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Flood Action Plan

FAP 17

Fisheries Studies
and
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study



Supporting Volume
No. 19



THEMATIC
SOCIOECONOMIC
STUDY



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FINAL REPORT



SUPPORTING VOLUME NO.19

Special Study.

THEMATIC SOCIOECONOMIC STUDY

Flood Control and
Fishing Communities in Bangladesh

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FAP 17
FISHERIES STUDIES
AND PILOT PROJECT

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June, 1994

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INTRODUCTION

The FAP 17 Fisheries Study

The FAP 17 Fisheries Study, as part of the Bangladesh Flood Action Plan (FAP) aims to address concerns expressed within the context of the FAP that a major expansion of the area under flood control in Bangladesh would have serious negative impacts on the freshwater fisheries sector in the country. It has frequently been stated that fisheries, whether as a full-time occupation, a seasonal stop-gap or an occasional source of food, constitute an essential part of the livelihood strategies of many rural households living in floodplain areas. It is feared that a rapid expansion of the areas protected from flooding by the various flood control measures envisaged by the FAP would cause a significant reduction in the fisheries resources available to these people. The possibility that poorer households might be particularly dependent on seasonal access to open-water fisheries has caused particular concern.

This, coupled with the realisation that the floodplain fisheries of the country represent a highly productive natural system, has raised doubts that the negative impacts on fisheries caused by flood control might actually outweigh the benefits arising through improved agricultural production and protection from flood damage.

The purpose of the FAP 17 Study is to investigate the extent to which these concerns are justified and, at the same time, obtain a greater and more detailed understanding of fisheries in the country as a whole, both in terms of their biological parameters and their social and economic importance, particularly in rural areas.

To date, planners involved in the FAP have faced serious constraints in incorporating concerns over fisheries into their plans due to the overall lack of understanding and basic data on the fisheries. The FAP 17 Study is also intended to address these constraints, providing a baseline of data on the fisheries which will serve as a means of monitoring future changes following flood control interventions.

Study Framework

In order to fulfil these objectives, the FAP 17 Study has approached the problem from two distinct points of view. On the one hand, detailed surveys of fishing effort and fish catch have been carried out by a large team of biologists in the field with a view to obtaining a

better understanding of the fisheries resource, its current condition, the way in which it is exploited and the impacts which flood control has on the resource and its exploitation.

At the same time, the social and economic component of the study has looked at communities on the floodplains and tried to understand the ways in which they interact with the fisheries resource as well as the role which fisheries play in the livelihoods of different social and economic groups in rural communities.

Both components of the study have placed considerable emphasis on the quantification of impacts, even though researchers are aware of the limitations of such an approach. It was accepted that planners of the FAP require some form of quantitative "bottom-line" with which to assess the feasibility of their proposed interventions and a great effort was put into coming up with practicable means of quantifying fisheries dependence and the ways in which it has been, or is likely to be, affected by flood control.

In order to do this, the basic model for both the fisheries and the social and economic components of the study has been to compare similar sites inside and outside existing flood control projects and attempt to detect differences in the fisheries resource and patterns of exploitation and livelihood which are attributable to the impacts of flood control. In practice, considerable difficulty was encountered in making these paired comparisons due to a combination of factors: the lack of flood control projects functioning according to design; the lack of true "control" areas, and the complexity of other variables influencing the factors which researchers were trying to measure. As a starting point for the study, however, the identification of inside/outside comparisons provided a practicable framework.

The Social and Economic Component of FAP 17

In order to measure the impacts of flood control on the role played by fisheries in the lives of rural households, the social and economic component of the FAP 17 Study used the agro-ecological characteristics of different land areas to identify groups of villages which, except for flood control, have basically similar agricultural resources and patterns of flooding. A selection of these areas was made in four regions of the country, the North Central, North West, North East and South West regions, inside and outside flood control projects which were assessed to be functional.

Within these areas, a random selection of communities was made in order to have one agricultural village located inside each project and another outside. A more purposive

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selection of specifically fishing communities was made in the immediate vicinity of these agricultural villages in order to cover "professional" fishing communities which exploited at least some of the same water areas as those used by the agricultural communities. Thus each paired comparison consisted of two "village clusters;" a agricultural village (predominantly agricultural) and one or more specialised fishing communities in the immediate vicinity. In supporting volumes (village studies) the villages are referred to as main villages and satellite villages, but in this report they are referred to as agricultural and fishing villages respectively.

Within each of these clusters, a quantitative survey of a stratified sample of households looked at labour, income and consumption over a one-year period, paying particular attention to activities related to fisheries. These surveys were supported by village appraisals which studied the historical and social processes in and around the villages and their effects on fisheries. Given the complexity of the fisheries environment and the number of factors influencing it, this more qualitative information provided a vital context for the quantitative data collected during the long-term monitoring of the communities.

Study Coverage

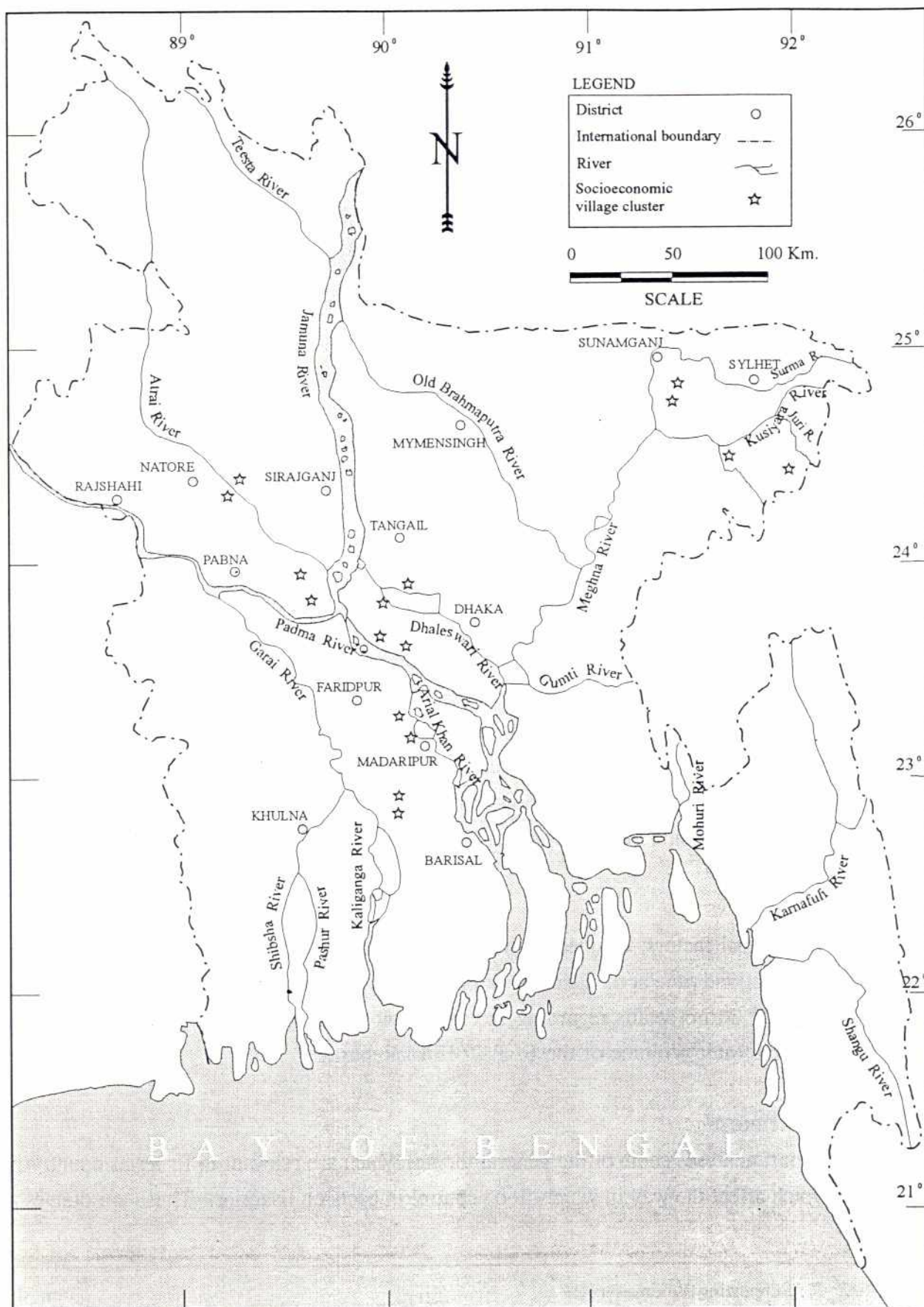
Four regions were looked at during the course of the study. The choice of regions was dictated by a combination of factors. On the one hand, there was a desire to study a "representative" set of sites located in the three principal catchments of the country : the Brahmaputra-Jamuna in the North Central and North West regions; the Ganges-Padma in the North West and South West, and the Surma-Kushiyara-Meghna in the North and East. On the other hand, as the basis for establishing and identifying impacts was the comparison of similar areas inside and outside flood control project, target areas for the study had to be located in and around functioning projects. This factor alone considerably narrowed the choice of areas.

These principal factors, coupled with the inevitable considerations regarding the resources of manpower and time at the disposal of the study, led to the identification of the sites shown in Figure 1. More details regarding the methodology used for the selection of sites can be found in the Main Volume of the FAP 17 Final Report.

Main Themes

This report analyses some of the general themes which are relevant to fisheries countrywide and which affect the way in which flood control impacts on fisheries. These are themes and

Figure 1 Location of FAP 17 study villages in Bangladesh



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areas of concern which FAP planners need to keep in mind when looking at the Figure potential social and economic impacts of changes in fisheries resulting from flood control interventions.

Given the complexity and variability of conditions on the floodplains of Bangladesh it has proved difficult to identify the set of yardsticks or standardised indicators which planners would normally hope to have at their disposal in order to predict or measure impacts. From the local-level studies carried out by FAP 17, it has become apparent that any generalizations about "floodplain fisheries in Bangladesh" run a great risk of superficiality. Extremely important differences were found between the four regions studied and, within these regions, between different areas and communities. Neighbouring water bodies with apparently very similar morphology might have completely different resources, patterns of exploitation and productivity because of apparently minor differences in water access or historical patterns of ownership and fishing rights. While researchers had expected a degree of variation, the complexity and range of factors which play a role in determining patterns of fisheries exploitation and dependence were nevertheless surprising.

This variability naturally creates problems in trying to make meaningful comparisons between pairs of sites. Identification of study areas and communities had taken into account agro-ecological similarities and location inside or outside flood control projects. But these two sets of variables, while important, were obscured on occasions by other factors which were more difficult to predict.

The series of 7 village studies published by the FAP 17 social and economic component looks at 7 areas and details the ways in which people in these communities incorporate fisheries into their livelihood strategies. Its importance in Bangladesh relative to other elements in those strategies is also assessed. In addition there is a discussion of fishing income and its distribution in the FAP 17 Final Report Main Volume. The levels of income and consumption of fish are so locally variable that they are not dealt with here.

Nutritional issues are also considered in a separate report published by FAP 17.

The themes which are dealt with in this report are as follows:

Social and economic change

The first section of the report attempts to place the impacts observed by FAP 17 into some

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kind of perspective by discussing some of the other changes taking place in floodplain areas and in floodplain communities which are having direct or indirect impacts on fisheries. This highlights the need to understand the context in which flood control is introduced, a context which is affected by a whole series of processes of social and economic transformation.

The way in which flood control fits into this pattern of change is discussed.

The people who fish

Discussion of impacts of changes in fisheries on people needs to be based on an understanding of who is actually involved in fishing and how these numbers are changing in different areas. This section therefore looks at ways of categorising different groups involved in fishing and discusses the limitations of the various categories which can be identified.

Flood control and access to fish

The key importance of controlled access to fish is discussed in detail, as this has turned out to be an all-important factor in determining the degree of dependence of different social groups on fisheries. Attention is also given to the sorts of changes in access arrangements which flood control measures are likely to encourage.

Mitigation measures

The issues raised by attempts to mitigate some of the negative changes in fisheries, whether directly due to flood control or otherwise, are discussed in this section.

1 SOCIAL AND ECONOMIC CHANGE

Flood control is only one of the types of human activity which is having an impact on floods and fisheries on the floodplains of Bangladesh. The rapid rise in population in rural areas of the country means that the level of human activity in floodplain areas has increased greatly over the last century and almost any activity on the floodplain has some kind of impact on the natural system.

1.1 Agriculture

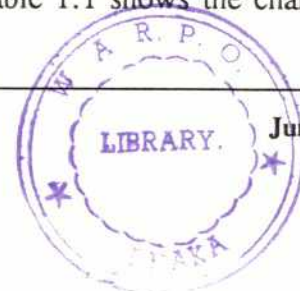
Many changes in agricultural patterns are taking place regardless of flood control interventions.

The last 30 years have seen the area devoted to agriculture increase to the point where there is very little land not being utilised for cultivation of one sort or the other. A considerable proportion of the "new" land which has been brought under the plough during this period consists of lowland which was not considered worth cultivating in the past or which previously posed technical problems discouraging agricultural activities.

The factors influencing this expansion in agricultural area are complex. The most obvious force, the rising population and the need for ever more extensive areas under cultivation in order to feed more mouths is only one, albeit important, factor at work. The widespread availability of means of draining and irrigating lowland and wetland, and the diffusion of high-yielding varieties of crops which have made the investment required for lowland cultivation worthwhile, have also played an important role in encouraging farmers to exploit areas previously regarded as risky or unsuitable for agriculture. The availability of a wider range of crops, particularly *rabi*, has certainly played a major role as well.

The result has generally been a concentration of agricultural activity in the winter season, extending from the drawdown of the floods in *Kartik* and *Augrahasan* (October to December) and a greater concentration of activity in lower-lying areas where water sources for irrigation during the dry season are more readily available.

The most obvious manifestation of this change has been the increase in the area under *boro* rice cultivation. In certain areas, such as Manikganj District, the diversification and expansion of winter vegetable cultivation is also evident. Table 1.1 shows the changes in



cropping patterns from the 1950s to the present in two of the villages studied in the South West Region.

Table 1.1
Kafurpur and Pathankandi
(South West Region)

Changes in cropping patterns : 1950s -1993

KAFURPUR		Principal crops - 1950s-60s		
Kharif I	Kharif II	Rabi	Area (%)	Land types
mixed <i>aus-aman</i>	mixed <i>aus-aman</i>	fallow	40%	very low / low
broadcast <i>aman</i>	broadcast <i>aman</i>	fallow	30%	low
jute	fallow	mustard / pulses	30%	medium low
PATHANKANDI		Principal crops - 1950s -60s		
mixed <i>aus - aman</i>	mixed <i>aus - aman</i>	fallow	40%	very low
mixed <i>aus - aman</i>	mixed <i>aus - aman</i>	pulses	20%	low
mixed <i>aus - aman</i>	mixed <i>aus - aman</i>	sesame	20%	low
broadcast <i>aman</i>	broadcast <i>aman</i>	mustard / pulses	20%	medium low

KAFURPUR		Principal crops - 1993		
Kharif I	Kharif II	Rabi	Area (%)	Land types
fallow	fallow	local <i>boro</i>	10%	very low
mixed <i>aus - aman</i>	mixed <i>aus - aman</i>	mustard / wheat	10%	low / medium-low
HYV <i>boro / aus</i>	fallow	mustard	70%	low / medium-low
jute	fallow	mustard / wheat	10%	low / medium-low
PATHANKANDI		Principal crops - 1993		
fallow	fallow	HYV <i>boro</i>	55%	very low / low
mixed <i>aus - aman</i>	mixed <i>aus - aman</i>	sesame / mustard pulses / wheat	10%	low / medium-low
jute	fallow	wheat	20%	low / medium-low
HYV <i>boro / aus</i>	fallow	mustard	15%	low / medium-low

Source : FAP 17 Village Appraisals

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From the point of view of fisheries, this change in agriculture has brought agriculturists into much closer contact with the areas of the floodplain which were previously utilised predominantly for fisheries. Residual water bodies left by the retreating floods are now no longer purely of interest to the fishermen who traditionally harvested them during the winter. Any water left on the floodplain during the *rabi* season is now likely to be targeted for irrigation purposes.

On one level this simply introduces a conflict over the use of water resources. A more important consequence, however, has probably been the focusing of wider attention on these water bodies and the potential which they contain, whether for agriculture or fisheries. The result has therefore been an increasing interest in the fisheries resource, the benefits which can be extracted from it and, as a direct consequence, the control of that resource.

1.2 Labour Patterns

The changes in agricultural patterns seen all over the floodplains of Bangladesh are also leading to a significant shift in the labour patterns in rural areas through the year. Increasingly, the peak period for agricultural work is the *rabi* season as many of the variety of *rabi* crops now being grown are relatively labour intensive. The growing importance of the *boro* season means that the period of the *boro* harvest, during the months of *Baishak* and *Joisthya* (April-June) is now the peak period for agricultural labour demand over much of the country.

Labour demand during the summer floods has always been limited as the principal crop, broadcast deep-water *aman*, demands very limited labour inputs up to the point of harvest. However, the decline in the area devoted to the mixed crop of broadcast *aman* and *aus* has further narrowed the opportunities available to rural labourers. The traditional peak in labour demand during the month of *Kartik* at the time of the *aman* harvest also seems to be less important than previously and this may lead more labourers to seek alternatives during this period. Because this is the peak period for open-access floodplain fisheries, as the waters recede from the floodplain and become concentrated in residual water bodies, fishing may be attracting more people as an alternative.

1.3 Land Tenure

Directly linked to the changes in agriculture mentioned above are the changes in land tenure which have made them possible.

Many of the low-lying areas, such as *beel* or *chak*, which have been converted from fallow or waste land to *boro* cultivation have also frequently undergone a change in their tenurial status. During the 1970s and '80s, the burgeoning population in Bangladesh encouraged the progressive conversion of all available land to agricultural use. Much of the land available for conversion has been previously low and very low land which was too deeply flooded to be cultivated during the summer season and either inaccessible or difficult to irrigate during the winter dry season.

A high proportion of this land was, following the abolition of the *zamindari* system, denominated as *khas* land, controlled by the government. This meant that it was available for distribution as one of the measures to combat landlessness which have been taken ever since Partition in 1947. As the technology to make use of these lands has become available, and flood control has created a more stable environment for agriculture, the tendency has been for these lands to be converted from *khas* to private ownership.

The extent to which this transfer has been officialised is very variable. In many areas, such as in Chalan *Beel*, many local people remember the major distribution of land rights in the *beel* area which took place during the 1970s. While this was theoretically intended to benefit the landless, it is clear that a sizeable proportion of these previously *khas* lands have ended up in the control of large landowners, partly because of the influence they have been able to exert on the process of distribution and partly because they have been in a better position to gain access to the technology and capital required to exploit lowland areas (irrigation and HYV). In other areas, large tracts of *khas* land have simply been occupied by local farmers and *de facto* private ownership established.

This major movement of people and agricultural activity into the lowlands, which were previously exploited almost exclusively by fishermen and generally poor people who collected wild produce from *beel* and flooded areas, has had a major impact on the patterns of exploitation of lowland resources. The presence of many agriculturalists in lowland areas seems to have increased people's awareness of the fisheries resources which are found there during the floods. In addition, the irrigation requirements of lowland crops during the winter

have greatly increased the number of excavated reservoirs in lowland areas and the importance of naturally occurring depressions. As the dry season progresses, these become steadily more and more important as sources of irrigation water. As the water levels decrease, the fish which have taken refuge in these depressions and pits become easier and easier to catch and it is not surprising that more and more farmers and labourers have become involved in the exploitation of these fisheries resources which were previously harvested almost exclusively by fishermen.

The professional fishermen who traditionally exploited the fisheries in *beel* around the country had relied on rights to the fisheries resource which were sanctioned in the past by local *zamindar* and then by the Government. However, these rights have always been limited to the fisheries resource rather than to the inundated land on which it was found. The shift in tenure of that land from Government to *de facto* or *de jure* private ownership has brought about an important change. Those agriculturalists exerting control over the land are increasingly inclined to exert control over the water and fish which is found on that land during the floods.

The significance of this change has been of particular importance for traditional fishermen. Whereas, in the past, competition for exploitation rights for fisheries in the floodplain was primarily between different fishing communities or the *zamindar* who patronised them, a far wider segment of the general population now has an interest in gaining access to fisheries. Given that the traditional fishing community commands very low social status, and frequently comes from the Hindu minority community, they are generally at a disadvantage in this competitive environment compared to higher status, and far more numerous, agriculturalists. In particular, land owners are able to extend their tenure of land to the floodwaters which cover it. As a result, it is increasingly difficult for traditional fishermen to command the secure tenure of fisheries resources which they had in the past.

1.4 Social Change

As population pressure in rural areas increases it is inevitable that the pressure on all resources which can be exploited as a means of livelihood tends to increase as well. Labour mobility and rural-urban migration are common responses to the narrowing of opportunities as more and more people compete for a more-or-less constant set of resources. This mobility has, by itself, encouraged the breakdown of many of the social norms which limited particular groups of people to particular occupations. This is coupled to the growing

impooverishment of large sections of the rural population who are forced to become more and more flexible and inventive in order to seek out ways of making ends meet.

The result has been a dramatic change in the ways in which people work and the options which people are willing to consider as a means of livelihood. In many rural areas, and for some types of occupation, this can be regarded as a question of supply and demand. Thus, in some areas where there has been considerable development such as road-building and embankment raising, work excavating and moving earth has become far more widespread and occupies an extremely important place in the livelihood strategies of many poor rural households. Older people in the same area may remember when it was considered a stop-gap form of employment for only the poorest of the poor.

Fishing is another activity which has traditionally been regarded as extremely low status. While some forms of occasional fishing are apparently "acceptable," fishing as a means of livelihood has long been regarded as something only fishermen should do and from which agriculturalists, whether farmers or labourers, should abstain except when absolutely necessary. This social stricture surrounding fisheries involvement, especially among Muslim agricultural communities, seems to have been extremely strong, at least in some areas. Even today, it can be very difficult to get non-professional fishermen to admit to the true extent of their fisheries involvement as it is regarded as

a source of shame. Box 1 gives an account of the extreme ostracism suffered by households in one particular area of the North West Region when they first took up fishing as a means of livelihood in the 1960s.

In the 1960s, even before the community of traditional, Hindu *rajbangshi* fishermen in Ahmmedpur migrated to India, one landless labourer in the Muslim community started secretly catching fish in the nearby Gajnar *Beel* and selling them at one of the local markets. When this was discovered, this person and his family were so violently ostracised by the local *panchayat* that they ended up leaving the village to go and live elsewhere. Not long after his departure, however, other landless households began to follow his example. When the traditional fishermen in the *rajbangshi* community moved out in the early 1970s, the numbers of landless labourers turning to fishing for a regular part of their livelihood during the floods and drawdown seems to have taken off. Now, an entire section of the Muslim community of Ahmmedpur is referred to as *jale para* and those engaged in fishing on a regular basis have become used to the fall in status which their involvement in fishing seems to have entailed.

Box 1: Muslim and fishing in Ahmmedpur

However, the steady growth in landlessness and the need to exploit any possible source of income has gradually led to the breakdown in taboos regarding fisheries involvement.

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Increasingly the exploitation of fisheries is seen as one option among many which can be adopted by households and utilised as and when it is possible or required. In some cases, these new entrants into fisheries have specialised to the point where they have, to all intents and purposes, become fishermen although they seldom have the professional knowledge and skills of the traditional fishing community.

1.5 Conclusions

The factors outlined above are just a few of the principal features of changes on the floodplains of Bangladesh which need to be borne in mind when considering the changes in fisheries which might be caused by flood control. It can be clearly seen that many of the natural and man-made changes identified here effectively mimic those changes which are identified as potential impacts of flood control. This obviously complicates the task of determining where natural or long-term processes of change stop and the impacts of flood control begin.

In order to understand what is happening in fisheries in a particular area it is clear that planners have to understand the historical processes at work which are affecting the fishery. Only by understanding how fisheries have changed in a particular area without flood control will it be possible to predict or measure how they may change with flood control.

2 SOCIAL AND ECONOMIC CHARACTERISTICS OF FISHING GROUPS

Flood control can have a series of relatively specific impacts on fisheries. However, projects often do not have the predicted impacts on flooding and many variables come into play to determine what those impacts might be in a particular case. As a result, it is often difficult to predict the physical impacts of a particular project.

When the question of human impacts is addressed, the problems multiply. In a highly dynamic natural environment, such as that found on the floodplains of Bangladesh, the relationship between people and the natural resources on which they depend is complex and highly variable. Statements such as that commonly used to justify concerns over the impacts of the FAP on fisheries ("80% of the population of Bangladesh depend on fisheries for all or part of their livelihoods") represent oversimplifications as they imply a degree of homogeneity among both the population and the resource which simply does not exist. In some years, under particular flooding conditions, it may be that as much as 80% of rural households have some members who engage in fishing at some time or another during the year, but this is very different from being dependent on fisheries.

Discussion of the real impacts on people of changes in fisheries due to flood control must therefore start from a better understanding of patterns of dependence on fisheries, irrespective of flood control.

2.1 Who Fishes?

The widespread perception that fishing constitutes an important seasonal source of food and income for many of the poorest of the poor in rural areas is understandable given the intense fishing activity which can be observed at certain times of the year in floodplains all over the country. The numbers of people involved in fishing, the variety of techniques employed and the apparent heterogeneity of the people involved obviously encourage this impression.

Most attempts to categorise this varied and heterogeneous fishing population end up identifying three groups: "professional" or full-time fishermen; seasonal or part-time fishermen, and "subsistence" fishermen. At first sight, these categories appear arbitrary. It is true that, at least in the past, "professional" fishermen in Bangladesh have been a clearly circumscribed group, defined socially by their profession and, at least in part, by religion, caste and social status. Given the widespread diffusion of the fisheries resource which occurs

during the floods, however, extensive fisheries involvement among the rest of population can be expected. Logically such involvement would depend, above all, on factors such as distance from suitable water bodies, availability of alternatives and seasonal or annual variations in flood extent.

Through the more precise measurement of income from different sources among a large sample of rural households, the FAP 17 social and economic studies aimed to provide a more precise picture of the different levels of fisheries involvement and dependence among different groups of the rural population and develop a more accurate framework for discussing different levels of fishing involvement.

The findings of the studies indicate however that the commonly used categorisations of fishing households-professional, seasonal and subsistence-hold up quite well to more detailed analysis of relative levels of fisheries dependence although certain points regarding definition need to be kept in mind. Given the degree of variation noted above between regions, areas, villages and years, there are obviously many groups and areas which will fall outside any attempt at categorisation at any given moment; increasingly many "seasonal" fishermen are becoming "professional" and most "subsistence" fishermen are also "seasonal" (Fig. 2.1). The definitions and variations within these three groups are therefore discussed below in some detail. The terms "professional," "seasonal" and "subsistence" will continue to be used throughout the report but the inevitable inadequacies of these categories need to be kept in mind and they should not be interpreted in a rigid fashion.

Table 2.1 gives the regional breakdown of the proportion of households in the agricultural (non-fishing) villages studied by FAP 17 involved in seasonal (for income) and subsistence (for consumption) fishing respectively. As the dividing line between "seasonal" and "subsistence" fishermen is inevitably vague, a breakdown between "fishing" and "non-fishing" population in these villages is also given.

Table 2.2 uses data from the FAP 17 fish catch assessment surveys, carried out on the fishing grounds as opposed to in the villages, to show the distribution of catch, by value, among different categories of fishermen. This data is broken down by region and by type of fisheries habitat. There were slight differences in the ways in which the categories outlined above were interpreted in this survey, but the correspondence is sufficiently close to make these data and these obtained from the village studies comparable.

