beel						5.5	4.9	0.9	1.0				12.3	6.8
	Floodplain	10.3	16.6	16.2	25.9	19.3	3.4							91.6	50.5

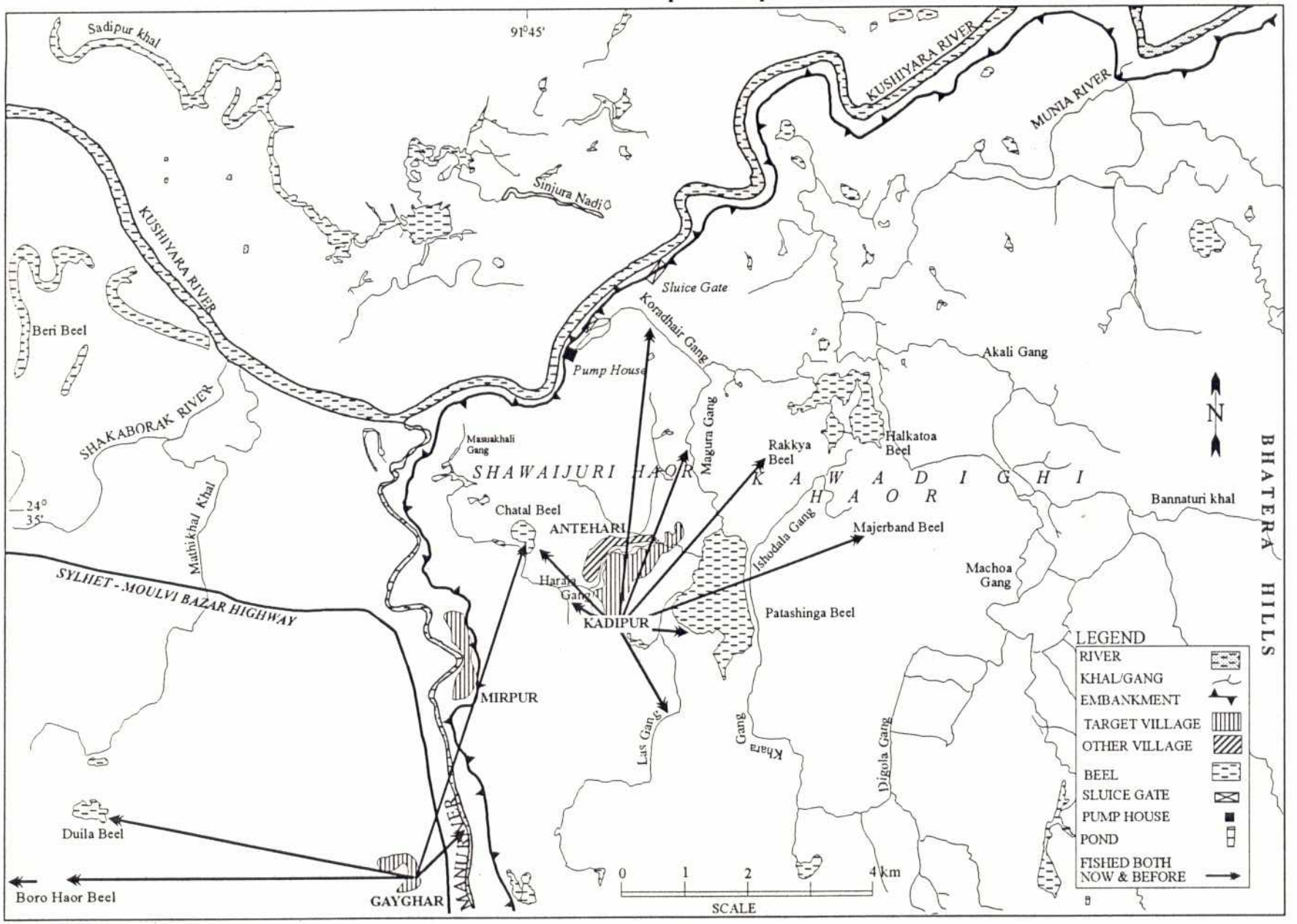
NE2–3 Sadipur

Units: Man Days per Village Household

Gear	Habitat	Baishak	Jois	Ashar	Sraban	Bhadra	Ashwin	Kartik	Augra	Poush	Magh	Falgoon	Choytra	Total	Eff %
Leaseholder labour	Beel							2.0	4.1	5.8	1.9	1.9	1.8	17.6	7.7
Ber jal	Floodplain	7.1	7.2	9.0	7.9	5.6	8.6	1.5						46.9	20.4
Current jal	Floodplain	1.9	2.1	2.8	5.3	5.1	1.4							18.5	8.1
Afa	Beel	3.6						3.7	6.4	6.2	8.2	7.5	5.5	41.2	17.9
	Floodplain	2.9	5.6	3.3	4.2	3.9	3.9							23.8	10.4

Note : Depth of shading indicates relative intensity of gear use gear within the year

Figure 15
Kadipur and Gayghar
Water bodies fished - past and present



Patashinga *beel* has always been important for the fishermen of Kadipur. Other important water bodies are *beel* Chatal, Rakkya, Khal Kata, Nelagor and Majerband, and Koradhair and Haraia *gang*. With the exception of Haraia *gang*, where the local fishermen's *samity* holds the lease and Kadipur fishermen can pay a fixed fee to fish, in all the other water bodies they have to compete with fishermen from Chandpur, Habiganj and other nearby communities to fish either as leaseholder labour or on a catch-share basis. Kadipur fishermen also fish in Las *gang*, but since this is connected with Patashinga *beel*, the leaseholder reportedly imposes strict restrictions on fishing. Villagers admitted, however, that fishing is still done secretly by evading the leaseholder's *parahadar*.

Boro *haor*, which has several *beel* and is known for its *katha* fishery, has always been the most important water body for Gayghar fishermen. Other water bodies exploited by Gayghar fishermen include the *beel* Dolia, Chatal, Barchapra, Kalni, Dulni and Urua. Sometimes the fishermen of Gayghar travel as far as Chittagong, where they are hired by local *mahajan* to fish in Kaptai Lake.

Although the Manu River flows close to the village, it has never been a major fishing site for Gayghar fishermen. Since construction of the MIP, villagers have come to rely less on floodplain fishing and more on fishing in such residual water bodies as village ponds.

Shahpur and Sadipur

There has not been any radical change over the past 20 years in the water bodies most commonly exploited by the fishermen of Shahpur and Sadipur, which are shown in Figures 16 and 17.

Fishermen in both villages exploit Gurguri *beel*, north-east of Shahpur village. Shahpur fishermen also fish in Nagua, Tural, Chatla and Chokia *beel*. During the peak flooding season they fish in the floodplain, which includes Gobindapur *chak*. There are a number of *khal* around the village, including Muktar, Zia, Gora and Kanthinala *khal*, but none are vital fishing areas.

Sadipur fishermen work the same water bodies as Shahpur fishermen, primarily as fishing labourers. In addition, they use Ranchi and Maisla *beel* in Hakaluki *haor* north of the village.