Figure 2.1 Categories of fisheries involvement in Bangladesh

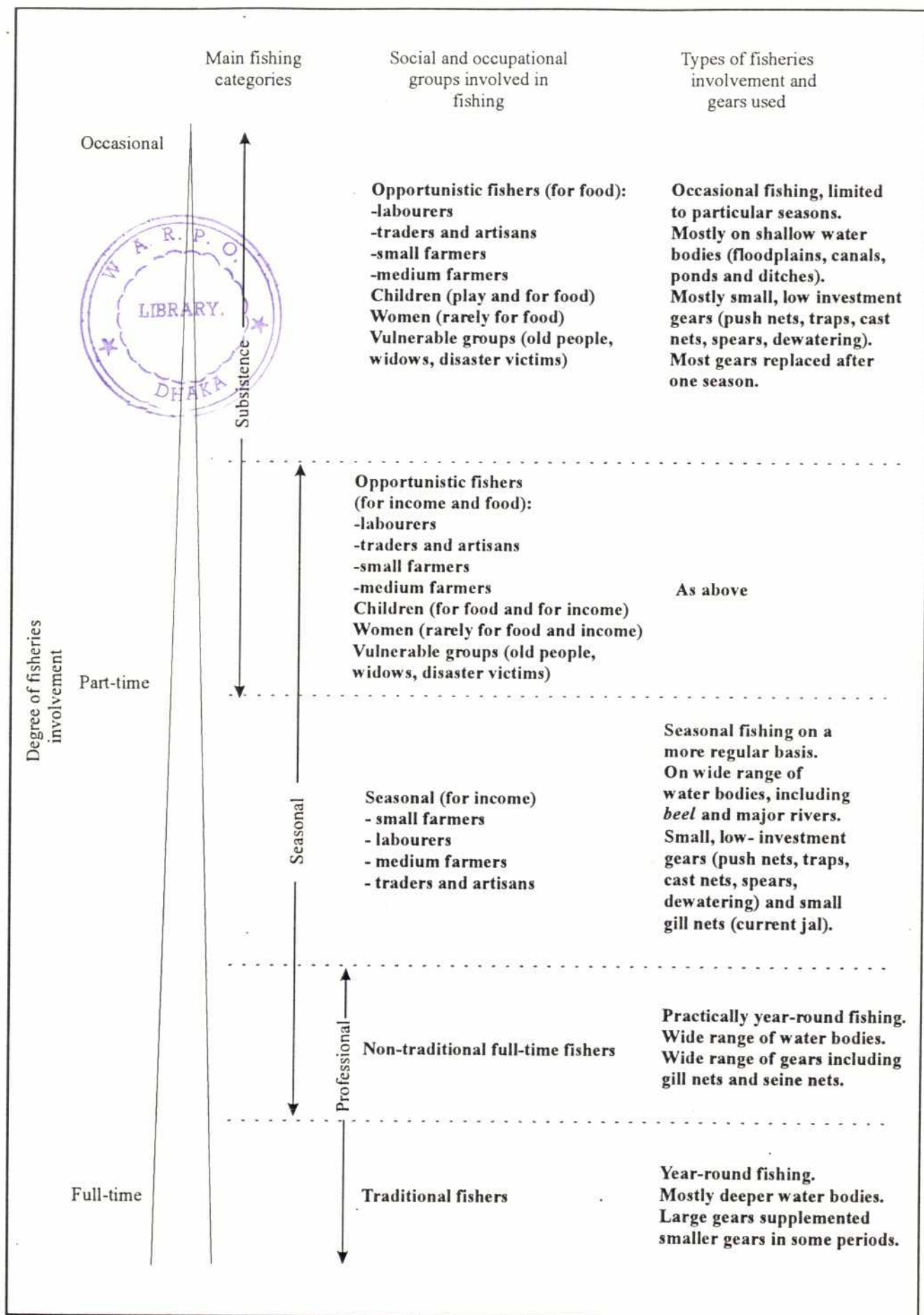


Table 2.1
Seasonal and subsistence fishing in agricultural villages :
proportion of households involved (% by landholding category)

Landholding categories ¹	Regions											
	North Central			North West			North East			South West		
	Seas. ²	Subst. ³	NFish. ⁴	Seas.	Subst.	NFish.	Seas.	Subst.	NFish.	Seas.	Subst.	NFish.
Medium farmers	6.0	79.0	14.0	11.0	34.0	11.6	2.0	64.0	34.0	15.0	60.0	24.0
Small farmers	10.0	63.0	23.0	12.0	31.0	10.1	3.0	58.0	28.0	26.0	48.0	33.0
Landless	15.0	48.0	37.0	18.0	28.0	24.9	10.0	49.0	41.0	32.0	29.0	27.0
Village total	12.0	61.0	27.0	15.0	32.0	13.4	6.0	57.0	37.0	27.0	44.0	29.0
Total fish./non-fish.	73.0		27.0	47.0		53.0	63.0		37.0	71.0		29.0

Source : FAP 17 Village Census and Supplementary Surveys

Notes :

- 1 Landholding categories are defined in relation to total land owners as follows:
medium - 2.5-7.49 acres : small - 0.5-2.49 acres : landless < 0.49 acres
- 2 Seasonal fishermen - reporting some income from fishing during the year
- 3 Subsistence fishermen - reporting fishing / owning gear but not reporting income from fishing
- 4 Non-fishing - no fishing activity reported and no gear owned

Table 2.2
Distribution of catch by value (%) on different fisheries habitats
among different categories of fish catchers in four regions

Fisheries habitat	Fishing categories by region											
	North Central			North West			North East			South West		
	Prof.	Seas.	Subst.	Prof.	Seas.	Subst.	Prof.	Seas.	Subst.	Prof.	Seas.	Subst.
Main Rivers	53.7	34.5	11.7	72.0	16.5	11.6	-	-	-	46.6	47.1	6.2
Secondary Rivers	47.5	15.5	37.0	54.9	35	10.1	80.4	9.0	10.2	61.7	15.2	23
Khal	42.3	13.8	44.1	37.9	37.2	24.9	55.9	25.5	14.6	41.4	31.7	27.4
Floodplains	22.4	15.6	61.7	47.9	38.9	13.4	57.5	23.1	19.6	41.0	45.6	19.3
Beel	15.7	22.2	62.1	66.5	27.5	6.1	84.6	7.2	8.3	35.2	51.1	14.1

Source : FAP 17 Fisheries Studies

2.1.1 Subsistence fishermen

The term "subsistence" fishermen is normally used for those households where most catch is consumed in the household rather than converted into income. In practice, the term tends to be as a catch-all for everyone engaged in fishing who does not regard it as an "occupation." Alternative terms for this group might be "opportunistic" fishermen or "non-fishermen who fish." Although the latter term seems contradictory, it expresses well the social importance of not being regarded as a "fishermen" (*jele*) even if someone spends a considerable amount of time fishing.

Subsistence fishing gears

Many rural people fish regularly throughout the flood season and drawdown, but at low levels of intensity (a few hours at a time). They use small, flexible gears on generally shallow and peripheral water bodies or flooded areas which yield small amounts of fish. Others might only fish once or twice during the year under very particular circumstances (for example during the pre-monsoon *ozaya maatsch* fishery in the *haor* of the North East Region or during the dewatering of ponds and ditches during the drawdown period).

Households engaged in fishing activities of this sort might not own any fishing gear as such, but rely on their hands, baskets and other implements which are not primarily destined for use in fisheries. Those gears which are owned are generally cheap and frequently can be constructed with materials readily available in and around the village. Table 2.3 shows the gears in each region which are predominantly operated by fishermen who fish "primarily for consumption." It also shows the principal source of income reported by people using those gears.

While some regional variations are clear, there are a group of gears which can safely be defined as "subsistence" fishing gears in that they are overwhelmingly operated by this group. These are:

- *deol* : a length of fine mesh netting strung between two vertical poles and pulled through the water by two people; also called *dhor jal* (North Central and North West) and *lathi jal* or *manipuri jal* (North East)
- *dharma jal* : a square lift net of various sizes hung from a bamboo poles and usually operated from the banks of rivers and *khal*
- *ucha* : a woven bamboo scoop pulled along the bottom of streams and flooded areas

Table 2.3
Social and economic characteristics
of subsistence gear users in different regions

NORTH CENTRAL REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Gill net	<i>current jal</i>	6.0	94.0	19.2	40.5	40.4	19.1	16.8	50.6	8.0	5.5
Seine net	<i>deol</i>	1.7	98.3	2.6	7.6	89.8	2.6	49.0	28.5	7.5	12.4
Lift net	<i>dharma jal</i>	3.8	96.2	2.6	10.0	87.4	2.6	33.5	37.6	12.8	13.6
Scoop net	<i>ucha</i>	2.9	97.1	1.5	2.3	96.2	1.5	34.3	45.3	14.0	5.0
Traps	<i>doiar</i>	5.3	94.7	24.5	33.7	41.8	24.5	13.8	45.4	10.4	5.8
Hook/lines	<i>sip</i>	12.7	87.3	3.1	9.8	87.2	3.1	24.7	40.2	16.3	15.7
	<i>daun</i>	8.3	91.7	33.0	44.7	22.3	33.1	10.7	49.0	4.7	2.5
	<i>tana barsi</i>	16.4	83.6	38.4	8.1	53.4	38.5	11.4	26.6	13.8	9.8
Cast net	<i>jhaki jal</i>	54.6	45.4	55.6	4.3	40.0	55.7	17.3	15.0	8.4	3.7
Push net	<i>thella jal</i>	2.8	97.2	1.7	3.9	94.4	1.7	29.3	50.2	10.5	8.3
Miscellaneous	hand fishing	5.9	94.1	3.3	0.3	96.4	3.2	22.8	52.4	9.2	12.4

NORTH WEST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Seine net	<i>deol</i>	3.4	96.6	6.2	34.2	59.5	6.3	62.2	24.5	1.7	3.2
Lift net	<i>dharma jal</i>	1.4	98.6	7.8	67.8	24.5	7.7	43.0	26.8	12.1	10.4
Traps	<i>deal</i>	1.2	98.8	6.0	52.7	41.1	6.1	32.3	43.5	10.7	7.4
Hook/lines	<i>sip</i>	2.7	97.3	7.7	33.3	59.1	7.6	34.8	32.6	11.7	13.4
	<i>tana barsi</i>	27.4	72.6	24.6	22.6	52.7	24.6	15.4	13.6	25.4	20.9
Cast net	<i>jhaki jal</i>	21.6	78.4	48.5	29.7	21.8	48.5	17.7	21.9	5.5	6.4
Push net	<i>thella jal</i>	1.6	98.4	11.0	44.0	44.9	11.1	36.5	38.2	6.0	8.2
Miscellaneous	hand fishing	1.9	98.1	4.4	27.7	67.9	4.4	48.0	32.5	5.3	9.7

NORTH EAST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Seine net	<i>deol</i>	22.9	77.1	19.5	28.9	51.9	19.6	53	18.2	-	3.2
Scoop net	<i>ucha</i>	8.0	92.0	6.2	18.0	75.8	6.3	73.4	15.6	-	2.6
Hook/lines	<i>tana barsi</i>	10.5	89.5	60.5	18.7	20.7	60.5	27	8.3	-	2.6
Push net	<i>thella jal</i>	16.6	83.4	33.1	20.9	46.1	33.1	38.2	20.1	1.1	7.4
Miscellaneous	dewatering	4.4	95.6	34.0	7.2	58.8	34	52.2	6.9	-	7.7
	hand fishing	8.3	91.7	5.2	10.0	84.8	5.2	68.1	16.6	1	6.7

SOUTH WEST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Scoop net	<i>ucha</i>	2.6	97.4	5.2	19.5	75.3	5.2	29.2	39.6	15.6	10.4
	<i>tukri</i>	38.9	61.1	8.2	12.2	79.6	8.2	43.3	28.6	14.7	5.2
Traps	<i>polo</i>	48.4	51.6	17.2	31.3	51.5	17.2	42.2	26.6	12.5	1.6
Hook/lines	<i>sip</i>	53.9	46.1	18.7	20.9	60.3	18.7	27.2	33.7	13.5	6.8
Spear	<i>koch</i>	58.7	41.3	18.4	31.5	50.1	18.4	39.8	27.9	8.5	5.4
Cast net	<i>jhaki jal</i>	35.5	64.5	15.1	22.0	62.9	15.1	37.3	27.1	14.5	6.0
Push net	<i>thella jal</i>	8.6	91.4	8.3	16.8	74.9	8.3	38.2	31.0	17.8	4.7
Miscellaneous	hand fishing	15.1	84.9	5.0	11.0	84.0	5.0	49.9	31.3	8.7	5.1

Source : FAP 17 Fisheries Studies

1 The gears shown are those where more than 20% of the gear users enumerated during FAP 17 catch assessment surveys claimed to be fishing for subsistence only

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- *doiar* or *deal* : different types of bamboo trap
 - *sip* and *tana barsi* : a simple hook and line with or without a float
 - *jhaki jal* : a circular cast net of various dimensions
 - *thella jal* : a triangular push net on a bamboo or wooden frame
 - hand fishing : usually associated with the dewatering of residual water bodies as the floods recede.

Children in subsistence fishing

In many areas these opportunistic fisheries are dominated by children who can account for well over 50% of fishing effort using some of the most important "subsistence" gears such as *thella jal* (push net) and *ucha* (scoop net). It is particularly in this extremely important group of children involved in fisheries that problems of categorisation become most difficult. Some children undoubtedly make a significant contribution both to household income and consumption through their fishing activity. For children, even from "non-fishing" families, fishing can be a seasonal "job" taking up 10-12 hours of the day even though parents may be reluctant to regard it as a significant source of income. In the eyes of adults, and even from the point of view of many children, fishing is a form of play rather than a productive activity. In fact, for pre-adolescent children, fishing clearly plays an important social and educational role as well as augmenting family food availability.

Subsistence or occupation

There is generally a fairly clear distinction between those who regard fishing as a regular source of income, and have accepted the social implications of this choice, and those who catch fish without regarding themselves as "fishermen." Many "subsistence" fishermen may be reluctant to admit that they fish, even if they do so frequently. They are likely to consider the activity as being "only for consumption" even if, seasonally, they may earn considerable income.

Year-to-year variation

This subsistence category is subject to the greatest degree of variation from year to year as it is highly dependent on flooding patterns and the extent of inundation. In a year of many "subsistence" fishermen may be reluctant to admit that they fish, even if they do so frequently. They are likely to consider the activity as being "only for consumption" even if, seasonally, they may earn considerable income. During relatively high floods, the commonly cited figure of 80% of floodplain residents engaged in fisheries may well be close to the truth. But in a relatively dry year the figure might be dramatically less.

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This was indicated by FAP 17's own experience. The original village census in the 16 agricultural villages selected for study around the country was conducted in November-December, 1992, towards the end of a drought year where flood levels were considerably below "normal" levels. The numbers of respondents reporting even minor fishing involvement was well below expectation. During the subsequent 1993 flood season, when floods and rainfall were higher, far higher levels of fishing activity were generally observed and measured during household monitoring. A supplementary survey looking at "subsistence" fishing activity in a sample of villages in the North Central Region early in 1994 (also a year of relatively "normal" flooding) seemed to confirm a higher level of fishing activity than had originally been reported in the same region during the census in 1992 (see Table 2.1).

The differences in flooding from one year to another play an important part in determining whether these "subsistence" fishermen are active or not. Many of the gears used for this kind of fishery require very low investment and only last, at the most, for one fishing season. So in a dry year it would be easy to find households who engage in some fishing in years of "normal" or high flooding, but during that particular year have not fished at all and do not even have any fishing gear in the house. If a census of fishing gear were to be conducted during such a "dry" year, the numbers of people involved in fishing would appear to be very low.

Consumption or sale

"Subsistence" fishing does not necessarily mean that catch is used purely for household consumption. All fish catch in Bangladesh is marketable and even the tiniest amounts of fish caught by children are frequently sold rather than consumed. A significant proportion of subsistence catches does end up in the family cooking pot, but as much of the catch of these "opportunistic" fishermen is probably sold as is consumed.

Regional variations

While these points outline certain common features of the subsistence fishing subsector there are clear regional variations in terms of importance and mode of operation which need to be highlighted.

North Central

The North Central Region is the area where subsistence fishermen play the most important role in terms of their contribution to overall fishing effort and the numbers of people in rural communities involved.

There are several reasons for this. On the one hand, there are a large number of relatively small water bodies which seem to lend themselves to exploitation by subsistence fishermen using low levels of technology. Many of the other areas studied are characterised by extensive and relatively inaccessible areas of lowland with large *beel* and wide flooded areas during the monsoon which constitute a considerable barrier to access for occasional fishermen. The North Central Region, while not lacking in water and fisheries resources, is characterised by smaller *baor (rak)*, rivers and relatively small *beel* which are more accessible to surrounding people.

As shown in Table 2.2, particularly high proportions of medium (79%) and small (63%) farmers are involved in subsistence fishing. This may be due to the fact that they spend more time in and around their villages than labourers who tend to be more mobile in their search for employment. While the proportion of labourers is lower, at 48%, this nevertheless translates into high numbers of landless involved in fishing as there are many labourers in the region. In Table 2.3, the high proportions of fishermen using "subsistence" gears who report labouring as their principal source of income is notable.

The market for labour seems to be more active in the North Central Region, perhaps due to the proximity to urban centres. This may explain why more people are involved in subsistence fishing rather than seasonal fishing. Labourers may have a wider range of employment options which discourages them from taking up fishing on a more stable basis. Given the relative lack of concern for the social stigma attached to fishing in the area (compared to say the North West Region) a greater degree of fishing for income might have been expected. Labourers seem to prefer to seek employment elsewhere, however, although they may be active subsistence fishermen during the flooding season and drawdown.

Perhaps as importantly, the level of control exerted over these water bodies by leaseholders and others is not particularly strong, facilitating access for opportunistic fishermen. In Table 2.2 above, the high proportion of catches (by value) in the region going to subsistence fishermen from *beel* is particularly noteworthy. Over 62% of the value of catches from *beel* were accounted for by subsistence fishermen, roughly the same as that for floodplains. Many

of the *beel* in the region are seasonal and not leased out, while those that are leased tend to be, at best, loosely supervised, either because the traditional fishermen cannot effectively enforce their rights or because the water bodies are not productive enough to justify the extra expense required for protection.

North West

The contrast with the North West Region could not be more marked. Here subsistence fishing plays a relatively minor role. On *khal* about a quarter of the value of catch is taken by the subsector, but on *beel* only 6% is accounted for by subsistence fishermen. This reflects the larger, more deeply flooded areas which dominate the floodplains in the areas studied by FAP 17, the greater control exerted over the more productive fishing grounds by leaseholders and the social attitudes towards fishing which dominate.

The floodplains around Gandahasti *Beel* in Pabna District and in the Chalan *Beel* area are extremely extensive and relatively difficult to access during the floods and drawdown. Taking up fishing therefore requires more investment in time and money to acquire the proper gear and means of reaching fisheries resources. In many areas, those resources are tightly controlled by leaseholders and the professional fishermen, both Hindu and Muslim, who work for them. In order to take up fishing, households have to be willing to accept a fall in social status and, quite possibly, considerable ostracism from their neighbours. As a result, those that do turn to fishing, out of necessity or lack of alternatives, tend to fish more intensively, making them seasonal as opposed to subsistence fishermen.

Only around 30% of all landholding categories are generally involved in subsistence fishing. A relatively large proportion of most subsistence gear users are farmers and the involvement of labourers is more limited. Those who turn to fishing they do so as a regular source of income.

North East

In the North East, a different situation again prevails. On the one hand, the deep and sustained flooding to which the *haor* basin is subject creates considerable opportunities for fishing of all kinds. Natural conditions out in the *haor* may be somewhat unfavourable to subsistence gear users as the distances are great and water depths frequently higher than in many other areas. Around 50% of landless households are engaged in some subsistence fishing during the year, and even higher proportions of farmers.

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Higher levels might have been expected given the abundance and ubiquity of the fisheries resources in the region, but the productivity of the resource attracts much higher levels of control by leaseholders and the fishermen working for them. This leaves more limited areas open to subsistence exploitation. The distribution of catch value shown in Table 2.2 illustrates this clearly. Whereas the proportions of rural households involved in fishing are not that much lower than in the North Central Region (about 57% as opposed to 61%) the proportion of the catch value which is taken by subsistence fishermen is dramatically less - between 15-20% on *khal* and floodplains and less than 10% on *beel* - whereas in the North Central the proportions are 44% for *khal* and 62% for floodplains and *beel*.

South West

The characteristics of subsistence fisheries in the South West Region are, in some respects, more similar to those in the North Central Region: relatively large numbers involved; easy access to extensive areas of floodplain and *beel*, and a more even distribution of catch value across different fishing categories. What is noticeable, however, is the relatively low proportion of landless households engaged in subsistence fishing. The main reason for this appears to be the greater levels of involvement in seasonal fishing for income. For many landless households in the region the options during the summer floods are limited to migration to urban areas to seek work or movement into fishing. As a result, the numbers of labourers who limit themselves purely to subsistence fishing are relatively low, at around 29%.

The limited amount of catch by value going to the subsistence subsector from floodplains and *beel* is particularly noticeable, although it is more than made up for by the very high proportion being taken by seasonal fishermen who, more than in other areas, tend to replace subsistence fishermen.

2.1.2 Seasonal fishermen

This category presents the greatest problems in terms of definition. The line dividing those involved in fisheries on a purely opportunistic basis, whether for income or consumption, from those for whom fisheries represents a more consistent part of their livelihood strategy and in which they invest time and resources on a regular basis is often difficult to draw.

As discussed above for subsistence fisheries, a large number of people living in floodplain areas fish seasonally when the annual floods make the fisheries resource accessible to

practically everyone. Even those fishing exclusively for household consumption may sell or barter some of their catches when they have more than can be immediately consumed. For certain brief periods when fish are particularly easily caught, such as during the flood recession or the early flood season in the *haor* basin, large numbers of people who would not normally fish or admit to any dependence on fish may actually earn considerable amounts from intensive fishing over short periods.

As a general rule, however, "subsistence" fisheries are highly opportunistic and dependent on annual patterns of flooding. Those who actually involve themselves in seasonal fishing as a source of livelihood on a regular basis from year to year, and invest more substantial resources in fishing, are more clearly defined as a group. The majority of these are Muslims who have had to overcome the strong social stigma attached to fishing as an occupation before taking it up on a routine basis.

The development of seasonal fisheries

Before the 1970s, the numbers of people who would have fallen into this group was probably negligible. However, from that period on, in response to periods of crisis due to flooding or famine or simply due to the steady increase in competition for land and labour, groups of landless or small farming households started fishing on a more regular basis during the floods and drawdown. This often occurred in spite of intense social pressure from their co-religionists who regarded the involvement of anyone from their village in fishing as impinging on the status of the community at large. As is discussed later, the decline in the numbers of Hindu traditional fishermen, largely due to out-migration, has also played a role in encouraging this shift.

Those people who have overcome the social barriers surrounding involvement in fisheries by "non-fishermen" have often tended to make it worth their while and fish relatively intensively during the period when fisheries resources are accessible to them. This pattern was particularly pronounced in the North West Region. Undoubtedly, the expanded availability of a relatively cheap gear which requires little expertise in operation (*current jal* or monofilament gill net) also facilitated the involvement in fishing of more and more people.

Seasonal fishermen have generally started out by targeting areas of the floodplain not fished by traditional fishermen: higher parts of the floodplain during the floods; drawdown fisheries and peripheral water bodies such as the channels (*halot*), ditches (*maital*) and other areas which are not generally subject to traditional fishing rights. Where flood control, and other

Table 2.4
Social and economic characteristics
of seasonal gear users in different regions

NORTH CENTRAL REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Gill net	<i>current jal</i>	6.0	94.0	19.2	40.5	40.4	19.1	16.8	50.6	8.0	5.5
	<i>koi / fashi jal</i>	11.7	88.3	30.2	48.6	21.3	30.1	12.6	48.0	7.1	1.9
	monofilament gill net	6.1	93.9	77.5	20.2	2.3	77.6	8.2	11.3	2.7	0.3
Clap net	<i>shangla jal</i>	14.7	85.3	34.2	51.5	14.3	34.1	22.4	33.8	9.7	5.0
Traps	<i>doiar</i>	5.3	94.7	24.5	33.7	41.8	24.5	13.8	45.4	10.4	5.8
Hook/lines	<i>daun</i>	8.3	91.7	33.0	44.7	22.3	33.1	10.7	49.0	4.7	2.5

NORTH WEST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Gill net	<i>current jal</i>	4.3	95.7	51.1	38.2	10.6	51.2	15.4	30.6	1.7	1.1
	<i>koi / fashi jal</i>	6.1	93.9	64.9	26.5	8.7	64.9	10.6	18.8	4.5	1.2
	monofilament gill net	17.5	82.5	71.3	26.7	2.0	71.2	6.5	16.4	3.8	2.0
Seine net	<i>deol</i>	3.4	96.6	6.2	34.2	59.5	6.3	62.2	24.5	1.7	3.2
	<i>moi jal</i>	16.3	83.7	65.9	26.4	7.7	65.9	6.4	20.4	2.0	5.3
	<i>baoli</i>	10.2	89.8	67.6	25.4	6.9	67.9	11.1	19.9	0.7	0.7
Bag net	<i>suti jal</i>	27.7	72.3	67.0	26.4	6.6	67.1	10.9	7.3	13.0	1.8
Lift net	<i>dharma jal</i>	1.4	98.6	7.8	67.8	24.5	7.7	43.0	26.8	12.1	10.4
Traps	<i>deal</i>	1.2	98.8	6.0	52.7	41.1	6.1	32.3	43.5	10.7	7.4
	<i>doair</i>	1.9	98.1	42.5	42.5	14.9	42.7	22.7	26.6	5.4	2.7
Hook/lines	<i>sip</i>	2.7	97.3	7.7	33.3	59.1	7.6	34.8	32.6	11.7	13.4
	<i>tana barsi</i>	27.4	72.6	24.6	22.6	52.7	24.6	15.4	13.6	25.4	20.9
	<i>daun</i>	7.8	92.2	54.9	37.7	5.5	56.9	6.0	33.6	3.0	0.6
	<i>nol barsi</i>	3.4	96.6	37.9	48.0	13.4	38.0	11.0	46.5	-	4.5
Cast net	<i>jhaki jal</i>	21.6	78.4	48.5	29.7	21.8	48.5	17.7	21.9	5.5	6.4
Push net	<i>thella jal</i>	1.6	98.4	11.0	44.0	44.9	11.1	36.5	38.2	6.0	8.2
Miscellaneous	hand fishing	1.9	98.1	4.4	27.7	67.9	4.4	48.0	32.5	5.3	9.7
	<i>akra</i>	2.2	97.8	44.2	38.8	17.0	44.2	10.3	40.3	1.2	4.0

NORTH EAST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Gill net	<i>current jal</i>	8.9	91.1	65.5	27.4	7.2	65.4	20.8	11.1	1	3.2
	<i>koi / fashi jal</i>	6.7	93.3	72.9	22.3	4.8	72.9	18.1	5.9	1.7	1.7
Seine net	<i>deol</i>	22.9	77.1	19.5	28.9	51.9	19.6	53	18.2	-	3.2
Cast net	<i>jhaki jal</i>	15.1	84.9	54.8	27.6	17.6	54.8	20.6	17.7	2.9	2.6
Push net	<i>thella jal</i>	16.6	83.4	33.1	20.9	46.1	33.1	38.2	20.1	1.1	7.4

SOUTH WEST REGION											
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Fishing categories of gear users (%)			Gear users' first ranked source of income (%)				
		Hindu	Muslim	Prof	Seas	Subst	Fishing	Farming	Labour	Trade	Other
Gill net	<i>current jal</i>	47.7	52.3	47.9	38.8	13.2	48.0	22.9	24.0	4.0	1.2
	<i>koi / fashi jal</i>	55.8	44.2	63.2	27	9.8	63.3	18.1	15.1	3.1	0.3
	monofilament gill net	39.5	60.5	70.5	26.9	2.6	70.5	4.0	24.3	1.3	-
Seine net	<i>moi jal</i>	35.5	64.5	69.4	26.5	4.1	69.4	6.4	21.1	2.5	0.6
Lift net	<i>dharma jal</i>	53.3	46.7	16.0	33.4	50.7	16.0	32.0	44.0	4.0	4.0
Traps	<i>doair</i>	49.4	50.6	49.9	36.8	13.2	50.0	24.0	19.5	5.7	0.7
	<i>polo</i>	48.4	51.6	17.2	31.3	51.5	17.2	42.2	26.6	12.5	1.6
Hook/lines	<i>sip</i>	53.9	46.1	18.7	20.9	60.3	18.7	27.2	33.7	13.5	6.8
	<i>daun</i>	38.9	61.1	62.5	35.0	2.5	62.5	11.1	20.4	6.0	-
	<i>nol barsi</i>	56.4	43.6	57.8	34.7	7.4	57.8	13.9	24.3	3.2	0.7
Spear	<i>koch</i>	58.7	41.3	18.4	31.5	50.1	18.4	39.8	27.9	8.5	5.4
Cast net	<i>jhaki jal</i>	35.5	64.5	15.1	22.0	62.9	15.1	37.3	27.1	14.5	6.0
Push net	<i>thella jal</i>	8.6	91.4	8.3	16.8	74.9	8.3	38.2	31.0	17.8	4.7

Source : FAP 17 Fisheries Studies

1 The gears shown are those where more than 20% of the gear users enumerated during FAP 17 catch assessment surveys claimed to be fishing for subsistence only

North Central

Seasonal fishing in the North Central Region is considerably less widespread than the high numbers of subsistence fishing might lead to expect, with only about 15% of landless and 10% of small farming households having some dependence on fishing as a source of livelihood. This may in part be due to the greater opportunities for other sources of employment particularly among landless households and labourers, as explained above. However, of those who are engaged in seasonal fishing for income, a relatively high proportion are landless, whereas for subsistence fishing, farmers are more heavily involved, as might be expected.