Figure 16
Shahpur
Water bodies fished - past and present

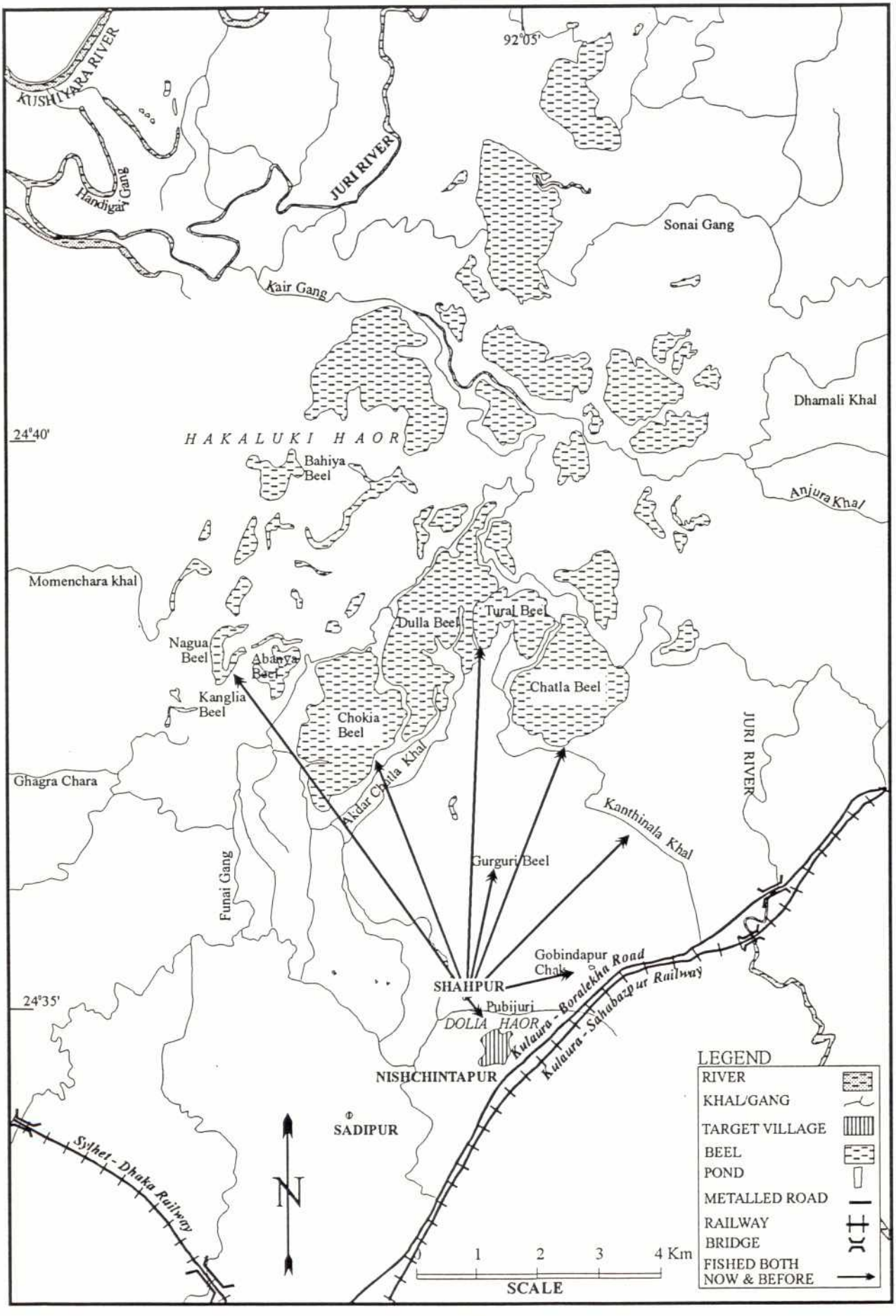
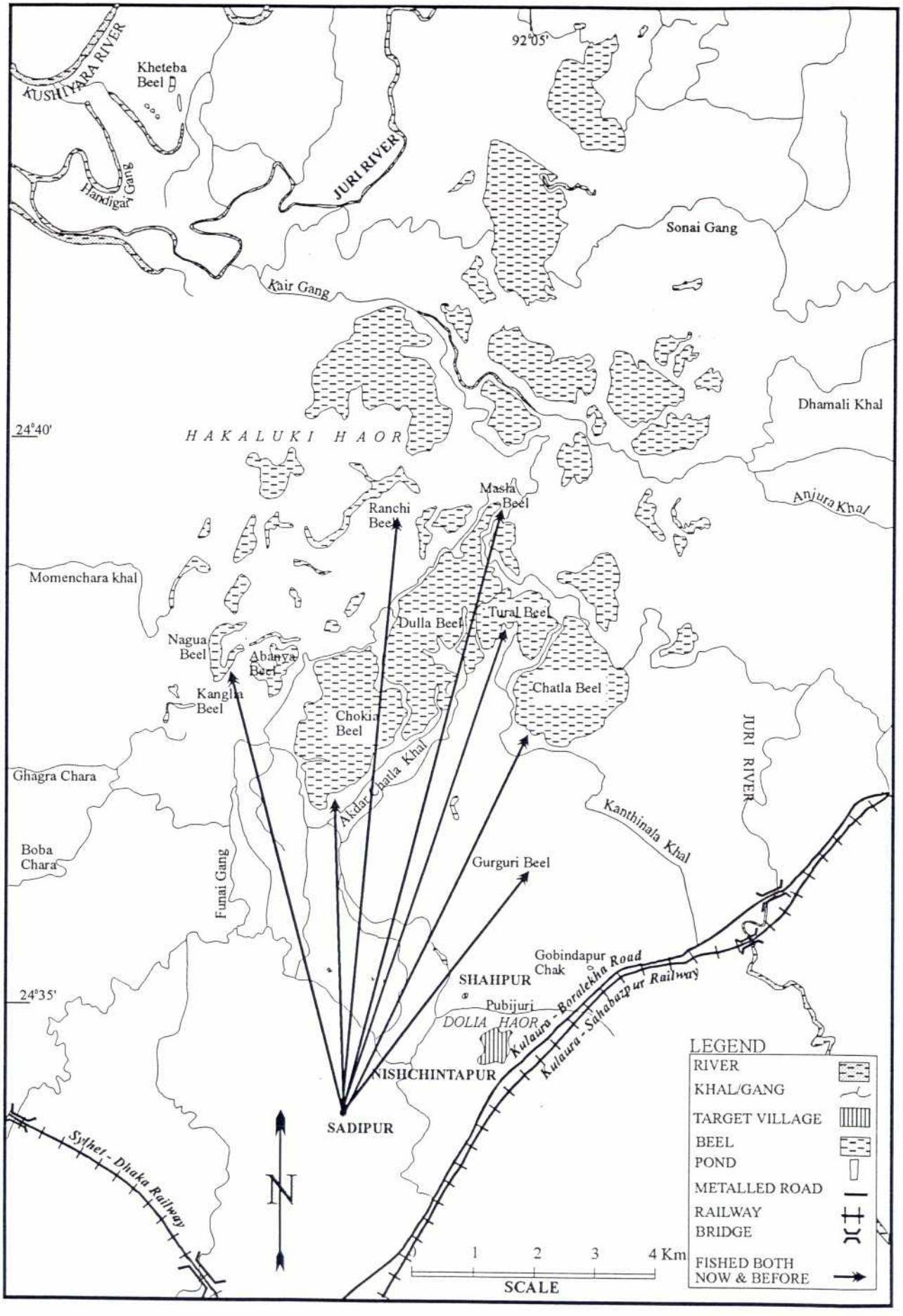


Figure 17
Sadipur
Water bodies fished - past and present



For both communities, pond harvesting is an important source of dry season income. While in Shahpur ponds are harvested after being dewatered, in Sadipur the ponds are all naturally stocked and are harvested while still containing water.

3.10 Occupations and Income

Kadipur and Gayghar

Tables 15 and 16 and Figures 18 and 19 show income flows from different sources for Kadipur and Gayghar households.

Fishing-related activities, which provide year-round income, are the main source of livelihood in Kadipur. The highest income from these activities occurs from *Joisthya* (May-June) to *Bhadra* (August-September) and peaks in *Sraban* (July-August), the floodplain fishing season for Kadipur fishermen. For the remaining months Kadipur fishermen work either as fishing labourers or on a catch-share basis, but since they have little representation in the most frequently hired fishing groups, their income from fishing labour is small: for the community as a whole, it accounts for only 1.8% of the total income.