Several specific fisheries offer particular opportunities for seasonal fishermen in this area. The *shangla jal* fishery for *ilish* on the Padma River attracts a high level of activity with seasonal fishermen accounting for over 50% of the users of this gear and 34% of all catch by value on the main rivers where it is utilised.

North West

In contrast to the North Central Region, seasonal fishing is extremely important in the North West. Around 30% of all the households enumerated in FAP 17 agricultural villages had some kind of dependence on fisheries for their livelihoods. On the principal fisheries habitats available to these seasonal fishermen who do not usually have official access rights, i.e. secondary rivers, *khal*, and floodplains the subsector accounts for between 35-40% of catch by value.

While the *current jal* and other small gill nets play the most important role for these fishermen, the range of gears used by this group in the North West is far greater. Apart from the large seine nets, the gear used by seasonal fishermen is also closer to that used by many Muslim professional fishermen in the area.

North East

Seasonal fishermen represent a relatively minor category in the North East Region. They account for about a quarter of catches by value on floodplains and *khal* but are almost completely excluded from the key fisheries on the *beel* and from access to rivers. This reflects above all the tight control on fisheries access exerted by leaseholders in the *haor* basin. This restricts the area available for exploitation on a seasonal basis. A considerable proportion of whatever seasonal fishing is carried out is "illegal" and entails considerable risks as leaseholders are not gentle when it comes to enforcing what they regard as their



rights. The range of gears used is, predictably, also small.

South West

The South West Region seems to offer among the best opportunities for non-fishermen to exploit fisheries on a routine, if not year-round, basis and make fishing a regular part of their livelihood for at least part of the year.

Seasonal fishermen account for about the same proportion of catch by value as do professional fishermen on most habitats including on the main rivers such as the Arial Khan and the Padma, and on *beel*. On the latter, seasonal fishermen account for no less than 51% of catch by value.

Much of this is due to the relative lack of leased areas in the *beel* in the South West. A large proportion of the main *beel* areas are flooded only to shallow depths and dry up almost completely during the winter dry season. As a result the areas under *jalmahal* are fewer and the seasonally flooded land can be freely exploited by fishermen.

Farmers and labourers both fish although it is especially important for landless households.

The lack of alternative opportunities for many landless households in the area also encourages many people to move into fishing as a seasonal stop-gap during the summer months. Among landowners, many are involved in the seasonal exploitation of submersible ponds and fish pits (*kua*) which can contribute significantly to household income.

2.1.3 Women in subsistence and seasonal fisheries

Women in rural communities are often disproportionately reliant on the exploitation of open-access, common resources as their formal rights to land and other privately-held resources is frequently very limited. Such reliance on common resources often increases in direct proportion to the relative poverty of the household. The possibility of a particular reliance of women from poor rural households on fisheries, particularly when they are themselves heads of those households, needs to be considered.

Overall, the involvement of women in capture fisheries in rural Bangladesh is relatively limited. The regulation of women's exposure to the world outside the confines of the household tends to be limited, at least notionally, by the dictates of *purdah*. Fishing, as an

activity, generally requires movement in a very open and exposed environment and this is enough to discourage the involvement of many women once they have reached adolescence.

However, *pardah* is, above all, an ideal of female behaviour which, especially among poorer sections of rural society, is in direct conflict with the day-to-day necessities of survival. While the idea of the women exposing themselves to the view of strangers in an area of open water may be frowned upon, at least by the men in the household, women in many areas of the country are more and more inclined to seek work and contribute to the household's livelihood. The case in Box 2 illustrates well the tensions between ideal norms of female behaviour, as dictated by men in the community, and the realities of life for women in the village. It is particularly noticeable that in areas where there has been intensive NGO activity with

women's groups, such as in the North Central Region around Manikganj, more women are seen engaged in fishing as the taboos against women being seen in the open are being eroded.

In areas where *pardah* is more strictly enforced, women's involvement in fishing is usually extremely limited. They may participate in fishing in ditches and ponds immediately adjacent to the homestead, but they are unlikely to venture further afield.

Older women, particularly widows in conditions of dire need, are frequently seen fishing, almost exclusively with rod and line, in small water bodies near homesteads. However, the fact that they generally take care to choose areas which are away from public view and as hidden as possible is indicative of the sense of shame which is attached to being driven to such an activity.

Most women from medium and small landholding households in Durgapur are still constrained by *pardah* which prevents them from getting involved in fishing. One woman said : "How could we ever go fishing in front of our brothers-in-law." But for women in landless households the story is quite different. Many women of all ages are seen regularly in the shallow *chak* around their homesteads fishing with *ucha* and *thella jal*, particularly during the period from *Ashwin* to *Kartik* as the floods begin to recede. These women still have to deal with a general sense of male disapproval of their involvement in fishing. They report that often they have to wait for *hat*-days, when their husbands are out of the village, in order to organise their fishing expeditions. Even this only applies to some families. Among many landless households there seems to be practically no restriction on women fishing; only newly married women would generally not go out.

Box 2: Only on *hat*-days - women and fishing in Durgapur

2.1.4 Professional fishermen

Until relatively recently, “professional” fishermen in Bangladesh have represented a distinct group of exploiters of fisheries resources. Their prime characteristic was that they distinguished themselves as *jete*, a term which, for anyone except a member of a well-established, traditional fishing community, would only be used with extreme reluctance as it carries significant negative social connotations in relation to the rest of rural society. The term “traditional” could also be used to define the group and distinguish it from the growing community of “non-traditional” fishermen who effectively fish full-time and are becoming “professional.”

Some of the apparent reasons for this are discussed below, but the extent to which this situation is true is now changing. In most areas, these “traditional” fishermen are rapidly being outnumbered by new entrants to the fishery who are mostly Muslim farmers or labourers who have moved into fishing in spite of the negative social connotations of the occupation and their relative lack of skills and knowledge regarding the fisheries resource.

Table 2.5 shows the gears commonly associated with professional fishermen and the characteristics of those fishermen who use them in each region. Note that in this table, the figures for proportions of gear users who are professional fishermen is divided into two categories : the first for those whose sole occupation is fishing, the second for those for whom it is the principal, but not the only, source of household income. This helps to show the extent to which the category of professional fishermen has come to include many non-traditional fishermen who may have other sources of income as well as fishing.

The social status of fishing as an occupation

Historically, fishing as an occupation has been associated with specific castes in Hindu society. These traditional, caste fishermen have tended to live as distinct communities clearly set apart from the rest of rural society although closely interdependent with them. The *jete para* is generally either a distinct hamlet set away from the rest of the village, or a closely knit unit within a larger village.

In traditional Hindu society this was clearly a function of their involvement in an “unclean” activity i.e. fishing. This may be due to a number of factors : fishing involves killing animals, which generally is a polluting activity; fishing may also cause pollution because it involves immersion in water, which can both pollute and cleanse; perhaps fishing is, more

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Table 2.5
Social and economic characteristics
of professional gear users in different regions

NORTH CENTRAL REGION				Fishing categories of gear users (%)				Gear users' first ranked source of income (%)				
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Prof.2				Fishing	Farming	Labour	Trade	Other
		Hindu	Muslim	1	2	Seas	Subst.					
Gill net	koi / fashi jal monofilament gill net	11.7	88.3	14.7	15.5	48.6	21.3	30.1	12.6	48.0	7.1	1.9
		6.1	93.9	27.3	50.2	20.2	2.3	77.6	8.2	11.3	2.7	0.3
Seine net	ber jal	79.9	20.1	87.0	7.4	4.7	1.0	94.4	0.5	2.0	3.2	-
	kathi jal	49.1	50.9	56.3	10.9	19.3	13.5	67.3	6.1	24.3	-	2.4
	moi jal	42.1	57.9	52.2	27.2	11.2	9.4	79.4	4.9	10.0	3.9	1.8
Bag net	suti jal	93.8	6.2	97.0	-	-	3.0	97.0	-	3.0	-	-
Lift net	veshal	79.9	20.1	85.1	1.6	9.5	3.9	86.7	1.6	7.7	3.3	0.7
Clap net	shangla jal	14.7	85.3	10.4	23.8	51.5	14.3	34.1	22.4	33.8	9.7	5.0
Traps	doiar	5.3	94.7	24.5	10.1	14.4	41.8	24.5	13.8	45.4	10.4	5.8
Hook/lines	tana barsi	16.4	83.6	18.8	19.6	8.1	53.4	38.5	11.4	26.6	13.8	9.8
	daun	8.3	91.7	12.6	20.4	44.7	22.3	33.1	10.7	49.0	4.7	2.5
Cast net	jhaki jal	54.6	45.4	53.9	1.7	4.3	40.0	55.7	17.3	15.0	8.4	3.7

NORTH WEST REGION				Fishing categories of gear users (%)				Gear users' first ranked source of income (%)				
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Prof.2				Fishing	Farming	Labour	Trade	Other
		Hindu	Muslim	1	2	Seas	Subst.					
Gill net	current jal	4.3	95.7	29.3	21.8	38.2	10.6	51.2	15.4	30.6	1.7	1.1
	koi / fashi jal	6.1	93.9	22.4	26.5	26.5	8.7	64.9	10.6	18.8	4.5	1.2
	monofilament gill net	17.5	82.5	23.4	26.7	26.7	2.0	71.2	6.5	16.4	3.8	2.0
Seine net	ber jal	59.0	41.0	84.5	11.2	4.4	-	95.6	1.0	1.6	1.7	-
	moi jal	16.3	83.7	44.2	21.7	26.4	7.7	65.9	6.4	20.4	2.0	5.3
	baoli	10.2	89.8	44.1	23.5	25.4	6.9	67.9	11.1	19.9	0.7	0.7
Bag net	suti jal	27.7	72.3	55.5	11.5	26.4	6.6	67.1	10.9	7.3	13.0	1.8
Lift net	veshal	61.1	38.9	84.6	8.4	6.7	0.4	92.9	2.7	3.3	0.8	0.4
Traps	doair	1.9	98.1	24.0	18.5	42.5	14.9	42.7	22.7	26.6	5.4	2.7
Hook/lines	tana barsi	27.4	72.6	24.6	17.7	6.9	52.7	24.6	15.4	13.6	25.4	20.9
	daun	7.8	92.2	54.9	22.0	37.7	5.5	56.9	6.0	33.6	3.0	0.6
Cast net	jhaki jal	21.6	78.4	48.5	36.0	12.5	21.8	48.5	17.7	21.9	5.5	6.4
Miscellaneous	akra	2.2	97.8	44.2	17.0	38.8	17.0	44.2	10.3	40.3	1.2	4.0

NORTH EAST REGION				Fishing categories of gear users (%)				Gear users' first ranked source of income (%)				
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Prof.2				Fishing	Farming	Labour	Trade	Other
		Hindu	Muslim	1	2	Seas	Subst.					
Gill net	chandi jal	-	100	65.7	14.3	11.5	8.6	80	11.4	5.7	2.8	-
	current jal	8.9	91.1	47.4	18.1	27.4	7.2	65.4	20.8	11.1	1	3.2
	koi / fashi jal	6.7	93.3	44.3	28.6	22.3	4.8	72.9	18.1	5.9	1.7	1.7
Seine net	ber jal	25.7	74.3	77.5	16.1	5.4	1	93.6	3.9	1.7	0.8	-
	uttar jal	13.5	86.5	70.4	24.9	4.7	-	95.3	2.7	1.5	0.5	-
	dora jal	34.0	66.0	84.2	11.6	4.3	-	95.7	2.5	0.9	0.9	-
Bag net	ghori jal	1.0	99.0	77.4	17.0	1.0	4.6	94.3	4.2	-	1.5	-
Lift net	veshal	5.0	95.0	83.8	12.5	2.7	1.1	96.1	2.4	0.9	0.3	0.3
Clap net	shangla jal	28.6	71.4	61.2	32.7	6.1	-	94.0	2.0	2.0	2.0	-
Traps	doair	46.4	53.6	31.3	36.3	27.5	5.0	67.6	17.6	12.1	-	3.1
Hook/lines	sip	4.0	96.0	17.6	12.8	18.0	51.6	30.5	25.7	29.3	3.1	31.7
	tana barsi	10.5	89.5	31.3	29.2	18.7	20.7	60.5	27.0	8.3	-	2.6
	nol barsi	4.5	95.5	94.0	1.4	2.9	1.6	95.5	1.6	2.9	-	-
Cast net	jhaki jal	15.1	84.9	43.4	11.4	27.6	17.6	54.8	20.6	17.7	2.9	2.6
Push net	thella jal	16.6	83.4	23.0	10.1	20.9	46.1	33.1	38.2	20.1	1.1	7.4
Miscellaneous	dewatering	4.4	95.6	26.4	7.6	7.2	58.8	34	52.2	6.9	-	7.7

SOUTH-WEST REGION				Fishing categories of gear users (%)				Gear users' first ranked source of income (%)				
Gear category (English)	Gear name (Bengali)	Religion of gear users (%)		Prof.2				Fishing	Farming	Labour	Trade	Other
		Hindu	Muslim	1	2	Seas	Subst.					
Gill net	current jal	47.7	52.3	2.2	45.7	38.8	13.2	48.0	22.9	24.0	4.0	1.2
	koi / fashi jal	55.8	44.2	60.9	27.0	27.0	9.8	63.3	18.1	15.1	3.1	0.3
	monofilament gill net	39.5	60.5	28.8	26.9	26.9	2.6	70.5	4.0	24.3	1.3	-
Seine net	ber jal	55.5	44.5	33.3	47.7	18.3	0.7	81.0	7.6	8.3	3.1	-
	moi jal	35.5	64.5	16.6	52.8	26.5	4.1	69.4	6.4	21.1	2.5	0.6
Lift net	veshal	78.6	21.4	28.5	52.9	17.6	1.0	81.4	10.1	7.2	1.3	-
Clap net	shangla jal	1.2	98.8	6.5	36.8	49.5	7.1	43.4	17.7	37.6	0.7	0.6
Traps	doair	49.4	50.6	5.9	44.0	36.8	13.2	50.0	24.0	19.5	5.7	0.7
Hook/lines	daun	38.9	61.1	19.5	43.0	35.0	2.5	62.5	11.1	20.4	6.0	-
	nol barsi	56.4	43.6	51.9	34.7	34.7	7.4	57.8	13.9	24.3	3.2	0.7

Source : FAP 17 Fisheries Studies

- 1 Gears shown are those where more than 20% of the gear users claimed to have fishing as their sole or main source of household income
 2 Professional fishermen are divided into the following sub-categories :
 1 - fishing as sole source of household income : 2 - fishing as main source of household income

importantly, a hunting activity which places it outside the structured world of the Hindu agricultural community. It is worth noting that even within fishing there appear to be gradations in status, although the exact order of different fishing groups depends very much on who you are talking to. The riverine fishermen on the main rivers seem to occupy pride of place as they use larger, more expensive technology and seem to belong to old fishing castes. There may even be a connection with the fact that they spend less time actually in the water and fish from boats. Other groups involved in *beel* and floodplain fisheries tend to spend more time immersed in the water to operate their gears and this seems to be reflected in their status. It is also notable that many of these fishing castes or groups seem to be more recent entrants into fisheries.

Table 2.6 reviews some of the principal traditional fishing groups, where they are found, the habitats they exploit, the gears they use and provides a very brief note on what is known of their background.

Changes in participation in “professional” fishing

Until the 1970s, most professional fishermen in Bangladesh were also “traditional” fishermen. Fishing as an occupation and principal source of livelihood was almost entirely limited to specific social groups whose position in society and identity as a community was defined by their involvement in fishing. These traditional fishermen are frequently thought of as being almost all Hindu, but, as shown in Table 2.6, in many areas of the country, there are extensive communities of Muslim “traditional” fishermen who are either Hindu fishing communities who have converted to Islam at some point in the past or poor Muslim communities which have been involved in fishing for so many generations that they have become traditional fishermen and effectively occupy the same social niche.

However, during the 1970s a combination of rising population, the accompanying increase in competition for all resources and the out-migration of many traditional Hindu fishermen to India seem to have created the circumstances which have encouraged more and more non-traditional fishermen to turn to fishing as a means of livelihood. As mentioned above, many have concentrated on purely seasonal activity. But, once they have entered the fishery, a sizeable proportion of Muslim agriculturalists have realised that it is potentially lucrative and have effectively become full-time fishermen.

There is considerable regional variation in the extent of this phenomenon as shown in Table 2.5.

Table 2.6
Terms used with reference to
castes or groups of professional fishermen

Name of caste or group associated with fisheries	Religion	Regions where active	Habitats exploited	Gears used	Current status	Notes on origins
<i>bogdi</i>	Hindu	NC / SW	<i>khol, beel, floodplain</i>	small gear, spears, traps, barriers	Very minor fishing group. Limited secure access to water bodies	Originally a caste of agricultural labourers brought to work on the indigo plantations from West Bengal during the 19th Century, turned to fishing after partition.
<i>barman</i>	Hindu	NC / NW NE / SW	main & secondary rivers, <i>khal</i>	large seine nets & gill nets, cast nets, lift nets	Important fishing caste. Tradition of access control on some important rivers.	Apparently one of the original fishing castes in the country. Certainly the group with some of the most profound cultural traditional associated with fishing. Very active on many of the most important riverine fisheries on the Padma and Meghna rivers.
<i>gain</i>	Hindu	SW	<i>beel, floodplain, khal</i> & secondary rivers	seine nets, current jal, traps, lift nets, guiding barriers	Apparently important in limited areas of the South West, particularly in the Madaripur beel tracts	Apparently a namasudra subcaste not necessarily involved in fishing, but in some areas, regarded as jale.
<i>halder</i>	Hindu	NC / NW / SW	N.A.	N.A.	N.A.	A rather deceptive term used in different ways by different groups. For non-fishermen, it is generally used to refer generically to Hindu traditional fishermen. By non-riverine Hindu fishermen, it is generally used to refer to riverine traditional Hindu fishermen i.e. barman or malo, particularly on the Padma and Ganges rivers. Among the barman and malo fishermen it is used to refer to the hear fishermen or skipper of a fishing team on the river. It is not the name of a caste.
<i>jala das</i>	Hindu	NC / NW / SW / SE everywhere	main & secondary rivers, estuaries, beel	seine nets, gill nets, bag nets	Certainly important on the Lower Meghna River, possibly elsewhere.	Perhaps a sub-caste of the kaibarta das caste fishing groups, but this may be simply a generic term for fishermen ["net" (jala) das as opposed to "plough" (halda) das]
<i>jela / joola / joola</i>	Hindu or Muslim	NW / SW	N.A.	N.A.	N.A.	Generic bangla term for fishermen.
<i>kaibarta das</i>	Hindu	NC / NW NE / SW	<i>beel, khal & floodplains</i>	traps, guiding barriers, small seine nets, lift nets	Generally in beel areas such as Chalan beel and the Madaripur beel tracts.	Derogatory term used to refer to Muslim professional fishermen. Particularly used around Chalan Beel.
<i>maimul</i>	Muslim	NE	main & secondary rivers, <i>beel, khal, floodplains</i>	various	Seem to be found all over the country but concentrated along lower Meghna.	Hindu caste fishermen, probably one of the largest of the fishing castes. Frequently also involved in fish trading.
<i>malo</i>	Hindu	NC / NW / SW	main & secondary rivers	large seine nets, lift nets, gill nets, cast nets, lines	Generally fishing on beel in the haor region of the North East	A caste-like group of traditional Muslim fishermen specific to the North East Region. Also used more generically for anyone from the region associated closely with fisheries, including fish dealers and leaseholders.
<i>matya das</i>	Hindu	NE	main & secondary rivers, <i>beel, khal, floodplains</i>	large seine nets, large gill nets, lift nets	Important fishing caste. Tradition of access control on some important riverine fisheries.	A traditional Hindu fishing caste apparently very close to the barman. Particularly associated with riverine fisheries, whether on main or secondary rivers.
<i>namasudra</i>	Hindu	NE / SW	<i>beel, khal, floodplains</i> <i>beel, floodplains, khal</i>	seine nets, gill nets, lines, lift nets cast nets small seine nets, current jal, cast nets	One of principal Hindu fishing groups in the North East Region. Encountered as "fishermen" in the North East and South West in particular, but common throughout the country in other occupations.	This may simply be a regional name for the kaibarta das caste.
<i>nikari</i>	Muslim	NC / NW NE / SW	N.A.	N.A.		A generic term for a large group of sudra sub-castes, some of whom engage in fishing. However, not a "fishing caste" as such. Some of these sub-castes engaged in fishing have different names of their own (see gain). Mostly commonly referred to in the haor basin for non-traditional Hindu fishermen other than matya das or patni.
<i>patni</i>	Hindu	NE	secondary rivers	N.A.		Usually a generic term for fish traders but also sometimes used generally for Muslims involved in fisheries in any way.
<i>rajbangshi</i>	Hindu	NC / NW / SW	<i>beel, floodplains, khal</i> , rivers	smaller seine nets, gill nets, current jal, cast nets	Widespread in the North Central and North West in particular.	Hindu caste boatmen, but also involved in fisheries in some areas. A large caste of fishermen, apparently more recent entrants to the fisheries (perhaps over the last 150 years). They may be part of a tribal group which has moved onto the plains from the North West. Generally fishing internal water rather than rivers.

Source : FAP 17 Village Studies



Regional variation

North Central

Most Hindu fishermen in the North Central Region can be assumed to be traditional caste fishermen. Members of the *malo* and *barman* castes are generally active on the Padma and Jamuna rivers and the various secondary rivers which cross the region such as the Kaliganga and the Dhaleswari.

The many *rajbangshi* fishermen tend to fish more on the internal waters, such as *beel* and on floodplains. Some are increasingly involved in aquaculture as well. In addition, there does not seem to be a long tradition of Muslim involvement in fishing in this area, although this is rapidly changing.

It can be seen from Table 2.5 that, for certain gears, Hindu fishermen still make up the vast majority of the category 1 professional fishermen (no other source of income). For example, looking at the gear which perhaps most typifies traditional Hindu fishermen, 87% of all *ber jal* users have no source of income besides fishing and 80% are also Hindu. Similar figures were recorded for several gears, such as the bag net *suti jal*, and the lift net *veshal*. All these can be regarded as relatively specialised gears requiring either high investments or special skills to be operated successfully.

However, for many of the other gears operated predominantly by "professional" fishermen it can be seen that the numbers of Hindu traditional fishermen involved in their operation are generally matched by the numbers of Muslim fishermen operating the same gear. Gears such as *kathi jal*, used for the harvesting of *katha*, and *moi jal*, a small seine net, are used as extensively by Muslim fishermen as they are by Hindu. While many of these Muslim fishermen are purely seasonal in their operations, more and more are working in fishing for longer periods of the year and may regard fishing as their main source of income.

Muslim "professional" fishermen are most likely to use similar gears to those used widely for seasonal fishing, particularly the monofilament gill nets, whether *current jal* or the larger mesh drift nets used on the main rivers, particularly for *ilish*.

North West

Measuring the extent to which professional fishing is being taken up by Muslim new entrants is more difficult in the North West Region as there are some areas covered by FAP 17 where

there is a relatively long tradition of Muslims engaged in fishing, particularly in the Chalan Beel area. However, the high proportions of professional gears used by Muslim fishermen, many of whom also have alternative sources of income other than fishing is a clear indicator that many of these are probably relatively recent entrants to fisheries. As noted above, seasonal fishing is very widespread in the region and more and more of these seasonal fishermen seem to be moving into full-time fishing.

While *ber jal* and *veshal* fisheries are still the preserve of the traditional Hindu professionals and Muslim fishermen who have been in fishing for at least several generations, most of the other gears in use in the area are more commonly in the hands of Muslims who have recently taken to fisheries. Once again, the *current jal* and other gill nets are particularly popular among this group.

Some of the communities of Muslim fishermen who have a longer tradition of fishing, particularly in Chalan Beel, are specialised in fisheries specifically adapted to the vast expanses of shallowly-flooded seasonal floodplain in that area using a variety of traps. Other sections of the Muslim fishing community have specialised in the "harvesting" of the many residual water bodies left in the *beel* after the drawdown.

The history of these Muslim fishing communities, who have taken on many of the characteristics of the Hindu caste fishing communities, is not clear. Often they live in the same villages as declining Hindu fishing communities suggesting that they may be people who have moved into fishing over the 50 years as more and more Hindus have left.

North East

There is a very extensive traditional Muslim fishing community, the *maimul* community, in the *haor* basin. As can be seen in Table 2.5, Muslim fishermen dominate the professional subsector in the region to more or less the same extent as in the North West but a slightly higher proportion are completely dependent on fisheries. This is because of the near total dependence of this very extensive community of professional fishermen on fisheries.

Hindu fishermen have somewhat different patterns of gear use to those in other areas. Only some of the Hindu fishing community in the North East seem to belong to true fishing castes, such as the *matsya das*. Other Hindus involved in fishing seem to be merely low-caste *namasudra* who fish using mostly gears not normally typical of "professional" Hindu fishermen. Note the high proportion of Hindus using *doi ar*, a simple bamboo trap commonly

used by seasonal and subsistence fishermen.

At least in the areas of the North East Region covered by FAP 17, the Muslim *maimul* are the dominant traditional fishing community. Many of these communities are linked to powerful local *mahajan* and leaseholders, some of whom come from the fishing community themselves. Given the strict control of leased water bodies which is typical of the region, those groups who are linked to the controllers of access to these water bodies are those who are most bound to fish.

The distribution of catch by value for the North East, shown in Table 2.2, indicates the importance of this in the region. On secondary rivers, such as the Manu, the Kushiya and the Surma, and on *beel*, professional fishermen, who are mostly either *maimul* or Hindu caste fishermen, take over 80% of the value of the catch (although a considerable portion of this goes to the leaseholders rather than to the fishermen themselves). On the *khal* and floodplains, the figures are lower but still well over 50%.

South West

In the South West Region, the movement of Muslims into professional fishing has also been considerable. In some areas this may have quite a long history. It would seem that some parts of the Madaripur *Beel* tracts have always been considered so wild and remote that many of the traditional caste fishermen did not regularly exploit the potentially rich fisheries resources there. In addition, the relatively shallow flooding depths which predominate seem to have discouraged the involvement of professional fishermen who habitually used larger gears better suited for deeper water in local rivers.

As a result, many of the fisheries on *beel* and floodplain areas and on some of the *khal* which criss-cross the area have apparently always been the preserve of both Muslim and Hindu fishermen of varying degrees of professionalism. The high proportions of "professional" fishermen who have other sources of income is indicative of this. *Veshal*, the lift net used on *khal* and rivers which is frequently a gear used specifically by traditional Hindu fishermen, is used more by fishermen who have other sources of income.

One important feature which may also explain the apparent diversification of income sources professional fishermen in the region is the high level of aquaculture activity which is found there. During FAP 17 village studies several traditional *malo* communities were encountered who have shifted the focus of their activity from capture fisheries over to culture fisheries.

This additional activity may be regarded as a source of livelihood "other than fisheries."

2.2 Other Beneficiaries from Fisheries

The beneficiaries from fisheries include not only those physically engaged in the catching of fish but all those who are involved in the various stages and levels of servicing the sector. Obviously, any changes in the fisheries resource is likely to affect these factors as well.