Farming and agricultural labour respectively provide 20% and 16% of the community's income. Construction of the MIP embankment has increased agricultural opportunities in the area. Some *khal* in the vicinity, including Adumda, Norkhai, Jodubali and Borang are reported to have completely dried up and become arable land. In addition, 20% of previously fallow land has now been brought under cultivation. The MIP has also encouraged HYV *boro* cultivation, which now covers about 50% of the total cultivable area. The remaining 50% is equally divided between local *boro* and deep water rice. As a result of the increased agricultural activity, even those households whose main occupation is fishing are now involved in the *boro* harvest during *Baishak* (April-May). The increased agricultural activity has not precluded fishing by farming households, who are involved in floodplain fishing from *Joisthya* (May-June) to *Bhadra* (August-September).

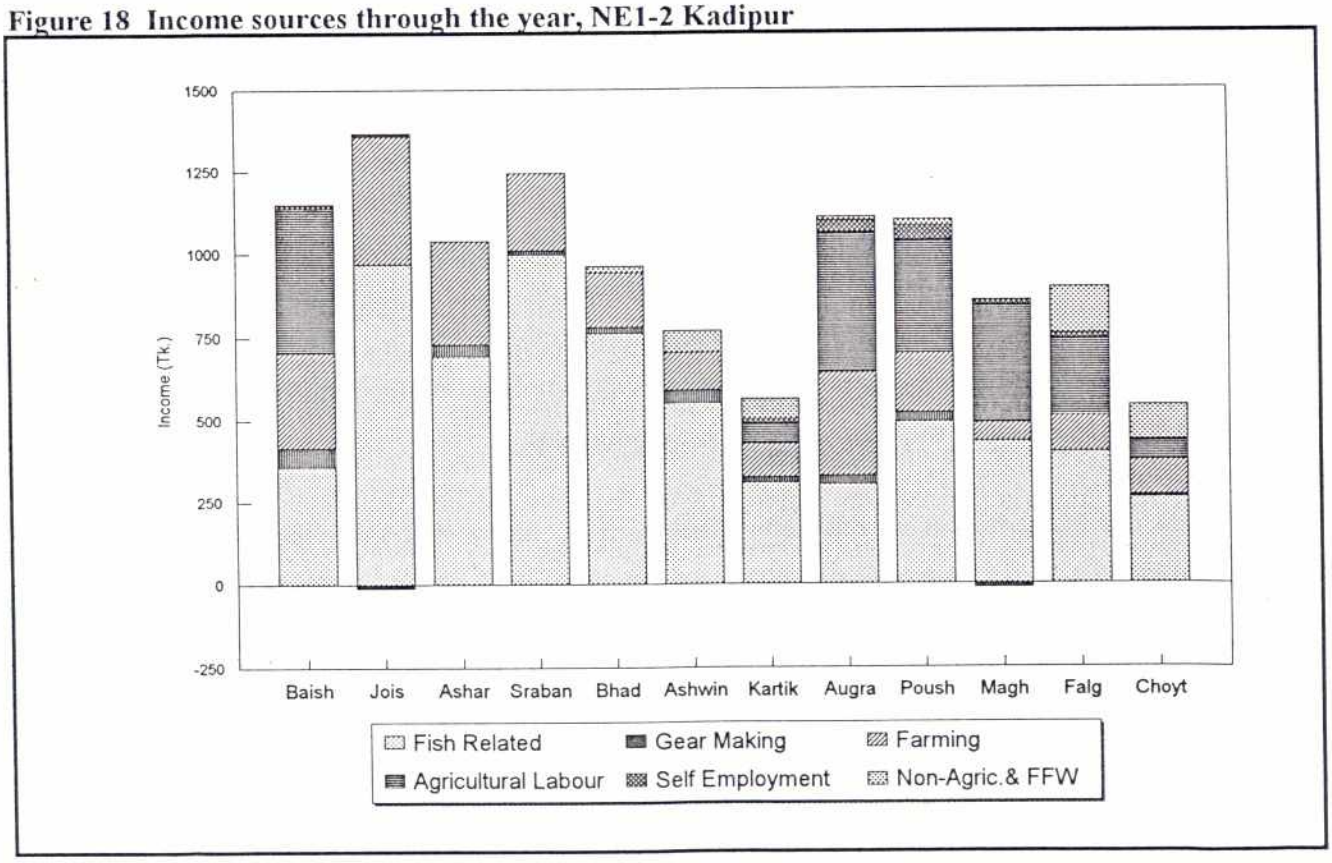
Since the construction of the embankment, fish culture has flourished in Gayghar. The number of ponds has reportedly increased by about 30% in recent years, and all ponds are now cultured. Ditches have also been re-excavated and brought into production. Pond owners hire local *maimul* to harvest the ponds.

Table 15 Income sources through the year, by fishing category, NE1-2 Kadipur

UNIT: TK.

FISH CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
F1	Fishing	-	1,480	495	1,350	1,000	490	-	-	-	-	-	-	4,815	40.3
	Fish Trading	-	-	-	-	-	-	-	425	400	-	-	-	825	6.9
	Farming	500	800	400	-	-	-	-	35	-	-	-	-	1,735	14.5
	Agricultural Labour	1,140	-	-	-	-	-	-	-	700	825	770	-	3,435	28.7
	Non-Agric.& FFW	-	-	-	-	-	-	-	-	-	-	650	500	1,150	9.6
	Total	1,640	2,280	895	1,350	1,000	490	0	460	1,100	825	1,420	500	11,960	100
F2	Fishing	453	1,156	690	1,074	856	671	389	236	391	258	292	163	6,628	52.4
	Fishing Labour	-	-	-	-	-	-	-	-	-	124	-	-	124	1.0
	Fish Trading	-	-	-	-	-	-	-	125	119	58	134	138	575	4.5
	Gear Making	75	(13)	46	17	25	25	-	-	-	(17)	-	8	167	1.3
	Farming	218	416	333	248	154	93	100	386	220	-	61	49	2,277	18.0
	Agricultural Labour	493	-	-	-	-	-	78	526	390	409	260	75	2,231	17.6
	Self Employment	10	14	-	-	-	-	17	47	56	15	13	5	176	1.4
	Non-Agric.& FFW	-	-	-	-	25	83	79	13	25	-	144	109	478	3.8
	Total	1,249	1,573	1,069	1,339	1,060	872	663	1,333	1,201	847	904	547	12,656	100
F3	Fishing	-	-	758	568	275	-	-	-	170	500	93	-	2,363	36.4
	Fishing Labour	-	-	-	-	-	-	-	-	260	-	278	125	663	10.2
	Gear Making	-	-	-	-	-	125	100	163	175	-	-	-	563	8.7
	Farming	565	165	165	225	220	235	133	33	20	320	355	399	2,834	43.6
	Self Employment	25	-	-	-	-	-	-	-	-	18	28	-	70	1.1
	Total	590	165	923	793	495	360	233	196	625	838	754	524	6,493	100
Com-	Fishing	359	970	695	997	762	550	308	187	339	289	247	129	5,834	50.4
munity	Fishing Labour	-	-	-	-	-	-	-	-	44	98	47	21	212	1.8
	Fish Trading	-	-	-	-	-	-	-	115	109	46	106	110	486	4.2
	Gear Making	59	(10)	36	13	20	41	17	28	30	(13)	-	7	228	2.0
	Farming	288	387	307	235	160	113	102	313	178	55	109	107	2,352	20.3
	Agricultural Labour	433	-	-	-	-	-	62	417	335	354	234	59	1,894	16.4
	Self Employment	12	11	-	-	-	-	13	37	44	15	15	4	151	1.3
	Non-Agric.& FFW	-	-	-	-	20	66	63	10	20	-	138	105	421	3.6
	Total	1,151	1,358	1,038	1,245	962	770	565	1,107	1,099	844	896	542	11,578	100