2.2.1 Traders

The lack of refrigeration in most rural areas and the overwhelming consumer preference for fresh fish means that the marketing of fish in Bangladesh offers enormous possibilities for employment and gain for a large number of people in both rural and urban areas.

The fish marketing system in Bangladesh is discussed in some detail in the Report on the Inland Fish Marketing System in Bangladesh, Supporting Volume No. 20 of the FAP 17 Final Report. However, in brief, it is clear that it is of great importance as a source of rural livelihood. The poor communications and transport in rural areas, linked with the need for rapid movement of fish once it has been caught, create a complex series of employment opportunities ranging from the simplest transport of individual baskets of fish from a landing place to a point of sale or collection to the complex systems of regional and national distribution controlled by large *aratdar* in the important urban centres.

Seasonal or opportunistic fish traders

Fish traders are as varied in terms of their degree of involvement as are fishermen in general. A large number of "subsistence" and "seasonal" fishermen are likely to become traders when they have occasional catch to dispose of and the sale or barter of fish is frequently carried out by the household members of the fishers themselves. Other rural households may regard fish trading as a seasonally important source of income in which they engage on a regular basis.

It is notable, however, that many of the attitudes regarding fishing apply even more strongly to fish trading. Some poor small farming or labouring households take advantage of the fact that larger traders to whom they sell are often willing to advance credit for the purchase of fish which would otherwise be impossible to obtain. Generally, however, fish trading seems to be left to traders associated with the fishing community. The sale of fish in markets is

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an even more "public" activity than the actual catching of fish and, while many children can be encountered in local *hat* all over the country during the flooding season selling small amounts of excess catch, many seasonal or subsistence fishermen who regard fishing as an additional source of income are apparently unwilling to be seen actually selling fish.

Given these social attitudes, it is difficult to establish with precision to what extent involvement in fish trading might have been under-reported to researchers. The case recounted in Box 3 shows the problems encountered in trying to estimate both the fishing and fish trading involvement of "non-fishermen" in one area of the *haor* basin of the North East Region. The extent of fish trading dependence is discussed in more detail in the following chapter.

Professional fish traders

In addition to these "opportunistic" fish traders there are also groups of professional fish traders who are more or less completely dependent on fish trading as a source of income. These groups exist in various levels of the fish trading hierarchy.

On the one hand, there are specific communities in rural areas who are associated with fish trading. Sometimes these may be groups of traditional fishermen who, because of changes in local water bodies or competition with other fishers, have been forced out of fishing and have turned to fish trading as a substitute. Groups of Hindu fishermen who have turned to fish trading as a profession were encountered by FAP 17 researchers in several areas in the North Central and South West regions.

Significantly, the process can also function in the opposite direction, with groups of fish

In one of the FAP 17 agricultural villages, located in the *haor* region near Sunamganj, researchers were somewhat surprised by the extremely limited involvement in fishing reported by households in the community. Even though there were tight restrictions on fisheries access in nearby *haor* and even on some of the surrounding floodplains, some fishing involvement was to be expected. But local people almost universally claimed that "almost no-one except children from the village ever went fishing." This version was contradicted by *matsya das* traditional fishermen in the nearby village of Doradhar who claimed that the local *hat* was almost always "at least 40% full of *"bangali"* from Akhtapara selling their catches." The truth appeared to be somewhere in between. A visit to the market revealed a few Muslim labourers selling small amounts of fish but very reluctant to discuss their fishing activity in public. The more detailed monitoring of incomes in Akhtapara failed, however, to turn up much in the way of fisheries earnings. It seems that the Muslim farmers of Akhtapara regard theirs as a relatively "high status" village of *abadi* or original inhabitants of the *haor*. For such people, an admission of dependence on fisheries, even for a minimal part of their livelihoods, would represent a major blow to their social status.

Box 3: Fishing and fish trading in Akhtapara

traders becoming increasingly involved in capture fisheries. In the North Central Region, near Satoria Thana headquarters, a community of *nikari*, in this case professional Muslim fish traders, had, over the past 20 years, turned increasingly to capture fishing on local *beel* and *khal* as the Hindu traditional fishermen who had exploited these water bodies in the past migrated out to India. They are now the most important group of fishermen in the immediate vicinity and have also become very active in fish culture in the area.

On another level are the fish traders based in urban centres who deal with the movement and sale of fish over wider areas. These *chalani* and *aratdar* can operate on many scales, from individual retailers to large-scale fish dealers with direct contacts to international markets.

2.2.2 Fish processors

The overwhelming preference of fish consumers in Bangladesh is for fresh fish. Although the infrastructure for ensuring that fresh fish can reach consumers is often limited, the ubiquity of fresh water resources, and the fish they contain, throughout the country, means that consumers are seldom very far from a source of fresh fish. This may explain why fish processing is not developed an activity as might be expected. The sun-drying of fish is almost exclusively carried out when there is a glut and only for small, low-value species.

Drying of fish may be more common where households have excess catch which they wish to conserve for their own use. However, it seems more likely that households tend to convert any excess into cash or other goods given the ready market for most fish.

2.2.3 Leaseholders and landowners

Control or tenure of fisheries resources in Bangladesh has never resided in any formal sense with the fishermen who are physically responsible for catching fish. At the most, some water bodies such as the major rivers were "open" and no-one except traditional fishermen was interested or able to take advantage of the resources they contained. But fisheries in *beel*, *khal*, and even on some areas of floodplain have practically always been controlled, at least nominally, by land or water lords from whom the fishermen have had to obtain some form of permission to fish.

In some areas, those exercising control of fisheries resources have come from the traditional fishing community itself, but more frequently they have been local landowners, farmers and

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influential people who have little or nothing to do with fishing as an activity.

Current institutional arrangements for the leasing of fisheries *jalmahal* effectively perpetuate this situation. Those who catch fish directly are rarely able to muster the resources necessary to gain direct control of *khas* fisheries or, if they do formally control them, to enforce that control. As a result an additional stratum of leaseholders form an important part of the fisheries system. These are sometimes people with links to the fishing community, but more often they are rural *mahajan*, moneylenders, fish traders or simply businessmen investing in fisheries. The degree to which they involve themselves in the actual fishery varies, but for the most part it is limited. As competition for the resource increases, and the value of fisheries leases rises, the role of these fisheries financiers is becoming increasingly important.

In areas not under lease, which, when flooded, are theoretically open-access for fishing, the growing awareness of the value of the fisheries resource is encouraging land owners on the floodplains and along the banks of *khal* to establish tenurial claims to the water and fish which are found on and around their land during the floods. Through the excavation of fish pits (*kua*) and the placement of brush-piles (*katha*) which aggregate the fish as the flood waters recede, landowners are able to establish some control over fisheries resources and extract benefits from it without suffering the negative connotations of involvement in capture fisheries. Much of the actual fishing is still done by fishermen or labourers, but the benefits are further subdivided, with the "owner" of the resource taking a sizeable proportion.

This category of people who claim some kind of tenurial rights over the fisheries resource is growing steadily. FAP 17 researchers commonly encountered cases where those with some form of tenure, either through landowning or through fisheries leaseholding, were claiming an extension of that right to any fish which could end up, at the end of the flood season, being caught on their land. Thus landowners are increasingly claiming a right to exclude fishing both on and around their land areas when it is flooded. This is particularly so where submersible ponds or *kua* been excavated. Similarly, the holders of fisheries leases are tending to extend the area over which they claim control on the grounds that even if the water is not theirs, the fish are.

The characteristics of this particular group of resource users is of key importance in looking at the distribution of benefits from fisheries and, consequently, the distribution of impacts from changes in the fisheries.

2.3 Income from Fisheries

The distribution of fishing income provides a basis for estimating the impact that any change in the total value of the fishery will have on different groups.

Significance of Fisheries Income to Different Groups - North Central

Professional fishermen in the fishing villages

Analysis of the size and breakdown of the income of professional fishermen serves two important functions. First, their absolute income levels serve as a good indicator of their relative economic status and hence of their vulnerability to a decline in their fishing opportunities due to a change in either the fish stock or their access to it. Second, the relative contribution of their other economic activities determines their capacity to benefit from both the intended impacts achieved by flood control and from different types of mitigation measure.

Fishing communities were studied to ensure adequate coverage of professional fishermen, a group of principal importance to FAP 17 that was liable to be missed in any random sample of villages, due to clustering. The selection of fishing categories covered in monitoring was therefore strongly biased towards F1 and F2 households, the full-time professionals. However, in some communities, a significant proportion of households were found to be in transition from (or to) livelihoods chiefly dependent on capture fisheries. These (F3) households were therefore included. In North Central Region, this involved three of the seven fishing communities covered.

The average income for all the fishing communities monitored in North Central is presented in Table 2.7 and Figure 2.2 below. The average annual household income was about Tk.22,000, very similar to that of the agricultural villages within the region (see below). Of this, 41% came from capture fisheries. These figures disguise considerable variations between communities. The richest (NC3-2) had an average income of Tk.74,000, of which only 12.5% came from fishing; the poorest (NC3-3), which was in the same cluster, an average of less than Tk.14,000, with 60% from capture fisheries. Such variations may be more likely to occur between fishing than agricultural communities for a number of reasons, (see Box 4), but the variation should be borne in mind when interpreting these results.



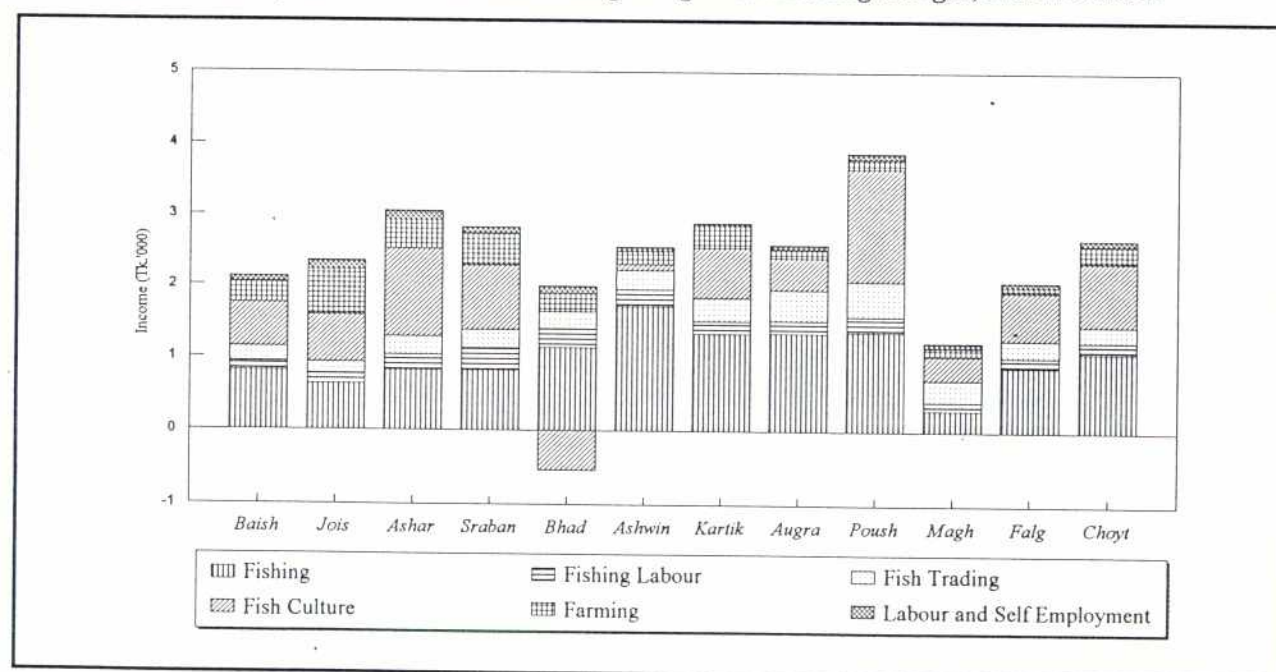
Table 2.7 Income by different household fishing categories in fishing villages, North Central

Units: Tk

Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Magh	Falg	Choyt	Total	%
	Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
F1 Fishing	922	660	1,185	1,057	1,545	2,058	1,817	1,384	1,701	(1,003)	945	950	13,221	69.2
Fishing Labour	180	193	576	544	634	571	312	322	418	180	170	345	4,443	23.3
Fish Trading	0	0	0	0	0	0	0	0	9	0	25	0	33	0.2
Gear Making	2	61	11	25	18	12	4	18	23	7	4	4	186	1.0
Farming	35	74	95	72	65	40	4	44	53	37	32	65	613	3.2
Agricultural Labour	46	67	2	0	0	0	14	0	0	0	0	37	165	0.9
Self Employment	175	11	26	9	4	0	0	4	11	7	4	2	250	1.3
Non-Agric. & FFW	2	32	79	28	0	0	0	21	19	9	0	0	189	1.0
Total	1,362	1,096	1,972	1,734	2,265	2,681	2,149	1,792	2,233	(763)	1,178	1,402	19,100	100.0
F2 Fishing	1,080	821	961	896	999	1,844	1,498	1,484	1,313	(2,079)	1,228	1,359	11,404	44.7
Fishing Labour	93	101	101	236	171	138	117	191	214	84	124	75	1,645	6.4
Fish Trading	167	173	291	245	141	266	288	405	555	339	202	224	3,296	12.9
Fish Culture	592	799	1,518	879	(7,292)	(131)	1,120	640	2,506	481	1,104	1,167	3,383	13.3
Gear Making	0	2	0	4	33	7	4	6	3	3	0	1	63	0.2
Farming	309	729	450	599	585	228	486	138	174	218	92	180	4,188	16.4
Agricultural Labour	10	34	21	6	0	0	0	0	49	0	0	9	129	0.5
Self Employment	48	105	61	110	182	101	61	68	32	102	99	116	1,085	4.3
Non-Agric. & FFW	13	7	16	52	52	23	21	56	61	8	4	4	317	1.2
Total	2,312	2,771	3,419	3,027	(5,129)	2,476	3,595	2,988	4,907	(844)	2,853	3,135	25,510	100.0
F3 Fishing	743	902	578	431	1,137	2,328	958	864	445	2,237	743	671	12,037	36.0
Fishing Labour	26	114	0	103	96	0	0	0	0	56	70	26	489	1.5
Fish Trading	918	480	548	811	1,049	885	983	1,288	1,261	883	906	725	10,737	32.1
Fish Culture	536	(736)	1,202	496	(895)	(729)	(301)	133	438	538	359	655	1,696	5.1
Gear Making	0	75	21	0	0	0	14	0	0	0	0	0	110	0.3
Farming	473	843	1,838	725	370	58	54	461	408	112	51	850	6,244	18.7
Agricultural Labour	0	0	126	0	0	0	0	0	249	0	0	0	375	1.1
Self Employment	0	5	1,107	9	12	0	0	0	7	2	2	2	1,146	3.4
Non-Agric. & FFW	37	49	0	0	0	0	0	0	0	165	165	200	617	1.8
Total	2,733	1,731	5,420	2,575	1,768	2,542	1,708	2,747	2,808	3,994	2,297	3,129	33,452	100.0
Community Fishing	806	631	828	819	1,139	1,715	1,344	1,349	1,362	303	885	1,083	12,264	55.5
Fishing Labour	127	137	210	310	263	232	171	177	218	109	142	159	2,255	10.2
Fish Trading	205	160	253	253	231	275	323	422	496	302	236	216	3,372	15.3
Gear Making	1	33	7	14	30	9	6	10	13	6	1	2	132	0.6
Farming	285	635	400	455	253	181	314	124	140	115	79	247	3,228	14.6
Agricultural Labour	12	26	11	2	0	0	4	0	24	0	0	10	89	0.4
Self Employment	57	43	73	44	65	37	16	20	13	49	47	56	520	2.4
Non-Agric. & FFW	9	17	36	24	17	15	12	28	32	16	10	12	228	1.0
Total	1,502	1,682	1,818	1,921	1,998	2,464	2,190	2,130	2,298	900	1,400	1,785	22,088	100.0

Note: Data for community were based on the weighted average of all households sampled

Figure 2.2 Income by different household fishing categories in fishing villages, North Central



Note: Data in figure include fish culture but these were omitted in tabulated data

F1 households (which gave fishing as the only ranked source of income) had an average income of around Tk.19,000, of which over 90% came from fishing or fishing labour. This is very close to the average income of the landless in North Central.

F2 households, as was common across all regions, had higher average incomes (Tk.25,510) than F1. Returns from fishing were slightly less than those of F1 households and they earned less from

fishing labour. But with a sizable average contribution from both fish culture and fish trading, fish related sources of income made up nearly 80% of the total. Farming (including crop cultivation and livestock) providing over Tk.4,000 (16%), more than North Central landless.

F3 households incomes were the most varied. In some communities (NC4-2 and NC4-3), the majority of their income did come from fishing, suggesting misclassification during the community census. In others, fishing was a relatively minor source, with fish trading or fish culture important. Together, fish related activities accounted for nearly 75% of total income; farming accounted for nearly 20%; the (small) balance was made up by labouring and self employment.

The overall picture therefore is of communities, with a similar average economic status to the main, agricultural floodplain villages, that are still heavily dependent on fish related activities. Were fisheries to be seriously damaged by flood control, these communities would clearly be vulnerable.

Fishing in the agricultural villages

Assessing the significance of fishing in the agricultural villages requires an understanding of both the extent of participation in the fishery - what proportion of households fish, and the value of catch to the households that do fish, relative to their other sources of income. These measures of the breadth and depth of the impact of a decline in the fishery will determine mitigation measures may be appropriate.

The two principal determinants of household fishing income are the gear owned and the degree/terms of access to the more valuable fisheries resources, which are often correlated. Access to an important *beel* can, depending on leasing arrangements, yield economic benefits (in returns per man day) that are many times higher than access to its adjacent floodplain. The resource base of agricultural communities also varies, with average landholding and crop potential, but not to the same extent. In addition, a minority of fishing communities are moving into fish culture, which can also yield very significant returns - the reason why incomes in NC3-2 were so high.

Box 4: Reasons for Income Variability

The initial census of the agricultural villages chosen for socioeconomic monitoring suggested a lower level of part-time and subsistence fishing than has been reported elsewhere, particularly in the North West and North East regions. The subsequent monitoring of households from these villages (which included a sample of those not reporting fishing in the census) indicated that some under-reporting had taken place, but not enough to explain the discrepancy. To clarify this issue, a further survey was undertaken. Two villages were chosen adjacent to each of the monitored villages and a sample of 100 households taken. The levels of fishing activity reported were, in general, closer to those originally expected. The pattern of the type and level of fisheries involvement for different landholding categories was however consistent between the initial census and the follow-up surveys. Reporting on participation below gives the merged results for the two surveys.

In North Central fishing was relatively more widely spread among households in the villages monitored than elsewhere; but, in common with other regions, as landholdings rise participation in the fishery increases but its significance to the households involved declines (Table 2.8).

Fishing either for subsistence or as a source of income was more common among farmers than for the landless in all 12 North Central villages. The lower participation of the landless reflects lack of resources to purchase gears. It may also be that the search for work, which in North Central is primarily non-agricultural, takes them away from the village either for long hours or days at a time. Farmers, in contrast, can combine more easily the casual setting of traps or *current jal* in their paddy with the routine agricultural operations that keep them on the floodplain: their opportunity cost of labour for subsistence fishing is thus lower than for the landless.

Among all categories, fishing did not however tend to be ranked as a source of income. For the landless it was ranked more often than for farmers, but still represented less than a quarter of those fishing. That the landless should tend to sell their catch more than the landed reflects their higher marginal utility of income: **they cannot afford to forego the potential income.**

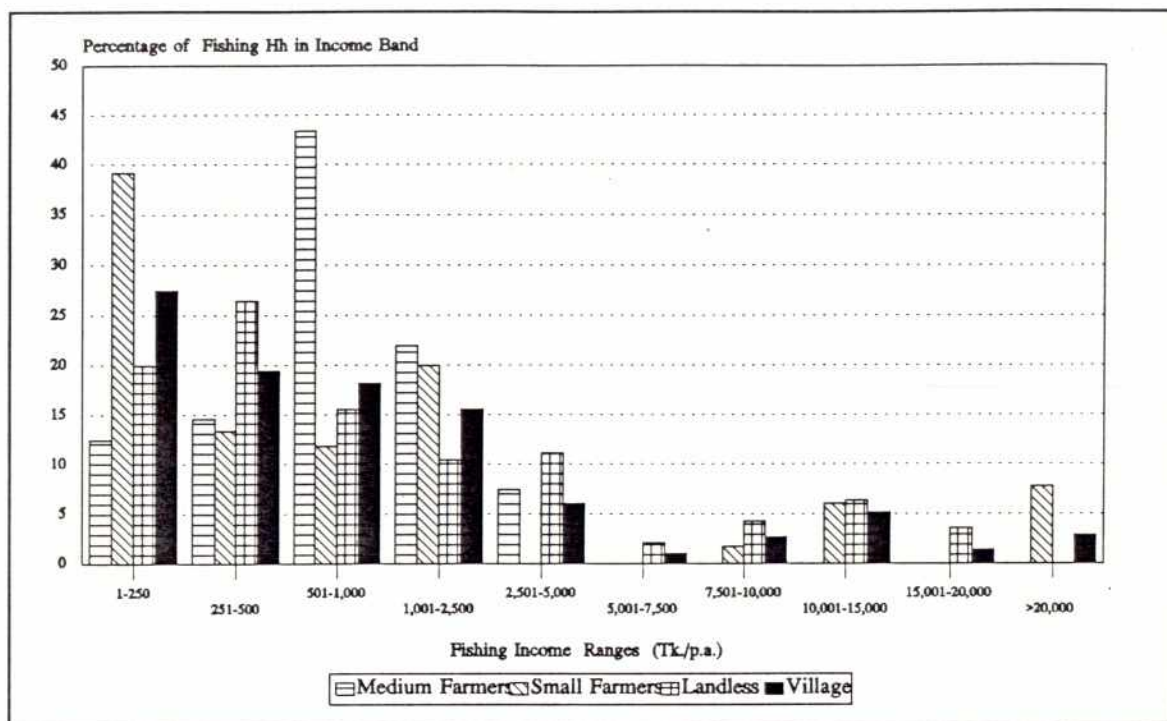
Table 2.8 Fishing participation (%) , North Central

Category	For Income	Subsistence	Non-fishing
Medium Farmers	6	79	14
Small Farmers	10	63	23
Landless	15	48	37
Village	12	61	27

Source: FAP17 Census and Supplementary Surveys

Note: Data for village derived from weighted average of all categories

Figure 2.3 Distribution of fishing income for fishing households, North Central



Note: Data for village derived from weighted average of all categories

The household monitoring allowed the calculation of the net value of fish caught through the year, both sold and consumed within the household. The percentage distribution of households catching fish within different ranges of value is shown in Figure 2.3.

In contrast to the other regions, in North Central there is a progressive decline in the proportion of households earning successively higher quantities of income. The modal range for the value of fish caught was Tk.250 per annum or less, which included around 27% of the households fishing. Indeed nearly two thirds of fishing households caught fish worth less than Tk.1,000. The range is extended, with nearly 10% of fishing households earning more than Tk.10,000.

The relative significance of fishing is best gauged in relation to its contribution to total income. This is shown for each landholding category and overall in Table 2.9, which gives the average income (both cash and monetized value of consumption¹) from each category

¹ Subsistence production of rice was monetized in the month when it was eaten, not when produced. This had the effect of spreading agricultural incomes through the year.

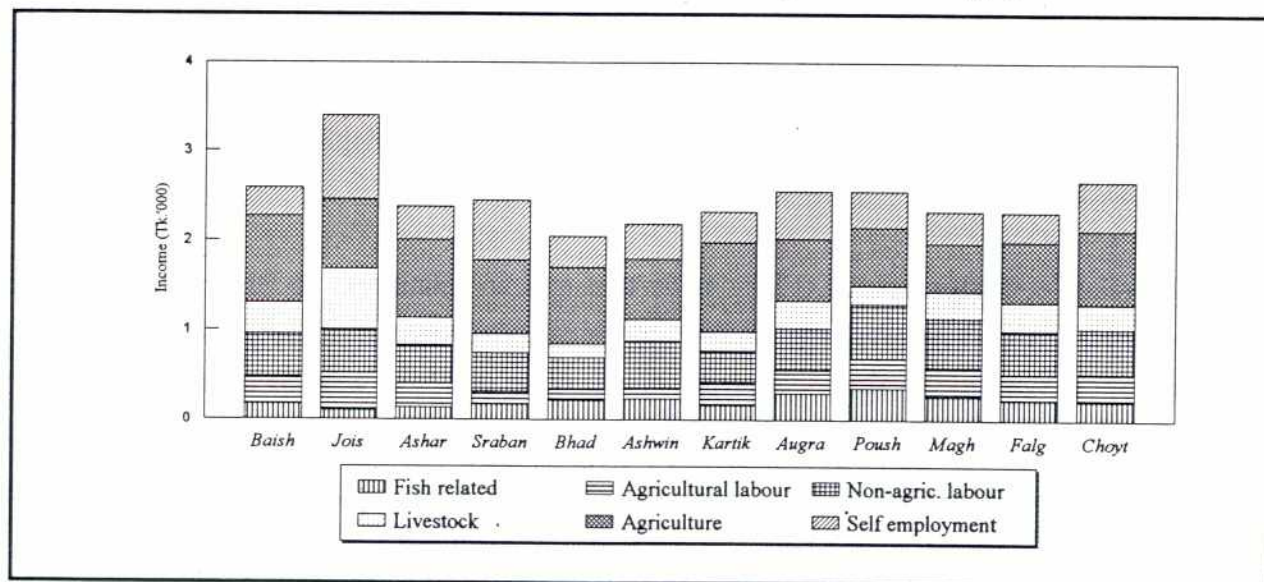
Table 2.9 Sources of income by landholding category in agricultural villages, North Central

Units: Tk.

Category	Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Mogh	Falg	Choyt	Total	%
		Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
Medium Farmers	Fishing	14	19	21	128	70	99	85	62	60	25	36	32	650	1.2
	Fish trading	4	29	24	31	20	0	0	0	0	0	0	0	108	0.2
	Fish culture	9	0	0	0	0	0	0	0	0	31	20	81	141	0.3
	Agricultural labour	10	29	16	10	0	0	0	60	49	23	16	16	229	0.4
	Non-agric. labour	448	523	407	414	407	967	396	479	901	488	488	530	6,448	12.0
	Small stock	39	168	94	392	83	47	103	73	41	75	50	77	1,238	2.3
	Large stock	783	890	340	244	160	554	445	695	343	511	478	464	5,905	11.0
	Agriculture	3,161	3,177	3,578	3,022	3,763	2,332	3,180	1,501	1,822	1,243	1,565	2,066	30,408	56.8
	Self employment	512	1,274	575	845	507	969	871	756	637	597	485	369	8,396	15.7
	Total (Tk.)	4,980	6,109	5,055	5,086	5,010	4,968	5,080	3,626	3,853	2,993	3,138	3,635	53,523	100.0
	Total (%)	9.3	11.4	9.4	9.5	9.4	9.3	9.5	6.8	7.2	5.6	5.9	6.8	100	
Small Farmers	Fishing	405	170	172	170	288	234	206	158	196	612	515	514	3,638	11.6
	Fish culture	5	0	0	0	0	(42)	(42)	326	488	9	9	18	770	2.4
	Agricultural labour	130	268	161	113	57	78	175	166	165	215	188	185	1,899	6.0
	Non-agric. labour	422	408	396	432	356	348	286	424	472	492	486	492	5,014	15.9
	Small stock	77	128	93	60	33	59	56	143	68	55	55	48	874	2.8
	Large stock	402	798	296	143	109	139	135	172	167	235	353	270	3,218	10.2
	Agriculture	1,037	676	711	774	657	617	1,095	988	678	647	740	898	9,517	30.2
	Self employment	303	1,386	458	894	494	403	311	675	429	231	224	747	6,552	20.8
	Total (Tk.)	2,781	3,834	2,287	2,586	1,994	1,836	2,222	3,052	2,663	2,496	2,570	3,172	31,482	100.0
	Total (%)	8.8	12.2	7.3	8.2	6.3	5.8	7.1	9.7	8.5	7.9	8.2	10.1	100	
Landless	Fishing	85	68	157	201	216	339	223	154	76	83	71	26	1,699	8.7
	Fish culture	0	0	0	0	0	0	0	2	5	8	2	2	17	0.1
	Agricultural labour	578	722	500	227	238	244	459	428	596	539	490	545	5,564	28.6
	Non-agric. labour	439	446	372	333	270	332	326	471	473	551	406	395	4,812	24.8
	Small stock	26	149	50	38	64	55	55	32	62	45	29	42	646	3.3
	Large stock	21	144	65	34	26	36	21	43	17	78	71	16	570	2.9
	Agriculture	203	133	199	151	125	81	98	100	182	117	135	198	1,722	8.9
	Self employment	367	401	336	366	289	330	316	326	345	478	440	421	4,411	22.7
	Total (Tk.)	1,719	2,063	1,679	1,350	1,228	1,417	1,498	1,556	1,756	1,899	1,644	1,645	19,441	100.0
	Total (%)	8.8	10.6	8.6	6.9	6.3	7.3	7.7	8.0	9.0	9.8	8.5	8.5	100	
Village	Fishing	173	100	136	172	215	261	191	142	119	258	224	202	2,191	7.4
	Fish trading	1	5	4	6	4	0	0	0	0	0	0	0	20	0.1
	Fish culture	3	0	0	0	0	(21)	(21)	161	242	12	7	20	404	1.4
	Agricultural labour	310	423	274	142	121	120	264	258	342	325	287	314	3,180	10.7
	Non-agric. labour	468	479	420	430	363	527	347	470	602	551	490	492	5,636	18.9
	Small stock	55	146	87	93	58	49	57	85	63	59	48	54	852	2.9
	Large stock	294	532	217	118	91	189	149	222	138	235	271	218	2,671	9.0
	Agriculture	959	770	867	824	851	670	999	691	648	541	674	819	9,312	31.3
	Self employment	316	941	371	662	350	395	338	525	402	352	323	552	5,526	18.5
	Total (Tk.)	2,579	3,396	2,376	2,447	2,053	2,190	2,324	2,554	2,556	2,333	2,324	2,671	29,792	100.0
	Total (%)	8.7	11.4	8.0	8.2	6.9	7.4	7.8	8.6	8.6	7.8	7.8	9.0	100	

Note: Data for village derived from weighted average of all categories

Figure 2.4 Seasonal variation in the distribution of income in agricultural villages, North Central



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of enterprise through the year. Overall fishing was the fifth ranked source of annual income, contributing 7.4% of a total of Tk.29,792. Seasonally it was of greatest importance in the flood season, when it contributed just under 10% of the total, though there was a secondary spike in December-February. Figure 2.4 gives a graphical presentation of this data.