Figure 18 Income sources through the year, NE1-2 Kadipur



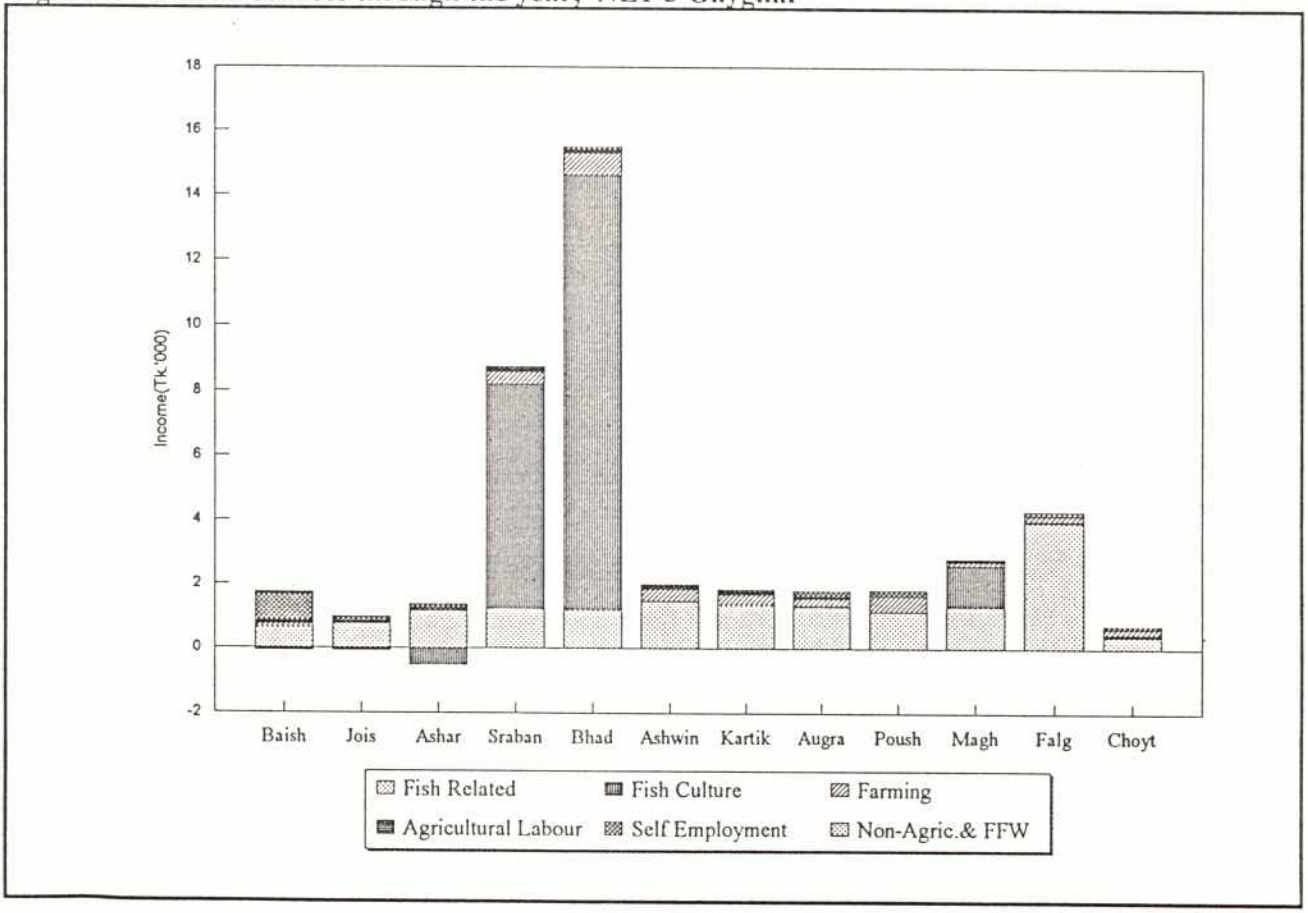
Source: FAP 17 Socioeconomic Monitoring

Table 16 Income sources through the year, by fishing category, NE1-3 Gayghar

UNIT: TK.

FISH CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
F1	Fish Trading	1,650	1,330	1,700	2,050	1,170	750	1,050	1,150	1,000	1,550	1,675	1,600	16,675	73.5
	Self Employment	-	-	1,100	900	900	1,100	900	1,100	-	-	-	-	6,000	26.5
	Total	1,650	1,330	2,800	2,950	2,070	1,850	1,950	2,250	1,000	1,550	1,675	1,600	22,675	100
F2	Fishing	205	290	346	442	525	714	509	553	680	543	3,861	(565)	8,104	17.0
	Fishing Labour	127	75	255	257	355	666	726	646	182	351	414	436	4,489	9.4
	Fish Trading	194	289	312	308	245	282	240	177	265	353	282	182	3,129	6.5
	Fish Culture	(111)	(111)	(691)	8,901	17,057	-	-	27	-	1,664	27	114	26,878	56.3
	Farming	70	27	52	470	838	452	399	301	411	167	230	234	3,652	7.6
	Agricultural Labour	114	45	-	64	136	-	-	-	-	-	-	-	359	0.8
	Self Employment	14	122	82	23	23	-	27	114	169	18	22	15	628	1.3
	Non-Agric.& FFW	38	34	-	-	-	82	73	-	-	68	144	95	534	1.1
	Total	651	771	356	10,465	19,179	2,196	1,974	1,818	1,707	3,164	4,980	511	47,773	100
F3	Fishing	88	353	247	230	-	-	-	-	-	587	938	1,000	3,442	13.4
	Fish Trading	510	470	2,019	1,590	1,560	716	780	856	1,343	785	871	447	11,947	46.7
	Fish Culture	-	-	-	-	-	-	-	-	17	-	-	-	17	0.1
	Farming	267	40	150	10	20	67	33	-	1,350	7	-	-	1,943	7.6
	Agricultural Labour	167	-	-	-	-	-	-	375	-	-	-	-	542	2.1
	Self Employment	7,008	248	-	10	-	-	-	8	367	43	-	33	7,718	30.1
	Total	8,040	1,111	2,416	1,840	1,580	783	813	1,239	3,077	1,422	1,809	1,480	25,609	100
Com-	Fishing	172	272	303	376	413	562	401	436	536	499	3,156	(324)	6,802	15.9
munity	Fishing Labour	100	59	201	203	279	524	572	509	143	277	326	344	3,537	8.3
	Fish Trading	364	406	645	622	488	377	379	348	463	514	480	343	5,429	12.7
	Fish Culture	(87)	(87)	(544)	7,013	13,439	-	-	21	2	1,311	21	90	21,178	49.5
	Farming	88	26	59	371	663	364	318	237	487	133	181	184	3,113	7.3
	Agricultural Labour	110	36	-	50	107	-	-	45	-	-	-	-	349	0.8
	Self Employment	860	126	164	101	100	100	103	191	178	20	17	16	1,976	4.6
	Non-Agric.& FFW	30	27	-	-	-	64	57	-	-	54	113	75	421	1.0
	Total	1,637	865	828	8,736	15,489	1,991	1,830	1,787	1,809	2,808	4,294	728	42,805	100

Figure 19 Income sources through the year, NE1-3 Gayghar



Source: FAP 17 Socioeconomic Monitoring

In the highly stratified *maimul* community of Gayghar, only 10% of the people are directly involved in fishing; the rest have switched to fish trading, leaseholding, and agricultural labour. The very high income peak in *Sraban* and *Bhadra* (July-September) is due to the incomes of three very rich households. For the rest of the year, starting in *Kartik* (October-November), the *maimul* who fish earn their livelihood as leaseholder labour with the peak reached in *Falgoon* (February-March) when *beel* harvesting draws to an end.