Between the different groups there were however important differences. For medium landholders, despite their high level of participation, fishing was only of marginal significance, contributing a little over 1% of the total income. Fishing gave both the greatest amount (Tk.3,638) and the highest proportion (11.6%) to small farmers. In part this reflects their high involvement in fishing combined with their greater willingness than medium farmers to do so on a commercial basis. Their pattern of income is also noteworthy, as it is consistently highest in the dry season.

For the landless, fishing, on an annual basis, was relatively less important than for the small farmers sampled; but it constituted almost a quarter of income earned in the flood season, when all three of their main sources (agricultural labour, non-agricultural labour and self-employment) are at their annual low.

Significance of Fisheries Income to Different Groups - North East

Professional fishermen in the fishing villages

The tight control over the richest fisheries resources in this region limits the incomes earned by most professional fishermen. These are shown in Table 2.10. The average annual income in the fishing communities monitored was a little less than Tk.20,234, of which 78% came from fish related activities (53% from capture fisheries). There was however considerable variation between communities, ranging from Tk.42,805 in NE1-3, where half the total came from fish culture, to Tk.11,578 in NE1-2. There was also considerable variation within communities, often relating to leasing. Though the majority of fishermen benefit from the leasing system only to the extent that it stops a free-for-all, some households do gain significantly, either by obtaining a sub-lease or by assisting in the management of *beel* for larger leaseholders. This also accounts for the considerable irregularity in income flows from fishing, see Figure 2.5. (The average income of Tk.2,533 in *Poush* was largely accounted for by one leaseholder in one community.)

Reflecting the importance of large gears, there is a significant contribution of income from fishing labour (10.3%). Fish trading was also important. Fish culture is not shown because

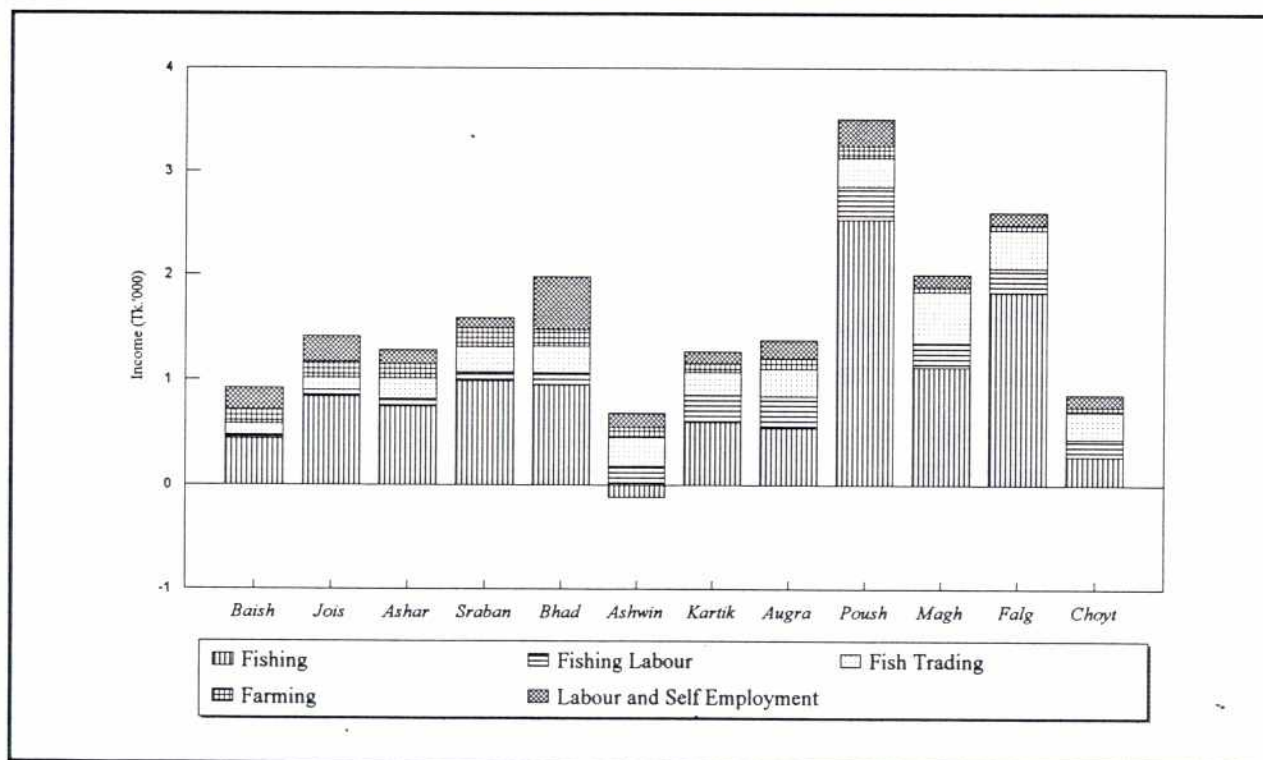
Table 2.10 Income by different household fishing categories in fishing villages, North East

Units: Tk.

	Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Mogh	Falg	Choyt	Total	%
		Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
F1	Fishing	306	986	676	1,056	1,010	780	428	364	687	1,143	988	731	9,154	55.8
	Fishing Labour	31	39	49	74	109	106	331	308	447	144	211	182	2,030	12.4
	Fish Trading	236	205	253	333	166	156	174	(335)	279	246	266	237	2,217	13.5
	Farming	96	161	82	6	36	9	23	13	9	0	3	24	462	2.8
	Agricultural Labour	373	217	79	38	19	19	80	104	190	195	153	35	1,501	9.2
	Self Employment	0	6	157	129	129	157	129	157	0	1	1	1	868	5.3
	Non-Agric. & FFW	0	0	0	0	0	0	0	0	0	0	92	72	164	1.0
	Total	1,041	1,613	1,296	1,635	1,471	1,228	1,164	610	1,613	1,729	1,715	1,283	16,397	100.0
F2	Fishing	576	946	766	992	967	928	602	590	867	875	1,898	(540)	9,467	45.8
	Fishing Labour	39	69	87	100	134	228	253	332	319	282	278	175	2,296	11.1
	Fish Trading	102	(390)	167	222	223	261	228	321	257	508	391	244	2,534	12.2
	Fish Culture	(153)	(153)	(950)	1,113	2,132	0	0	3	0	208	3	14	2,217	10.7
	Farming	111	156	129	194	175	111	87	110	110	41	49	47	1,320	6.4
	Agricultural Labour	228	110	40	33	26	0	13	85	83	79	43	20	760	3.7
	Self Employment	57	174	75	57	562	85	57	85	190	91	53	39	1,525	7.4
	Non-Agric. & FFW	19	60	44	44	58	76	73	28	40	23	52	51	568	2.7
	Total	979	972	358	2,755	4,277	1,689	1,313	1,554	1,866	2,107	2,767	50	20,687	100.0
F3	Fishing	133	278	683	758	696	(5,599)	445	221	12,074	2,507	413	354	12,963	51.6
	Fishing Labour	0	0	0	0	0	0	0	0	53	0	56	26	134	0.5
	Fish Trading	152	224	584	555	704	493	266	443	600	674	501	378	5,573	22.2
	Gear Making	0	0	0	0	0	26	21	32	35	0	0	0	114	0.5
	Farming	309	203	200	210	149	155	118	96	363	70	74	85	2,032	8.1
	Agricultural Labour	74	0	0	0	0	0	13	112	0	0	0	0	198	0.8
	Self Employment	1,648	282	144	45	21	27	0	429	757	250	232	259	4,093	16.3
	Total	2,315	987	1,611	1,568	1,570	(4,898)	862	1,333	13,882	3,501	1,275	1,101	25,107	100.0
Comm- unity	Fishing	443	844	747	989	950	-117	605	549	2533	1126	1833	278	10,780	53.3
	Fishing Labour	35	59	75	88	121	187	257	300	322	231	237	163	2,075	10.3
	Fish Trading	106	117	191	240	249	266	211	255	281	485	365	258	3,024	14.9
	Gear Making	7	-1	5	2	3	5	2	4	4	-2	0	1	30	0.1
	Farming	127	154	136	172	158	101	85	97	117	40	46	51	1,284	6.3
	Agricultural Labour	222	125	47	36	26	4	23	89	74	82	46	23	797	3.9
	Self Employment	194	183	93	61	455	73	55	155	230	111	81	75	1,766	8.7
	Non-Agric. & FFW	13	55	40	40	48	62	61	25	35	16	43	40	478	2.4
	Total	1,147	1,536	1,334	1,628	2,010	581	1,299	1,474	3,596	2,089	2,651	889	20,234	100.0

Note: Data for community were based on the weighted average of all households sampled

Figure 2.5 Income by different household fishing categories in fishing villages, North East



anomalies in the survey resulted in negative values at the community level. (The early rounds of data collection failed to pick up income flows from pond culture in all cases; later rounds caught expenditure but, due to timing, not the ultimate harvest.)

Fishing in the agricultural villages

In other regions, the relative importance of subsistence and part-time fishermen derived from the analysis of the FCA data and that derived from the socioeconomic monitoring was broadly consistent. In the North East, this was not the case. In the socioeconomic surveys, part-time fishing was of only minor significance: it was reported less frequently than anywhere else in the village surveys (including the initial census), see Table 2.11; in the household monitoring, it was a rarity (9 households, compared to 281 for subsistence) and it gave a much lower average level of income than in other regions. Though there are reasonable explanations for this (see below) this downward bias must be borne in mind in the interpretation of the results presented.

The level of part-time fishing may be lower in the villages monitored because of the distinct cultural barriers to the sale of fish among the traditional inhabitants of agricultural communities in the North East. Traditional Muslim fishermen (*maimuls*) are longer and more widely established in the North East than in any of the other areas monitored by FAP 17. But their social status within the wider community is particularly low and farmers are therefore reluctant to fish for income. There are however significant communities of migrants, settled in the region in the last two generations, who, being less socially constrained, do fish seasonally for income. The migrants are generally located on the lower land away from the older communities that occupy the ridges. As a result, there is a distinct clustering of part-time fishermen in separate communities - none of which happened to be covered by the socioeconomic monitoring.

Table 2.11 Fishing participation (%), North East

Category	For Income	Subsistence	Non-fishing
Medium Farmers	2	64	34
Small Farmers	3	58	28
Landless	10	49	41
Village	6	57	37

Source: FAP 17 Census and Supplementary Surveys

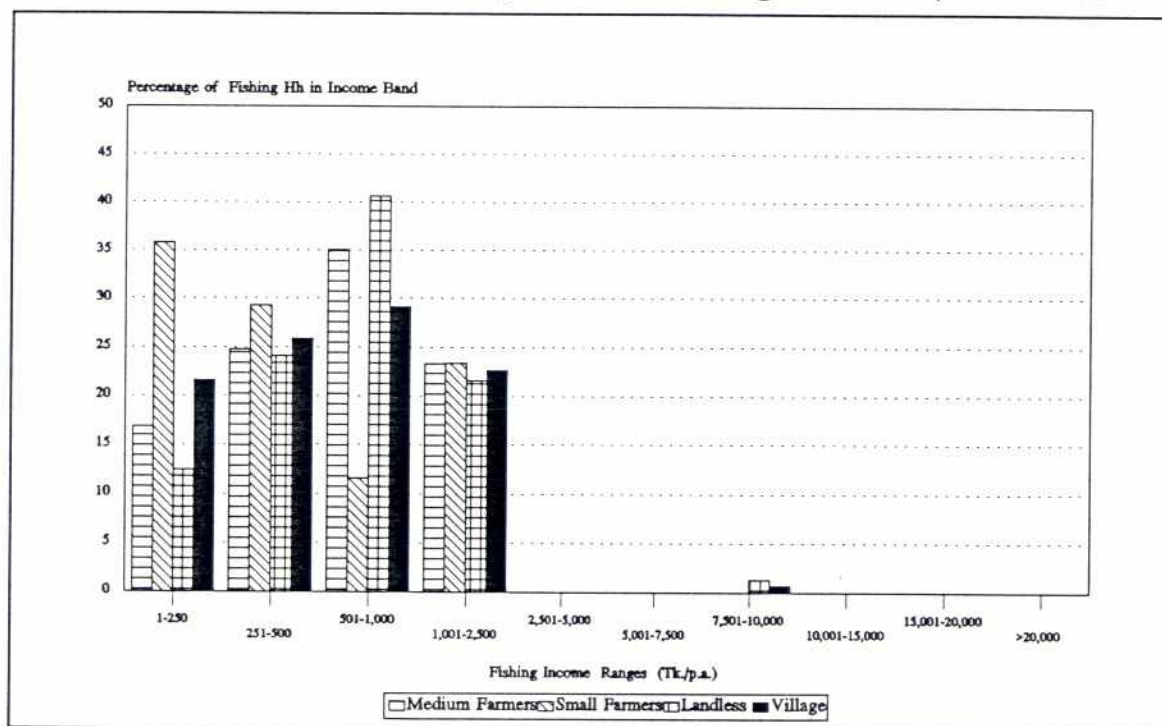
Note: Data for village derived from weighted average of all categories

It is also possible that the levels of income from fishing recorded in the monitored communities were underreported, both because of cultural taboos and because of the detailed

questioning that linked fishing activities to local water bodies. Leaseholders in the North East are particularly aggressive in the policing of fishing of their *beel* and, increasingly and illegally, on the surrounding floodplain. Subsistence fishing is sometimes tolerated, independent fishing for sale is not. Where questions are asked generally, households may be willing to admit that they earn income from fishing; where the questions relate to specific water bodies, they may not.

The distribution of households across different fishing income ranges (cash plus monetary value of consumption) is shown in Figure 2.6. The modal range was Tk.500-Tk.1,000, though there was little difference across the first four ranges. The most notable feature of this Figure is the almost complete lack of households catching fish worth more than Tk.2,500 (and very few came close to this figure).

Figure 2.6 Distribution of fishing income for fishing households, North East



Note: Data for village derived from weighted average of all categories

Together with the relatively lower participation rates (second lowest after the North West), this made fishing less important to the monitored villages in the North East, than to those covered in any other region. The overall distribution of income by source is given in Table 2.12 and Figure 2.7. Annual fishing income was relatively invariant across landholding

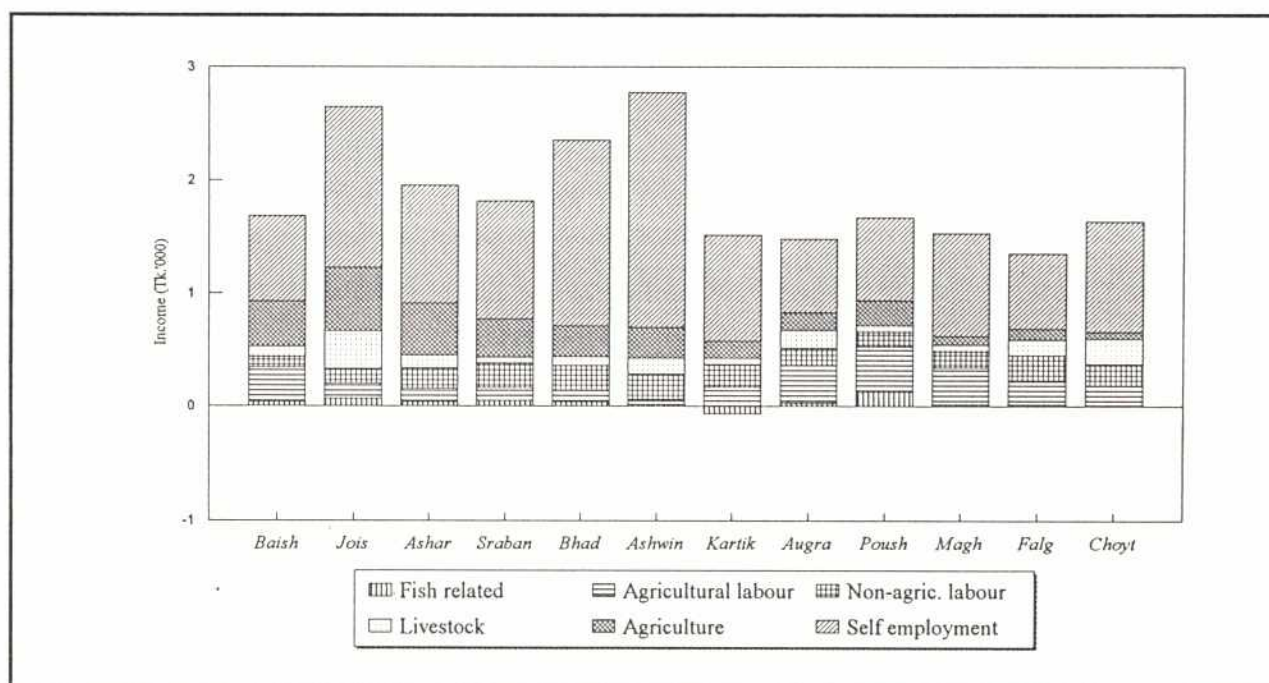
Table 2.12 Sources of income by landholding category in agricultural villages, North East

Units: Tk.

Category	Activity	Baish Mar/Apr	Jois Apr/May	Ashar May/Jun	Sraban Jun/Jul	Bhad Jul/Aug	Ashwin Aug/Sep	Kartik Sep/Oct	Augra Oct/Nov	Poush Nov/Dec	Magh Dec/Jan	Falg Jan/Feb	Choyt Feb/Mar	Total	%
Medium Farmers	Fishing	49	100	53	73	31	10	11	11	3	30	25	25	418	0.9
	Fish culture	0	0	0	0	0	0	(703)	0	879	0	0	0	176	0.4
	Agricultural labour	0	0	0	0	0	0	0	0	0	15	0	0	15	0.0
	Non-agric. labour	27	44	44	67	64	67	57	155	77	44	47	52	743	1.5
	Small stock	35	113	17	31	35	35	26	64	23	7	27	40	451	0.9
	Large stock	235	413	162	58	38	81	172	364	68	127	510	171	2,399	4.9
	Agriculture	1,157	1,244	1,068	1,173	741	968	569	552	715	216	194	110	8,706	17.8
	Self employment	2,480	3,324	2,403	3,237	5,429	5,710	3,297	1,260	1,626	3,093	1,399	2,666	35,920	73.6
	Total (Tk.)	3,983	5,238	3,747	4,639	6,338	6,871	3,429	2,406	3,391	3,532	2,202	3,064	48,828	100
	Total (%)	8.2	10.7	7.7	9.5	13.0	14.1	7.0	4.9	6.9	7.2	4.5	6.3	100	
Small Farmers	Fishing	38	73	41	43	45	37	20	16	13	22	24	10	380	1.6
	Agricultural labour	194	67	79	88	106	90	177	310	322	234	158	147	1,970	8.2
	Non-agric. labour	15	61	119	142	146	165	173	91	49	47	117	84	1,207	5.0
	Small stock	28	11	3	8	13	15	17	24	8	13	13	21	171	0.7
	Large stock	35	176	41	39	177	320	33	145	62	42	44	233	1,345	5.6
	Agriculture	452	709	635	389	372	321	142	130	193	44	39	39	3,464	14.4
	Self employment	643	2,285	1,521	642	1,691	2,817	780	838	1,077	665	812	1,717	15,486	64.5
	Total (Tk.)	1,405	3,382	2,439	1,351	2,550	3,765	1,342	1,554	1,724	1,067	1,207	2,251	24,023	100
	Total (%)	5.8	14.1	10.2	5.6	10.6	15.7	5.6	6.5	7.2	4.4	5.0	9.4	100	
Landless	Fishing	29	57	39	55	33	9	30	40	25	12	12	8	346	2.5
	Agricultural labour	454	192	158	139	140	44	201	430	535	457	281	238	3,268	23.9
	Non-agric. labour	147	175	247	300	302	306	263	184	198	221	346	280	2,966	21.7
	Small stock	5	3	4	25	20	11	5	11	1	2	3	8	96	0.7
	Large stock	32	316	135	6	5	56	0	36	39	24	24	223	896	6.5
	Agriculture	165	285	219	62	95	56	35	44	66	19	73	38	1,156	8.4
	Self employment	280	388	393	447	558	756	368	446	354	360	377	228	4,953	36.2
	Total (Tk.)	1,112	1,416	1,195	1,034	1,153	1,238	902	1,191	1,218	1,095	1,116	1,023	13,681	100
	Total (%)	8.1	10.4	8.7	7.6	8.4	9.0	6.6	8.7	8.9	8.0	8.2	7.5	100	
Village	Fishing	37	70	41	54	37	16	25	30	19	17	17	11	373	1.7
	Fish culture	0	0	0	0	0	0	(88)	0	110	0	0	0	22	0.1
	Agricultural labour	306	132	114	108	106	47	167	331	395	325	202	172	2,403	10.7
	Non-agric. labour	90	125	179	218	216	224	199	152	134	145	234	190	2,106	9.4
	Small stock	15	30	5	24	20	17	12	24	7	5	9	17	183	0.8
	Large stock	74	305	105	24	58	121	47	132	49	50	124	208	1,297	5.8
	Agriculture	403	567	465	341	271	271	148	159	221	76	100	58	3,078	13.8
	Self employment	760	1,422	1,047	1,049	1,650	2,082	941	655	735	912	670	983	12,904	57.7
	Total (Tk.)	1,685	2,651	1,956	1,818	2,358	2,778	1,451	1,483	1,670	1,530	1,356	1,639	22,366	100.0
	Total (%)	7.5	11.9	8.7	8.1	10.5	12.4	6.5	6.6	7.5	6.8	6.1	7.3	100	

Note: Data for village derived from weighted average of all categories

Figure 2.7 Seasonal variation in the distribution of income in agricultural villages, North East



ya
classes, at Tk.418, Tk.380 and Tk.346 for medium farmers, small farmers and landless respectively and accounted for only 1.7% of average village income. The profile of income through the year, indicates an earlier peak than other regions. In the North East it came in *Joisthya*, *Ashar* and *Sraban* (mid-April to mid-July). Elsewhere, it occurred more commonly in the period from August to October. This reflects the earlier flooding patterns in the North East and the heavier policing of fishing by leaseholders as soon as the floods start to recede.

In the agricultural villages in the North East incomes varied significantly. In the villages on the Surma-Kushiyara floodplains (NE1-1 and NE2-1), the overall levels of village income were both significantly higher than anywhere except North Central. The villages in the *haor*, NE3-1 and NE4-1, which are more remote and subject to deeper and more protracted flooding, had much lower village incomes, comparable to the poorer villages of the North West or the South West. It was in the North East however that the disparity between landholding groups was the sharpest, with medium landowners generally recording much higher incomes than other groups and with the landless earning considerably less in all villages except NE1-1, where proximity to Moulvibazar enabled self-employment to hold up the annual total. Two additional features stand out: the very low levels of agricultural income, and the much greater significance of self-employment across all landholding groups. In the North East, the average income earned from agriculture by medium farmers was similar to that earned by small farmers in the North West and less than that earned by them in North Central. The very deep and extended flooding in this region undoubtedly contributes to this, as it severely constrains cropping options, often to a single local *boro* crop. Furthermore, early in the year, even this is vulnerable to flash floods (which did occur in the period monitored). Self-employment, therefore, has to assume a greater degree of importance than in other regions. But, adding to this, are the flows of income from remittances, which for ease of tabulation have been classified as "self-employment." For medium farmers, in particular, these remittances were a very important component of total annual income. Accordingly, the figure recorded for their self-employment in the North East is three times that recorded by them in the next highest region (South West).

Significance of Fisheries Income to Different Groups - North West

Professional fishermen in the fishing villages

The income structures of fishing communities are shown in Table 2.13 and Figure 2.8. The professional fishermen in the North West include a significant number of more recent

Table 2.13 Income by different household fishing categories in fishing villages, North West

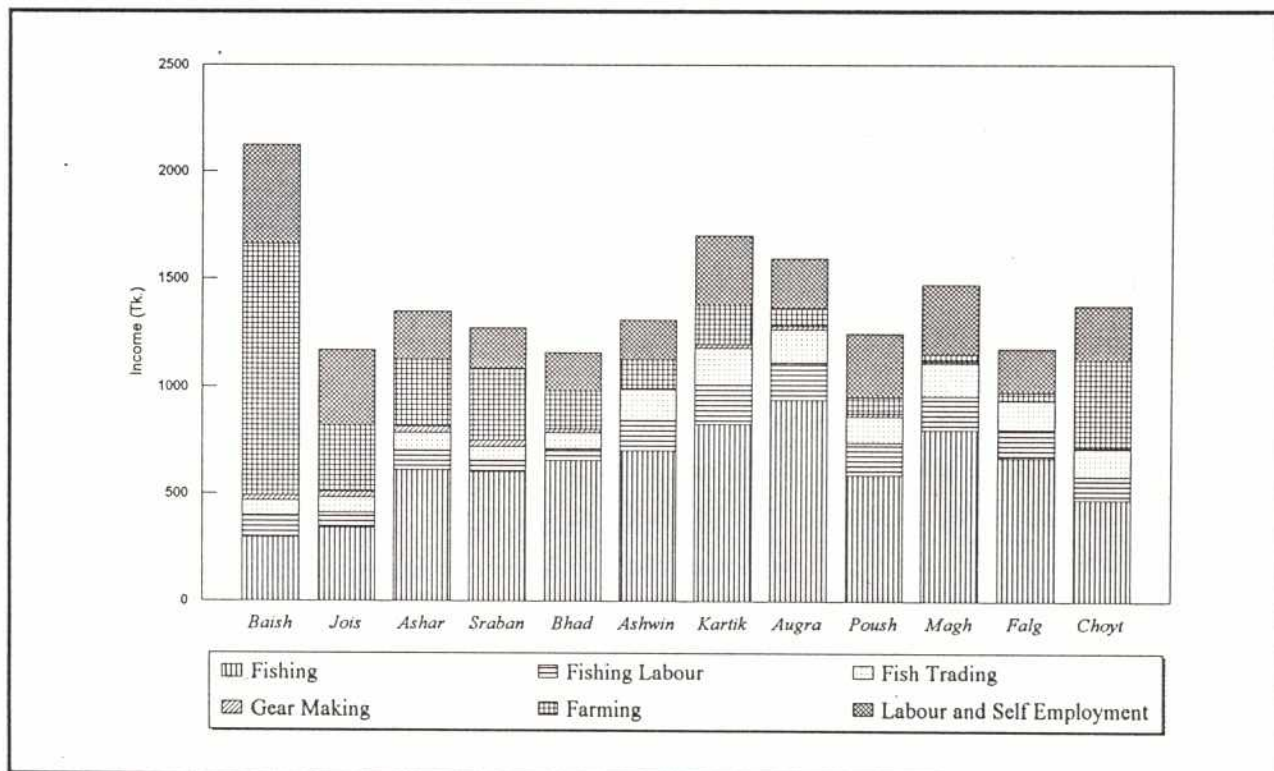
Units: Tk.

	Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Magh	Falg	Choyt	Total	%
		Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
F1	Fishing	662	472	593	612	592	683	773	767	562	1,318	1,290	940	9,263	71.1
	Fishing Labour	85	88	112	60	62	128	160	68	112	75	78	70	1,098	8.4
	Fish Trading	0	0	18	22	35	28	30	38	22	0	0	0	193	1.5
	Fish Culture	0	(12)	0	0	0	0	0	0	28	0	95	0	112	0.9
	Gear Making	18	12	12	28	12	13	17	18	28	0	0	5	163	1.3
	Farming	62	0	2	3	40	0	2	3	7	3	2	2	125	1.0
	Agricultural Labour	30	0	0	0	0	0	0	0	0	0	0	13	43	0.3
	Self Employment	63	65	57	68	68	95	107	62	67	52	55	53	812	6.2
	Non-Agric. & FFW	57	162	162	147	105	105	147	147	147	15	15	20	1,227	9.4
	Total	977	787	955	940	913	1,053	1,235	1,103	972	1,463	1,535	1,103	13,037	100.0
F2	Fishing	139	276	604	628	661	553	1,009	1,603	828	749	469	320	7,839	49.0
	Fishing Labour	196	112	129	40	51	181	270	326	273	288	259	237	2,362	14.8
	Fish Trading	48	73	82	34	38	68	131	112	83	193	148	170	1,180	7.4
	Gear Making	28	44	45	34	29	7	21	19	12	12	5	9	265	1.7
	Farming	116	218	110	285	82	74	282	20	22	0	21	550	1,780	11.1
	Agricultural Labour	116	78	8	0	7	0	13	26	9	31	44	67	399	2.5
	Self Employment	13	133	59	32	58	52	63	19	20	63	50	85	647	4.0
	Non-Agric. & FFW	141	114	120	160	141	159	83	63	78	133	167	169	1,528	9.6
	Total	797	1,048	1,157	1,213	1,067	1,094	1,872	2,188	1,325	1,469	1,163	1,607	16,000	100.0
F3	Fishing	236	456	685	(363)	766	858	743	360	165	564	490	341	5,301	22.6
	Fishing Labour	43	25	58	126	119	206	189	228	173	163	115	51	1,494	6.4
	Fish Trading	313	216	256	241	240	741	751	635	488	478	478	406	5,243	22.4
	Farming	2,494	743	690	619	460	366	413	335	334	75	64	490	7,081	30.2
	Agricultural Labour	59	64	66	46	28	21	54	39	71	38	45	79	609	2.6
	Self Employment	625	271	206	183	186	223	419	304	390	420	148	255	3,629	15.5
	Non-Agric. & FFW	0	0	0	0	0	0	0	0	0	33	30	0	63	0.3
	Total	3,769	1,775	1,961	853	1,799	2,415	2,568	1,900	1,620	1,769	1,369	1,623	23,419	100.0
Comm- unity	Fishing	298	342	612	605	658	703	829	940	588	801	669	473	7,518	44.3
	Fishing Labour	102	70	92	53	56	143	182	173	154	157	136	111	1,429	8.4
	Fish Trading	69	70	83	64	71	140	170	155	123	153	131	128	1,357	8.0
	Gear Making	22	27	29	28	19	7	20	17	14	9	3	7	202	1.2
	Farming	1,171	309	309	333	178	133	181	83	73	32	37	407	3,246	19.1
	Agricultural Labour	133	99	43	25	21	12	41	43	46	46	47	84	640	3.8
	Self Employment	262	168	95	75	82	94	209	124	184	205	57	92	1,647	9.7
	Non-Agric. & FFW	69	84	86	91	74	79	71	62	68	74	98	77	933	5.5
	Total	2,126	1,169	1,349	1,274	1,159	1,311	1,703	1,597	1,250	1,477	1,178	1,379	16,972	100.0

Note: 1. Negative values for fish culture removed

2. Data for community were based on the weighted average of all households sampled

Figure 2.8 Income by different household fishing categories in fishing villages, North West



Note: Data in figure include fish culture but these were omitted in tabulated data

entrants to the profession. Average annual incomes are low, at just under Tk.17,000, with 70% coming from fish related activities, the lowest of any region. The communities inside and outside Chalan Beel Polder B had particularly low incomes (Tk.13,657 for NW3-2 and Tk.10,694 for NW4-2). Those inside Pabna Irrigation Project were higher. Interestingly, the highest of these (NW1-2) was a community of non-traditional fishermen, that supplemented their principal agricultural incomes with significant seasonal fishing in the main flood period, following their *boro* harvest.

Looking at all communities together, farming (crops and livestock taken together) represented 19.1% of the annual total, the highest figure in any region.

Fishing in the agricultural villages

The importance of part-time, rather than subsistence fishermen, is also reflected in the data gathered from the socioeconomic village monitoring, and has significant implications for the potential impact of flood control measures that would affect the value of the fishery.

The participation percentage in the fishery of different landholding classes is given in Table 2.14. Of all regions the North West had the highest proportion of non-fishing households (53%). The next highest, North East, was 16 percentage points lower, and the other two regions were less than 30%. However, of those that did fish, the ratio of those fishing for income to those fishing only for subsistence was high; just under half for all groups but rising to nearly two thirds for the landless.

Table 2.14 Fishing participation (%), North West

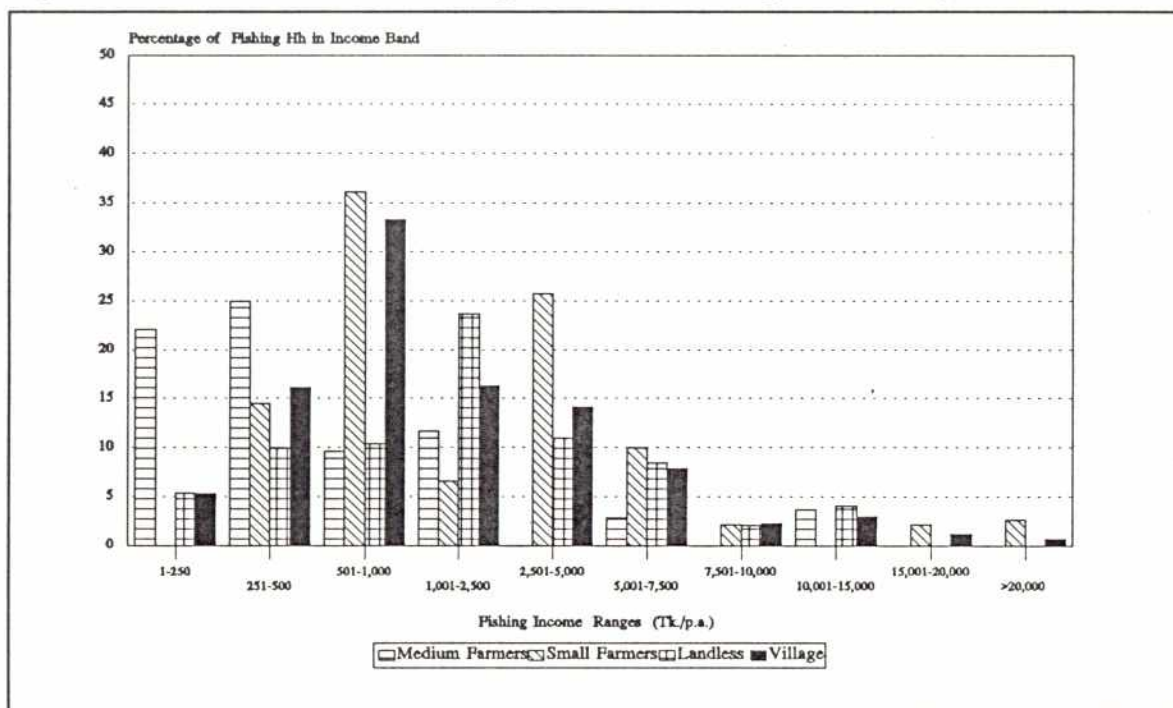
Category	For Income	Subsistence	Non-fishing
Medium Farmers	11	34	55
Small Farmers	12	31	45
Landless	18	28	53
Village	15	32	53

Source: FAP 17 Census and Supplementary Surveys

Note: Data for village derived from weighted average of all categories

The distribution of households across different income ranges (cash income plus the monetized value of catch consumed) is shown in Figure 2.9. In contrast to North Central, where the modal income was less than Tk.250, in the North West it was in the range Tk.500 to Tk.1,000. There were relatively few households with income less than Tk.500 and the distribution had a long tail stretching into the upper ranges.

Figure 2.9 Distribution of fishing income for fishing households, North West



Note: Data for village derived from weighted average of all categories

In the four villages studied, the average income earned by those selling fish was relatively steady across all landholding categories, at around Tk.5,000 and the numbers of households recording no cash sales was significantly lower than any other region. Such incomes are clearly of varying significance to these households, depending on their other sources but for the landless, whose average income in this region was around Tk.12,500, they are clearly of great significance.

The overall picture of the significance of fishing to each landholding group is given in Table 2.15 and Figure 2.10. Two opposing forces were at work: the low level of participation and the generally high incomes of those who did fish. The monitored villages reported here had a generally lower level of participation than those covered in the subsequent subsistence survey and included one village (NW2-1) in which fishing was systematically underreported, due to a bitter dispute over access on their most important fishing ground. As a result, despite the high household fishing incomes for those participating, fishing does not feature significantly when averaged across any of the groups: for medium farmers it was less than 1% of total income; for small farmers it was 3.7%; and for the landless it was only 4.5%.

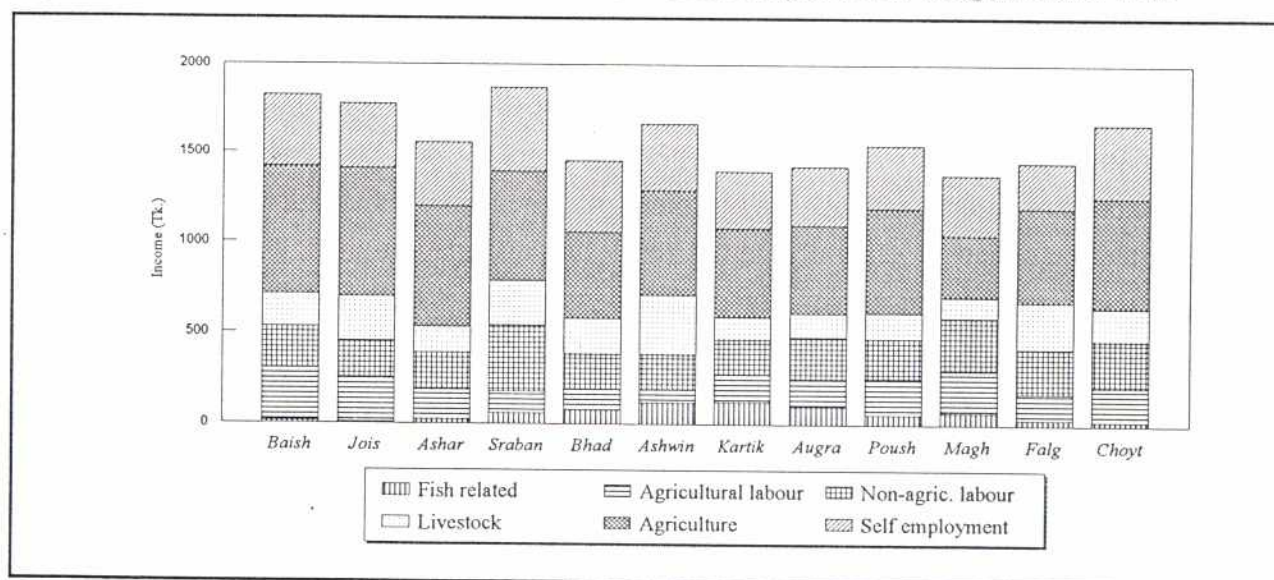
Table 2.15 Sources of income by landholding category in agricultural villages, North West

Units: Tk.

Category	Activity	Baish Mar/Apr	Jois Apr/May	Ashar May/Jun	Sraban Jun/Jul	Bhad Jul/Aug	Ashwin Aug/Sep	Kartik Sep/Oct	Augra Oct/Nov	Poush Nov/Dec	Magh Dec/Jan	Falg Jan/Feb	Choyt Feb/Mar	Total	%
Medium Farmers	Fishing	0	0	7	31	34	38	36	43	13	27	16	15	259	0.8
	Fish culture	(1)	0	0	(1)	(2)	0	(1)	0	14	94	19	87	209	0.7
	Agricultural labour	28	29	35	15	21	0	20	42	43	17	10	22	281	0.9
	Non-agric. labour	260	260	260	266	260	260	260	297	317	267	269	287	3,264	10.5
	Small stock	15	22	6	11	20	15	9	49	27	14	22	16	225	0.7
	Large stock	325	827	230	203	423	173	180	154	255	333	356	362	3,821	12.3
	Agriculture	1,993	2,132	1,539	1,867	1,392	1,863	1,752	1,464	1,972	1,253	2,279	1,405	20,910	67.1
	Self employment	298	139	383	64	64	297	73	81	71	95	38	603	2,204	7.1
	Total (Tk.)	2,918	3,409	2,460	2,456	2,212	2,646	2,329	2,130	2,712	2,100	3,009	2,797	31,173	100.0
	Total (%)	9.4	10.9	7.9	7.9	7.1	8.5	7.5	6.8	8.7	6.7	9.7	9.0	100	
Small Farmers	Fishing	31	16	13	80	90	191	205	131	56	53	27	0	891	3.7
	Fish trading	0	0	7	7	7	4	3	0	0	6	5	0	38	0.2
	Fish culture	0	0	(4)	(1)	2	2	(2)	10	19	5	7	0	38	0.2
	Agricultural labour	324	172	94	92	105	38	105	116	149	252	92	124	1,662	6.9
	Non-agric. labour	291	298	294	993	278	283	284	307	319	676	367	327	4,713	19.6
	Small stock	41	30	33	176	79	56	32	59	51	48	35	40	677	2.8
	Large stock	276	181	233	427	186	505	185	162	155	65	173	158	2,705	11.2
	Agriculture	846	757	937	762	640	738	470	603	571	360	415	959	8,056	33.5
	Self employment	443	550	359	732	437	412	391	377	384	506	303	382	5,278	21.9
	Total (Tk.)	2,252	2,004	1,966	3,268	1,824	2,229	1,673	1,765	1,704	1,971	1,424	1,990	24,058	100.0
	Total (%)	9.4	8.3	8.2	13.6	7.6	9.3	7.0	7.3	7.1	8.2	5.9	8.3	100	
Landless	Fishing	7	1	35	57	75	105	110	90	45	30	16	4	574	4.5
	Fish trading	0	0	0	0	0	0	0	12	11	14	13	0	49	0.4
	Agricultural labour	368	361	237	167	152	112	221	212	274	295	214	267	2,879	22.7
	Non-agric. labour	199	144	156	167	140	142	140	185	149	154	194	228	1,995	15.7
	Small stock	22	17	14	45	35	35	19	40	21	29	33	51	361	2.8
	Large stock	35	28	28	21	23	252	31	24	43	15	200	62	759	6.0
	Agriculture	227	217	237	139	118	96	138	146	141	42	94	198	1,790	14.1
	Self employment	421	306	325	415	466	348	339	361	405	320	279	303	4,287	33.8
	Total (Tk.)	1,279	1,074	1,032	1,011	1,009	1,090	998	1,070	1,089	899	1,043	1,113	12,694	100.0
	Total (%)	10.1	8.5	8.1	8.0	7.9	8.6	7.9	8.4	8.6	7.1	8.2	8.8	100	
Village	Fishing	11	5	25	60	76	117	123	89	43	36	19	5	608	3.2
	Fish trading	0	0	0	0	0	0	0	6	6	8	7	0	27	0.1
	Fish culture	0	0	(1)	(1)	0	1	(1)	2	6	21	5	18	52	0.3
	Agricultural labour	292	248	161	120	116	70	154	155	200	232	143	185	2,073	10.9
	Non-agric. labour	228	200	204	363	192	194	193	230	218	292	248	259	2,820	14.8
	Small stock	26	21	18	76	44	37	21	47	31	31	31	40	424	2.2
	Large stock	154	222	125	168	151	292	100	82	111	85	226	141	1,856	9.8
	Agriculture	709	713	665	607	476	578	490	488	579	339	516	608	6,767	35.6
	Self employment	405	366	360	478	399	378	318	326	350	335	255	414	4,381	23.0
	Total (Tk.)	1,825	1,775	1,557	1,871	1,454	1,667	1,398	1,425	1,544	1,379	1,450	1,670	19,008	97
	Total (%)	9.6	9.3	8.2	9.8	7.6	8.8	7.4	7.5	8.1	7.3	7.6	8.8	100	

Note: Data for village derived from weighted average of all categories

Figure 2.10 Seasonal variation in the distribution of income in agricultural villages, North West



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Aside from the significance of fishing, though not unrelated to it, one particular feature emerges from this Table. Again, for the average rural household, activities unrelated to agriculture contribute a major fraction of total income; here, in the North West, non-agricultural labour and self-employment made up over one third of the total. For the landless, not unnaturally, this picture is that much stronger, with nearly 50% of the annual total coming from these two sources.

Significance of Fishing to Different Groups - South West

Professional fishermen in the fishing villages

Professional fishermen in the South West have a higher average income than those in either the North West or the North East. The breakdown of their income is shown in Table 2.16 and Figure 2.11. All fishing categories earned similar total incomes (around Tk.24,000), though the balance between different sources varied.

The F1 households earned only around 60% of income from the fishing, but other fish-related sources (fishing labour, fish trading and fish culture) took this up to nearly 94% of the total. Month to month variation is high, even discounting the unnaturally low incomes in *Baishak* due to cash outflows related to fish trading. Open-water fishing and fish culture are used as complementary features of the overall strategy. The former is particularly important in the period August-December; the latter cuts in towards the end of this period but continues on into the dry season.

The F2 households earn slightly more (Tk.16,500) than the F1 from open-water fishing, which is close to or above the total annual income of many fishing households in the North East and North West. But their sources are more diversified, they get less from fishing labour and more from farming and agricultural labour (15% together). One particular feature of F2's incomes is their seasonality, with a steady rise from *Baishak* (March/April), a peak in *Ashwin* (August/September) and then a steady fall until *Choytra* (February/March).

The F3 households are diversified again. Fishing incomes are lower (Tk.10,000), at around 45% and activities unrelated to fishing make up more than half the total, with significant contributions from farming (19%) and non-agricultural labour (18.8%).

Fishing in the agricultural villages

Fishing was a major contributor to household incomes for the wider agricultural community



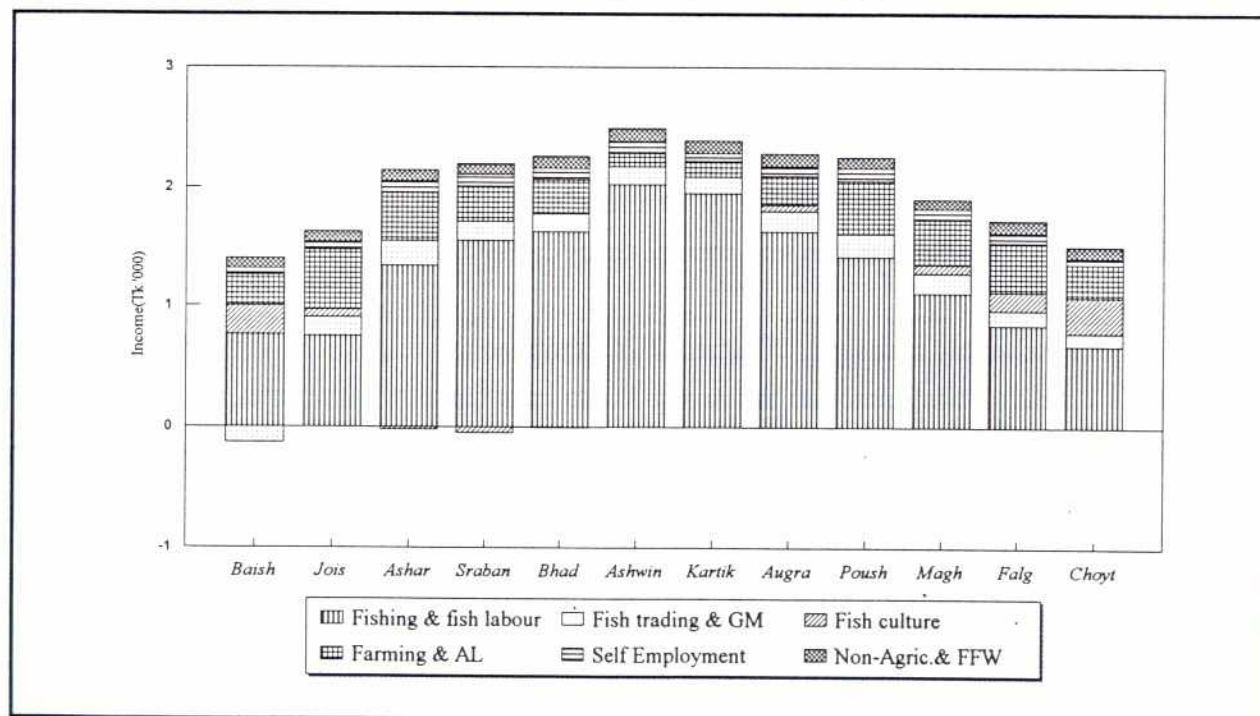
Table 2.16 Income by different household fishing categories in fishing villages, South West

Units: Tk.

Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Magh	Falg	Choyt	Total	%
	Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
F1 Fishing	1,032	1,056	809	875	523	1,805	1,642	1,460	1,430	1,265	1,184	1,007	14,088	60.2
Fishing Labour	90	87	235	180	116	84	70	815	762	556	411	429	3,835	16.4
Fish Trading	(1,058)	330	500	275	171	87	86	15	0	106	127	72	711	3.0
Fish Culture	929	316	(129)	(224)	(36)	0	0	110	0	235	735	1,346	3,282	14.0
Gear Making	0	0	0	0	0	8	0	0	0	0	0	0	8	0.0
Farming	21	29	31	14	27	43	9	5	5	25	33	23	265	1.1
Agricultural Labour	96	84	0	0	0	0	0	0	50	131	150	127	638	2.7
Self Employment	4	3	7	10	5	142	142	10	4	5	4	4	340	1.5
Non-Agric. & FFW	0	84	50	0	0	0	18	38	38	0	0	0	228	1.0
Total	1,114	1,989	1,503	1,130	806	2,169	1,967	2,453	2,289	2,323	2,644	3,008	23,395	100.0
F2 Fishing	573	617	1,656	1,918	2,261	2,271	2,249	1,622	1,399	907	585	459	16,517	68.7
Fishing Labour	119	107	97	77	68	73	79	147	150	162	132	144	1,355	5.6
Fish Trading	72	86	104	79	123	139	107	150	157	186	102	91	1,396	5.8
Fish culture	89	(3)	4	(4)	(3)	(4)	(3)	(1)	(1)	4	11	41		
Gear Making	7	11	16	13	3	13	10	7	13	8	8	11	120	0.5
Farming	107	255	243	228	188	73	60	121	250	175	132	45	1,877	7.8
Agricultural Labour	171	182	128	75	29	20	36	114	178	270	296	236	1,735	7.2
Self Employment	18	29	47	51	57	38	7	23	56	66	46	22	460	1.9
Non-Agric. & FFW	62	50	17	26	42	73	58	58	44	27	68	72	597	2.5
Total	1,218	1,334	2,312	2,463	2,768	2,696	2,603	2,241	2,246	1,805	1,380	1,121	24,057	100.0
F3 Fishing	908	696	1,162	1,324	1,200	705	987	945	714	629	836	751	10,857	45.8
Fish Trading	0	0	0	0	0	0	0	0	70	0	0	0	70	0.3
Fish Culture	3	3	0	0	0	0	0	66	0	63	2	2	139	0.6
Gear Making	50	50	50	60	60	53	63	106	106	35	47	39	719	3.0
Farming	113	731	547	190	674	151	346	284	516	306	390	262	4,510	19.0
Agricultural Labour	162	187	81	53	45	22	40	125	180	219	207	195	1,516	6.4
Self Employment	89	101	141	131	122	109	109	135	154	117	111	104	1,423	6.0
Non-Agric. & FFW	268	227	421	406	478	408	349	413	411	407	355	316	4,459	18.8
Total	1,593	1,995	2,402	2,164	2,579	1,448	1,894	2,074	2,151	1,776	1,948	1,669	23,693	100.0
Comm- unity	Fishing	634	635	1,215	1,458	1,549	1,946	1,869	1,178	903	694	512	13,977	58.3
Fishing Labour	125	113	120	95	74	79	82	244	239	212	154	166	1,703	7.1
Fish Trading	(160)	126	173	117	122	115	107	119	134	140	95	77	1,165	4.9
Fish Culture	241	63	(24)	(48)	(9)	(2)	(2)	51	0	77	154	299	802	3.3
Gear Making	29	32	36	38	29	34	34	52	60	23	29	28	423	1.8
Farming	101	315	316	248	258	98	103	136	279	136	169	59	2,218	9.3
Agricultural Labour	157	187	91	54	30	17	26	114	166	240	246	219	1,548	6.5
Self Employment	51	63	93	95	96	92	68	78	105	93	78	53	966	4.0
Non-Agric. & FFW	85	89	97	88	104	116	105	105	92	80	105	95	1,161	4.8
Total	1,263	1,624	2,118	2,146	2,253	2,495	2,391	2,286	2,254	1,903	1,723	1,508	23,963	100.0

Note: Data for community were based on the weighted average of all households sampled

Figure 2.11 Income by different household fishing categories in fishing villages, South West



Note: Data in figure include fish culture but these were omitted in tabulated data

in the South West. The seasonal character of the fishery does not support a completely specialised sub-group of professional fishermen, as it does in the other regions. Further fishing here is an activity which all groups feel little hesitation in taking up, when the opportunities arise, whether it be for subsistence or income.

This is reflected in the participation rates of different groups in the fishery, shown in Table 2.17. Though the region has a slightly higher rate (29%) of non-participation than North Central (27%), fishing is important for all. Interestingly, it is the landless that have the highest non-participation rate of all groups (37%) but, of those who do fish, the majority do so for income - the only agricultural village group for which this is true in any region. The greater interest in fishing as a source of income is also shared by both small and medium farmers: in the South West, fishing was ranked as a source of income by 26% and 15% of these groups respectively, compared to 12% and 11% in the North West, the next highest region.