Shahpur and Sadipur

Tables 17 and 18 and Figures 20 and 21 show the income sources for Shahpur fishermen through the year. Fishing-related activities provide the majority of their income. Fishing income is lowest in *Falgoon* and *Choytra* (February-April), when no fishing is done in the *haor*. Floodplain fishing from *Baishak* (April-May) to *Ashwin* (September-October) provides about 41% of the community's total income. Since the Shahpur fishermen are less preferred by the leaseholders, fishing labour provides only slightly more than 3% of the total income.

The income of fish traders, most of whom live in Ujan Shahpur, rises during *Magh* (January-February), when they purchase fish from leaseholders harvesting *beel*. The traders collect fish from Chokia, Tural and Kalapani *beel* and sell it at Juri, Kulaura and Fultoli *bazar*.

The agricultural income during *Baishak* (April-May) is the result of fishermen's involvement in the *boro* harvest. Farming households and agricultural labourers earn their livelihood by planting *boro* from *Augrahayan* to *Poush* (November-January) and harvesting it in *Baishak* (April-May). The major source of income is provided by fishing on the floodplain. Farming and agricultural labour together account for 10% of the total community income.

In Sadipur, as illustrated in Table 18 and Figure 21, fishing-related activities provide the majority of the income. The figures reflect the Sadipur villagers' total dependence on fishing.

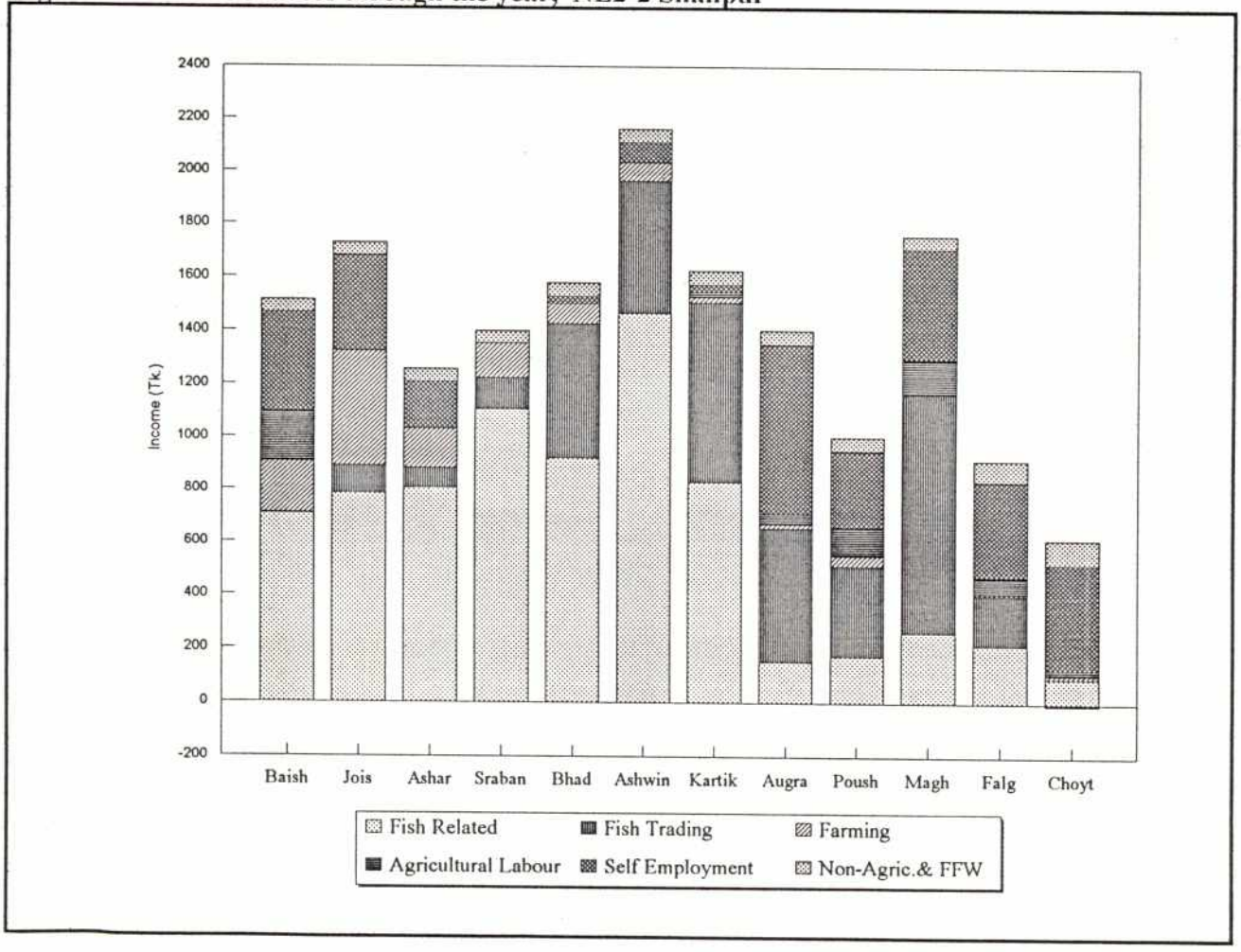
As reported in Section 3.7, Sadipur fishermen have open access from *Baishak* (April-May) to *Bhadra* (August-September), but from *Augrahayan* (November-December) they become dependent on leaseholders for access to the water bodies. During *Ashwin* (September-October) and *Kartik* (October-November) the leaseholders begin to impose restrictions. During this period the fishermen either pay off the leaseholders' *beel* guards or evade them by secretly laying traps at the edge of the *beel*. With neither open access nor fishing labour, this is the leanest period for the fishermen.

Table 17 Income sources through the year, by fishing category, NE2-2 Shahpur

UNIT: TK.

FISH CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
F2	Fishing	888	914	716	969	612	751	247	212	241	252	273	131	6,206	43.7
	Fishing Labour	-	67	67	67	67	182	256	-	-	116	-	-	820	5.8
	Fish Trading	-	153	109	92	321	398	729	461	305	813	170	(13)	3,537	24.9
	Farming	233	609	210	181	102	100	28	20	53	9	5	17	1,568	11.0
	Agricultural Labour	183	-	-	-	-	-	-	59	153	172	86	28	682	4.8
	Self Employment	32	28	6	-	37	51	39	33	39	95	51	36	446	3.1
	Non-Agric.& FFW	67	67	67	67	73	73	73	73	73	67	117	133	950	6.7
	Total	1,403	1,838	1,175	1,376	1,212	1,555	1,372	858	864	1,524	702	332	14,209	100
F3	Fishing	258	297	862	1,283	1,513	2,774	1,633	-	-	-	67	-	8,687	36.7
	Fish Trading	8	-	-	183	960	743	547	610	427	1,142	237	-	4,857	20.5
	Farming	115	-	-	-	13	-	-	-	-	-	8	8	145	0.6
	Agricultural Labour	200	-	-	-	-	-	67	-	-	-	-	-	267	1.1
	Self Employment	1,203	1,160	600	-	-	133	-	2,134	917	1,188	1,133	1,263	9,733	41.1
	Total	1,784	1,457	1,462	1,466	2,486	3,650	2,247	2,744	1,344	2,330	1,445	1,271	23,689	100
Com-	Fishing	706	736	758	1,060	873	1,337	648	151	171	179	213	93	6,924	40.8
munity	Fishing Labour	-	47	47	47	47	129	182	-	-	82	-	-	583	3.4
	Fish Trading	2	108	77	118	506	498	676	504	340	908	189	(9)	3,919	23.1
	Farming	199	433	149	129	76	71	20	14	38	7	6	14	1,156	6.8
	Agricultural Labour	188	-	-	-	-	-	19	42	109	122	61	20	562	3.3
	Self Employment	371	356	178	-	26	75	28	641	293	412	364	391	3,134	18.5
	Non-Agric.& FFW	47	47	47	47	52	52	52	52	52	47	83	95	675	4.0
	Total	1,513	1,727	1,256	1,401	1,580	2,162	1,625	1,404	1,003	1,757	916	604	16,953	100