Table 2.17 Fishing participation (%), South West

Category	For Income	Subsistence	Non-fishing
Medium Farmers	15	60	24
Small Farmers	26	48	33
Landless	32	29	37
Village	27	44	29

Source: FAP 17 Census and Supplementary Surveys

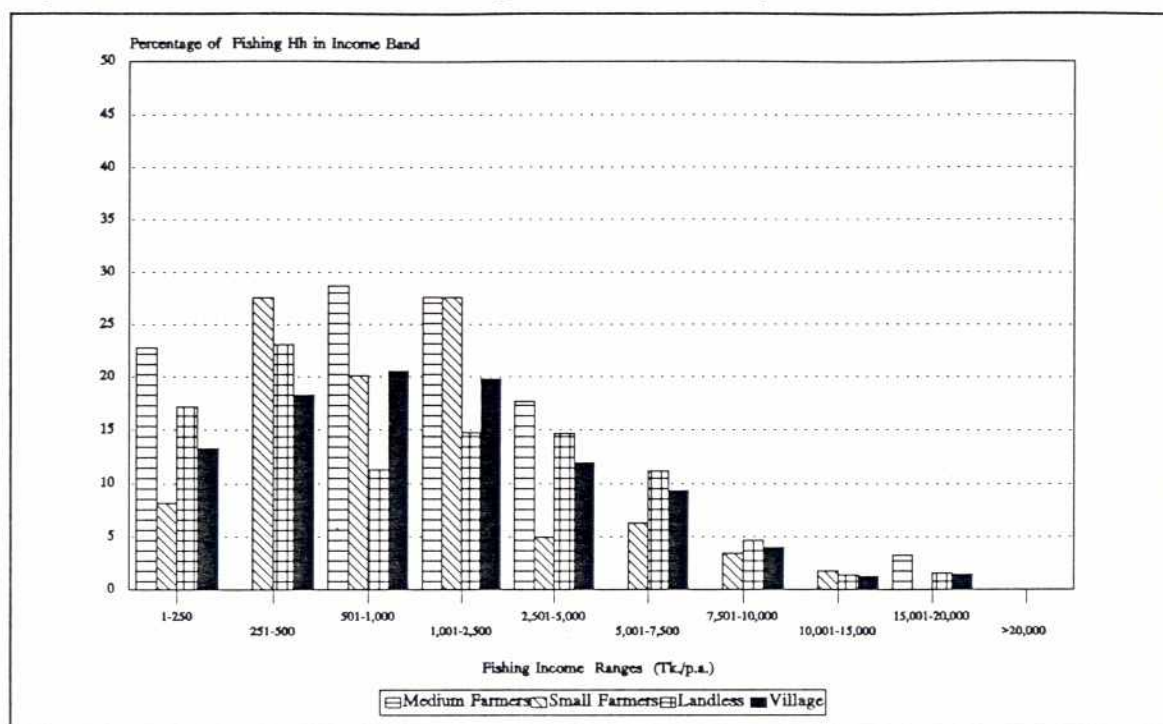
Note: Data for village derived from weighted average of all categories

The distribution of fishing households across income bands is shown in Figure 2.12. The modal range is, again, Tk.500-Tk.1,000 but the distribution is less sharply peaked than in the North West, with a greater proportion of households on either side of the mode. Like the North West, there is a long tail to the distribution, with a significant proportion (28%) of fishing households catching fish worth more than Tk.2,500 per annum.

In the agricultural communities monitored in the South West, the overall participation rate was not as high as in North Central, and the levels of income earned by households that did fish was not as high as for the North West. But the combination of high participation and high incomes, gave villages in the South West the highest dependence on fisheries income.

The overall distribution of income through the year for each landholding category and for the village is given in Table 2.18 and the distribution for the latter is shown in Figure 2.13. Fishing contributes just over 10% of annual income, reaching a peak of over 20% in the

Figure 2.12 Distribution of fishing income for fishing households, South West



Note: Data for village derived from weighted average of all categories

Bangla month of *Ashwin* (mid-August to mid-September). For the landless this seasonal income is even more important, as it represents a little less than a third of the total at this time.

From a wider perspective, one of the more interesting features of this Table is the significance of non-agricultural activities. Agriculture, including livestock and agricultural labour, contributes just under 40% of total village income. Self-employment is almost as important on its own and with non-agricultural labour contributes just under half of annual income. Naturally, what is true for the village is even more true for the landless.

2.4 Conclusions

The limits of any categorisation of the groups involved in floodplain fisheries in Bangladesh have to be recognised. The conditions are too diverse and too variable to permit anything but a very approximate set of groupings which can act as a guide in discussions of the fishing population. But certain characteristics of these groups are of particular importance when discussing the impacts of flood control.

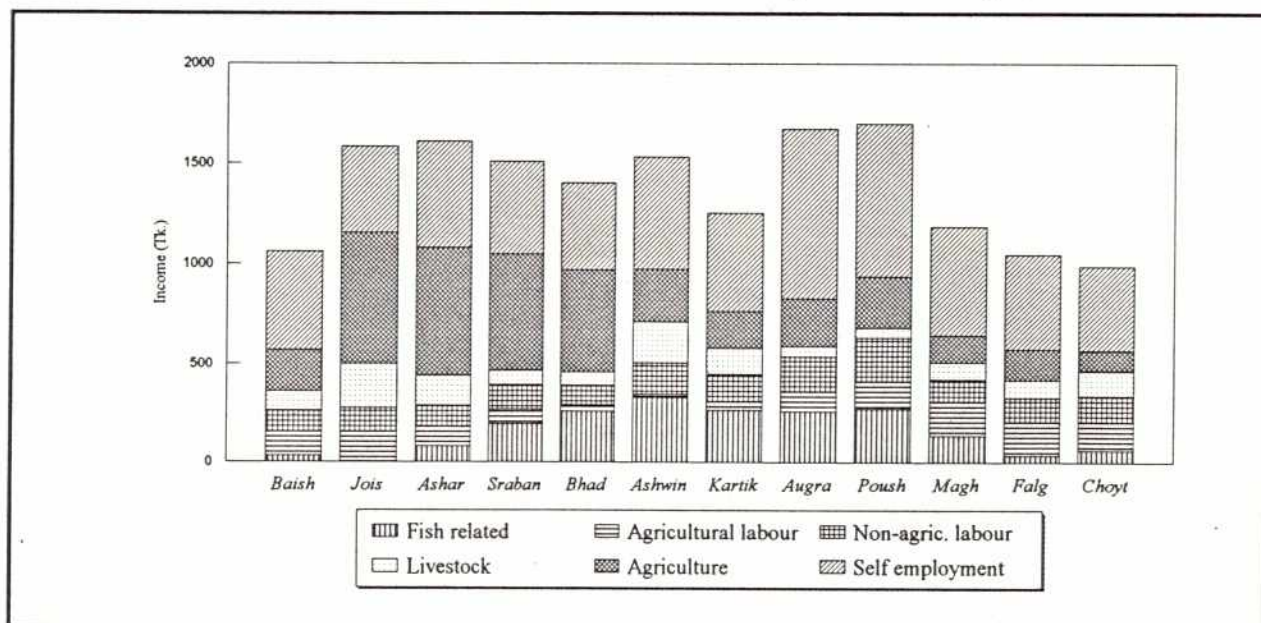
Table 2.18 Sources of income by landholding category in agricultural villages, South West

Units: Tk.

Category	Activity	Baish	Jois	Ashar	Sraban	Bhad	Ashwin	Kartik	Augra	Poush	Magh	Falg	Choyt	Total	%
		Mar/Apr	Apr/May	May/Jun	Jun/Jul	Jul/Aug	Aug/Sep	Sep/Oct	Oct/Nov	Nov/Dec	Dec/Jan	Jan/Feb	Feb/Mar		
Medium Farmers	Fishing	11	13	32	113	164	269	149	204	101	109	28	5	1,195	4.2
	Fish culture	0	(38)	(31)	(2)	0	(38)	(27)	(1)	339	141	49	94	487	1.7
	Agricultural labour	7	0	0	0	0	14	0	1	0	0	0	0	23	0.1
	Non-agric. labour	195	204	225	211	194	180	177	201	205	111	111	204	2,216	7.9
	Small stock	28	32	14	41	17	33	24	37	28	22	41	24	339	1.2
	Large stock	307	297	68	44	30	157	470	33	47	125	263	522	2,361	8.4
	Agriculture	458	1,841	1,422	1,707	1,261	668	761	710	595	432	174	347	10,374	36.8
	Self employment	704	852	1,537	631	642	921	822	1,398	1,069	1,056	851	679	11,161	39.6
	Total (Tk.)	1,710	3,201	3,267	2,745	2,308	2,204	2,376	2,583	2,384	1,996	1,517	1,875	28,156	100.0
	Total (%)	6.1	11.4	11.6	9.7	8.2	7.8	8.4	9.2	8.5	7.1	5.4	6.7	100	
Small Farmers	Fishing	45	11	29	142	229	307	231	148	69	22	18	11	1,259	7.3
	Fish culture	44	(1)	(36)	(36)	(83)	(29)	36	32	130	73	2	93	226	1.3
	Agricultural labour	91	118	55	56	9	8	53	86	98	144	154	110	981	5.7
	Non-agric. labour	115	133	77	104	89	150	116	128	146	102	94	114	1,365	7.9
	Small stock	31	32	45	19	30	25	17	18	20	29	23	26	314	1.8
	Large stock	90	291	156	88	78	425	93	48	52	125	104	103	1,652	9.6
	Agriculture	251	752	978	617	483	263	112	280	372	147	233	69	4,556	26.4
	Self employment	493	388	474	574	554	602	509	1,028	895	518	485	392	6,910	40.0
	Total (Tk.)	1,160	1,724	1,778	1,564	1,389	1,751	1,167	1,768	1,782	1,160	1,113	918	17,263	100
	Total (%)	6.7	10.0	10.3	9.1	8.0	10.1	6.8	10.2	10.3	6.7	6.4	5.3	100	
Landless	Fishing	27	6	132	237	290	332	268	292	151	66	31	12	1,843	14.4
	Fish trading	0	0	0	0	4	7	8	12	43	0	0	0	73	0.6
	Fish culture	0	0	3	0	(2)	(1)	(5)	9	45	6	2	0	57	0.4
	Agricultural labour	162	199	156	111	48	21	58	139	207	230	217	201	1,747	13.6
	Non-agric. labour	54	50	109	127	84	151	148	225	300	118	154	125	1,643	12.8
	Small stock	18	24	8	16	16	13	6	24	9	9	10	12	163	1.3
	Large stock	0	138	168	22	28	12	12	3	5	0	0	0	386	3.0
	Agriculture	45	206	184	181	276	159	68	91	71	2	62	51	1,393	10.9
	Self employment	597	333	347	377	317	453	427	765	675	454	393	396	5,531	43.1
	Total (Tk.)	903	956	1,107	1,071	1,061	1,147	990	1,560	1,506	885	869	797	12,836	100
	Total (%)	7.0	7.4	8.6	8.3	8.3	8.9	7.7	12.2	11.7	6.9	6.8	6.2	100	
Village	Fishing	29	9	90	204	261	344	272	255	128	70	30	11	1,701	10.3
	Fish trading	0	0	0	0	3	4	5	8	11	0	0	0	30	0.2
	Fish culture	4	(6)	(9)	(11)	(5)	(20)	(11)	(5)	132	65	6	51	192	1.2
	Agricultural labour	120	151	97	74	30	17	45	103	141	172	171	144	1,264	7.6
	Non-agric. labour	107	119	108	126	102	161	138	176	222	115	122	132	1,627	9.8
	Small stock	25	29	23	20	22	22	13	24	16	18	19	19	250	1.5
	Large stock	73	198	130	50	45	183	118	27	32	70	70	108	1,104	6.7
	Agriculture	212	657	644	585	516	264	185	244	259	136	157	105	3,961	23.9
	Self employment	492	427	528	460	429	556	490	843	757	543	476	421	6,420	38.8
	Total (Tk.)	1,062	1,584	1,611	1,508	1,403	1,531	1,255	1,675	1,698	1,189	1,051	991	16,549	100
	Total (%)	6.4	9.6	9.7	9.1	8.5	9.3	7.6	10.1	10.3	7.2	6.4	6.0	100	

Note: Data for village derived from weighted average of all categories

Figure 2.13 Seasonal variation in the distribution of income in agricultural villages, South West



1. Of most significance is the clear distinction between the various groups of traditional professional fishermen and the rest of the rural population that in some way makes use of fisheries resources. The fact that the traditional fishers in Bangladesh constitute a distinct social, and often religious, group with clear characteristics in terms of their access to fisheries resources, the technology which they use and the social position which they occupy is of key importance in understanding the way in which the impacts of flood control are distributed.
2. The scale of the shift of many non-traditional fishermen into more-or-less full-time fishing needs to be appreciated. The last 30-40 years has seen the ratio between traditional fishermen and non-traditional but "full-time" fishermen engaged in fishing change radically. Immediately after partition, most fishing was done by traditional fishermen with only a small number of subsistence fishermen exploiting peripheral resources on an opportunistic basis. At present, professional but non-traditional fishermen are at least as numerous and frequently outnumber traditional fishermen on most fishing grounds. The exceptions are areas, such as the leased *jalmahal* on the *haor* in the North East and some parts of the North West, where leaseholders are sufficiently powerful and the resources sufficiently rich to make strict enforcement of access restrictions worthwhile.
3. Control of access is therefore one of the key factors determining who fishes and to what extent in Bangladesh. This is highlighted by the differences in the distribution of catch by value between different groups of fishermen from region to region. These differences are primarily a result of the differences in both the cultural background to fisheries access control and the levels of enforcement of those controls.
4. The numbers and groups of people involved in fishing, particularly in subsistence and seasonal fishing, varies greatly from season to season as the extent of flooding has a important impact on the ease of access to fisheries for non-professionals.

3 FISHERIES ACCESS

If the ubiquity of water and fish in Bangladesh were the principal factors determining the level of fishing activity and dependence on the resource, it would be reasonable to expect a fairly consistent level of fishing effort throughout floodplain areas of the country with variation determined mainly by distance from water bodies and the productivity of individual areas of water. This is clearly not the case. There are distinct variations in fishing activity around the country which are not due to the position or richness of the resource. It is access to the resource and the controls placed on that access which are the principal determinants of fishing activity.

Some historical context to the question of access is required.

3.1 Historical Patterns of Fisheries Access

The ways in which patterns of fisheries access have developed in Bangladesh result from of a combination of cultural factors and the inherent features of floodplain fisheries.

3.1.1 Before partition

Fisheries in the floodplains of Bangladesh were, historically, concentrated on two environments. On the one hand the main rivers where the Hindu caste fishermen have always held sway and access, in the past, appears to have been open or controlled to some extent by the fishing communities themselves under a series of informal arrangements.

On the other hand, the *beel* fisheries generally came under the areas controlled by local *zamindar*. Rights of access to these fisheries on the deepest and most productive parts of the *beel* had to be obtained from the *zamindar* against payment of a usually fairly nominal fee. Often this "tax" took the form of simply presenting some of the finest fish in the catch to the *zamindar*. While this implies a relative low value being attached to the fisheries resource, it is clear that in some places competition for particularly rich fishing grounds was fierce, both between fishing communities and between *zamindar*. What is equally clear, however, is that competition was essentially limited within these two groups: the "landlords" who had nominal control over water bodies and access to them and the fishermen who were usually patronised by a particular *zamindar* on a reasonably stable basis. The numbers of people competing for the resource were therefore limited. Seasonal and subsistence fishermen

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existed but in small numbers and the resource was easily abundant enough to cater for all.

Most areas other than the *beel* seem to have generally been regarded as "open-access" for fisheries as long as they were under water. Some *khal*, or other particularly deep sections of floodplain, or even areas specifically excavated by landowners in the floodplain to concentrate fish (*kua*) may have had various forms of restriction placed on them. But these were generally applied only once the borders of these areas could in some way be distinguished above the floodwaters. Then fishing actually on these privately owned water bodies would be restricted. However, there was a generally accepted, if not officially institutionalised, rule that flooded land was open to all for fishing as long as no boundaries or other means of establishing ownership could be distinguished.

The stability of this system relied very much on this balance. *Beel* fisheries were highly concentrated during the later half of the year from *Kartik* (November-December) through to *Falgun* (February-March) when floodwaters receded and water and fish were concentrated in residual water bodies in the deepest parts of the *beel*. Given the nature of floodplain fisheries, this is clearly the most efficient moment to fish as minimum fishing effort yields maximum returns.

The managers of these water bodies where fish concentrated at the end of the season, whether *zamindar*, fishermen themselves or, as in the *haor* basin of the North East, a separate group of large traditional leaseholders, were clearly aware of this and would concentrate their efforts on maximising the *beel* yield. This did not mean catching as much as possible every year, but selectively fishing in most years, pursuing a precise programme of maintenance and enhancement of the *beel* and harvesting more completely according to a far longer cycle, in some places up to 12 years.

Under conditions of limited fishing effort and long periods of control by individual leaseholders or fishermen, there was clearly some incentive to manage *beel* carefully in this way. Failure to harvest some fish of specific species (particularly the migratory major carps) in a particular year, either through inefficient harvesting methods or foregoing catch by choice, did not necessarily mean loss of that catch. The high-value migratory carps (*ruí*, *mrigel*, *catla* and *kalbaús*) migrate longitudinally up river to spawn and then onto the floodplain to feed and grow. These carp are reported by fishermen to return to the same *beel* and even the same *katha* year-after-year and, as long as there was a good chance of those fish being able to return, leaseholders could afford to wait until they reached their third or

fourth year of growth before harvesting them. This ensured better sustainability, as fish would be given time to breed at least once before being caught, and it optimised the value of the fish as the price per kilogram increases with size.

This functioned well as a sustainable management system as long as fishing effort being applied outside leaseholders' *jalmahal* was relatively limited and leaseholders could be assured of at least three years of control of the *jalmahal*. Under these conditions fish which moved out of the *beel* during the floods to graze on the floodplain stood a reasonably good chance of making it back to the *beel* to be harvested by the leaseholder. Likewise, broodstock returning to rivers to overwinter in the deep scour-pits (*doiar*) in the major rivers would have a reasonable probability of not being caught and returning to the *beel* with the subsequent year's flood.

The extent to which this "system" was intentional should not be exaggerated. Failure to catch fish from one year to the next has far more to do with inefficiency of gear than with the intentions of the leaseholders to sustain the resource. However, longer periods of control by individual owners or groups of fishermen, such as those which predominated prior to the Independence of Bangladesh in 1971, would certainly encourage a level of management which is rare at present.

Better management in the *beel* in the past would have also ensured that there were more fish on the floodplain for those subsistence fishermen, and the very few seasonal fishermen, catching fish there during the floods and the early part of the drawdown.

3.1.2 Partition to independence

With the Partition of India in 1947 and the subsequent changes in land tenure introduced with the Land Settlement Act in 1952, most of the lowland areas and *beel* where these fisheries were concentrated passed from the *zamindari* estates to the State as *khas* land. Much of this *khas* land was subsequently redistributed as part of efforts to alleviate landlessness. But the more productive water bodies were generally kept under State control as *khas jalmahal* to be leased out for fisheries and collect revenue for the State.

These *jalmahal* were generally leased out by auction, a process which generally ignored the traditional patterns of exploitation by particular groups of fishermen which had developed in the past. Clearly, given that many of the Hindu *zamindar*, with whom traditional fishing



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communities had long-standing relationships of reciprocal exchange, had left the country at Partition, security of access to traditional fishing grounds for many of these fishermen was significantly reduced. In practice, more some time to come, many Hindu fishing communities were able to continue as the principal exploiters of "their" water bodies for some time to come and some still today have good access to their traditional water bodies. In addition, lease periods, although shortened, still sometimes respected the need for more long-term management and 3-year leases were not uncommon.

But the stable pattern of secure access for traditional fishermen and long-term management practices was already undermined. With the rapid increase in population during the 1960s and 70s, more and more poor rural people began to fish as a means of livelihood and the fisheries resources which previously had been almost the exclusive preserve of the fishermen began to come under pressure. The disappearance of the old established patterns of tenure brought a new, more heterogeneous group of rural power brokers and large landowners into the market for control of fisheries leases, although frequently they did not have any knowledge or experience of the fishery. While they might continue to hire traditional fishermen for harvesting the *beel*, the concern of these new "waterlords" was more inclined to be towards maximising short-term returns on their investments.

The current leaseholder of the Bordoi-Kastunga Group Fishery in Dekker Haor comes from a family of *maimul* leaseholders who are extremely influential locally and have a long history of control of many of the most important *jalmahal* in the area, going back to the colonial period. Local fishermen say that this leaseholder has a special relationship with the *chata* called *Khoas Khijir*, a spirit said to have power over everything that lives in water. According to *maimul* fishermen, the *chata* will only allow the present leaseholder and his descendents to harvest two of the key *beel* in the *haor*, Kastunga and Rangapoli. Any other leaseholder who attempts to take over the fishery would be doomed to failure. The key to the leaseholder's success is said to be his careful show of respect for the *chata*: he holds a yearly *mela* or festival for the villages around the *haor* in her honour (also reinforcing his standing and popularity in the villages); at the *mela* a bullock is slaughtered and sweets called *shirni* distributed; at other time of the year, no women and nobody wearing shoes are allowed to enter the *beel* itself.

Box 5: Leasholder control and local beliefs in Dekker Haor

In the *haor* region the change seems to have been less traumatic as the existing group of traditional leaseholders who controlled many of the most important fisheries in the *haor* were not immediately displaced but continued to manage the fisheries in much the same way as before. This has much to do with the particular nature of *haor* society and the central role played in it by many of these traditional leaseholders. Box 5 gives an example of the mixture

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of fear and respect which some leaseholders have been able to create around their persons as an additional means of assuring continued control of fisheries.

But even in the *haor*, with time, the increasing interest in control of fisheries and the potential for considerable profits through the leasing of *jalmahal* has started to undermine the old system.

3.1.3 After independence

After the Independence of Bangladesh in 1971, the changes have accelerated. The numbers of seasonal fishermen and non-traditional fishermen turning professional have risen exponentially putting great pressure on the fisheries resource. In this context, the old patterns of fisheries management on *beel* no longer make economic sense. Any fish which a leaseholder or fisherman sub-leasee does not catch one year is extremely unlikely to make it back to the same *beel* during the following flood season and drawdown. In response to the increase in general levels of fishing effort, almost everyone involved ends up “mining” the resource i.e. attempting to extract the maximum short term gain without concern for the long-term consequences for the resource.

Where the resource is sufficiently valuable to justify it, as in the North East Region, this has led to a dramatic increase in the costs of protecting the resource (in order to maximise returns) and the lengths to which people are willing to go in order to protect their “rights” to the fisheries resource. “Rights” in the context of often remote *beel* and *haor* areas, may well be determined more by the level of intimidation which any particular leaseholder or landowner is able to impose on other claimants. Thus powerful leaseholders in the *haor*, who are able to call on sizeable numbers of armed *paharadar* or *beel*-guards, may effectively extend the area where they say no-one can fish without their permission far beyond the area actually covered by their *jalmahal*.

In other areas, where the resource is either less abundant or more difficult to protect, attempts to enforce any sort of control may prove useless and the *beel* may effectively cease to be a *jalmahal* and become an “open-access” fishery with no controls on fishing effort at all. In this sort of situation, it becomes easier for anyone who can establish any sort of claim to the resource. Thus the claims of private landowners to sections of adjacent *khāl* and to the floodwaters covering their land during the summer have proliferated. The excavation of *kua* or submersible ponds in lowland areas has enhanced this process, and the extent of the rights

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to exclusive use of fisheries resources has been expanded: from fish trapped within the boundaries of the landholding or pond to the water above it when it is flooded; from the water immediately above privately-owned land to that immediately around it; from the floodplain surrounding private holdings to the entire catchment adjacent on the grounds that any fish there could end up on privately-owned land at the end of the flood season.

3.2 Changes in Formal Leasing Arrangements

Under the best of circumstances it would be difficult for the institutional arrangements governing fisheries access to keep pace with these changes. But attempts have been made to adapt the system to changing circumstances.

3.2.1 The *jalmahal* system

The changes in the leasing system introduced after Partition, with auctions for government *jalmahal* and leases for fixed periods, were primarily aimed at improving the coverage and efficiency of the mechanisms for revenue collection from government *jalmahal*. The management of the leasing system was entrusted to the Land Revenue Department and, while the government revenue collection system may have benefitted from these changes, they clearly led to the increasing marginalisation of the primary producers, fishermen, from the resource on which they depend.

It was, however, generally recognised that state-owned resources should also be used to redress inherent inequalities in rural areas. An example is the distribution of *khas* land to landless households. Therefore, from Independence in 1971, fishing communities, organised into *samity* or cooperative societies, were given the exclusive opportunity to make the first bid at auctions of *jalmahal*. If they were able to offer at least the base price set by the authorities, they were theoretically entitled to the lease. Only if fishermen were unable to reach this base price at the first auction were other prospective lessees to be given the opportunity to make their own bids. While control of *jalmahal* remained with the Land Revenue Department, the Fisheries Department became more involved in establishing fisheries *samity*.

Certain features built into this revised leasing system have made it practically impossible for it to achieve its overt distributional intentions. Notably, the automatic raising of base lease fees by 25% from one lease period to another has quickly led to fishing communities being

priced out of the market. Only by borrowing increasingly large sums from local *mahajan*, and, in turn, surrendering effective control to the lender, have fishing communities been able to maintain even a nominal title to access rights. In reality, the leaseholders are usually the active movers in the 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 lack of effective sources of institutional credit means that relatively few have been able genuinely to obtain the fishing rights as intended.

The base price system has been subject to widespread abuse. Many important *khas* water bodies, particularly in the *haor* basin where the commercial interests and pressures on the leasing system are particularly strong, have been unleashed for years. This generally means that they are either occupied and treated like private *jalmahal* by local elites, including former leaseholders, or they are left "open" and become the focus for a fishing free-for-all.

The explanations for these anomalies tend to vary according to respondent. According to officials, leaseholders in some areas are forming cartels and preventing any offers being made at the base price set by the government. This either results in the base price being lowered before finally being leased out to a prearranged beneficiary or no lease being issued at all for that year, in which case the leaseholders simply occupy the *beel* in question and reserve the rights of exploitation by a mixture of force and intimidation. According to leaseholders, government officials deliberately delay awarding leases in the hope of inflating the bribes from prospective lessees hoping to sway the decision their way. When leaseholders refuse to satisfy their demands, they refuse to issue a lease at all.

What is certain is that litigation concerning the award of *jalmahal* leases clogs the courts all over the country. Matters are complicated by the involvement of different levels of government administration in the distribution of leases with the result that cases are reported where different leases have been issued to the same water body by different level authorities. In theory, there are set parameters for the size of water bodies handles by different levels of administration. However, the definition of the size of a water body is subject to interpretation in the floodplain environment and the scope for confusion over who is responsible for which water body is ample.

3.2.2 New Fisheries Management Policy (NFMP)

The introduction, in 1986, of the New Fisheries Management Policy (NFMP) or *nitimala* as

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it is commonly called, was intended to address the political and distributional problems inherent in the leasing system. On the limited number of water bodies where it has been introduced, the replacement of a leasing system with a licensing arrangement for "genuine" fishermen has reportedly had a beneficial impact in redirecting the flow of benefits from the fishery towards the primary producers. However, even this new system faces considerable problems, especially where it is applied in the face of the sort of well-entrenched and politically powerful system of lessee control which is found in some areas of the country. Box 6 shows an example from the North East Region where the introduction of the NFMP has made little impact on the *status quo*.

In other locations, where the NFMP has been introduced in coordination with a programme of support for

fishermen through NGOs, the policy has been more successful in redirecting fisheries benefits towards traditional and other full-time fishermen. However, the sustainability of such arrangements without external support remains to be demonstrated. As is often the case in artisanal fisheries the world over, fishermen are often dependent on their "patrons," in the case of Bangladesh, the leaseholders, for considerably more than just access to fisheries. Leaseholders frequently finance the season's fishing activities in advance as they have access to capital which is otherwise simply not available for traditional fishermen. In some areas, the leaseholders take responsibility for a whole series of activities in support of fishing operations such as accommodation in remote parts of lowland areas, food and shelter, support for families and coordination of marketing of catches. Efforts to sever these ties of dependency between fishermen and leaseholders have to take account of these complex

On the Mahasingh River in Sunamganj District, the introduction of the NFMP has had little impact on access arrangements for the river. In theory, a list of "genuine" fishermen from local fishing communities was drawn up by the *Thana* Fisheries Committee, to whom fishing licences were to be directly issued giving them rights to fish with particular types of gear on particular sections of the river. In reality, a representative of the most powerful traditional leaseholder sits on the *Thana* Fisheries Committee and effectively controls the distribution of licences through the committee. Local fishermen are told that they should make their submissions and payments for licences directly to this individual who then says that they are licenced to fish but provides no official documentation. When one fishermen asked about his license, the leaseholder is reported to have answered : "I am your license." These fishermen are, effectively, allowed to fish on the river and it is somewhat ironic that the undermining of the intentions of the new system may actually provide better guarantees of access to local fishermen than if they really were managing it themselves. The local leaseholder is at least able to genuinely limit fishing effort by strict (and often violent) policing. However, some fishing sites, such as for *bel jal* (lift net), on the river are reportedly auctioned off to the highest bidder. The destination of the proceeds of this auction are unclear and some of the rates paid seem to far higher than would be normal under the regulations. The NFMP section of the Mahasingh continues to be managed like a privately-held leaseholding by the former leaseholder.