Figure 20 Income sources through the year, NE2-2 Shahpur



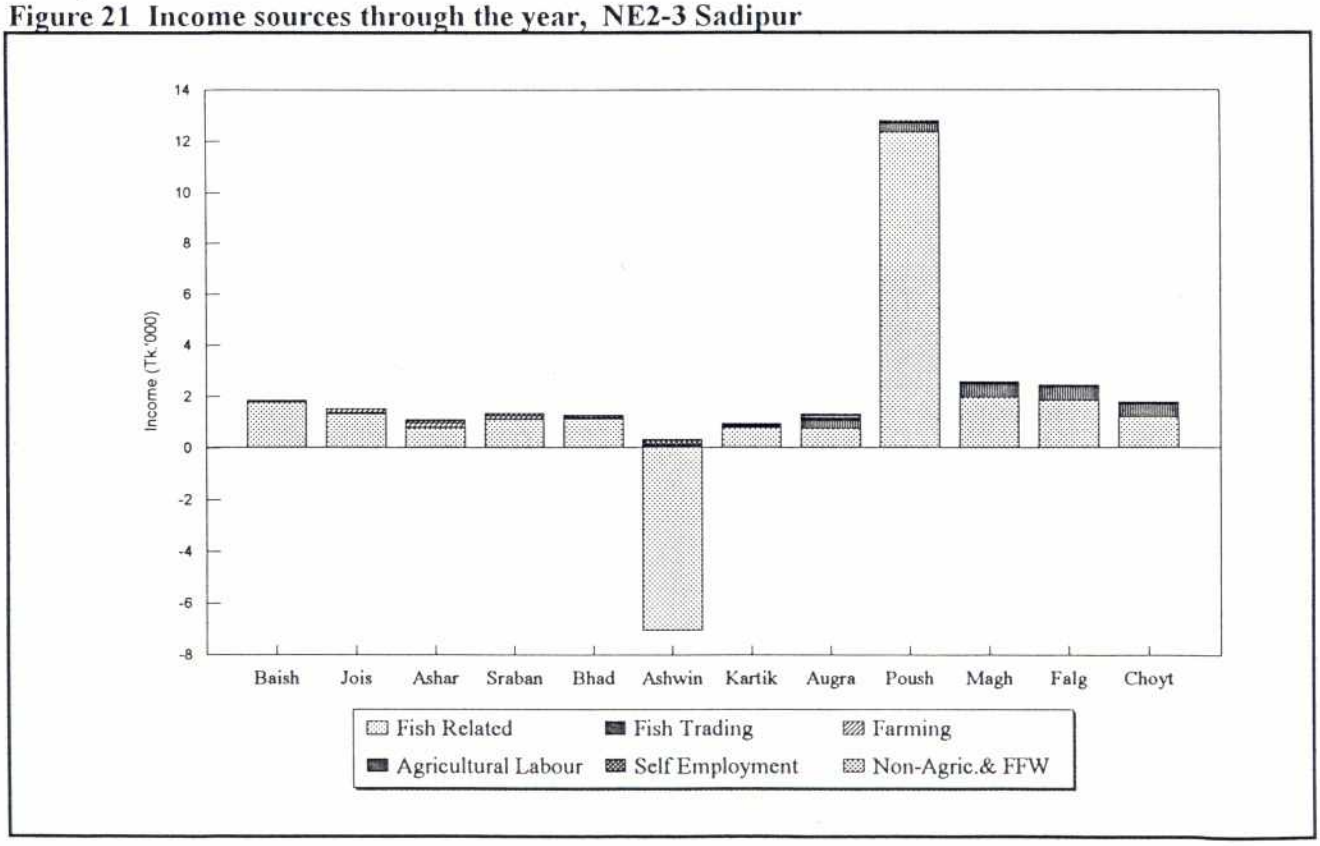
Source: FAP 17 Socioeconomic Monitoring

Table 18 Income sources through the year, by fishing category, NE2-3 Sadipur

UNIT: TK.

FISH CAT.	ACTIVITY	BAISH	JOIS	ASHAR	SRABAN	BHAD	ASHWIN	KARTIK	AUGRA	POUSH	MAGH	FALG	CHOYT	TOTAL	%
F1	Fishing	1,960	1,566	665	1,221	808	798	400	1,368	1,268	4,029	3,279	2,906	20,266	77.6
	Fishing Labour	213	275	175	175	363	325	738	713	863	325	475	498	5,135	19.7
	Farming	-	-	-	-	-	-	-	50	-	-	-	-	50	0.2
	Agricultural Labour	-	-	-	-	-	-	135	238	-	70	80	138	660	2.5
	Total	2,173	1,841	840	1,396	1,171	1,123	1,273	2,369	2,131	4,424	3,834	3,542	26,111	100
F2	Fishing	2,326	1,653	837	1,043	1,309	1,294	653	233	113	1,360	1,144	465	12,428	67.5
	Fishing Labour	-	-	-	-	-	186	129	188	294	200	509	138	1,643	8.9
	Fish Trading	-	113	50	81	88	100	88	444	288	338	444	296	2,328	12.7
	Farming	3	3	9	1	-	8	13	-	25	4	4	10	77	0.4
	Agricultural Labour	-	-	-	-	-	-	-	94	50	-	-	-	144	0.8
	Self Employment	-	-	188	100	88	400	113	155	169	81	69	44	1,405	7.6
	Non-Agric.& FFW	50	-	-	-	81	84	60	-	-	50	-	50	376	2.0
	Total	2,379	1,769	1,084	1,225	1,566	2,072	1,056	1,114	939	2,033	2,170	1,003	18,401	100
F3	Fishing	317	210	620	878	770	(31,300)	383	-	45,000	233	157	-	17,268	67.4
	Fish Trading	243	-	-	-	-	253	-	450	857	1,443	1,392	1,440	6,078	23.7
	Farming	-	483	683	397	13	12	10	-	17	27	7	20	1,668	6.5
	Agricultural Labour	-	-	-	-	-	-	-	187	-	-	-	-	187	0.7
	Self Employment	-	-	120	217	100	-	-	-	-	-	-	-	437	1.7
	Total	560	693	1,423	1,492	883	(31,035)	393	637	45,874	1,703	1,556	1,460	25,638	100
Com-	Fishing	1,710	1,258	734	1,049	1,034	(7,222)	515	481	11,969	1,795	1,469	1,008	15,800	70.7
munity	Fishing Labour	58	75	48	48	98	176	261	282	373	183	369	200	2,168	9.7
	Fish Trading	63	53	24	38	41	112	41	325	356	530	567	510	2,660	11.9
	Farming	1	125	180	103	3	7	8	14	16	9	3	10	479	2.1
	Agricultural Labour	-	-	-	-	-	-	37	157	24	19	22	37	295	1.3
	Self Employment	-	-	119	103	67	189	53	73	80	38	32	21	775	3.5
	Non-Agric.& FFW	24	-	-	-	38	40	28	-	-	24	-	24	177	0.8
	Total	1,856	1,511	1,105	1,341	1,281	(6,698)	943	1,332	12,818	2,598	2,462	1,810	22,354	100

Figure 21 Income sources through the year, NE2-3 Sadipur



Source: FAP 17 Socioeconomic Monitoring

For many Shahpur and Sadipur fishermen, fish trading is an important part of their livelihood strategy. During the open-access season Sadipur fishermen sell their catch in Ghater *bazar* and Moshagong *hat* (market). Their average daily income ranges from Tk. 30 to Tk. 150. Fish traders who purchase fish from leaseholders and resell them in the marketplace earn an average daily income of Tk. 30 to Tk. 80.

The dramatic peak of income in *Poush* (December-January) is distorted by the data of a single household, which leased a small *beel* and totally harvested it during that month. This household earned about Tk. 135,000 in *Poush,* but lost Tk. 95,000 in *Ashwin* (September-October). Apart from this distortion for those two months, income for Sadipur fishermen is more or less evenly distributed through the whole year, reaching its maximum of Tk. 2,000 during the beel harvest in *Magh*.

4. CONCLUSIONS AND IMPLICATIONS FOR FUTURE FLOOD CONTROL SCHEMES

The *haor* region of the North East has always been known for its rich agriculture and fisheries resources. The distinct social and cultural phenomena associated with fisheries have given it characteristics unique to the region. The situation has changed over the past 20-30 years, however. At present, the levels of fish production, the value of the fishery and the degree of competition for control of the resource are far higher in the North East than anywhere else in the country.

Socioeconomic trends in fisheries exploitation

In most of the floodplains of Bangladesh traditional fishermen are facing acute competition from farming and labouring communities, which are gradually pushing them out of the fishery. The change can be attributed to such factors as increasing population, changes in cropping and labour patterns and changes in the physical conditions in the floodplains and *beel.* While many of these changes are unrelated to flood control measures, some are direct or indirect impacts of such interventions.

Whatever their source, these changes are forcing members of the traditional fishing communities to adopt new livelihood strategies. Some opt for a new occupation, others for migration; those who continue fishing concentrate their efforts on water bodies where competition is less acute. For Hindu fishermen this situation has been exacerbated by the fact that their competitors and potential employers are usually Muslims. Even so, their fishing skills and experience enable them to retain some hold on the fisheries resource.

The construction of full flood and submersible embankments in the *haor* has encouraged intensive cultivation and more and more areas are being brought under the plough. Land that was fallow 20 years ago now supports crops, and *khas* land has been transformed into cultivable land either through distribution to landless households or through the establishment of *de facto* control by powerful large landowners.

Changes in the physical condition of the *haor* include increasing sedimentation in *beel* areas and the disappearance of forests. The villagers of Mirpur and adjacent communities report the complete loss of freshwater swamp forest that once occupied the northwestern part of the *haor,* now within the MIP. The former forest land is now either inhabited or is being used for agriculture. In both the Manu Irrigation Project and Hakaluki *haor,* the principal rivers,

the Manu, Kushiyara and Juri, are known for their heavy silt loads. The unique physical features and pattern of human settlement in the *haor,* are resulting in a pattern of fisheries exploitation that is different from the rest of the country.

The physical location of *haor*, history of human settlement and susceptibility of the area to disastrous flooding seem to have encouraged the development of a social structure where a powerful landowning class has control over land and people. The complex hierarchies of credit, patronage and political influence centred on these powerful landowners are based on the traditions built by colonial *zamindars* and revenue farmers who, in order to encourage settlement, provided free land and agricultural loans. The patron-client relationship that emerged survives today in both agriculture and fisheries. In the fisheries sector, fishermen are dependent on leaseholders for securing a job during the *beel* harvest, and leaseholders rely on them for an assured supply of labour. This patron-client relationship is generally considered to be exploitative.

The existing network of relationships and close ties between fishing communities and traditional leaseholding families is now threatened by the recent entrance of a new group of investors, who bid competitively for fisheries leases. The system may increase government revenue, but it is also breeding a fear in the fishing communities that it may undermine efficient management of the *beel* fisheries.

Social status of groups affected and their dependence on fisheries

Nowhere in Bangladesh is the social divide between the fishing and non-fishing communities as sharp as in the North East. Fishing continues to be considered a low-status occupation, and the Muslim *maimul* and Hindu *namasudra* live in caste-like segregation from the rest of the population. Non-fishermen live under constant threat of social ostracism if they take up fishing. Recent immigrants to the area, called *abadi,* are less concerned with status and less constrained by local customs and values. Even *abadi* women in Mirpur admitted to fishing.

In both the MIP and Hakaluki *haor,* policing of water bodies by leaseholders is becoming more intense, sometimes extending beyond the limit of the leased water body and encroaching on areas that have traditionally been open to fishing during the peak flooding period. To effect this, leaseholders are investing more on guards to ensure that the maximum quantity of fish return to the *beel* during the drawdown. This tactic may not be as effective as the leaseholders would hope, however; fishermen in Kadipur, Shahpur and Sadipur

allegedly bribe the guards in order to be permitted access to fishing the floodplain during the peak flooding season.

Implications for the Flood Action Plan

The Manu Irrigation Project has not been able to achieve its intended goal. No major change in the cropping pattern is reported in the area, because the embankment has failed to provide sufficient protection to the major agricultural crop. Local farmers who initially switched to HYV *boro* cultivation have subsequently shifted to HYV *aus*.

Fish production in the area, especially carp production, is said to have declined because the embankment has closed off migratory routes. The reduction of floodplain area, caused by accelerated siltation after construction of the embankment, is also held responsible for reduced fish production.

There have also been flooding interventions in Hakaluki *haor,* where local farmers have built small submersible embankments to facilitate irrigation during the dry season. These embankments have limited impacts on the fish resource, but they promote sedimentation by restricting the flow of water. The *haor* has also been affected in other ways. Some *beel* and *khal* in the *haor* have completely dried up and are being transformed into crop land. As the agricultural frontier pushes deeper into the *haor,* the possibilities of conflict between leaseholders and farmers increase. This process would be intensified by the addition of more flood control measures.

In both village clusters studied, floods continue to have disastrous effects on people's economic lives. The inability of small and marginal farmers to cope with crop losses due to floods, especially flash floods, continues to be a major factor in the steady increase of area landlessness.

GLOSSARY

The following is a glossary of Bangla terms encountered during the course of FAP 17 research. It is not a definitive taxonomy of Bangla terms concerned with fisheries and aquatic resources. Such an undertaking would require taking into account the fact that terminologies and usages change radically from region to region and even from village to village. The aim, rather, is to highlight the different meanings some of these words and terminologies may have in different parts of the country. The region(s) where the term occurs is (are) indicated. Cross references to other entries in the glossary are indicated in small capital letters.

The Roman alphabet is rather poor as a vehicle for communicating Bangla terms, and the versions given here make no pretence at being definitive. There is no standard procedure for transliterating Bangla, and marked differences in the regional pronunciation of words mean that different spellings of the same word may be equally "correct" in terms of the sound of the word.