Box 6: "I am your license"

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relations and provide valid alternatives. Simply changing access arrangements to give preferential access to "genuine fishermen" is not enough.

3.3 Fisheries Access on Different Fisheries Habitats

Currently, different types of fisheries habitat tend to attract different types of leasing arrangements and raise different issues regarding fisheries access.

3.3.1 Main rivers

Fisheries access on the main rivers in Bangladesh is extremely complex. The principal rivers such as the Padma, Jamuna and Meghna are extremely large and attract a great diversity of fishing activity which cannot be dealt with in detail here.

Most of the rivers are subject to formal leasing arrangements. The size of the areas leased tends to mean that single parties or organisations are unlikely to administer fishing activities directly but sub-lease areas to second parties. Most of the major leases on main rivers are at least nominally assigned to fisheries cooperatives. Access to these riverine fisheries is usually in the form of a fixed fee for the operation of a particular gear for a set period.

Policing these riverine *jalmahal* is obviously difficult. Leaseholders on some *jalmahal* on the rivers Padma and Meghna exact tolls from all boats passing through the area leased to them, probably as a substitute for fishing fees given the difficulty in enforcing access limitations.

The NFMP has been introduced on some of the most important fisheries on these main rivers, such as the Padma-Jamuna Barabant at the confluence of these two rivers. While this arrangement has effectively involved "genuine" fishermen from *samity* in Manikganj District, these complain that they have no effective means of enforcing access controls and the fishery has become a "free-for all" where some of the key resources on which the specialised fishermen relied, such as the *pangas*, are being badly depleted by overfishing and failure to observe the closed season. Traditional fishermen obviously feel that they are being penalised most as they still have to pay to gain access to the fishery while the fact that most non-traditional fishermen ignore the leasing arrangements means that they see none of the benefits of a limited-access regime. Further down the river, where major commercial interests are concerned with the fishery, particularly important fish traders from Dhaka, enforcement seems to be better financed and more effective.

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Some of the seasonal fisheries carried out by small craft on the main rivers, notably the *shangla jal* fishery on the Padma, are effectively completely unregulated and open-access. These fisheries attract thousands of people, mostly farmers and labourers, from communities along the banks of the rivers during the period of the annual *ilish* migration upstream.

Peripheral parts of the river, especially in areas where the stream is highly braided, offer numerous opportunities for *ad hoc* access arrangements too spring up. Fishermen frequently come to temporary informal arrangements with the leaders of communities along the banks of the river if they wish to exploit water areas adjacent to their villages,

3.3.2 Secondary rivers

Secondary rivers are more easily controlled. Most are also subject to formal government leasing arrangements which are imposed with a varying degree of rigour.

Originally most *jalmahal* on secondary rivers were directed towards traditional fishing communities. However, they are increasingly being taken over by local *mahajan* who have often previously lent money to fisheries cooperatives so that they can afford the lease fee. As there are more and more "professional" fishermen available to do the actual work of fishing, the need for a particular *mahajan* to always patronise the same fishing community is reduced.

Modalities of leasing and sub-leasing vary according to the physical features of the river. On larger rivers which remain deep year round, fixed fees for gears are generally charged by the leaseholder. Where the river becomes dry during the winter, sections may be leased out in much the same way as *beel* for dewatering and harvesting. Fisheries productivity can vary dramatically from one point to another on the same stretch of river. This offers further possibilities for extracting additional revenue (officially or unofficially) as individual sights for fixed gears such as *veshal* can be auctioned off to the highest bidder.

The dewatering of sections of river traditionally seem to have often taken the form of community fishing events. During these events, large numbers of children and occasional fishermen are involved and leaseholders seem willing to allow them to take smaller fish around the periphery of the area as this also serves a purpose in driving the more valuable larger fish into the nets of the fishermen proper. However, these community fishing events seem to be subject to greater and greater levels of control as the value of all fish catch rises

and they are reportedly becoming rarer.

The placing of *katha* results in an overlay of additional restrictions on fishing. *Katha* are generally charged an access fee much as any other fishing gear. However, where the holders of leases are not in a position to properly enforce restrictions, people owning land on river banks, or even land which has been covered by the river, may claim the right to place *katha* without payment. *Katha* owners may then restrict fishing activity in the area around their *katha* on the grounds that "their fish" might be disturbed or caught.

The increase in *boro* cultivation and the ever-growing demand for irrigation water can seriously affect these smaller secondary rivers which may be reduced to artificially low levels during the dry season by water extraction and encroachment into the river bed in order to plant *boro*. Conflicts between different groups of users are apparently becoming more frequent.

River movement and erosion creates ample room for ambiguity regarding tenurial arrangements and conflicting sets of use rights. Rivers may change course quite radically without the official designation of the *jalmahal* areas being adjusted accordingly. Newly formed *baor*, or ox-bow lakes, can find themselves in a form of administrative limbo where it is not clear whether they are still to be regarded as part of the riverine *jalmahal* or have acquired a new status. Generally, surrounding landowners other powerful figures are quick to establish new rights over any water area whose status is in doubt. Box 7 describes a case in point from the North Central Region.

The Kaliganga River near Ashapur village has a long history of lateral movement which has spelt disaster and poverty for many households from the village. Some households who insisted that they were "medium landowners" were living on borrowed homesteads with only the roof of what had obviously once been a relatively large house as shelter. Most of these households are unwilling to move as they would rather wait for the river to move again and restore their land to them or their descendants. The situation on Ashapur *kul*, a branch of the Kaliganga which is still seasonally attached to the main river but is effectively a *baor* for the rest of the year, is even more complex. Officially the *kul* seems to still be part of the *jalmahal* on the river itself. The local *rajbangshi* fishermen who usually fish the *jalmahal* certainly regard it as such. In practice, however, the only access they have to the rich fisheries on the *kul* is when *katha* owners call them to manage or harvest their *katha*. The sites on the *kul* are either utilised or rented out by a bewildering variety of claimants: people who still have land title to land covered by the *kul*; landowners along the banks, and the union *parishad* chairman who has claimed for the union the right to distribute leases and rent *katha* sites.

Box 7: Whose water is this?

3.3.3 *Khal*

Khal are subject to much the same confusion, in some places, as secondary rivers. Frequently, union-level authorities claim the right to lease out lengths of *khal*, if these are not covered by higher-level arrangements. These seem to be generally recognised, especially where the proceeds of leasing arrangements go towards the upkeep of local institutions such as mosques or *madrassa*.

Where there is no clear authority over a *khal* the most common arrangement seems to be for people owning land along the banks of the *khal* to exact some kind of fee for fishing activity on the *khal*. This applies primarily to large gear and, particularly, to fixed gear such as the *veshal* used by traditional fishermen.

In some cases, landowners may claim actual tenure over *khal* and place their own *katha* there or even excavate *kua* in the *khal*. This practice is becoming more common. In more productive *khal* sections may be leased out to individuals for the placement of barriers and traps to capture fish leaving the floodplains at the time of the drawdown. Parts of the *khal* are then dewatered.

Fishing with smaller gear, such as cast nets (*jhaki jal*), push nets (*thella jal*) and even *current jal* are frequently not subject to any control.

The final dewatering of sections of *khal* seems frequently to take the form of a community fishing event with large numbers of children taking part and little real control. In some seasonal *khal*, *kua* are excavated in order to concentrate further fish during the drawdown.

3.3.4 Floodplains

Access arrangements on floodplains are the most ambiguous area. By tradition, flooded land is open-access as long as it is underwater. However, as soon as boundaries become visible as the floods recede, landowners can begin to exert some control. With greater interest in the exploitation of the fisheries resource, this control is being exerted earlier and earlier in the year and efforts being made to create artificial boundaries.

Two sets of people are able to lay some claim to fisheries resources on the floodplain and regularly attempt to control fisheries access. Leaseholders who have rights to some part of

the floodplain or a *beel* located in the floodplain may restrict fishing not only on their *jalmahal* area but on the floodplain round about, as they regard any fish that could originate from or end up in their *beel* as notionally "theirs." Landowners may claim similar rights over floodplain areas surrounding their landholdings, particularly as they have *kua* or submersible ponds for the concentration of the fisheries resource at the end of the flood season.

In some areas, communities may organise the "harvesting" of areas of floodplain belonging to the community in a more organised fashion. In Hakaluki *Haor* in the North East Region a group of landowners had bounded a large area of floodplain where they owned land in order to entrap the receding floodwaters and harvest the fish more systematically. Fishermen had been hired to do the work, but large numbers of children from the village were involved informally and were able to take home small fish which they had caught.

During the drawdown, as floodwaters recede from the floodplain, particular sites where fish trying to reach deeper water are concentrated are sometimes rented out temporarily by the owners of that particular point.

Fishing with small gear, such as push nets, cast nets and *current jal* is generally tolerated, at least during the period when the floodwaters are high. Fishing using larger gear, however, such as that generally used by professional fishermen, is more likely to be charged some kind of fee by landowners or whoever else feels they can legitimately extort a fee. The extremely vague status of flooded land in terms of use rights leaves plenty of room for *ad hoc* interpretations of the law.

The excavation of *kua* in floodplain areas is increasing and with it the claims of landowners to tenure over fisheries resources.

3.3.5 *Beel*

The discussion of leasing arrangements above has already dealt with the problems of *beel* in some detail. The degree of control exerted over fisheries access on *beel* is very variable and depends to a great extent on who is leasing it. In many cases, where the lessees are traditional fishermen from low-status, and often numerically small, communities, their rights to prevent fishing by others on the *beel* are frequently ignored. It is common, in areas such as the North Central Region or the North West Region to see non-traditional fishermen

operating their *current jal* immediately next to the *katha* placed by traditional fishermen on leased *beel* designated. Traditional fishermen claim that they are generally unable to prevent this. On the other hand, where fishermen are working on behalf of a powerful protector or *mahajan*, fishing restrictions are more likely to be respected.

3.3.6 Other water bodies

Large numbers of other small water bodies of indeterminate status are found in floodplain areas. Many of these are borrow-pits, where earth has been extracted for the raising of homestead mounds or roadways. Where these are naturally flooded during the monsoon, they then become reservoirs for fish. In addition there are many natural depressions which are too small to be regarded as *beel* but which, nevertheless, may retain water for much of the year.

Access arrangements are very variable on these water bodies. Some of the deeper ditches and depressions, which are known to provide rich fisheries, may be leased out by village authorities or assigned to the upkeep of local religious institutions. Others may be left open for fishing by anyone in the community.

However, as interest in control of fisheries resources grows, competition for the establishment of tenure for these water bodies is also growing. The lack of definition regarding access rights for many of these water bodies means that conflicts and confusion are frequent.

Even household borrow-pits have a somewhat ambiguous status regarding fisheries access. Borrow-pits are frequently "owned" by more than one household as the same pit may be used to raise several neighbouring homesteads. These households will frequently dewater the borrow-pit together at the end of the floods and share whatever fish they find in it. During the floods children, and even women, may fish occasionally in these *maital* or *pagar* if they are located near the homestead. In the past, even itinerant fishermen might fish these borrow-pits without any formal permission, although such arrangements are increasingly rare and precarious from the point of view of the fishermen, as illustrated in Box 8.

As fish culture activities become more popular, more and more of these peripheral water bodies are being improved and converted for culture purposes. This is effectively removing from the sphere of open-access a large number of small water bodies which were particularly

important as household fishing sites where children and women could easily have access.

3.3.7 Ponds

The dividing line between ponds and the other water bodies discussed above is somewhat vague. In some areas of the country, the same word is used for *kua*, or submersible fish-pits located in low parts of the floodplains, and ponds excavated specifically for fish culture near homesteads. Ponds here are taken to mean areas specifically intended for the culture of fish and / or the retention of water. Naturally, where fish culture is being undertaken in ponds, fisheries access tends to be limited, although occasional fishing by children may be tolerated even in these circumstances.

During the month of *Poush* (mid-January) researchers met a *malo* fisherman from the neighbouring village of Kutirhat and his 8-year-old son moving from *maital* to *maital* in the homestead area of Jhikutia, casting his *jhaki jal* in each ditch he came to where there was still some water. In one *maital*, after his first cast, he pulled out a large *soal* (snakehead). He was about to head home with his catch when a small boy who had been watching called out to members of the households to whom the *maital* actually belonged. The women in the family came out and demanded an "owner's share" of half the catch. Rather than divide the single fish he had caught, the household head suggested that the fisherman try a few more casts in the *maital* to see if he could come up with anything more which could be shared out more amicably. After a few unsuccessful casts, the women from the owner's household began insisting that they should get the whole of what the fisherman had caught as he had been fishing "without prior permission." By this time, people from households all around were present and joining in the debate, with many standing up for the right of the fisherman to at least part of the catch. But, in the end, tenure rights prevailed and the women took the whole *soal* into their home. As the fisherman and his son left, they lamented that this was a common occurrence and was even happening to them more and more on water bodies which they had legally leased out for fishing.

Box 8: *Maital* fishing in Jhikutia, Manikganj District

Most ponds are privately-owned, although many are subject to multiple ownership. This is particularly the case where homestead borrow-pits have been converted into culturable ponds and all the surrounding homestead owners may have some claim. These ponds are frequently leased out to pond operators either for a fixed fee or a fixed proportion of the product.

Khas ponds are frequently older and larger ponds dating from the *zamindari* period. They often form key fisheries resources for local people. Attempts to convert these to more intensive culture, which almost always involves limiting fishing and giving tenurial rights to a smaller number of people, can meet with resistance where these ponds are commonly used for subsistence fishing. Box 9 describes a case like this.

3.4 Flood Control and Fisheries Access

Where flood control actually has an impact on fisheries, reducing the value of fish resources in *beel* and floodplain areas protected from riverine flooding, changes in access arrangements which are already underway tend to be accelerated. Fishing activity by non-professionals is encouraged and the decline of leased areas tends to open up access to a greater range of fishermen.

The extent to which this more open regime lasts is less clear. The process of landowners establishing property rights over low-lying areas is also accelerated and, as seen above, this is increasingly leading to the establishment of similar claims over the fisheries resource.

In addition, by creating a more controlled environment where the movement of water and fish can at least in theory be regulated, flood control can lead to the concentration of access to fisheries in fewer locations to the detriment of others. This is particularly the case where water access to protected areas is limited to a few key channels. Whoever controls fisheries access to these key channels is in a position to extract a disproportionate quantity of the available benefits from the fisheries and prevent a more general distribution. The case already cited of the Talimnagar sluice gate in the Pabna Irrigation and Rural Development Project is a good example of this.

It can be seen that changes in access inside flood control projects are less likely to be in response to changes in the physical extent or depth of flooding as in response to changes in the value of the resource which is available. Thus the initial decline in the presence of high-value fish leads to the decline in traditional fishermen's viability and thus to their control of the resource. Access generally opens up as a result. As lower-value fish gain value, and competition for all resources increases, more and more non-fishermen move in to establish claims to whatever part of the fisheries resource they can control.

The village of Gopalsen in the South West Region near Kotwalipara has one large *khas* ponds dating back to the *zamindari* period. This has always been used as a fishing site and water source by people in the village as a whole. Not surprisingly, however, with the intensive growth of fish culture in the area, the potential of this water body for fish culture was eventually realised. A local NGO became particularly interested in using the pond as a source of income for some of the landless households with whom they were working. Eventually, they succeeded in obtaining the lease for the pond in the name of one of their groups of landless from a neighbouring village, but when they went to take possession and begin developing it for pond culture, the people of Gopalsen prevented them, claiming that the pond was theirs and should remain that way. At the time of the FAP 17 study, the dispute had not yet been resolved.

Box 9: The *khas* pond in Gopalsen

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This has important implications for attempts to mitigate losses to fisheries, whether caused by flood control directly, or by some of the more generalised changes already discussed. In fact, as discussed in the final chapter, attempts to mitigate fisheries losses can have a more serious impact in fisheries access, particularly for the poor and landless, than flood control itself.

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4 MITIGATION

4.1 Water Management

The principal means envisaged for mitigating against negative impacts of flood control is through improved water management. This is the area which offers the best opportunities for ensuring that the benefits and disbenefits of flood control for fisheries do not fall disproportionately on one group or another.

Most flood control projects are designed above all to benefit agriculture and their operation tends to reflect this priority and ignore the needs of fisheries. Having said this, in areas where farmers are shifting back from *boro* cultivation towards traditional cropping patterns with deep-water rice during the *kharif* season, the needs of farming and fisheries are not seriously in conflict. Farmers with broadcast *aman* planted in low-lying areas inside flood control projects want the flood waters to rise steadily. For fishermen, the important point is that fish have access to the *beel*. The two objectives are complementary.

4.1.1 Conflicts over water management

Problems over water management are more likely to arise where single sluice gates effectively control the water flow for very wide areas. In these cases, the demands of different groups of users of such wide areas are bound to come into conflict. The timing of water access may suit farmers with land on the far side of the *beel* from the sluice gate while farmers nearer to the entrance already have enough water and want the gate closed. Different groups of cultivators inevitably plant and harvest at slightly different times and it may be difficult to satisfy all. With fisheries, the problems are increased. During the dry season, fishermen harvesting *beel* areas ideally wish for a steady decline in water levels. This suits farmers when they are planting *boro* seedlings into the declining shoreline, but later in the season, when *beel* harvesting may be in full-swing, farmers want more water put into the system for irrigation.

Such conflicts of interest are almost inevitable, but they become increasingly difficult to manage the larger the number of users involved and the wider the area covered. While mechanisms frequently exist for regulating such conflicts and trying to satisfy most users most of the time, the realities of rural power structures often do not allow for a very equitable resolution of problems.

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Even without considering the conflicts between agricultural demands and fisheries uses of water, even within the fisheries sector, the way in which water is managed can considerably affect access to the resource. One of the important impacts of flood control on fisheries access can be to concentrate the resource, particularly of migratory fish, into one or two key access points whereas, prior to flood control, the connections between river and *beel* may have been numerous. This means that fishermen controlling access to these key points have a disproportionate degree of control over the fisheries resource for the entire area. For fishermen in areas of the project which are further away from the access points, this may mean that they rarely get to see the more valuable migratory fish as they have mostly been caught well before they reach their fishing grounds.

4.1.2 Possibilities for improved water management

The operation of flood control projects in general can undoubtedly be improved, first and foremost by ensuring greater participation of local people in all phases of their design and construction. The formation of water management committees, no matter how representative, to manage a project in which the people affected have had no say and may not even understand the purpose of, is unlikely to assist in resolving conflicts over water use. Systematic involvement of representatives of all potential user groups at the earliest possible stages in the preparation of flood control projects would enhance understanding of the possibilities of improved water management offered by flood control and increase the effective participation of various groups in eventual management committees.

Participation alone, however, may not ensure that the needs of some particularly poorer, low status groups, are actually taken into consideration by these representative committees. Probably the only areas of the country where flood control structures are operated in response to fisheries needs is where fisheries involves people with the influence, resources and political power to make their requirements known and get them taken into consideration. Almost by definition, this will happen only where fisheries is of major economic benefit and involves a significant proportion of the local population. Thus, in the Manu Irrigation Project in the North East Region the fisheries inside the projects are sufficiently rich, and the leaseholders controlling them sufficiently influential, to ensure that fisheries needs are taken into consideration when the pumped irrigation facilities are operated.

In areas where those involved in fishing professionally are a minority, and the fishery does not attract the same sort of political and economic patronage as it does in the North East,

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considerable support would be required in order to sustain the involvement of fishing interests in water management mechanisms.

4.2 Mitigation for Traditional Fishermen

If there is one group which unequivocally suffers as a result of flood control, it is traditional fishermen. The fisheries which they have normally targeted are those worst affected, and they are frequently the social group in the worst position to deal with such negative changes.

4.2.1 Redirecting fisheries benefits to traditional fishermen

As discussed in the section on fisheries access above, attempts have been made to direct the benefits of fisheries more specifically towards "genuine" fishermen and to protect their status as a specialised community with an intimate knowledge of the fisheries resource, its needs and its potential.

Experience with the New Fisheries Management Policy has shown that, in specific circumstances, it is possible to enhance fishermen's control over fisheries resources and enable them to manage them effectively themselves. Programmes on some of the *baor* of the South West Region, involving both fishing communities, government and NGOs, seem to have successfully laid the basis for management of fisheries by fishermen themselves. However, the success of this has apparently been highly dependent on the sustained support from NGOs and it may be some time before genuinely autonomous management by fishermen is possible. The nature of the *baor* also seems to lay a role in making such efforts feasible; they are relatively narrow, more easily policed and they have clearly defined boundaries. On more ill-defined and variable *beel* in floodplain areas, the difficulties are greater. Similar attempts to turn the management of fisheries in the *haor* over to fishermen have had problems with the dependence of fishermen on leaseholders for far more than just fisheries access, but also for credit, logistical support for fishing operations in the remote *haor* and help with marketing.

4.2.2 Involvement of leaseholders and fish traders

It is probably a mistake, however, to make generalisations about the feasibility of such efforts to put control of fisheries into the hands of the fishing communities themselves. There will always be specific locations where it may be possible to provide the kind of support required.

Even here such efforts would probably be enhanced by involvement of leaseholders and the fisheries-credit/marketing nexus, who tend to be excluded out of hand as they are regarded as exploitative and antagonistic. This may sometimes be the case, but they are generally the actors who make the fisheries system function as such and they play a key role. As the "patrons" of fishermen they are extremely difficult to replace, especially with government services. NGOs can, if their commitment is sufficiently long-term, generally do a better job at substituting some of the vital support services provided by leaseholders and fish traders for fishing.

Particularly where improved fisheries management is the goal, however, leaseholders may be able to play a key role precisely because of the greater economic and social influence which they command and which can be directed towards improving the lot of the fishing community. Although the relations between leaseholders, *mahajan* and fish traders and fishermen are often exploitative, they are also interdependent and the more powerful groups also rely on the skills and knowledge of fishermen. Some basis for cooperation can therefore be found. Without such cooperation, the chances of successful fisheries development in some areas of the country are practically nil.

4.2.3 Retraining of fishermen

Traditional fishing communities represent an age-old tradition of knowledge and experience about the fisheries resource. It is based on an intimate interaction and respect for the natural system which is exemplary. This fund of traditional knowledge and skill, as well as the distinct culture in which it is rooted, is rapidly being depleted. The natural resource on which it is based is being overexploited and the people with whom it resides are driven into poverty or, in many cases, migration.

This said, in the context of acute and widespread poverty found in rural Bangladesh, the opportunities for preserving this culture, maintaining its unique link with the fisheries resource and ensuring the welfare of traditional fishing community are, unfortunately, few. Wherever they exist, they need to be sought out and exploited, but, for many traditional fishing communities, the levels of competition for the resource linked to their minority status and lack of social and political influence mean that their livelihoods based on fisheries may not be sustainable.

In these cases, which are unfortunately widespread, mitigation efforts could well be concentrated on looking for alternative means of livelihood for traditional fishermen. Examples have already been cited in this report of traditional fishing communities who have made the move out of fishing. Frequently this has involved the identification of extremely localised niches in the economy which they have been able to exploit. Sometimes opportunities have been found in activities linked to fisheries, such as fish trading or fish culture. In many cases, one of the principal constraints on fishing households making this shift is lack of access to resources for investment. Targeted credit could resolve this problem.

Although the encouragement of traditional fishermen to leave fisheries is a grave cultural loss, it needs to be accepted that situations will occur, sometimes due to flood control, where persuading fishermen to keep on fishing may entail even greater human losses in the form of poverty and destitution.

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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

<i>barman</i>	NC/NW/ NE/SW	Hindu caste fishermen generally associated with riverine fishing. Very close to <i>MALO</i> with intermarriage. Apparently a "genuine" fishing caste.
<i>jele</i>	NC/NW/ NE/SW	Generic terms for fishermen.
<i>maimul</i>	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.
<i>malo</i>	NC/NW/SW	Hindu caste fishermen very close to <i>BARMAN</i> .
<i>matsya das</i>	NE	Hindu caste fishermen encountered in the <i>HAOR</i> region. Possibly the same as <i>KAIBARTA DAS</i> .
<i>namasudra</i>	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 <i>sudra</i> sub-castes.

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Terms used to describe actors in fish trading system

<i>aratdar</i>	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.
<i>chalani</i>	NC/NW/ NE/SW	People who transport fish from district wholesale markets to higher-level markets. Limited to the carriers.
<i>hat</i>	NC/NW/ NE/SW	Daily or weekly market.
<i>mahajan</i>	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 <i>ARATDAR</i> who are generally moneylenders in their own right.
<i>nikari</i>	NC/NW/ NE/SW	A generic term for fish traders. Occasionally used for Muslims involved in fisheries activities of any kind.
<i>samity</i>	NC/NW/ NE/SW	Association of people grouped together for a common objective or purpose.

Terms used to describe water bodies

<i>baor</i>	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 <i>BEEL</i>).
<i>beel</i>	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, <i>KHAL</i> , even artificial channels). Often refers to flooded areas with no obvious deeper section or depression that used to have perennial areas of water.
<i>chak</i>	NC/NW/ NE/SW	Floodplain; often used for a portion of floodplain. Tends to be used for floodplains with fairly clearly defined boundaries.

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<i>gari</i>	NW	Used for a range of water bodies in <i>BEEL</i> areas, especially Chalan <i>BEEL</i> . Normally refers to small rivers and <i>KHAL</i> . Also sometimes used for artificial ditches and borrow pits.
<i>haor</i>	NC/NW/ NE/SW	Depression on the floodplain located between two or more rivers, which functions as a small internal drainage basin.
<i>jalmahal</i>	NC/NW/ NE/SW	A "water estate," now referring to any area of <i>khas</i> water body controlled by the government and normally leased out for fisheries.
<i>katha</i>	NC/NW/ NE/SW	Cut branches of trees submerged in <i>BEEL</i> to attract fish.
<i>khal</i>	NC/NW/ NE/SW	Artificial or natural channel, small river or canal.
<i>kua</i>	NC/NW/SW	Artificial fish pit excavated in the floodplain or <i>BEEL</i> . Deeper than a <i>DANGA</i> . In the South West Region, sometimes used for borrow pits near homesteads or roads.
<i>maital</i>	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 <i>BEEL</i> and floodplain.
<i>rak</i>	NC/SW	Same or similar to <i>BAOR</i> . Dead river or oxbow lake. Most <i>kul</i> appear to be connected with the parent river at one end, but it is unclear whether this is a defining feature.
<i>pushkunni</i>	NC/SW	Artificial pond, usually of fairly regular shape and near a homestead. In South West, also widely used for artificial, submersible ponds (<i>KUA</i>) excavated in <i>BEEL</i> or floodplain.

Terms used to describe administrative divisions and human settlements

<i>abadi</i>	NE	The settlers in <i>HAOR</i> areas who have come from outside districts within the last one or two generations.
<i>khas</i>	NC/NW/ NE/SW	Government owned land.
<i>mauza</i>	NC/NW/ NE/SW	The smallest recognised administrative unit. It not the same as a village. Some <i>mauza</i> in the <i>HAOR</i> area have no villages in them at all although a <i>mauza</i> can cover anything from a single village or hamlet to 12 or more villages.

<i>nitimala</i>	NC/NW/ NE/SW	Policy.
<i>para</i>	NC/NW/ NE/SW	Usually a subdivision of a village, or <i>gram</i> . Sometimes constitutes a village or hamlet in its own right. Fishing communities frequently live in their own <i>para</i> , often referred to as the <i>JELE para</i> .
<i>thana</i>	NC/NW/	Equivalent of a sub-district or county. Groups together between 10 and 20 UNIONS. Seat of the <i>thana nirbahi</i> committee, which plays an important role in allocating fisheries leases and, under the NFMP, in the identification and licensing of fishermen.
<i>union</i>	NC/NW/ NE/SW	The lowest level of government administration. Usually groups together anything between five and 30 <i>MAUZA</i> . Important for fisheries as it is the lowest level at which <i>khas</i> land and water bodies can be administered.
<i>zamindari</i>	NC/NW/ NE/SW	Estate/landed property.