Terms used to describe fishing castes/groups

bagdi	NC/SW	Hindu caste group brought from West Bengal in the 19th century to work on indigo plantations. Involved in fishing in the North Central Region since Partition.
barman	NC/NW/ NE/SW	Hindu caste fishermen generally associated with riverine fishing. Very close to *MALO* with intermarriage. Apparently a "genuine" fishing caste.
gain	SW	Hindu caste group often, but not necessarily, involved in fishing in the South West Region. Apparently low sub-caste (*NAMASUDRA*).
haldar	NC/NW/SW	Among non-fishermen, refers to Hindu fishermen in general. Among non-riverine Hindu fishermen, used to refer to *MALO* or *BARMAN* Hindu caste fishermen who traditionally fish on the Padma and Ganges. Among *MALO* and *BARMAN* fishermen, refers to the lead fisherman or skipper of a riverine fishing team (the *HALDAR*). Always refers to Hindu fishermen.
jala das	NC/NW/SW	Sub-caste of the Hindu *KAIBARTA DAS* caste fishing group.
jele/jaola/ jeola	NC/NW/ NE/SW	Generic terms for fishermen.
jiani	NW/SW	Derogatory term used for Muslim professional fishermen, particularly around Chalan *BEEL*.

kaibarta das	NC/NW/ NE/SW	One of the largest groups of traditional Hindu caste fishermen; found all over the country.
maimul	NE	Muslim traditional fishermen and traditional leaseholders. A caste-like group sometimes extended for bureaucratic convenience to anyone involved in, or wishing to become involved in, fisheries, including leaseholders.
malo	NC/NW/SW	Hindu caste fishermen very close to *BARMAN*.
matsya das	NE	Hindu caste fishermen encountered in the *HAOR* region. Possibly the same as *KAIBARTA DAS*.
namasudra	NE/SW	Hindu caste group often, but not necessarily, involved in fishing. Most commonly found in the North East Region, particularly the Sylhet Basin, but also occurring in the South West. A generic term for a large group of *sudra* sub-castes.
patni	NE	Hindu caste boatmen who are sometimes involved in fishing as well; often found living with caste fishing communities.
rajbangshi	NC/NW/SW	Hindu caste fishermen. Apparently relatively recent entrants to fisheries. Possibly a tribal group from Northern Bihar/West Bengal that moved onto the plains in the last century and took up fishing. Often, but not exclusively, fishing on "closed" water bodies such as *BEEL* and floodplains.

Terms used to describe actors in fish trading system

aratdar	NC/NW/ NE/SW	Fish wholesaler. A key figure in the marketing chain. Generally the source of credit inputs into the marketing system, advancing money to other actors in the system to ensure fish supply. Usually based in district wholesale markets.
chalani	NC/NW/ NE/SW	People who transport fish from district wholesale markets to higher-level markets. Limited to the carriers.
furial	NC/NW/ NE/SW	Someone who transports fish from the landing to a primary market or secondary shipment point. In the *HAOR* often used for fish traders taking fish from the *BEEL* shore to the road where they are loaded on buses or trucks for transport to towns or larger marketing centres.

mahajan	NC/NW/ NE/SW	A very generic but important term that is most commonly used for moneylenders. Effectively it means almost any rich, influential person in rural areas (closer to its literal meaning, "great man"). These people usually lend money as well. In fisheries, it is commonly used to refer to the leaseholder of a particular water body, the owner of or major shareholder in a particular fishing operation. Also used for many *ARATDAR* who are generally moneylenders in their own right.
nikari	NC/NW/ NE/SW	A generic term for fish traders. Occasionally used for Muslims involved in fisheries activities of any kind.
paikar	NC/NW/	Fish trader.
paharadar	NE	Guards hired by leaseholders to prevent fishing and theft of fish from *JALMAHAL*. Normally hired for the period from flood recession (October/November) until the completion of harvesting in February or March, but increasingly hired for the whole year to prevent all fishing on leased areas. Usually, but not necessarily, hired from fishing communities. Can become a position of considerable influence as *paharadar* can broker fisheries access for local people behind the leaseholder's backs.

Terms used to describe water bodies

beel	NC/NW/ NE/SW	Officially, a "back swamp" or depression. Can be either perennial or seasonal. In reality it used for a wide variety of freshwater bodies (oxbow lakes, old river beds, *KHAL*, even artificial channels). Often refers to flooded areas with no obvious deeper section or depression that used to have perennial areas of water.
bandh	NC/NE	Floodplain (same as *CHAK*); used in *HAOR* region near Sunamganj and around Tangail in the North Central Region.
baor	NC/SW	An oxbow lake; a cut-off curve or meander of a river. Sometimes completely isolated, sometimes connected seasonally or at one end to the parent river. Also used for old river beds now far from the present course of the river (may also be called a *BEEL*).
chak	NC/NW/ NE/SW	Floodplain; often used for a portion of floodplain. Tends to be used for floodplains with fairly clearly defined boundaries.

danga	NC/SW	Artificial or natural ditch often formed from homestead borrow pit, usually in floodplain. Shallower than *KUA*. Used very commonly in the North Central Region around Manikganj. Most common usage is for high land.
dubi/doba	NE	Artificial ditch in the floodplain or *HAOR*; relatively shallow. Used very commonly in *HAOR* region around Sunamganj.
gang	NC/NW/ NE/SW	River; colloquial word for *NADI*. Frequently used for smaller rivers.
gara	NE	Artificial pit or ditch in the floodplain or *HAOR*; deeper than a *DUBI*. Specific to *HAOR* area. Sometimes used as a fish pit but usually originating from a borrow pit or other section of land where earth has been excavated.
gari	NW	Used for a range of water bodies in *BEEL* areas, especially Chalan *BEEL*. Normally refers to small rivers and *KHAL*. Also sometimes used for artificial ditches and borrow pits.
gopat	NW/SW	Grazing land within homestead area of village; generally under community ownership.
halot	NC/SW	Depressed pathway running through the village homestead area, generally under community ownership. Dry pathway during the dry season also used for grazing livestock, when inundated used for open-access fishing.
jala	NC/NW	General term for water body, used for water bodies like *BEEL*, *KHAL*, ponds but not for rivers. Comes from the word *jal* used in Hindu communities for water.
jalmahal/ jalkor	NC/NW/ NE/SW	A "water estate", now referring to any area of *khas* water body controlled by the government and normally leased out for fisheries.
joar pani	SW	High tide.
khal	NC/NW/ NE/SW	Artificial or natural channel, small river or canal.
khandi	NE	Ridge, often covered with low bushes, in the floodplain or *HAOR*. Sometimes used as a pathway during dry season. Specific to *HAOR* region.
khara	NE	Artificial or natural channel, usually connecting two *BEEL* in the *HAOR*. Specific to the *HAOR* region around Sunamganj.
kua	NC/NW/SW	Artificial fish pit excavated in the floodplain or *BEEL*. Deeper than a *DANGA*. In the South West Region, sometimes used for borrow pits near homesteads or roads.

kul	NC/SW	Same or similar to *BAOR*. Dead river or oxbow lake. Most *kul* appear to be connected with the parent river at one end, but it is unclear whether this is a defining feature.
maital	NC/NW/SW	Small natural or artificial ditch. In North Central and North West regions usually used for ditches and borrow pits near homesteads. In South West, also used for ditches and fish pits in *BEEL* and floodplain.
nadi	NC/NW/ NE/SW	River.
nal	NW	A few cases found in North West in the Chalan *BEEL* area where it apparently means a small channel like a *KHAL*.
nala	NE	A drain; usually near a homestead.
pukur	NC/NW/ NE/SW	Artificial pond, usually of fairly regular shape and near a homestead. In South West, also widely used for artificial, submersible ponds (*KUA*) excavated in *BEEL* or floodplain.
pushkunni	NC/SW	Same as *PUKUR*. Used frequently in South West Region.
tala	NC/NW/ NE/SW	Bottom land; used for the bottom of any water body, also often used for the lowest part of the *BEEL*.

Terms used to describe administrative divisions and human settlements

mauza	NC/NW/ NE/SW	The smallest recognised administrative unit. It not the same as a village. Some *mauza* in the *HAOR* area have no villages in them at all although a *mauza* can cover anything from a single village or hamlet to 12 or more villages.
para	NC/NW NE/SW	Usually a subdivision of a village, or *gram*. Sometimes constitutes a village or hamlet in its own right. Fishing communities frequently live in their own *para*, often referred to as the *JELE para*.
thana	NC/NW/	Equivalent of a sub-district or county. Groups together between 10 and 20 UNIONS. Seat of the *thana nirbahi* committee, which plays an important role in allocating fisheries leases and, under the NFMP, in the identification and licensing of fishermen.
union	NC/NW/ NE/SW	The lowest level of government administration. Usually groups together anything between five and 30 *MAUZA*. Important for fisheries as it is the lowest level at which *khas* land and water bodies can be administered.